JAWAHAR HIGHER SECONDARY SCHOOL, CBSE – NEYVELI II FULL PORTION EXAM (2022 – 2023) ENGLISH (CODE – I) T

MARKS: 80 TIME: 3Hrs

General instructions:

i) This paper is divided into three sections, section A, B and C.

ii. All the sections are compulsory.

iii) Read the instructions given with each section and question wherever necessary

iv) Read these instructions carefully

SECTION – A (Reading)

1. Read the passage given below:

Donated Organs and their Transportation

1. Once an organ donor's family gives its consent and the organs are matched to a recipient, medical professionals are faced with the onerous challenge of transporting organs while ensuring that the harvested organ reaches its destination in the shortest possible time. This is done in order to preserve the harvested organs which involves the police especially the traffic police department.

2. The traditional method of transporting organs by road is referred to as a 'green corridor'. The first green corridor in India was created by Chennai Traffic Police in September 2008 when they accomplished their task of enabling an ambulance to reach its destination within 11 minutes during peak hour traffic. That organ saved a nine-year- old girl whose life depended on the transplant. Similarly, such given corridors have been created by traffic police of various cities such as Pune, Mumbai, Delhi etc.

3. Experts point out the lack of a robust system to transport organs to super- speciality hospitals in least possible time National Organ and Tissue Transplant Organization (NOTTO), the country's apex organ donation agency, is now framing a proposal to airlift cadaver organs and will send a report to the Union Health Ministry. "Cadaver organs have a short life and so transplant should be done within a few golden hours." Director (NOTTO) expressed, "Therefore, we are preparing a proposal for airlifting organs at any given moment."

4. Most states do not have well trained experts to retrieve or perform transplant procedures. Also, there is an acute shortage of advanced healthcare facilities to carry out a transplant. So, it is referred to other big centres in metropolitan citics. Organs retrieved from Aurangabad, Indore, Surat and Pune are sent to Mumbai as these cities do not have super- speciality healthcare centres, informed officials.

5. In India about fifty thousand to one lakh patients are suffering from acute heart failure and need heart transplant at any point of time. In a private set-up, a heart transplant costs 15-20 lakhs, which is followed up by post-operative medication of about Rs. 30000 per month lifelong. Moreover, the risk factor is a great hindrance.

Based on your understanding of the above passage, answer any ten of the questions given below by
choosing the most appropriate option:(10x1=10)

i) The first green corridor in India was created in:

- a) New Delhi b) Chennai c) Mumbai d) Pune
- ii) The organization which is framing a proposal to airlift cadaver organs is
 - a) Union Health Ministry
 - b) Regional Organ and Tissue Transplant Organization
 - c) National Organ and Tissue Transplant Organization
 - d) State Organ and Tissue Transplant Organization
- iii) The onerous task that the author is talking about in paragraph 1 is:
 - a) finding organ donors.
 - b) finding doctors capable of performing transplants.
 - c) to carry the harvested organ in the shortest possible time.
 - d) to arrange the requisite facilities for the transplant.
- iv) Most of the people do not go for the heart transplant as
 - a) it is cheap c) it may cause slight discomfort.
- b) it is very painful.
- d) the cost is prohibitive.
- v) Most states refer organ transplant cases to big hospitals because:
 - a) they don't have well trained experts. b) the patients don't trust local doctors.
 - c) the state hospitals are very crowded d) they don't have a proof of harvested organs
- vi) Organ retrieved from a body, saved a child of _____years.
- a) two b) three c) eight d) nine
- vii) Apart from Chennai, where were other green corridors created?
- a) Delhi & Pune b) Pune & Mumbai c) Mumbai & Delhi d) Delhi, Pune & Mumbai viii) How much does a heart transplant cost a patient in a private hospital?
- a) Rs. 15-20 lakhs b) Rs 20 lakhs c) Rs. 20-25 lakhs d) 40-45 lakhs ix) Pick out the word/phrase from the passage which is similar in meaning to 'save' in paragraph 1.
- a) onerous b) preserve c) harvest d) consent
- x) Pick out the word / phrase from the passage which is opposite in meaning to 'destructed' in paragraph 2.
 a) enabled
 b) created
 c) transplanted
 d) accomplished
- xi) What is meant by the word 'cadaver' in paragraph 3. a) carcass b) corpse c) carrion
- d) carnage

2. Read the passage given below:

1. Royal Bengal Tiger is the largest, fiercest, and powerful member of the Big Cat family in India. Royal Bengal Tigers, also known as Indian Tiger and Bengal Tiger constitute a large population of the tiger family in the world. It is the national animal of India and is found mostly in India, China, Bhutan, Bangladesh and Burma

2. The biological name of this Big Cat is Panthera Tigris, which comes under the Felidae family under Mammalia category.

3. No two Bengal tigers look alike! Every Bengal Tiger has a unique stripe pattern. A tiger's colour ranges from yellow to light orange, with stripes from dark brown to black. Some of the Bengal tigers are white in colour. The tail is orange in colour with black rings. Unlike the other white tigers that have blue eyes, Bengal Tigers have yellow irises. They live for 10 to 15 years.

4. Being fierce in nature, Royal Bengal Tigers are not much friendly in nature and live a solitary life, except in winters when they can be seen in group of 3 or 4. Bengal Tigers are fast runners and good swimmers. Tigers attack their prey in a stealth mode. They are usually spotted in swamps, mangroves and grasslands.

5. Royal Bengal Tigers have very sharp memories; they never forget faces. Their memory is sharper than humans and other animals.

6. We can find the largest number of Royal Bengal Tigers in India, As per the latest tiger censes report 2017, there are 3786 Royal Bengal Tigers in India. India has more than 75% of the total tiger population in the world. Along with India, neighbouring countries to India holds a somewhat decent population of Royal Bengal Tiger in the world. The latest census of the tigers in India and neighbouring countries are shown in the table.

S.No	Name of the country	Minimum	Maximum
1	Bangladesh	300	460
2	Bhutan	80	460
3	China	30	35
4	India	2500	3800
5	Nepal	150	250

7. To know about the latest tiger population is always government's concern, as they want to save this majestic animal from getting extinct. India has lost 97% of its Royal Bengal Tiger population in the last century. The main reason is hunting, poaching. urbanization, habitat loss and illegal wild life trade. Poaching means to illegally trade the tiger made products like tiger skin, tiger made jewellery, etc. These skin and jewellery are sold for millions in the international market. Poaching has reduced the number of tigers to just 3,800 from 1,00,000 in the starting of the 20th century.



SECTION - B - Creative Writing Skills - 20 Marks

You are Secretary of the History Club of Vidya Mandir School, Bokaro. Draft a notice in not more than 50 words informing students of a proposed visit to some important historical sites in your city. (5)
 OR

You are Srinivas / Srinidhi of D.P. Public School, Nagpur. As Student Editor of your school magazine, draft a notice in not more than 50 words for your school notice board inviting articles and sketches from students of all classes.

 ii. You are Dhruv / Deepa. Your father, Shri. Dheeraj Sharma of Gurgram wants you to draft an invitation to be sent to friends and relatives on the occasion of your elder sister's marriage. Prepare the invitation giving necessary details in not more than 50 words.

OR

Your friend, P.V. Sathish, has invited you to attend the wedding of his brother, Jayan. You find that you have an important paper of pre-board exam on the day of the wedding. Thus, you cannot attend the event. Write in about 50 words a formal reply to the invitation expressing your regret. You are Ravinder / Reena of class XII M-10, Fort Road, Triplicane, Chennai.

 iii. You have read an advertisement in the newspaper for the post of a Software Engineer in Wipro Systems. You believe that you have the requisite qualifications and experience. Write an application in 120-150 words for the post, emphasizing your strong points. Also write your resume. You are Saurav / Shika of 10, Mall Road, Chandigarh.

OR

Write a letter in 120-150 words, to the Editor of a national newspaper on how we can improve the living conditions in the slums. You are Karan/Karina, 25 Strahans Road, New Delhi.

iv. Our performance in the Tokyo Olympics has told us that we do not pay enough attention to athletics and outdoor games. It is time we revised our attitude, Sports should be an important part of school's daily routine. Write an article in 120-150 words on 'Importance of Outdoor Games'. You are Sreeja / Thomas. (5) OR

Due to heavy rainfall, the river near your town started overflowing its banks. As a result, your town was flooded. It led to a great loss of life and property. Many N.G.Os came forward to help the people with food, shelter and medicines. Write a report in 120-150 words for a local newspaper on the tragedy and rescue efforts. You are Raghav / Ritika.

SECTION - C- LITERATURE- 40 Marks

4.i) Read the following extract and choose the most appropriate option for each question. (6x1=6)A) Aunt Jennifer's finger fluttering through her wool

- Find even the ivory needle hard to pull. The massive weight of Uncle's wedding band Sits heavily upon Aunt Jennifer's hand.
- 1. Why are Aunt Jennifer's fingers fluttering? It is because
 - a) she can't sit still b) she has grown weak with age
 - c) she is nervous and insecure d) both (b) $\overset{\circ}{\&}$ (c)
- 2. Why is the aunt finding even an ivory needle hard to pull?
 - a) because her fingers are shaking.
 - b) because she had a nervous breakdown.
 - c) because of the massive weight of her marriage ring.
 - d) because she had forgotten the art of embroidery.
- 3. What does the uncle's character reflect in the poem?
 - a) Male chauvinism and patriarchy
 - b) A man's physical strength.d) A male's view of the world.
- c) Male ego.4. For Aunt Jennifer, what do the tigers symbolize?a) freedom & cowardice b) indifference
- c) negligence

d) freedom & strength

- 5. What is Aunt Jennifer's mood in the above lines?
 - a) Aunt Jennifer is in a state of anxiety and nervousness.
 - b) Aunt Jennifer is in a state of extreme happiness.
 - c) Aunt Jennifer is in a state of self-contentment.
 - d) Aunt Jennifer is in a state of bliss.
- 6. Why was the weight of Uncle's wedding band 'massive"?
 - a) Uncle has given her a heavy gold wedding band.
 - b) Uncle's wedding band was a beautiful weight to carry.
 - c) Heavy wedding bands were common in those days.
 - d) The marriage weighed Aunt Jennifer down.

OR

B. Life is what it is about;

I want no truck with death.

If we were not so single-minded about keeping our lives moving.

and for once could do nothing.

- perhaps a huge silence
- might interrupt this sadness
- of never understanding ourselves
- and of threatening ourselves with death.

1.	What does the poet mean by 'I want no truck with death?
	a. He wants to race with a truck b. He wants to drive a truck
	c. He wants to run over the dead d. He wants no association with death.
2.	Why are humans upset?
	a. due to their money b. due to their property
	c. due to their misdeeds d. due to their hard work
3.	What are humans afraid of according to the poet?
	a. life b. death c. truck d. fishermen
4.	Who has been referred to as 'single-minded"?
	a. animals b. trees c. humans d. fish
5.	What according to the poet makes people sad?
	a. because they are not single-minded b. because they have not understood themselves
	c. because they don't like to be advised d. because they all speak in different languages
6.	What should interrupt the sadness lurking around humans according to the poet?
	a. money b. wealth c. silence d. selfishness
	-
4.	ii) Read the following extract and answer the following questions: (4x14=4)
ŀ	 Derry : I just wanted to come in. Into the garden.
	Mr. Lamb : So you did. Here we are, then.
	Derry : You don't know who I am.
	Mr. Lamb : A boy. Thirteen or so.
	Derry : Fourteen. (Pause) But I've got to go now. Good bye.
	Mr. Lamb: Nothing to be afraid of. Just a garden. Just me.
	Derry : But I'm not I'm not afraid. (Pause) People are afraid of me.
1.	Who was Derry?
	(a) A disappointed boy who didn't want to live
	(b) A disabled boy who was not loved by anyone
	(c) A frustrated boy who had lost hope in life
	(d) A boy with burnt face having negative attitude towards life
2.	Which character trait of Derry's matches the words 'People are afraid of me
	(a) arrogance (b) courage (c) illusion (d) inferiority complex
3.	Why were people afraid of Derry?
	(a) because of his burnt face. (b) because of his lame leg
	(c) because he was an introvert. (d) because he had an outgoing personality
4.	Why did Mr. Lamb used to spend much of his time in the garden?
	(a) because he kept himself busy in attending to his trees, crab apples, listening to the buzzing of the
	bees and reading books in his garden.
	(b) because he liked his garden very much.
	(c) because he didn't want anyone to enter his garden.
	(d) because his house was too small.
	OR
B	I was walking home from school one day, an old bag hanging from my shoulder. It was actually possible to
	walk the distance in ten minutes. But usually it would take me thirty minutes at the very least to reach
	home. It would take me from half an hour to an hour to dawdle along, watching all the fun and games that
	were going on, all the entertaining novelties and oddities is the streets, the shops and the bazaar.
1.	Who is 'l' in the above lines?
_	(a) Zitkala-Sa (b) Bama (c) Gertrude Simmons (d) Native American Woman
2.	How long would it take Bama to reach home?
~	(a) thirty minutes (b) ten minutes (c) twenty minute (d) forty minutes
3.	(a) new and strengther (b) strengthered and oddities?
4	(a) new and strange (b) strange and new (c) new (d) strange
4.	(a) Class Was Dama studying IT?
/ \	(a) Class II (b) Class III (c) Class IV (u) Class V iii) Poad the following extract and choose the most appropriate option for each question (6x1-6)
4) ^	In read the following extract and choose the most appropriate option for each question. (0x1-6)
А. Ц	T statted for school very late that morning and was in great dread of a scoluling, especially because w.
m	ament I thought of running away and spending the day out of doors. It was so warm, so bright The birds
111	or chiming at the edge of the woods, and in the energy field back of the sowmill the Drussian coldiers were
dr	ling
1	The author of "The Last Lesson' was a povelist and short story writer
۰.	a Spanish b German c French d Austrian
	a. Opanish b. German c. Frenen d. Adstrian
2	Franz was late and wanted to skin going to school as he dreaded
۷.	a beating from M. Hamel b scolding from the teacher
	c taunts from his classmates d scolding from parents
3	What would have M. Hamel questioned Franz about?
5.	a adjectives b writing skills c the previous days' activities d participles
4	Which of the outdoor activities were tempting Franz more than attending school that day?
••	a chirping of the birds b the drill practice by Russian soldiers
	c, both (a) and (b) d. children plaving outside
5	Who was Mr Hamel?
	a. Principal b. French teacher c. Village Sarpanch d. Franz's father

6. What did Franz think for a moment?

- a. teaching a lesson to his teacher
- c. bunking the class
- b. pranking M. Hamel
- d. joining the Civil movement

b. because they were united.

OR

B. On Saturday they made their weekly pilgrimage to watch United Sophie and her father and little Derek went down near the goal - Geoff, as always, went with his mates higher up. United won two-nil and Casey drove in the second goal, a blend of innocence and Irish genius, going round the two big defenders on the edge of the penalty area, with her father screaming for him to pass, and beating the hesitant goalkeeper from a dozen yards. Sophie glowed with pride. Afterwards Geoff was ecstatic. "I wish he was an Englishman," someone said on the bus. "Ireland'll win the World Cup," little Derek told his mother when Sophie brought him home. Her father was gone to the pub to celebrate.

1. Sophie's family's visit to watch United' was a 'pilgrimage' because

- a. Football lovers always watch the game with great devotion
- b. Sophie's family used to meet football players after the match
- c. Sophie's family occasionally watched the football match
- d. It was a weekly ritual of Sophie's family to watch the football match
- 2. 'Sophie glowed with pride. This means that Sophie
 - a. was full of adulation for the game.
 - b. had fantasized about their association
 - c. was proud of Danny Casey witnessing the crowd's adulation.
 - d. had interest in Danny Casey
- 3. 'I wish he was an Englishman. This indicates Sophie's
 - a. hope for Danny Casey. b. doubt about the footballer's race
 - d. joy.
- c. surprise 4. "Ireland 'll win the world cup. This implies that Sophic thinks
 - . a. Danny Casey's team will win the world cup b. Danny belongs to Ireland
 - c. Casey belongs to England d. champion Danny cannot win the world cup.
- 5. How did their favourite team win the match?
 - a. because they dribbled the ball well.
 - c. they planned well
- d. because of the goal made by Casey. 6. When do Sophic and her family go to watch the football match?
- a. Sunday morning b. Sunday evening d. Saturday c. Sunday afternoon

5. Answer any five questions in about 40-50 words.

- a. What sort of TV programs does Umberto Eco watch after dinner and why?
- b. Why does Jansic discourage Sophie from dreaming?
- C How does the writer describe the make-up room of the Gemini Studios?
- d. What made the Lieutenant Governor drop the case against Gandhiji?
- e. Why do you think Aunt Jennifer created animals that are so different from her own character? What might the poet be suggesting through this difference?
- f. Why do the people who run the roadside stand wait for the squeal of brakes so eagerly?

6. Answer any two questions in 40-50 words.

- a) Who was Annan? How did he justify the strange behaviour of the elder?
- b) How did Mr. Lamb keep himself open to everyone?
- c) Who was Sadao? Where was his house situated?

7. Answer any one question in 120-150 words.

- (1x5=5) a) Through the poem, "A Roadside Stand", Robert Frost underlines his sympathy for the rural people in opposition to the uncaring and pitiless rich urban elite. Justify
- b) Asokamitran has used humour and satire effectively in 'Poets and Pancakes'. Discuss

8. Answer any one question in 120-150 words.

- a. Marginalized sections are plagued by inequality. Bring out the truth of the statement with reference to the chapter, Memories of Childhood.
- b) The author, Tishani Doshi, calls her two-week stay in Antarctica, 'a chilling prospect'. How far do you think is she justified? What other features of the Antarctic environment are highlighted?

(1x5=5)

(2x2=4)

(5x2=10)

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2. The biological name of this Big Cat is Panthera Tigris, which comes under the Felidae family under Mammalia category.

3. No two Bengal tigers look alike! Every Bengal Tiger has a unique stripe pattern. A tiger's colour ranges from yellow to light orange, with stripes from dark brown to black. Some of the Bengal tigers are white in colour. The tail is orange in colour with black rings. Unlike the other white tigers that have blue eyes, Bengal Tigers have yellow irises. They live for 10 to 15 years.

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7. To know about the latest tiger population is always government's concern, as they want to save this majestic animal from getting extinct. India has lost 97% of its Royal Bengal Tiger population in the last century. The main reason is hunting, poaching. urbanization, habitat loss and illegal wild life trade. Poaching means to illegally trade the tiger made products like tiger skin, tiger made jewellery, etc. These skin and jewellery are sold for millions in the international market. Poaching has reduced the number of tigers to just 3,800 from 1,00,000 in the starting of the 20th century.

Based on your understanding of the	<u>e above passage, ans</u>	<u>swer any ten of th</u>	<u>e questions given below by</u>
choosing the most appropriate optic	on:		(10x1=10)
i) Which of these is the other name	for Royal Bengal Tig	er?	
a) Chinese tiger b) Ne	palese Tiger c) In	dian Tiger	d) Burmese Tiger
ii) In which of these neighbouring co	ountries of India, the I	Royal Bengal Tig	er is not found?
a) China b) Banglades	sh c) Bhutan	d) Sri Lanka	
iii) The biological name of Bengal Ti	iger is Panthera	-	
a) Tiger b) Tigress	c) Tigris	d) Tigers	
iv) The stripes of the Bengal Tiger a	are of <u>colour</u>		
a) yellow b) light orang	e c) white	d) dark brown	
v) Pick out the characteristic(s) of B	engal Tigers. They _		
a) are slow runners	b) do not attack ste	althily	
c) are poor swimmers	d) run fast, attack s	tealthily & are go	od swimmers.
vi) The largest population of Bengal	Tigers is found in		
a) India b) China	c) Nepal d) Ba	angladesh	
vii) When was the last survey of tige	ers conducted accord	ing to the passag	je?
a) 2010 b) 2017	c) 2019 d) 20)20	
viii) The number of tigers in	ranges from 80 to 4	60.	
a) Bangladesh b) Bhu	utan c) China	d) Nepal	

ix) From the pictorial representation, choose the option that correctly states the approximate percentage of

total tigers in the world which are found in India?



- d) Bangladesh and India
- c) China and Nepal xi) Pick out the option that correctly states the reason for reduction in the population of the tigers: c) climatic changes d) soil erosion a) poaching b) epidemic
- 1. Read the passage given below:
 - Donated Organs and their Transportation

1. Once an organ donor's family gives its consent and the organs are matched to a recipient, medical professionals are faced with the onerous challenge of transporting organs while ensuring that the harvested organ reaches its destination in the shortest possible time. This is done in order to preserve the harvested organs which involves the police especially the traffic police department.

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3. Experts point out the lack of a robust system to transport organs to super- speciality hospitals in least possible time National Organ and Tissue Transplant Organization (NOTTO), the country's apex organ donation agency, is now framing a proposal to airlift cadaver organs and will send a report to the Union Health Ministry. "Cadaver organs have a short life and so transplant should be done within a few golden hours." Director (NOTTO) expressed, "Therefore, we are preparing a proposal for airlifting organs at any given moment.'

4. Most states do not have well trained experts to retrieve or perform transplant procedures. Also, there is an acute shortage of advanced healthcare facilities to carry out a transplant. So, it is referred to other big centres in metropolitan citics. Organs retrieved from Aurangabad, Indore, Surat and Pune are sent to Mumbai as these cities do not have super- speciality healthcare centres, informed officials.

5. In India about fifty thousand to one lakh patients are suffering from acute heart failure and need heart transplant at any point of time. In a private set-up, a heart transplant costs 15-20 lakhs, which is followed up by post-operative medication of about Rs. 30000 per month lifelong. Moreover, the risk factor is a great hindrance.

Based on your understanding of the above passage	<u>, answer any ten of the questions given below by</u>
choosing the most appropriate option:	(10x1=10)
i) The first green corridor in India was created in:	
a) New Delhi b) Chennai c) Mun	nbai d) Pune
ii) The organization which is framing a proposal to a	rlift cadaver organs is
a) Union Health Ministry	
b) Regional Organ and Tissue Transplant Or	ganization
c) National Organ and Tissue Transplant Org	ganization
d) State Organ and Tissue Transplant Organ	ization
iii) The onerous task that the author is talking about	in paragraph 1 is:
a) finding organ donors.	
 b) finding doctors capable of performing tran 	splants.
c) to carry the harvested organ in the shortes	st possible time.
d) to arrange the requisite facilities for the tra	insplant.
iv) Most of the people do not go for the heart transpl	ant as
a) it is cheap	b) it is very painful.
c) it may cause slight discomfort.	d) the cost is prohibitive.
v) Most states refer organ transplant cases to big ho	spitals because:
 a) they don't have well trained experts. 	b) the patients don't trust local doctors.
c) the state hospitals are very crowded	d) they don't have a proof of harvested organs
vi) Organ retrieved from a body, saved a child of	years.
a) two b) three c) eight	d) nine
vii) Apart from Chennai, where were other green co	ridors created?
a) Delhi & Pune b) Pune & Mumbai	c) Mumbai & Delhi d) Delhi, Pune & Mumbai
viii) How much does a heart transplant cost a patien	t in a private hospital?
a) Rs 20 lakhs b) Rs. 15-20 lakhs	c) Rs. 20-25 lakhs d) 40-45 lakhs
ix) Pick out the word/phrase from the passage which	n is similar in meaning to 'save ' in paragraph 1.
a) onerous b) preserve c) harvest	d) consent
x) Pick out the word / phrase from the passage which	h is opposite in meaning to 'destructed' in paragraph 2.
a) enabled b) created c) transplanted	d) accomplished

a) carcass b) corpse c) carrion

SECTION - B- Creative Writing Skills

Marks

3. i) As Principal of Sardar Patel Vidyalaya, Lucknow, draft a notice in not more than 50 words informing students of the change in school timings with effect from the 1st of February, 2023. State valid reasons for the change.

d) carnage

OR

As Sports Secretary of G.D.G. Public School, Pune, draft notice in not more than 50 words for your school notice board informing the students about the sale of old sports goods of your school. You are Rohini / Rohit.

 ii) You are the Principal of Zodiac Senior Secondary School, Ooty. The school has completed 25 years of its meritorious services to the society. The Silver Jubilee Celebrations are to be held on Sunday, the 27th January, 2023. Mrs. M. Kamath, the founder Principal will preside. Draft a suitable invitation in about 50 words to be sent to important dignitaries of the city and the parents of students.

OR

Draft a formal reply in about 50 words accepting an invitation to be present on the occasion of the wedding of Ankush S/o Mr. & Mrs. Shankar of 24, Green Park Road, Kanpur. You are Vikram Gaur of Raja Ki Mandi, Agra.

iii) You are Anand/Arti of 14, Moel Town, Delhi. You have seen an advertisement in "The Hindu' for the post of Head Chef in a 5-Star Hotel. Apply for the job with complete biodata. Write in 120-150 words. OR

Write a letter to the Editor of National Herald, New Delhi about water scarcity in your locality suggesting ways to improve the position of water supply in 120-150 words. You are Ramnath/ Reema of 25. Mellows Road, Ghaziabad

 iv) India is standing at the threshold of joining the developed nations but that is not possible till we achieve complete literacy in the, country. The contribution of students may be very significant in achieving our goals. Write an article in 120-150 words on 'The Role of the Students in Removing Illiteracy'. You are Sreeja / Thomas.

OR

You are Ramesh / Rani, Sports Secretary, Government Senior Secondary School, Chandigarh. Last Monday an Inter-school Twenty-Twenty Cricket match was played on your school ground. Write a report in 120-150words for a local newspaper on the match. You are Ramesh/Ridhi.

SECTION - C- LITERATURE- 40 Marks

- 4. i) Read the following extract and choose the most appropriate option for each question. (6x1=6)A) Life is what it is about:
 - Life is what it is about;

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 might interrupt this sadness
 of never understanding ourselves
 and of threatening ourselves with death.

1. What does the poet mean by 'I want no truck with death?

- b. He wants to drive a truck
- a. He wants to race with a truck c. He wants to run over the dead

2. Why are humans upset?

a. money

a. due to their money

b. due to their property

d. fish

d. He wants no association with death.

b. because they have not understood themselves

d. because they all speak in different languages

d. fishermen

- d. due to their hard work
- c. due to their misdeeds d. due to 3. What are humans afraid of according to the poet?
- a. life b. death c. truck
- 4. Who has been referred to as 'single-minded"? a. animals b. trees c. humans

5. What according to the poet makes people sad?

- a. because they are not single-minded
 - c. because they don't like to be advised

b. wealth

- 6. What should interrupt the sadness lurking around humans according to the poet?
 - d. selfishness
 - c. silence (OR)
- B) Aunt Jennifer's finger fluttering through her wool Find even the ivory needle hard to pull. The massive weight of Uncle's wedding band Sits heavily upon Aunt Jennifer's hand.
- 1. Why are Aunt Jennifer's fingers fluttering? It is because
 - a) she can't sit still b) she has grown weak with age
 - c) she is nervous and insecure d) both (b) \breve{k} (c)
- 2. Why is the aunt finding even an ivory needle hard to pull?
 - a) because her fingers are shaking.
 - b) because she had a nervous breakdown.
 - c) because of the massive weight of her marriage ring.
 - d) because she had forgotten the art of embroidery.

- 3. What does the uncle's character reflect in the poem?
 - a) Male chauvinism and patriarchy
- b) A man's physical strength. d) A male's view of the world.

c) negligence

- c) Male eqo. 4. For Aunt Jennifer, what do the tigers symbolize? a) freedom & cowardice b) indifference
- 5. What is Aunt Jennifer's mood in the above lines?
 - a) Aunt Jennifer is in a state of anxiety and nervousness.

 - b) Aunt Jennifer is in a state of extreme happiness. c) Aunt Jennifer is in a state of self-contentment.
 - d) Aunt Jennifer is in a state of bliss.
- 6. Why was the weight of Uncle's wedding band 'massive"?
 - a) Uncle has given her a heavy gold wedding band.
 - b) Uncle's wedding band was a beautiful weight to carry.
 - c) Heavy wedding bands were common in those days.
 - d) The marriage weighed Aunt Jennifer down.
- 4.ii) Read the following extract and answer the following questions:
 - Derry : I just wanted to come in. Into the garden.
 - Mr. Lamb : So you did. Here we are, then.
 - Derry : You don't know who I am.

 - Mr. Lamb : A boy. Thirteen or so. Derry : Fourteen. (Pause) But I've got to go now. Good bye.
 - Mr. Lamb: Nothing to be afraid of. Just a garden. Just me.
 - Derry : But I'm not..... I'm not afraid. (Pause) People are afraid of me.
- 1. Who was Derry?

A)

- (a) A disappointed boy who didn't want to live
- (b) A disabled boy who was not loved by anyone
- (c) A frustrated boy who had lost hope in life
- (d) A boy with burnt face having negative attitude towards life
- 2. Which character trait of Derry's matches the words 'People are afraid of me
- (b) courage (a) arrogance (c) illusion (d) inferiority complex
- 3. Why were people afraid of Derry?
 - (a) because of his burnt face.
 - (b) because of his lame leg (d) because he had an outgoing personality (c) because he was an introvert.
- 4. Why did Mr. Lamb used to spend much of his time in the garden?
 - (a) because he kept himself busy in attending to his trees, crab apples, listening to the buzzing of the bees and reading books in his garden.
 - (b) because he liked his garden very much.
 - (c) because he didn't want anyone to enter his garden.
 - (d) because his house was too small.
- OR B) I was walking home from school one day, an old bag hanging from my shoulder. It was actually possible to walk the distance in ten minutes. But usually it would take me thirty minutes at the very least to reach home. It would take me from half an hour to an hour to dawdle along, watching all the fun and games that were going on, all the entertaining novelties and oddities is the streets, the shops and the bazaar.
- 1. Who is 'l' in the above lines?
- (a) Zitkala-Sa (b) Bama (c) Gertrude Simmons (d) Native American Woman
- 2. How long would it take Bama to reach home?
- (a) thirty minutes (b) ten minutes (c) twenty minute (d) forty minutes 3. What does the narrator mean by novelties and oddities?
- (a) new and strange (b) strange and new (c) new (d) strange 4. Which class was Bama studying in?
- (a) Class II (b) Class III (c) Class IV

(d) Class V 4 (iii) Read the following extract and choose the most appropriate option for each question.

A. I started for school very late that morning and was in great dread of a scolding. especially because M. Hamel had said that he would question us on participles, and I did not know the first word about them. For a moment I thought of running away and spending the day out of doors. It was so warm, so bright! The birds were chirping at the edge of the woods, and in the open field back of the sawmill the Prussian soldiers were drillina.

- ____ novelist and short story writer. 1. The author of "The Last Lesson' was a a. Spanish b. German c. French d. Austrian 2. Franz was late and wanted to skip going to school as he dreaded a. beating from M. Hamel b. scolding from the teacher c. taunts from his classmates d. scolding from parents 3. What would have M. Hamel questioned Franz about? c. the previous days' activities a. adjectives b. writing skills d. participles 4. Which of the outdoor activities were tempting Franz more than attending school that day? a chirping of the birds b the drill practice by Russian soldiers c. both (a) and (b) d. children playing outside 5. Who was Mr Hamel?
- a. Principal c. Village Sarpanch d. Franz's father b. French teacher 6. What did Franz think for a moment?
 - a. teaching a lesson to his teacher
 - c. bunking the class

- b. pranking M. Hamel
- d. joining the Civil movement

d) freedom & strength

B. On Saturday they made their weekly pilgrimage to watch United Sophie and her father and little Derek went down near the goal - Geoff, as always, went with his mates higher up. United won two-nil and Casey drove in the second goal, a blend of innocence and Irish genius, going round the two big defenders on the edge of the penalty area, with her father screaming for him to pass, and beating the hesitant goalkeeper from a dozen yards. Sophie glowed with pride. Afterwards Geoff was ecstatic. "I wish he was an Englishman," someone said on the bus. "Ireland'll win the World Cup," little Derek told his mother when Sophie brought him home. Her father was gone to the pub to celebrate.

1. Sophie's family's visit to watch United' was a 'pilgrimage' because

- a. Football lovers always watch the game with great devotion
- b. Sophie's family used to meet football players after the match
- c. Sophie's family occasionally watched the football match
- d. It was a weekly ritual of Sophie's family to watch the football match
- 2. 'Sophie glowed with pride. This means that Sophie
 - a. was full of adulation for the game.
 - b. had fantasized about their association
 - c. was proud of Danny Casey witnessing the crowd's adulation.
 - d. had interest in Danny Casey
- 3. 'I wish he was an Englishman. This indicates Sophie's
 - a. hope for Danny Casey. b. doubt about the footballer's race c. surprise d. joy.
- 4. "Ireland 'll win the world cup. This implies that Sophic thinks

. a. Danny Casey's team will win the world cup b. Danny belongs to Ireland

- c. Casey belongs to England
- 5. How did their favourite team win the match?

c. they planned well

b. because they were united.

d. champion Danny cannot win the world cup.

- a. because they dribbled the ball well. d. because of the goal made by Casey.
- 6. When do Sophic and her family go to watch the football match? a. Sunday morning b. Sunday evening c. Sunday afternoon d. Saturday
- 5. Answer any five questions in about 40-50 words.
- a) Why do the people who run the roadside stand wait for the squeal of brakes so eagerly?
- b) Why do you think Aunt Jennifer created animals that are so different from her own character? What might the poet be suggesting through this difference
- c) What made the Lieutenant Governor drop the case against Gandhiji?
- d) How does the writer describe the make-up room of the Gemini Studios?
- e) Why does Jansic discourage Sophie from dreaming?
- f) What sort of TV programs does Umberto Eco watch after dinner and why?
- 6. Answer any two questions in 40-50 words.
- a) Who was Sadao? Where was his house situated?
- b) How did Mr. Lamb keep himself open to everyone?
- c) Who was Annan? How did he justify the strange behaviour of the elder?
- 7. Answer any one question in 120-150 words
- a) Asokamitran has used humour and satire effectively in 'Poets and Pancakes'. Discuss
- b) Through the poem, "A Roadside Stand", Robert Frost underlines his sympathy for the rural people in opposition to the uncaring and pitiless rich urban elite. Justify
- 8. Answer any one question in 120-150 words.
- a) The author, Tishani Doshi, calls her two-week stay in Antarctica, 'a chilling prospect'. How far do you think is she justified? What other features of the Antarctic environment are highlighted?
- b) Marginalized sections are plagued by inequality. Bring out the truth of the statement with reference to the chapter, Memories of Childhood.

CLASS: XII DATE: 13.02.2023

JAWAHAR HIGHER SECONDARY SCHOOL – NEYVELI FULL PORTION EXAMINATION - (2022 - 2023) MATHEMATICS (CODE – I)

GENERAL INSTRUCTIONS:

- (i) This question paper contains five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
- (ii) Section A has 18 MCQ's and 02 Assertion Reason based questions of 1 mark each.
- (iii) Section B has 5 very short answer (VSA) type questions of 2 marks each
- (iv) Section C has 6 short answer type (SA) questions of 3 marks each
- (v) Section D has 4 long answer (LA) type questions of 5 marks each
- (vi) Section E has 3 source based / case based / passage based / integrated unit of assessment

SECTION — A (Questions 1 to 20 carry 1 mark each)

- 1. The point which does not lie in the half-plane $2x + 3y - 12 \le 0$ is (c) (2,1) (d)(-3,2)(a) (1,2) (b) (2,3)
- 2. Let A be a 3 \times 3 matrix such that C_{11} , C_{12} , C_{13} are the cofactors of an , a_{11} , a_{12} , a_{13} respectively. What is the value of $a_{11}C_{11} + a_{12}C_{12} + a_{13}C_{13}$? (b) 1 (a) 0 (c) -|A|(d) |*A*|
- 3. For an L.P.P. the objective function is Z = 400x + 300y, and the feasible region determined by a set of constraints (linear inequalities) is shown in the graph.



Find the coordinates at which the objective function is maximum.

- (b) (40,0) (c) (40,160) (a) (20,0)
- 4. The greatest integer function defined by f(x) = [x], 0 < x < 2 is not differentiable at (c) x = 2(d) any point (a) x = 0(b) x = 1
- 5. If $\vec{a} = \hat{\iota} 2\hat{\jmath} + 3\hat{k}$ and \vec{b} is a vector such that $\vec{a} \cdot \vec{b} = |\vec{b}|^2$ and $|\vec{a} \vec{b}| = \sqrt{7}$, then $|\vec{b}| = \sqrt{7}$ (b) $\sqrt{3}$ (c) 7 (a) √7 (d) 3
- 6. If *A* and *B* are two events such that $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P\left(\frac{A}{B}\right) = \frac{1}{4}$ then $P(A' \cap B')$ equals

(a)
$$\frac{1}{12}$$
 (b) $\frac{1}{4}$ (c) $\frac{1}{4}$ (d) $\frac{1}{16}$

7. If A is a matrix of order $p \times q$ and B is a matrix such that A'B and B'A are both defined, then the order of matrix B' is (a) $p \times q$

(d) (20,180)

$$q \qquad (b) \ q \times q \qquad (c) \ p \times p \qquad (d) \ q \times p$$

8. If $A = [a_{ii}]_{m \times n}$ is a square matrix, then which of the following is true? (a) m < n(b) m > n(c) m = n(d) m = 0

9. $\int x \sin(3-x^2) dx$ equals

(a)
$$-\frac{1}{2}\cos((3-x^2)) + C$$

(b) $\frac{1}{2}\cos((3-x^2)) + C$
(c) $\frac{1}{2}\sin((3-x^2)) + C$
(d) $-\frac{1}{2}\sin((3-x^2)) + C$

- 10. If $A = [a_{ij}]$ be a skew symmetric matrix of order *n*, then
 - (a) $a_{ij} = \frac{1}{a_{ji}}$ for all i, j(b) $a_{ij} \neq 0$ for all i, j
 - (d) $a_{ij} \neq 0$, where i = j(c) $a_{ij} = 0$, where i, j
- 11. If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$, then the value of x is (b) 3 (c) 6 (d) ±3
- 12. The integrating factor of the differential equation $\frac{dy}{dx} + y \tan x \sec x = 0$ is (d) $\frac{\tan^2 x}{2}$ (a) $\tan x$ (b) $\sec^2 x$ (c) $\sec x$

13. The order and the degree of the differential equation $2x^2 \frac{d^2y}{dx^2} - 3\frac{dy}{dx} + y = 0$ are (d) 3.1 (a) 1.1 (b) 2,1 (c) 1.2 14. If $f(x) = x \tan^{-1} x$, then f'(1) =(a) $1 + \frac{\pi}{4}$ (b) $\frac{1}{2} + \frac{\pi}{4}$ (c) $\frac{1}{2} - \frac{\pi}{4}$ (d) 2 15. $\int \frac{\sin^2 x - \cos^2 x}{\sin^2 x \cos^2 x} dx$ is equal to (a) $\tan x + \csc x + C$ (b) $\tan x + \cot x + C$ (c) $\tan x - \cot x + C$ (d) $\tan x + \sec x + C$ 16. A point that lies on the line $\frac{x-1}{-2} = \frac{y+3}{4} = \frac{1-z}{7}$ is (a) (1, -3, 1) (b) (-2, 4, 7) (c) (-1, 3, 1)(d) (2, -4, -7)17. A man is watching an aero plane which is at the coordinate point A (4, -1, 3), assuming the man is at 0 (0, 0, 0). At the same time, he saw a bird at coordinate point B (2, 0, 4). The unit vector along \overrightarrow{AB} is (b) $\frac{-2}{\sqrt{6}} \hat{\imath} + \frac{1}{6} \hat{\jmath} + \frac{1}{6} \hat{k}$ (a) $\frac{2}{6} \widehat{\imath} + \frac{1}{6} \widehat{\jmath} + \frac{1}{6} \widehat{k}$ (c) $\frac{-2}{\sqrt{6}} \hat{\imath} + \frac{1}{\sqrt{6}} \hat{\jmath} + \frac{1}{\sqrt{6}} \hat{k}$ (d) $\frac{4}{\sqrt{6}} \hat{\imath} + \frac{2}{\sqrt{6}} \hat{\jmath} + \frac{3}{\sqrt{6}} \hat{k}$ 18. The value of $(\widehat{k} \times \widehat{j})$. $\widehat{\imath} + (\widehat{j}, \widehat{k}) + 3$ (a) 0 (b) 1 (c) 2 (d) 3

ASSERTION – REASON BASED QUESTIONS

In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and Rare true but R is not the correct explanation of A.
- (e) A is true but R is false
- (d) A is false but R is true.
- 19. Assertion (A): $sin^{-1} \left(sin\frac{2\pi}{3}\right) = \frac{2\pi}{3}$ Reason (R) : $sin^{-1} \left(sin\theta\right) = \theta$, if $\theta \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
- 20. Assertion (A): The angle between the lines whose direction cosines are $-\frac{\sqrt{3}}{4}$, $\frac{1}{4}$, $-\frac{\sqrt{3}}{2}$ and $-\frac{\sqrt{3}}{4}$, $\frac{1}{4}$, $\frac{\sqrt{3}}{2}$ is 120°

Reason (R) : The angle between the lines whose direction cosines are l_1 , m_1 , n_1 , and l_2 , m_2 , n_2 is given by $\cos \theta = l_1 l_2 + m_1 m_2 + n_1 n_2$

SECTION-B (Questions 21 to 25 carry 2 marks each)

21. If θ is the angle between two vectors $\hat{i} - 2\hat{j} + 3\hat{k}$, and $3\hat{i} - 2\hat{j} + \hat{k}$ find $\sin \theta$. (or)

Find the value of λ for which the points A(-1,3,2), B(-4,2,-2) and $C(5,5,\lambda)$ are collinear

22. Find the value of :
$$sin^{-1}\left[sin\left(-\frac{17\pi}{8}\right)\right] + cos^{-1}\left[cos\left(\frac{13\pi}{6}\right)\right]$$

23. If
$$f(x) = \sqrt{1 + \cos^2(x^2)}$$
, find $f'\left(\frac{\sqrt{\pi}}{2}\right)$
(or)
If $f(x) = \tan^{-1}\left(\frac{\sqrt{x^2+1} - 1}{x}\right)$, then find $f'(x)$

- 24. Find the intervals in which the function $f(x) = 2x^3 24x + 107$ is (i) strictly increasing (ii) strictly decreasing
- 25. Find the projection of vector $(\vec{b} + \vec{c})$ on \vec{a} , where $\vec{a} = 2\hat{\imath} 2\hat{\jmath} + \hat{k}$, $\vec{b} = \hat{\imath} + 2\hat{\jmath} 2\hat{k}$ and $\vec{c} = 2\hat{\imath} \hat{\jmath} + 4\hat{k}$

SECTION – C (Questions 26 to 31 carry 3 marks each)

26. Evaluate $\int_0^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx$ using properties of determinants.

- 27. Amit and Nisha appear for an interview for two vacancies in a company. The probability of Amit's selection is $\frac{1}{5}$ and that of Nisha's selection is $\frac{1}{6}$. What is the probability that,
 - (i) only one of them is selected?
 - (ii) none of them are selected ?

(or)

Find the mean number of defective items if two items are drawn one – by – one without replacement from an urn containing 6 items, which include 2 defective items?

28. Solve the following Linear Programming Problem graphically:

Maximize
$$Z = x + y$$
, subject to the constraints
 $\frac{x}{25} + \frac{y}{40} \le 1$; $2x + 5y \le 100$, $x \ge 0$, $y \ge 100$

29. Find the particular solution of the differential equation: $\frac{dy}{dx} + 2y \tan x = \sin x$ given that y = 0 when $x = \frac{\pi}{3}$ (or)

Solve the following differential equation : $\left[x \sin^2\left(\frac{y}{x}\right) - y\right] dx + x dy = 0$

30. Evaluate : $\int_{1}^{4} \{|x-1| + |x-2| + |x-4|\} dx$

31. Evaluate : $\int \frac{3x+5}{x^3-x^2-x+1} dx$ (or) Evaluate: $fx^2 \tan^{-1}x dx$

SECTION - D (Questions 32 to 35 carry 5 marks each)

32. Find the area of the smaller region bounded by the ellipse ^{x²}/₁₆ + ^{y²}/₉ = 1 and the straight line 3x + 4y = 12.
33. Let *Z* be the set of all integers and *R* be the relation on *Z* defined as *R* = {(*a*, *b*) : *a*, *b* ∈ *Z* and (*a* − *b*) is divisible by 5}. Prove that *R* is an equivalence relation.

(or)

Let $f: N \to N$ be defined by $f(x) = \begin{cases} x+1, & \text{if } x \text{ is odd} \\ x-1, & \text{if } x \text{ is even} \end{cases}$ for all $x \in N$. Show that f is bijective. 34. If $A = \begin{bmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & -1 & 1 \end{bmatrix}$, Find A^{-1} . Using A^{-1} , solve the system of linear equations x - 2y = 10, 2x - y - z = 8, -2y + z = 7

35. Show that the lines $\frac{x+1}{3} = \frac{y+3}{5} = \frac{z+5}{7}$ and $\frac{x-2}{1} = \frac{y-4}{3} = \frac{z-6}{5}$ intersect. Also find their point of intersection. (or)

The scalar product of the vector $\vec{a} = \hat{\imath} + \hat{\jmath} + \hat{k}$ with a unit vector along the sum of vectors $\vec{b} = 2\hat{\imath} + 4\hat{\jmath} - 5\hat{k}$ and $\vec{c} = \lambda\hat{\imath} + 2\hat{\jmath} + 3\hat{k}$ is equal to 1. Find the value of λ .

SECTION – E – CASE STUDY (Questions 36 to 38 carry 4 marks each)



There are three categories of students in a class of 60 students:

- A : Very hardworking students
- B : Regular but not so hardworking
- C : Careless and irregular

It is known that 10 students are in Category A, 30 in Category B and the rest in Category C. It is also found that the probability of students of Category A, unable to get good marks in the final exam, is 0.002, of Category B it is 0.02 and of Category C, this probability is 0.20.

- (a) If a student selected at random was found to be the one who could not get good marks in the exam, find the probability that this student is of Category *C*.
- (b) Find the probability that the selected student is unable to get good marks in the exam.
- (c) A student selected at random was found to be the one who could not get good marks in the exam, then find the probability that this student is NOT of Category *A*.

(or)

(c) If a student selected at random was found to be the one who could not get good marks in the exam, find the probability that this student is of Category *B*.

36.



Assume that a spherical raindrop evaporates at a rate proportional to its surface area, given by the differential equation $\frac{dV}{dt} = kS$, where *V* is the volume and S is the surface area of the spherical raindrop and k is a constant.

- (a) If its radius originally is 3 mm, establish a relation between the radius and time t.
- (b) After 1 hour, if the radius has been reduced to 2 mm, find the radius of the raindrop at any time t.

38.



On the request of villagers, a construction agency designs a tank with the help of an architect. Tank consists of a rectangular base with rectangular sides, open at the top so that its depth is 2 m and volume is $8 m^3$. The construction of the tank costs *Rs*. 70 per sq.m for the base and *Rs*. 45 per sq.m for sides.

- (a) If x and y represent the length and breadth of the rectangular base, find the relation between the variables.
- (b) Express the cost C of making the tank in terms of x.
- (c) Find the value of x so that the cost of construction is minimum.

(or)

(c) Verify by second derivative test that cost is minimum at a critical point.

JAWAHAR HIGHER SECONDARY SCHOOL, NEYVELI

Second Full Portion Examination - 2022-23

DATE:17/2/2023

CLASS:XII

Mathematics

- 1. This Question Paper contains five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
- 2. Section A has 18 MCQs and 02 Assertion-Reason based questions of 1 mark each.
- 3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
- 4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.
- 5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.
- 6. Section E has 3 source based/case based/passage based/integrated units of assessment (4 marks each) with sub-parts.

Section-A

Multiple Choice Questions each question carries 1 mark.

1. The symmetric part of the matrix $A = \begin{vmatrix} 1 & 2 & 4 \\ 6 & 8 & 2 \\ 2 & -2 & 7 \end{vmatrix}$ is equal to

a) $\begin{vmatrix} 0 & -2 & -1 \\ -2 & 0 & -2 \\ -1 & -2 & 0 \end{vmatrix}$ b) $\begin{vmatrix} 1 & 4 & 3 \\ 2 & 8 & 0 \\ 3 & 0 & 7 \end{vmatrix}$ c) $\begin{vmatrix} 0 & -2 & 1 \\ 2 & 0 & 2 \\ -1 & 2 & 0 \end{vmatrix}$ d) $\begin{vmatrix} 1 & 4 & 3 \\ 4 & 8 & 0 \\ 3 & 0 & 7 \end{vmatrix}$

2. If $y = \tan^{-1} \sqrt{\frac{1 - \sin x}{1 + \sin x}}$, then the value of $\frac{dy}{dx}$ at $x = \frac{\pi}{6}$ is

a) $-\frac{1}{2}$ b) $\frac{1}{2}$ c) 1 d) -1

3. If $f(x) = \log_e(\sin x)$, then $f^1(e)$ is equal to

(a) e⁻¹ b) e c) 1 d) 0

4. The least, value of the function $f(x) = ax + \frac{b}{x}$, a > 0, b > 0, x > 0 is

b) $2\sqrt{\frac{a}{b}}$ c) $2\sqrt{\frac{b}{a}}$ d) $2\sqrt{ab}$ a) \sqrt{ab}

5. The point on the curve $x^2 = 2y$ which is nearest to the point (0,5) is

(a) $(2\sqrt{2}, 4)$ (b) $(2\sqrt{2}, 0)$ (c) (0, 0) (d) (2, 2)

6. The value of $\int (\sqrt{x} - \frac{1}{\sqrt{x}})^2 dx$ is

a)
$$\frac{x^2}{2} + \log_2 |x| = |2xC$$
 b) $\frac{x^2}{2} + \log|x| + 2x + C$ c) $\frac{x^2}{2} - \log|x| - 2x + C$ d) None of these

7. The area of the region bounded by the lines y = mx, x = 1, x = 2 and X -axis is 6 sq units, then m is equal to

c) 2 d) 4 a) 3 b) 1

8. Find the area of a curve xy = 4, bounded by the lines x = 1 and x = 3 and X-axis. (b) log 64 c) log 81 d) log 27 a) log 12

9. The area enclosed by y = 3x - 5, y = 0, x = 3 and x = 5 is

b) 13 sq units c) 13 ½ sq units d) 14 sq units a) 12 squnits

10. The degree of the differential equation $x = 1 + \left(\frac{dy}{dx}\right) + \frac{1}{2!} \left(\frac{dy}{dx}\right)^2 + \frac{1}{3!} \left(\frac{dy}{dx}\right)^3 + \dots - \dots - is$

(c) 1 (d) not defined (a) 3 (b) 2

11. The solution of $\frac{dy}{dx} = \frac{ax+g}{by+f}$ represents a circle, when a)a = b b) a = -b c) a = -2b d) a = 2b 12. The general solution of the differential equation $\frac{dy}{dx} = e^{y}(e^{x} + e^{-x} + 2x)$ is

(a)
$$e^{-y} = e^{x} - e^{-x} + x^{2} + C$$

(b) $e^{-y} = e^{-x} - e^{x} - x^{2} + C$
(c) $e^{-y} = -e^{-x} - e^{x} - x^{2} + C$
(d) $e^{y} = e^{-x} + e^{x} + x^{2} + C$

13. If $\lambda(3\hat{\imath}+2\hat{j}-6\hat{k})$ is a unit vector, then the value of λ is a) $\pm \frac{1}{7}$ b) ± 7 c) $\pm \sqrt{43}$ d) $\pm \frac{1}{\sqrt{43}}$

MARKS:80

14. If $\vec{a} = \hat{\imath} - 2\hat{\jmath} + 3\hat{k}$ and \vec{b} is a vector such than $\vec{a}.\vec{b} = |\vec{b}|^2$ and $|\vec{a} - \vec{b}| = \sqrt{7}$, then $|\vec{b}|$ is equal to a) $\sqrt{7}$ b) $\sqrt{3}$ c) 7 d) 3

15. The direction cosines of the line joining the points (4,3,-5) and (-2,1,-8) are a) $\left(\frac{6}{7},\frac{2}{7},\frac{3}{7}\right)$ b) $\left(\frac{2}{7},\frac{3}{7},\frac{-6}{7}\right)$ c) $\left(\frac{6}{7},\frac{3}{7},\frac{2}{7}\right)$ d) None of these 16. If the lines $\frac{1-x}{3} = \frac{y-2}{2\alpha} = \frac{z-3}{2}$ and $\frac{x-1}{3\alpha} = y - 1 = \frac{6-z}{5}$ are perpendicular, then the value of α is a) $\frac{-10}{7}$ b) $\frac{10}{7}$ c) $\frac{-10}{11}$ d) $\frac{10}{11}$

17. A bag A contains 4 green and 3 red balls and bag B contains 4 red and 3 green balls. One bag is taken at random and a ball is drawn and noted to be green. The probability that it comes from bag B is

a)
$$\frac{2}{7}$$
 b) $\frac{2}{3}$ c) $\frac{3}{7}$ d) $\frac{1}{3}$

18. If P(A)= $\frac{4}{5}$, and $P(A \cap B) = \frac{7}{10}$, then $P\left(\frac{B}{A}\right)$ is equal to

a)
$$\frac{1}{10}$$
 b) $\frac{1}{8}$ c) $\frac{7}{8}$ d) $\frac{17}{20}$

19. Assertion $\int \frac{xe^x}{(x+1)^2} dx = \frac{e^x}{x+1} + C$

Reason: $\int e^x \{f(x) + f'(x)\} dx = e^x f(x) + C$

- (a) Assertion is true, reason is true, reason is a correct explanation for assertion.
- (b) Assertion is true, reason is not a correct explanation for assertion.
- (c) Assertion is true, reason is false.
- (d) Assertion is false, reason is true.

0. Assertion
$$\int \frac{dx}{e^{x} + e^{-x} + 2} = \frac{1}{e^{x} + 1} + C$$

Reason: $f \frac{d\{f(x)\}}{\{f(x)\}^{2}} = -\frac{1}{f(x)} + C$

- (a) Assertion is true, reason is true, reason is a correct explanation for assertion.
- (b) Assertion is true, reason is true, reason is not a correct explanation for assertion.
- (c) Assertion is true, reason is false.
- (d) Assertion is false, reason is true.

Section - B

29 Find

2

This section comprises of very short answer type-questions (VSA) of 2 marks each.

21. Given
$$A = \begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$$
 compute A^{-1} and show that $2A^{-1} = 9I - A$.

22. Differentiate $\tan^{-1}\left(\frac{1+\cos x}{\sin x}\right)$ with respect to x.

- 23. Solve, $\cos\left(\frac{dy}{dx}\right)$ =a, y=1 when x=0.
- 24. Find the magnitude of each of the two vectors \vec{a} and \vec{b} having the same magnitude such that the angle between them is 60° and their scalar product is $\frac{9}{2}$.
- 25. Suppose a girls throws a die. If she gets 1 or 2, she tosses a coin three times and notes the number of tails. If she gets 3, 4, 5 or 6, she tosses a coin once gets notes whether a 'head' or 'tail' is obtained. If she obtained exactly one'tail', what is the probability that she threw 3, 4, 5 or 6 with the die?

Section - C

This section comprises of short answer type questions (SA) of 3 marks each.

26. Let R be a relation defined on the set of natural numbers N as follow:

 $R = \{(x, y) : x \in N, y \in N \text{ and } 2x + y = 24\}$

Find the domain and range of the relation R. Also, find if R is an equivalence relation or not.

27. If
$$A = \begin{bmatrix} 1 & -2 & 3 \\ 0 & -1 & 4 \\ -2 & 2 & 1 \end{bmatrix}$$
, then find $(A')^{-1}$ (or)

Find the adjoint of the matrix $A = \begin{vmatrix} -1 & -2 & -2 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{vmatrix}$ and hence show that $A(adj A) = |A|I_3$.

28. Find the values of *a* and *b* such that the function defined as follows is continuous.

$$f(x) = \begin{cases} x+2 & x \le 2\\ ax+b, & 2 < x < 5\\ 3x-2 & x \ge 5 \end{cases}$$
$$\int \frac{2x}{(x^2 + 1)(x^2 + 2)^2} dx \qquad \text{(or) Integrate W.r.t. } x, \frac{x^2 - 3x + 1}{\sqrt{1 - x^2}}$$

.. / 2

30. Solve the following differential equation

$$x\frac{dy}{dx} = y - x\tan\left(\frac{y}{x}\right)$$

31. Find a vector of magnitude 5 units and parallel to the resultant of $\vec{a} = 2\hat{i} + 3\hat{j} - \hat{k}$ and $\vec{b} = \hat{i} - 2\hat{j} + \hat{k}$. Section - D

This section comprises of long answer-type questions (LA) of 5 marks each.

32. Find the value of the following $\tan^{-1}(1) + \cos^{-1}\left(-\frac{1}{2}\right) + \sin^{-1}\left(-\frac{1}{2}\right)$

(or)

Find the value of the following $\cos^{-1}\left(\frac{1}{2}\right) + 2\sin^{-1}\left(\frac{1}{2}\right)$

33. Find both the maximum value and minimum value of $3x^4 - 8x^3 + 12x^2 - 48x + 25$ on the interval [0,3].

[or]

At what points in the interval $[0,2\pi]$, does the function $\sin 2x$ attain its maximum value? 34. Find the value of λ , so that the lines $\frac{1-x}{3} = \frac{7y-14}{\lambda} = \frac{z-3}{2}$ and $\frac{7-7x}{3\lambda} = \frac{y-5}{1} = \frac{6-z}{2}$ are at right angles. Also, find whether the lines are intersecting or not.

(or)

Find the shortest distance between the lines and $\vec{r} = (4\hat{\iota} - \hat{\jmath}) + \lambda(\hat{\iota} + 2\hat{\jmath} - 3\hat{k})$

$$\vec{r} = (\hat{\iota} - \hat{\jmath} + 2k) + \mu(2\hat{\iota} + 4\hat{\jmath} - 5\hat{k})$$

more

35. Maximize Z = -x + 2y, Subject to the constraints:

 $x \ge 3, x + y \ge 5, x + 2y \ge 6, y \ge 0$ (or)

than two points.

(or)
Minimise
$$Z = x + 2y$$
 subject to $2x + y \ge 3$, $x + 2y \ge 6$, x , $y \ge 0$. Show that the minimum of Z occurs at

Section – E

Case study based questions are compulsory.

36. Sun Pharmaceutical Industries Limited is an Indian multinational pharmaceutical company headquartered in Mumbai, Maharashtra, that manufactures and sells pharmaceutical formulations and active pharmaceutical ingredients in more than 100 countries across the globe.

Sun Pharmaceutical produces three final chemical products P_1 , P_2 and P_3 requiring mixup of three raw materialchemicals M_1 , M_2 and M_3 . The per unit requirement of each product for each material (in litres) is as follows:

$$A = \begin{array}{c} M_{1} & M_{2} & M_{3} \\ P_{1} \begin{bmatrix} 2 & 3 & 1 \\ 4 & 2 & 5 \\ 2 & 4 & 2 \end{bmatrix}$$

(i) Find the total requirement of each material if the firm produces 100 litres of each product, (ii) Find the per unit cost of production of each product if the per unit of materials M_1 , M_2 and M_3 are Rs.5, Rs. 10 and Rs.5 respectively, and

(iii) Find the total cost of production if the firm produces 200 litres of each product.
 37. Commodity prices are primarily determined by the forces of supply and demand in the market. For example, if the supply of oil increases, the price of one barrel decreases. Conversely, if demand for oil increases (which often happens during the summer), the price rises. Gasoline and natural gas fall into the energy commodities category.



The price *p* (dollars) of each unit of a particular commodity is estimated to be changing at the rate $\frac{dp}{dx} = \frac{-135x}{\sqrt{9+x^2}}$

where x (hundred) units is the consumer demand (the number of units purchased at that price). Suppose

400 units (x = 4) are demanded when the price is \$30 per unit.

- i) Find the demand function p(x)
 - (ii) At what price will 300 units be demanded? At what price will no units be demanded?
 - (iii) How many units are demanded at a price of \$20 per unit?

38. Quality assurance (QA) testing is the process of ensuring that manufactured product is of the highest possible quality for customers. QA is simply the techniques used to prevent issues with product and to ensure great user experience for customers.



A manufactured component has its quality graded on its performance, appearance, and cost. Each of these three characteristics is graded as either pass or fail. There is a probability of 0.40 that a component passes on both appearance and cost. There is a probability of 0.35 that a component passes on both performance and appearance. There is a probability of 0.31 that a component passes on all three characteristics. There is a probability of

0.64 that a component passes on performance. There is a probability of 0.19 that a component fails on all three characteristics. There is a probability of 0.06 that a component passes on appearance but fails on both performance and cost.

- (i) What is the probability that a component passes on cost but fails on both performance and appearance?
- (ii) If a component passes on both appearance and cost, what is the probability that it passes on all three characteristics?
- (iii) If a component passes on both performance and appearance, what is the probability that it passes on all three characteristics?

JAWAHAR HIGHER SECONDARY SCHOOL – NEYVELI SECOND FULL PORTION EXAMINATION - (2022 - 2023) DATE : 01.02.2023 PHYSICS – CODE – II

General Instructions:

CLASS: XII

- (1) There are 35 questions in all. All questions are compulsory
- (2) This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.
- (3) Section A contains eighteen MCQ of 1 mark each, Section B contains seven questions of two marks each, Section C contains five questions of three marks each, section D contains three long questions of five marks each and Section E contains two case study based questions of 4 marks each.
- (4) There is no overall choice. However, an internal choice has been provided in section B, C, D and E. You have to attempt only one of the choices in such questions.
- (5) Use of calculators is not allowed.
- (6) You may use the following values for the constants wherever necessary

 $e = 1.6 \times 10^{-19} C$; $\mu_0 = 4\pi \times 10^{-7} Tm A^{-1}$; $\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 Nm^2 C^{-2}$; $\varepsilon_0 = 8.854 \times 10^{-12} C^2 N^{-1} m^{-2}$

SECTION – A

1. Two charges of equal magnitudes kept at a distance r exert a force F on each other. If the charges are halved and distance between them is doubled, then the new force acting on each charge is

(i)
$$\frac{F}{16}$$
 (ii) $\frac{F}{4}$ (iii) $\frac{F}{2}$ (iv) 4 F

- 2. What is not true for equipotential surface for uniform electric field (i) Work done is zero (ii) Equipotential surface is flat (iii) Equipotential surface is spherical (iv) Electric lines are perpendicular to equipotential surface
- 3. Nichrome or manganin is widely used in wire bound standard resistors because of (i) mechanical strength (ii) strong dependence of resistivity with temperature (iii) very weak temperature dependent resistivity (iv) electric field dependence
- 4. A long straight wire of radius 'a' carry a steady current I. The current is uniformly distributed across its cross section. The ratio of the magnetic field at a/2 and 2a is (i) 1/2 (ii) 1 (iii) 4 (iv) 1/4
- 5. The sensitivity of moving coil galvanometer can be increased by decreasing (i) magnetic field (ii) number of turns of the coil (iii) area of the coil (iv) torsion constant of the spring and suspension wire
- 6. The best material for the core of a transformer (i) hard steel (ii)mild steel (iii) soft iron (iv) stainless steel
- 7. Lenz's law of electromagnetic induction is as per law of conservation of (iii) force (i) charge (ii) energy (iv) angular momentum
- 8. Which of the following statement is false for the properties of electromagnetic waves?
 - (i) Both electric and magnetic field vectors attain the maxima and minima at the same place and same time.
 - (ii) The energy in electromagnetic waves is divided equally between electric and magnetic field vectors. (iii) Both electric and magnetic field vectors are parallel to each other and perpendicular to the direction of
 - propagation of wave.
 - (iv) These waves do not require any material medium for propagation.
- 9. An aeroplane having a wing span of 35 m flies due north with the speed of 90 m/s, given $B = 4 \times 10^{-5} T$. The potential difference between the tips of the wings will be
 - (i) 0.126 V (ii) 1.26 V (iii) 12.6 V (iv) 0.013 V
- 10. Two slits in Young's double slit experiment have widths in the ratio 81: 1. What is the ratio of the amplitudes of light waves from them?
 - (iv) 1:9 (i) 81: 1 (ii) 1:81 (iii) 9: 1
- 11. The work function for a metal surface is 1.8 eV. The threshold wavelength for this metal surface is (i) 4326 A° (ii) 2062.5 A° (iii) 3246 A° (iv) 6875 A°
- 12. The current I in a coil varies with time as shown in the figure. The variation of induced emf with time would be



- 13. Which of the following statement is not true regarding Einstein's mass energy relation? (i) Mass disappears to reappear as energy.
 - (ii) Energy disappears to reappear as mass.
 - (iii) Mass and energy are two different forms of the same entity.
 - (iv) Mass and energy can never be related to each other.
- 14. Find out the value of current through 2 Ω resistance for the given circuit.
 - (i) 2 *A* (ii) 5 *A* (iii) *zero* (iv) 6 *A*



- 15. The ground state energy of hydrogen atom is -13.6 eV. The kinetic energy of the electron in this state is(i) 27.2 eV(ii) 13.6 eV(iii) -13.6 eV(iv) 6.8 eV
- 16. Two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.
 - (a) Both A and R are true, and R is the correct explanation of A
 - (b) Both A and R are true, and R is NOT the correct explanation of A
 - (c) A is true but R is false
 - (d) A is false and R is also false

Assertion (A) : The current flows in a conductor when there is an electric field within the conductor.

Reason (R) : The electrons in a conductor drift only in the presence of electric field.

17. Two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both A and R are true, and R is the correct explanation of A
- (b) Both A and R are true, and R .is NOT the correct explanation of A
- (c) A is true but R is false
- (d) A is false and R is also false

Assertion (A) : Thin film such as soap bubble or a thin layer of oil on water show beautiful colours when illuminated by white light.

Reason (R) : It happens due to the interference of light reflected from upper and lower face of the thin film.

18. Two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both A and R are true, and R is the correct explanation of A
- (b) Both A and R are true, and R is NOT the correct explanation of A
- (c) A is true but R is false
- (d) A is false and R is also false

Assertion (A) : de Broglie wavelength equation has significant for any microscopic particles.

Reason (R) : de-Broglie wavelength is inversely proportional to the mass of the object, if its velocity is constant.

SECTION – B

19. Which constituent radiation of the electromagnetic spectrum is used

(i) In RADAR systems

- (ii) To photograph internal parts of a human body?
- 20. The susceptibility of magnetic material is -4.3×10^{-6} , Identify the type of material. Draw the modification of the field pattern on keeping a piece of this material in a uniform magnetic field.
- 21. Draw the diagram showing the variation of binding energy per nucleon with mass number for different nuclei. State with reason why light nuclei usually undergo nuclear fusion.

(or)

Determine the distance of closest approach when an alpha particle of kinetic energy of 4.5 *MeV* strikes a nucleus of Z = 80, stops and reverses its direction.

- 22. Double-convex lenses are to be manufactured from a glass of refractive index 1.55, with both faces of the same radius of curvature. What is the radius of curvature required if the focal length is to be 20*cm*?
- 23. Draw the circuit diagram of full wave rectifier. Draw its input and output wave forms

(or)

Draw the energy band diagram of an n - type semiconductor. How does the forbidden energy gap of an intrinsic semiconductor vary with increase in temperature?

- 24. Laser light of wavelength 630 *nm* incident on a pair of slits produces an interference pattern in which the bright fringes are separated by 8.1 *mm*. A second light produces an interference pattern in which the fringes are separated by 7.2 *mm*. Calculate the wavelength of the second light.
- 25. A point charge causes an electric flux of $-1.0 \times 10^3 Nm^2/C$ to pass through a spherical Gaussian surface of 10.0 em radius centred on the charge.
 - (a) If the radius of the Gaussian surface were doubled, how much flux would pass through the surface?(b) What is the value of the point charge?

SECTION - C

- 26. Two long straight parallel conductors 'a' and 'b', carrying steady currents I_a and I_b are separated by a distance d. Write the magnitude and direction of the magnetic field produced by the conductor 'a' at the points along the conductor 'b'. If the currents are flowing in the same direction, what is the nature and magnitude of the force between the two conductors?
- 27. A square loop MNOP of side 20 cm is placed horizontally in a uniform magnetic field acting vertically downwards as shown in the figure. The loop is pulled with a constant velocity of 20 cm/s till it goes out of the field.
 - (a) Depict the direction of the induced current in the loop as it goes out of the field.
 - (b) For how long would the current in the loop persist?
 - (c) Plot a graph showing the variation of magnetic flux as a function of time.
- 28. An a.c. source generating a voltage $\varepsilon = \varepsilon o \sin \omega t$ is connected to a capacitor of capacitance *C*. Find the expression for the current *I* flowing through it. Plot a graph of ε and *I* versus ωt to show that the current is ahead of the voltage by $\pi/2$.

(or) An ac voltage $V = Vo \sin \omega t$ applied across a pure inductor of inductance *L*. Find an expression for the current *I*, flowing in the circuit and show mathematically that the current flowing through it lags behind the applied voltage by a phase angle of $\pi/2$. Also draw graphs of *V* and *I* versus ωt the circuit.

29. (i) Using photon picture of light, show how Einstein's photoelectric equation can be established.(ii) Write three salient features observed in photoelectric effect which can be explained using this equation.

(or) Draw a plot showing the variation of photoelectric current with anode potential for two different frequencies of incident radiation having the same intensity. In which case will the stopping potential be higher? Justify your answer.

- 30. (a) The energy levels of an atom are as shown below. Which of them will result in the transition of a photon of wavelength 275 *nm*?.
 - (b) Which transition corresponds to emission of radiation of (i) maximum wavelength and
 - (ii) minimum wavelength?



SECTION - D

- 31. (a) Two charges $2 \mu C$ and $-2 \mu C$ are placed at points *A* and *B* 6 *cm* apart. Identify an equipotential surface of the system. What is the direction of the electric field at every point on this surface?
 - (b) Obtain the equivalent capacitance of the network in the figure. For a 300 V supply, determine the charge and voltage across C_4 capacitor.

(or)



- (a) Is electric field intensity scalar or vector quantity? Give its SI unit. A point charge (+Q) is kept in the vicinity of uncharged conducting plate. Sketch electric field lines between the charge and the plate.
- (b) Obtain the expression for the electric field intensity due to a uniformly charged spherical shell of radius R at a point distant r from the centre of the shell outside it. Draw a graph showing the variation of electric field intensity E with r, for r > R and r < R.
- 32. (a) Explain the term drift velocity of electrons in a conductor. Hence obtain the expression for the current through a conductor in terms of drift velocity.
 - (b) Two cells of emfs E_1 and E_2 and internal resistances r_1 and r_2 respectively are connected in parallel as shown in the figure. Deduce the expression for the ϵ_{t_1} r_1
 - (i) equivalent emf of the combination
 - (ii) equivalent internal resistance of the combination
 - (iii) potential difference between the points A and B.



- (or)
- (a) Plot a graph showing the variation of resistivity with temperature for a metallic conductor. How does one explain such a behavior, using the mathematical expression of the resistivity of a material?
- (b) Derive the equation of the balanced state in a Wheatstone bridge using Kirchhoff's laws.
- 33. (a) When a parallel beam of monochromatic source of light of wavelength λ is incident on a single slit of width *d*, show how the diffraction pattern is formed at the screen by the single slit.
 - (b) A ray of light passes through equilateral prism ($\mu = 1.5$) such that angle of incidence is equal to angle of emergence and the latter is equal to 3/4 th of prism angle. Calculate the angle of deviation.

- (a) Draw the ray diagram showing the refraction off light through a glass prism and hence obtain the relation between the refractive index of the prism and angle of minimum deviation.
- (b) Write two differences between interference and diffraction pattern.

SECTION – E

Case Study :

Read the following paragraph and answer the questions:

34. Telescopes are of two types - refracting type telescopes and reflecting type telescopes. Refracting telescope are of two types - Astronomical telescope and Terrestrial telescope. An astronomical telescope is used to see heavenly bodies like stars, planets etc. It consists of two converging lenses, objective lens and eyepiece, mounted co-axially at the outer ends of two sliding tubes. Terrestrial telescope is used to see distant objects on the surface of the earth. Newtonian and Cassegrain are examples for reflecting telescope.

- (i) What do you mean by normal adjustment of telescope?
- (ii) Define magnifying power of a telescope.
- (iii) Write two advantages of a reflecting type telescope over a refracting type telescope.

(or)

(iii)Write two differences between compound microscope and an astronomical telescope.

35. When the diode is forward biased, it is found that beyond forward voltage $V = V_k$, called knee voltage, the conductivity is very high. At this value of battery biasing for p - n junction, the potential barrier is overcome and the current increases rapidly with an increase in forwarding voltage. When the diode is reverse biased, the reverse bias voltage produces a very small current about a few microamperes which almost remains constant with bias. This small current is reverse saturation current.

- (i) Define forward biasing in a p-n junction diode.
- (ii) Draw the V-I characteristics of a p-n junction diode.
- (iii) Write two conclusions when a diode is connected in forward biased?

(or)

(iii) Draw the circuit diagram for a forward biased p-n junction diode.

JAWAHAR HIGHER SECONDARY SCHOOL – NEYVELICLASS: XIISECONDFULL PORTION EXAMINATION – (2022 – 2023)DATE: 15.02.2023PHYSICS – CODE – I

General Instructions:

(1) There are 35 questions in all. All questions are compulsory

(2) This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All thesections are compulsory.

(3) Section A contains eighteen MCQ of 1 mark each, Section B contains seven questions of two marks each, Section C contains five questions of three marks each, section D contains three long questions of five markseach and Section E contains two case study based questions of 4 marks each.

(4) There is no overall choice. However, an internal choice has been provided in section B, C, D and E. Youhave to attempt only one of the choices in such questions.

SECTION – A

q

(5) Use of calculators is not allowed.

1. In the figure, if net force on *Q* is zero then value of *Q* is:

(a) $\sqrt{2}$ (b) $2\sqrt{2}$ (c) $\frac{1}{2\sqrt{2}}$ (d) $\frac{1}{\sqrt{2}}$

2. Two plates of a parallel plate capacitor are 1 cm apart and potential difference between them is 10 V. The electric field between the plates is

(a) $10 N C^{-1}$ (b) $250 N C^{-1}$ (c) $500 N C^{-1}$ (d) $1000 N C^{-1}$

3. The voltage *V* and current *I* graphs for a conductor at two different temperatures T_1 and T_2 are shown in the figure. The relation between T_1 and T_2 is

(a) $T_1 > T_2(b)T_1 \approx T_2$ (c) $T_1 = T_2$ (d) $T_1 < T_2$

4. A circular coil of radius r carries a current I. The magnetic field at its center is B. At what distance from the centre, on the axis of the coil, the magnetic field will be B/8

(a)
$$\sqrt{2} R$$
 (b) $2 R$ (c) $\sqrt{3} R$ (d) $3 R$

5. An electric current passes through a long straight copper wire. At a distance 5 cm from the straight wire, the magnetic field is B. The magnetic field at 20 cm from the straight wire would be

(a)
$$\frac{B}{6}$$
 (b) $\frac{B}{4}$ (c) $\frac{B}{3}$ (d) $\frac{B}{2}$

6. If a bar magnet is dropped down in an infinitely long vertical copper tube, then the magnet will move continuously

(a) increasing velocity and acceleration

(b) increasing velocity but constant acceleration

(c) decreasing velocity and ultimately comes to rest

(d) increasing velocity and ultimately acquires a constant terminal velocity

7. An aluminium ring B faces an electromagnet A. Which of the following statement is correct?

- (a) if I increases, A will repel B
- (b) if I decreases, A will repel B
- (c) if I increases, A will attract B

(d) whether I increases or decreases B will not experience any force

8. Which scientist experimentally proved the existence of electromagnetic waves?

- (a) Marconi (b) Heinrich Rudolf Hertz
- (c) James Clerk Maxwell (d) Jagdish Chander Bose

9. Two coils are placed close to each other. The mutual inductance of the pair of coils depends upon

- (a) currents in the coils
- (b) materials of the wires of the coils
- (b) relative position and orientation of the coils

(d) rates at which the currents are changing in the coils

10.What happens if a monochromatic light used in the Young's double slit experiment is replaced by white light?

- (a) no fringes are observed
- (b) all bright fringes become white
- (c) all bright fringes are coloured between violet and red
- (d) only central fringe is white and all other fringes are coloured

11. A particle of mass m and charged q is accelerated through a potential V. The De – Broglie wavelength of the particle will be:

(a)
$$\frac{Vh}{\sqrt{2 \ qm}}$$
 (b) $\frac{q}{\sqrt{2 \ mV}}$ (c) $\frac{h}{\sqrt{2 \ qmV}}$ (d) $\frac{mh}{\sqrt{2 \ qV}}$







MARK: 70 TIME : 3hrs

- 12. The minimum angular momentum of electron in Hydrogen atom will be (a) $\frac{h}{\pi} Js$ (b) $\frac{h}{2\pi} Js$ (c) $h \pi Js$ (d) $2 \pi h Js$
- 13. If elements with principal quantum n > 4 were not allowed in nature, the number of possible elements would have been
- (a) 4 (b) 32 (c) 60 (d) 64
- 14. Which of the following set up can be used to verify the Ohm's law?



- 16. Assertion : The resistivity of a semi-conductor increases with temperature.
 - Reason : The atoms of semi-conductor vibrate with larger amplitude as higher temperatures thereby increasing its resistivity.
 - (a) Both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
 - (b) Both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
 - (c) The Assertion is correct but Reason is incorrect.
 - (d) Both the Assertion and Reason are incorrect.
- 17. Assertion : In Young's experiment, the fringe width for dark fringes is different from that for white fringes.
 Reason : In Young's double slit experiment the fringes are performed with a source of white light, then only black and bright fringes are observed.
 - (a) Both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
 - (b) Both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
 - (c) The Assertion is correct but Reason is incorrect.
 - (d) Both the Assertion and Reason are incorrect.
- 18. Assertion : Photo-sensitivity of a metal is high if its work function is small.
 - Reason : Work function = hf_0 where f_0 is the threshold frequency.
 - (a) Both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
 - (b) Both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
 - (c) The Assertion is correct but Reason is incorrect.
 - (d) Both the Assertion and Reason are incorrect.

SECTION – B

- 19. A capacitor of capacitance C is being charged by connecting it across a DC source along with an ammeter. Will the ammeter show a momentary deflection during the process of charging? If so, how would you explain this momentary deflection and the resulting continuity of current in the circuit? Write the expression for the current inside the capacitor.
- 20. A small magnet of magnetic moment M, is placed at a distance r from the origin O with its axis parallel to X -axis as shown. A small coil, if one turn is placed on the X -axis, at the same distance from the origin, with the axis of the coil coinciding with X -axis. For what value of current in the coil does a small magnetic needle, kept at origin, remains undefiled ? What is the direction of current in the coil ?

21. What is Einstein's mass-energy equivalence? What is its importance?



(or) A chain reaction dies out sometimes. Why?

- 22. You are given two converging lenses of focal length 1.25 cm and 5 cm to design a compound microscope. If it is desired to have a magnification of 30, then find out the separation between the objective and eyepiece.
- 23. Draw the voltage-current characteristic curve of a diode and mark its important parameter.

(or)

Draw V - I characteristics of a p - n junction diode. Answer the following questions, giving reasons:

- (i) Why is the current under reverse bias almost independent of the applied potential upto a critical voltage?(ii) Why does the reverse current show a sudden increase at the critical voltage?
- 24. Draw a graph showing the variation of intensity against the position x on the screen in Young double slit experiment.

25. Two point charges having equal charges separated by 1 m distance experience a force of 8 N. What will be the force experienced by them, if they are held in water, at the same distance? (Given: $K_{water} = 80$)

SECTION - C

- 26. Give some points of similarities and differences between Biot-Savart law for the magnetic field and Coulomb'slaw for the electrostatic field.
- 27. A horizontal conducting rod 10 *m* long extending from east to west is falling with a speed5.0 ms^{-1} at right angle to the horizontal component of the Earth's magnetic field, $0.3 \times 10^{-4} Wb m^{-2}$. Find the instantaneous value of the emf induced in the rod.

28. A capacitor C, a variable resistor R and a bulb B are connected in series to the AC mains in the circuit as shown in the figure. The bulb glows with some brightness. How will the glow of the bulb change if (i) a dielectric slab is introduced between the plates of the capacitor keeping resistance R to be the same (ii) the resistance R is increased keeping the same capacitance?



(or)

State the condition under which the phenomenon of resonance occurs in a series LCR circuit. Plot a graph showing the variation of current with frequency of an AC source in series LCR circuit.

- 29. A proton and an alpha particle are accelerated through the same potential. Which one of the two has (i)greater value of de Broglie wavelength associated with it and
 - (ii) less kinetic energy? Give reason to justifyyour answer.

(or)

- (a) Give a brief description of the basic elementary process involved in the photoelectric emission in Einstein's picture.
- (b) When a photosensitive material is irradiated with the light of frequency γ , the maximum speed of electrons is given by V_{max} . A plot of V_{max}^2 is found to vary with frequency γ as shown in the figure.

Use Einstein's photoelectric equation to find the expressions for

- (i) Planck's constant and
- (ii) work function of the given photosensitive material, in terms of the parameters l, n and mass m of the electron.



30. The electron in a given Bohr orbit has a total energy of -1.5 eV. Calculate its

(i) kinetic energy

(ii) potential energy

(iii) wavelength of radiation emitted, when this electron makes a transition to the ground state. [Given, energy in the ground state = -13.6 eV and Rydberg's constant = $1.09 \times 10^7 m^{-1}$]

SECTION - D

31. A slab of material of dielectric constant *K* has the same area as that of the plates of a parallel plate capacitor but has the thickness d/2, where d is the separation between the plates. Find out the expression for its capacitance when the slab is inserted between the plates of the capacitor.

(or)

- (i) Define capacitance of a capacitor.
- (ii) Derive an expression for the capacitance of parallel plate capacitance having plate area A plate separation d.
- 32. (i) Derive an expression for the current density in terms of the drift speed of electrons.
 - (ii) Derive Ohm's law on the basis of the theory of electron drift.
 - (iii) Derive an expression for the resistivity of a conductor in terms of number density of free electrons and relaxation time.

(or)

A 100 *W* bulb B_1 and two 60 *W* bulbs B_2 and B_3 , are connected to a 250 *V* source as shown in the figure. Now W_1, W_2 and W_3 are the output powers of the bulbs B_1, B_2 and B_3 respectively. What is the relation between the output powers of bulbs?



- 33. (a) How is a wavefront defined ? Distinguish between a plane wavefront and a spherical wavefront. Using Huygen's constructions draw a figure showing the propagation of a plane wave refracting at a plane surface separating two media. Hence verify Snell's law of refraction. When a light wave travels from a rarer to a denser medium, the speed decreases. Does it imply reduction in its energy ? Explain.
 - (b)When monochromatic light travels from a rarer to a denser medium, explain the following.
 - (i) Is the frequency of reflected and refracted light same as the frequency of incident light?
 - (ii) Does the decrease in speed imply a reduction in the energy carried by light wave ?
 - (or)
 - (a) In Young's double slit experiment, two slits are 1 mm apart and the screen is placed 1 m away from the slits. Calculate the fringe width when light of wavelength 500 nm is used.
 - (b) What should be the width of each slit in order to obtain 10 maxima of the double slits pattern within the central maximum of the single slit pattern ?
 - (c) The intensity at the central maxima in Young's double slit experiment is I_0 . Find out theintensity at a point where the path difference is $\frac{\lambda}{6}$, $\frac{\lambda}{4}$ and $\frac{\lambda}{3}$

34. Total internal reflection (*TIR*) is the optical phenomenon in which waves arriving at the interface (boundary) from one medium to another (e.g., from water to air) are not refracted into the second ("external") medium,but completely reflected back into the first ("internal") medium. It occurs when the second medium has ahigher wave speed (i.e., lower refractive index) than the first, and the waves are incident at a sufficientlyoblique angle on the interface. For example, the water-to-air surface in a typical fish tank, when viewedobliquely from below, reflects the underwater scene like a mirror with no loss of brightness.

TIR occurs not only with electromagnetic waves such as light and microwaves, but also with other types of waves, including sound and water waves. If the waves are capable of forming a narrow beam , the reflectiontends to be described in terms of "rays" rather than waves; in a medium whose properties are independent ofdirection, such as air, water or glass, the "rays" are perpendicular to the associated wave fronts.Repeated total internal reflection of a 405nm laser beam between the front and back surfaces of a glassvpane. The colour of the laser light itself is deep violet; but its wavelength is short enough to causefluorescence in the glass, which re-radiates greenish light in all directions, rendering the zigzag beam visible.

Refraction is generally accompanied by partial reflection. When waves are refracted from a medium of lower propagation speed (higher refractive index) to a medium of higher speed e.g., from water to air the angle ofrefraction (between the outgoing ray and the surface normal) is greater than the angle of incidence (betweenthe incoming ray and the normal). As the angle of incidence approaches a certain threshold, called the criticalangle, the angle of refraction approaches 90°, at which the refracted ray becomes parallel to the boundarysurface. As the angle of incidence increases beyond the critical angle, the conditions of refraction can nolonger be satisfied, so there is no refracted ray, and the partial reflection becomes total. For visible light, thecritical angle is about 49° for incidence from water to air, and about 42° for incidence from common glass to air.



(i) What is refractive index of a medium? (in terms of speed of light)

(ii) In the above diagram, calculate the speed of light in the liquid of unknown refractive index?

(iii) What is refractive index of a medium (in terms of real and apparent depth)?

(or) What is the relation between refractive index and critical angle for a medium?

35. A pure semiconductor germanium or silicon, free of every impurity is called intrinsic semiconductor. At room temperature, a pure semiconductor has very small number of current carriers (electrons and holes). Hence itsconductivity is low. When the impurity atoms of valance five or three are doped in a pure semiconductor, weget respectively n - type or p - type extrinsic semiconductor. In case of doped semiconductor $n_e n_h = n_i^2$. Where n_e and n_h are thenumber density of electron and hole charge carriers in a pure semiconductor. The conductivity of extrinsicsemiconductor is much higher than that of intrinsic semiconductor.

Answer the following questions :

- (i) What is n -type semiconductor?
- (ii) Do pure semiconductors obey Ohm's law?

(or)

(iii) Why do semiconductors behave as conductors at room temperature?

Why does a semiconductor behaves as an insulator at very low temperature?

CLASS: XII DATE: 13.02.2023 JAWAHAR HIGHER SECONDARY SCHOOL, CBSE - NEYVELI II FULL PORTION EXAM (2022 – 2023) CHEMISTRY

General Instructions:

- 1. There are 35 questions in this question paper with internal choice
- SECTION A consists of 18 multiple choice questions carrying I mark each
- 3. SECTION B consists of 7 very short answer questions carrying 2 marks cach
- 4. SECTION C costs of 5 short answer questions carrying 3 marks each
- 5. SECTION D consist of 2 case-based questions carrying 4 marks each
- 6. SECTION E consists of 3 long answer questions carrying 5 marks each
- 7. All questions are compulsory
- 8 Use of log tables and calculators is not allowed

SECTION-A

Directions (Q. Nos. 1-18): The following questions are multiple-choice questions with one correct answer Each question carries 1 mark. There is no internal choice in this section

- 1) The boiling points of alcohols are higher than those of hydrocarbons of comparable masses dueto: a) ion-dipole interaction b) dipole -dipole interaction c) hydrogen bonding
 - d) vander Waals forces

2)The role of a catalyst is to change :

- b) Gibbs' energy of reaction a) enthalpy of reaction
- c) equilibrium constant d) activation energy of reaction
- 3) The value of K_{H} for Ar(g), CO₂(g), HCHO(g) and CH₄(g) are 40.39, 1.67, 1.83 × 10⁻⁵ and 0.41 respectively. Arrange these gases in increasing order of solubility.

(a)
$$\operatorname{Ar} < \operatorname{CO}_2 < \operatorname{CH}_4 < \operatorname{HCHO}$$

(b) Ar
$$\leq$$
 CH₄ \leq CO₂ \leq HCHC

(c) HCHO
$$\leq$$
 CH₄ \leq CO₂ \leq Ar

(d) HCHO \leq CO₂ \leq CH₄ \leq Ar

- 4) Out of the following, the strongest base in aqueous solution is: a) dimethylamine b) aniline c) methylamine d) trimethylamine
- 5) Out of the following transition elements, the maximum number of oxidation states are shownby:
- (a) Cr(Z = 24)b) Sc (*Z* = 21) c) Fe (Z = 26)d) Mn (Z = 25) 6) What is the correct IUPAC name of the given compound?

7) For the reaction, $2X+Y \rightarrow X_2Y$

What will be the expression for instantaneous rate of the reaction? 1 d(V) $1d(\mathbf{v},\mathbf{v})$

a) +
$$\frac{1u(t)}{2 dt}$$
 b) - $\frac{1u(x_2 t)}{2 dt}$ c) $\frac{-u(x)}{2 dt}$ d) None of these

8) For the reaction
$$2H_2O_2 \rightarrow 2H_2O + O_2$$
, $r = k[H_2O_2]$. The reaction is of :

b) second order c) third order a) first order d) zero order

9) The compound obtained by the reaction of nitrous acid on aliphatic primary amine is:

a) alkyl nitrite b) alcohol c) nitroalkane d) secondary amine

10) A graph was plotted between the molar conductivity of various electrolytes (NaCl, HCl and NH₄ OH) and \sqrt{c} (in mol L⁻¹). Which of the following is the correct set

- a) I (NH₂OH), II (HCI), III (NaCI) c) I (HCI), II (NaCI), III (NH₄OH)
- b) I (NaCl), II (HCl), (III) (NH₂OH) d) I (NH₄OH), II (NaCI), III (HCI)



- 11) Using valence bond theory, the complex $[Cr(NH_3)_4]^{3+}$ can be described as : a) d²sp³, inner orbital complex, paramagnetic
- b) d^2sp^3 , outer orbital complex, diamagnetic d) dsp^2 , inner orbital complex, diamagnetic c) $sp^{3}d^{2}$, outer orbital complex, paramagnetic 12) Which of the following compound will not undergo azo coupling reaction with benzene diazonium chloride?
 - a) Phenol b) Aniline c) Nitrobenzene d) Anisole

13) Major product obtained on reaction of 3-phenyl propene with HBr in presence of organicperoxide is:

- a) 3-phenyl-2-bromopropane
- b) 3-phenyl-1-bromopropaned) 1-phenyl-2-bromopropane
- c) 1-phenyl-3-bromopropane
 d) 1-phenyl-2-bromopropane
 14) During dehydration of alcohols to alkenes by heating with concentrated H₂SO₄, the initiation step is:
 - a) elimination of water
 - c) protonation of alcohol molecule
- b) formation of an ester
- d) formation of carbocation

Directions (Q. Nos. 15-18) : Each of the following questions consists of two statements, one is Assertion and the other is Reason. Give answer :

15) Assertion : Vanadium had the ability to exhibit a wide range of oxidation states.

- **Reason :** The standard potentials Vanadium are rather small, making a switch between oxidation states relatively easy.
 - a) Both Assertion and Reason are true but Reason is not a correct explanation of Assertion.
 - b) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - c) Assertion is fake but Reason is true.
 - d) Assertion is true but Reason is fake.

16) Assertion : DNA has a double strand helix structure.

Reason : The two strands in a DNA molecule are exactly similar.

- a) Both Assertion and Reason are true but Reason is not a correct explanation of Assertion.
- b) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- c) Assertion is fake but Reason is true.
- d) Assertion is true but Reason is fake.
- **17)** Assertion : Tertiary butylamine can be prepared by the action of NH₃ on tert-butylbromide.
 - **Reason :** Tertiary butyl bromide being 3° alkyl halide prefers to undergo elimination on the treatment with a base.
 - a) Both Assertion and Reason are true but Reason is not a correct explanation of Assertion.
 - b) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - c) Assertion is fake but Reason is true.
 - d) Assertion is true but Reason is fake.

18) Assertion: IUPAC name of the compound

is 2- Ethoxy-2-methylethane.

- **Reason :** In IUPAC nomenclature, ether is regarded as hydrocarbon derivative in which a hydrogen atom replaced by —OR or —OAr group
 - [where R = alkyl group and Ar = aryl group]
 - a) Both Assertion and Reason are true but Reason is not a correct explanation of Assertion.
- b) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- c) Assertion is fake but Reason is true.
- d) Assertion is true but Reason is fake.

SECTION – B

Directions (Q. Nos. 19-25) : This section contains 7 questions with internal choice in two questions. The following questions are very short answer type and carry 2 marks each.

19) Time required to decompose SO_2Cl_2 to half of its initial amount is 60 minutes. If the decomposition is a

first order reaction, calculate the rate constant of the reaction.

20) Which one of the following pairs of substances undergoes S_N2 substitution reaction faster and why?



21) A cell is constructed between copper and silver

 $Cu(s) \mid Cu^{2+}(aq) \mid Aq^{+}(aq) \mid Aq(s)$

If the two half-cells are working under standard condition, then calculate the emf of the cell.

 E° Cu^{2+/}Cu =+ 0.34 V, E° Ag+/Ag =+ 0.80 V

22) Identify compounds (A) and (B) in the following reactions and write the related balanced chemical equation

$$CH_3 CONH_2 \xrightarrow{P_2 O_3} (A) \xrightarrow{4[H]} (B)$$

Complete and name the following reaction:

(i) $RNH_2 + CHCI_3 + 3KOH \rightarrow$

(ii) $RCONH_2 + B_{r2} + 4NaOH$

23) (i) Sketch the zwitter ionic form of α -amino acetic acid.

(ii) What type of linkage holds together the monomers in DNA?

24) A zinc rod is dipped in 0.1 M solution of Zn SO₄. The salt is 95% dissociated at this dilution at 298K. Calculate the electrode potential.

 $[E^{\circ}(Zn^{2+}/Zn) = -0.76V]$

- 25) (i) Give the electronic configuration of the *d* orbitals of Ti in $[Ti(H_2O)_6]^{3+}$ ion and Explain why this complex is coloured ? [At. No. of Ti = 22]
 - (ii) Write IUPAC name of $[Cr(NH_3)_3 (H_2O)_3]Cl_3$

(OR)

Determine the structure and magnetic behaviour of $[CoCl_4]^{2-}$ using valence bond theory.

SECTION - C

Directions (Q. Nos. 26-30) : This section contains 5 questions with internal choice in two questions. The following questions are short answer type and carry 3 marks each.

- 26) (i) Draw the structural formulas and write IUPAC names of all the isomeric alcohols with the
 - molecular formula $C_5 H_{12} O$.
 - (ii)Classify the isomers of alcohols given in part (a) as primary, secondary and tertiary alcohols.
- 27) Answer the following questions :(Any three)
 - i) What do you mean by depression in freezing point?
 - ii) How can the molecular weight of a non-volatile substance be calculated by freezing point depression method? Only give the formula.
 - iii) Measurement of osmotic pressure method is preferred for the determination of molar massof macromolecules such as proteins and polymers.
 - iv) Elevation of boiling point of 1M KCl solution is nearly double than that of 1 M sugar solution.
- 28) (i) Write the IUPAC name of the following complex :

 $[Co(NH_3)_4(H_2O)Cl]Cl_2$

(ii) What is the difference between an Ambidentate ligand and a Bidentate ligand?

(iii) Out of $[Fe(NH_3)_{6]}^{3+}$ and $[Fe(C_2O_4)_3]^{3-}$ which complex is more stable and why?

- 29) What happens when :
 - (i) N-ethylethanamine reacts with benzenesulphonyl chloride.
 - (ii) Benzylchloride is treated with ammonia followed by the reaction with Chloromethane.
 - (iii) Aniline reacts with chloroform in the presence of alcoholic potassium hydroxide. (OR)
 - (i) Write the IUPAC name for the following organic compound :



(i) Butane-1, 3-diol (ii) But-2-enal (iii) But-2-enoic acid

SECTION – D

Directions (Q. Nos. 31-32) : The following questions are case-based questions. Each question has an internal choice and carries 4 marks each. Read the passage carefully and answer the questions that follow.

31) The rate law for a chemical reaction relates the reaction rate with the concentrations or partial pressures of the reactants. For a general reaction aA + bB C with no intermediate steps in its reaction mechanism, meaning that it is an elementary reaction, the rate law is given by $r = k[A]^x$ [B]^y, where [A] and [B] express the concentrations of A and B in moles per litre. Exponents *x* and *y* vary for each reaction and are determined experimentally. The value of *k* varies with conditions that affect reaction rate, such as temperature, pressure, surface area, etc. The sum of these exponents is known as overall reaction order. A zero order reaction has a constant rate that is independent of the concentration of the reactants. A first order reaction depends on the concentration of only one reactant. A reaction is said to be second order when the overall order is two. Once we have determined the order of the reaction, we can go back and plug in one set of our initial values and solve for *k*.

In the context of the given passage, answer the following questions

- (i) Calculate the overall order of a reaction which has the following rate expression : Rate = $k[A]^{1/2}[B]^{3/2}$
- (ii) What is the effect of temperature on rate of reaction?
- (iii) A first order reaction takes 77.78 minutes for 50% completion. Calculate the time required for 30% completion of this reaction log 10 = 1, log 7 = 0.8450.

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(OR)
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(iv) A first order reaction has a rate constant $1 \neq 10^{-3}$ per sec. How long will 5g of this reactant take to reduce to 3 g? (log 3 = 0.4771; log 5 = 0.6990)

32) An amino acid is a compound that contains both carboxyl group and an amino group. Although, many types of amino acids are known, the α -amino acids are the most significant in the biological world because they are the monomers from which proteins are constructed. A general structural formula of an α -amino acid is shown in figure below.



Although, figure (a) is a common way of writing structural formulas for amino acids, it is notaccurate because it shows an acid (—COOH) and a base ($-NH_2$) within the same molecule. These acidic and basic groups react with each other to form a dipolar ion or internal salt (figure(b)). The internal salt of an amino acid is given the special name Zwitter ion. Note that a Zwitter ion has no net charge, it contains one positive charge and one negative charge.

Because they exist as Zwitter ions, amino acids have many of the properties associated with salts. They are crystalline solids with high melting points and are fairly soluble in water but insoluble in non-polar organic solvents such as ether and hydrocarbon solvents.

According to the above passage, answer the following questions :

- i) Amino acids are usually colourless, crystalline solids. They behave like salts rather than simple amines or carboxylic acids. Why amino acids show such a behaviour?
- ii) Amino acids are essential and non-essential depending upon their need. One of the essentialamino acid is lysine. Can you say why lysine is considered an essential amino acid?
- iii) Here are given some amino acids—lysine, Tyrosine, Glycine, Alamine. One of these amino acids is not optically active. Which one is that amino acid? Also, provide the reason. (OR)
- iv) The pk_{a1} and pk_{a2} of an amino acid are 2.3 and 9.7 respectively. What would be the isoelectric point of the amino acid? Calculate by defining it.

SECTION – E

Directions (Q. Nos. 33-35) : The following questions are long answer type and carry 5 marks each. Two questions have an internal choice.

33. (i) The cell in which the following reaction occurs:

 $2Fe^{3+}(aq) + 2I(aq) \longrightarrow 2Fe^{2+}(aq) + I_2(s)$

has E° Cell = 0.236 Volt at 298K. Calculate the standard Gibbs energy of the cell reaction. (Given : 1F = 96,500 C mol-1)

(ii) How many electrons flow through a metallic wire if a current of 0.5 A is passed for 2 hours? (Given : 1F = 96,500 C mol–1)

- (iii) Explain the following with reason :
 - (a) Chlorine can displace iodine from KI solution but iodine can not displace bromine from KBr solution.
 - (b) Following reaction is possible or not.
 - $H_{g} + H_{2}SO_{4} \longrightarrow H_{g}SO4 H2$
- 34) (i) Account for the following :
 - (a) Transition metals from large number of complex compounds.
 - (b) The lowest oxide of transition metal is basic whereas the highest oxide is amphotericor acidic.
 - (c) Ec value for the Mn^{3+}/Mn^{2+} couple is highly positive (+1.57 V) as compare to Cr^{3+}/Cr^{2+} .
 - (ii) Write one similarity and one difference between the chemistry of lanthanoid and actinoidelements.

(OR)

- (i) (a) How is the variability in oxidation states of transition metals different from that of the
 - *p*-block elements ?
 - (b) Out of Cu^+ and Cu^{2+} , which ion is unstable in aqueous solution and why ?
 - (c) Orange colour of Cr_2O^{2-} ion changes to yellow colour when treated with an alkali. Why ?
- (ii) Chemistry of actinoids is complicated as compared to lanthanoids. Give two reasons.

35) (i) Write the product (s) in the following reactions



- (ii) Give simple chemical test to distinguish between the following pairs of compounds :
- (a) Butanal and Butan-2-one.
- (b) Benzoic acid and Phenol.

(OR)

(i) An organic compound (A) with molecular formula C_3H_7NO on heating with Br_2 and KOH forms a compound (B), compound (B), on heating with $CHCI_3$ and alcoholic KOH produces a foul smelling compound (C) and on reacting with $C_6H_5SO_2CI$ for ms a compound (D) which is soluble in alkali. Write the structures of (A), (B), (C) and (D).

ii) Give reasons to support the answer :

(a) Presence of alpha hydrogen in aldehydes and ketones is essential for aldol condensations.

(b) 3-Hydroxy pentan-2-one shows positive result to Tollen's test.

General instructions:

CLASS:XII

DATE:17/2/2023

Read the following instructions carefully.

- a) There are 35 questions in this question paper with internal choice.
- b) SECTION A consists of 18 multiple-choice questions carrying 1 mark each.
- c) SECTION B consists of 7 very short answer questions carrying 2 marks each.
- d) SECTION C consists of 5 short answer questions carrying 3 marks each.
- e) SECTION D consists of 2 long answer questions carrying 4 marks each.
- f) SECTION E consists of 3 long answer questions carrying 5 marks each.
- g) All questions are compulsory.
- h) Use of log tables and calculators is not allowed

SECTION A

The following questions are multiple-choice questions with one correct answer. Each question carries 1 mark. There is no internal choice in this section.

1. De-icing is the process of removing snow, ice or frost from a surface. In extremely cold regions, car windows get covered by ice reducing the visibility. The image below shows the de-icing of the window of a car during extreme cold using a fluid. (1)



Which of the following compounds could be present in the de-icing fluid used above?

- A. formaldehyde B. phenol C. propan-2-ol D. acetic acid
- 2. Which of the following reaction mechanism is not involved in the given reaction sequence? (1) $CH_3CH_2CH_3 \rightarrow (CH_3)_2 CHCI \rightarrow (CH_3)_2 CHCN$

(CH₃)₂ CHCH₂ NHCOCH₃
$$\leftarrow$$
 (CH₃)₂ CHCH₂ NH₂
A. free-radical substitution B. nucleophilic subs

stitution C. elimination D. nucleophilic addition-elimination

3. The graph below shows the observed standard electrode potential of some transition elements.



Which of the following reactions can be predicted based on the graph above?

A. Cu + 2 H2SO4 --> CuSO4 + SO2 + 2 H2O C.

B.
$$Cu + 2 HNO_3 --> Cu(NO_3)_2 + H_2$$

$$CuO + 2 HCl --> CuCl_2 + H_2O$$

B.
$$Cu + 2 HNO3 --> Cu(NO3)2 + H2$$

D. $Cu^{2+} + 2 NaOH --> Cu(OH)2 + 2 Na^{+}$

4. Kamlesh was conducting an experiment to figure out the rate equation of the following reaction: $2 \text{ NO} + \text{O}_2 -> 2 \text{ NO}_2$

He measured the rate of this reaction as a function of initial concentrations of the reactants as follows: (1)

Number	Initial [NO]	Initial [O ₂]	formation of No ₂
1	0.2	0.2	0.074
2	0.2	0.4	0.15
З	0.4	0.2	0.29
4	0.4	0.4	0.20

Which of the following could be a reason for the inconsistency in the initial rate of formation of NO2 data for experiment 4?

- A. The rate of reaction does not depend on the concentration of the reactants.
- B. Higher concentration of O₂ could have resulted in slowing down the rate of reaction.
- C. Higher concentration of NO could have resulted in slowing down the rate of reaction.
- D. The temperature of the reactants in experiment 4 could have been different than for the other experiments.

(1)



Based on this, Which of the following statements is/are correct?

- (i) The solution remains electrically neutral during electrolysis.
- (ii) Electrons flow from the current source towards the solution at one electrode, and an equal number of electrons flow away from the solution at the other electrode.
- (iii) The number of positive ions moving towards one electrode is always equal to the number of negative ions moving towards the other electrode.
- A. i onlyB. i and ii onlyC. ii and iii onlyD. all- i, ii, and iii6. For a certain reaction X, rate = $0.7Z_{AB}e^{-E_A/RT}$.(1)It is seen that for another reaction, Y, rate = ZABe $^{-E_A/RT}$.

Based on the above, what can be said about reactions X and Y?

A) Both the reactions involve complex molecules.

B) Both the reactions involve simple molecules or atomic species.

C) Reaction X involves simple molecules or atomic species, while reaction Y involves complex molecules.

D) Reaction X involves complex molecules, while reaction Y involves simple molecules or atomic species.

7. A metal ion Mⁿ⁺ forms a complex ion of formula $[ML_2]^{(n-4)+}$ where L represents a bidentate ligand. Which of the following could be the charge on the ligand L? (1)

8. The image below shows different benzene derivates that give mononitration product at ortho, meta and para positions along with the rate of nitration relative to benzene. (1)

Row	Compound	Main products of mononitration	Rate of nitration relative to benzene
A	CH ₃	CH ₃ NO ₂ O NO ₂ NO ₂	Faster
в	phenol OH	OH NO ₂ OH OH NO ₂	Slower
с	nitrobenzene		Faster
D	benzoic acid	COOH NO2	Slower

Which of the following row shows atleast one INCORRECT description about the reaction?

A. only B B. only C C. only B and C D. only C and D

9. The rate constants of a reaction at 400 K and 600 K are 5 x 10^{-3} s⁻¹ and 8 x 10^{-3} s⁻¹ respectively. (1)

- What extra piece of information is needed to calculate the value of A (frequency factor)?(According to the Arrhenius equation, rate constant is given by, $k = Ae^{-E_a/RT}$.)
 - A. the order of the reaction
 - B. the activation energy of the reaction
 - C. the initial concentration of the reactants

D. [No extra information is needed. A can be calculated with the informationavailable]

10. The compound $[Co(NH_3)_5Cl]SO_4$ is isomeric with the compound $[Co(NH_3)_5SO_4]Cl$.

Which of the following rows correctly represents the oxidation state of cobalt in these compounds?

Rows	[Co(NH3)5Cl]SO4	[Co(NH3)5SO4]Cl
А	+2	+3
В	+3	+2
С	+2	+1
D	+3	+3

(1)

11. The image below shows an experimental setup to prepare an organic product X.



Which of the following could 'X' be?

A. ethane B. ethane C. ethanoic acid D. diethyl ether

12. During protein synthesis in cells, amino acids condense (in the presence of enzymes) through the formation of the amide link (-CONH-), or peptide bond, to form a polypeptide chain, which then folds to form a biologically active protein.

The equation below shows the formation of a dipeptide, Ala-Gly, formed by condensation of the two amino acids, alanine and glycine in a test tube. Which of



Which of the following statements is/are true for the above reaction?

- (i) A dipeptide Gly-Ala is equally likely to be formed by condensation of alanine and glycine. (1)(ii) Water is eliminated in the above condensation reaction. (1)
- (iii) Oxygen and hydrogen is released as gases in the above condensation reaction.
- A. i only B. i and ii only C. ii and iii only D. all- i,ii, and iii
- 13. Zirconium (Zr, Atomic number 40) and Hafnium (Hf, Atomic number 72) are transition series metals of group 4. They are found together in nature and are difficult to separate from each other. Which of the following is the reason for the above? (1)
- A. The almost identical radii of the atoms.
- B. The elements belong to the same group.
- C. The elements belong to adjacent periods. D. The presence of the same number of unpaired electrons in both the elements.
- 14. Which of the following would be among the products of the reactions between ammonia reacts with bromoethane?
- (i) CH₃CH₂NH₂ (ii) (CH₃CH₂)₂NH (iii) (CH₃CH₂)₃N (iv) (CH₃CH₂)₄ N⁺ Br⁻
- A. only i B. only i and ii C. only i, ii, and iii D. all- i, ii, iii and iv
- 15. Given below are two statements labelled as Assertion (A) and Reason (R). (1)
 Assertion (A): Dimethyl amine has higher boiling point than trimethyl amine.
 Reason (R): The molecular mass of trimethyl amine is relatively higher than that of dimethyl amine.
 Select the most appropriate answer from the options given below:
 - A. Both A and R are true and R is the correct explanation of A.
 - B. Both A and R are true but R is not the correct explanation of A.
 - C. A is true but R is false.
 - D. A is false but R is true.
- 16. Given below are two statements labelled as Assertion (A) and Reason (R). Assertion (A): A silver mirror can be created at the wall of a test tube using ethanal.

Reason (R): Ethanal can react with Fehling's solution

Select the most appropriate answer from the options given below:

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true but R is not the correct explanation of A.
- C. A is true but R is false.
- D. A is false but R is true.

17. Given below are two statements labelled as Assertion (A) and Reason (R).

- Assertion (A): At a constant temperature, the dissociation constant of chloroethanoic acid will be higher than that of propanoic acid.
 - Reason (R): Higher the number of carbon atoms in a compound, lower will be the dissociation constant. Select the most appropriate answer from the options given below:

A. Both A and R are true and R is the correct explanation of A.

- B. Both A and R are true but R is not the correct explanation of A.
- C. A is true but R is false. D. A is false but R is true.

(1)

(1)

18. Given below are two statements labelled as Assertion (A) and Reason (R).

Assertion (A): At room temperature, propan-2-ol and 2-methylpropan-2-ol, when heated with acidified potassium dichromate, slowly turns the colour of orange dichromate to green.

Reason (R) : Secondary and tertiary alcohols are readily oxidised to aldehydes which gets oxidised to acids.

Select the most appropriate answer from the options given below:

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true but R is not the correct explanation of A.

C. A is true but R is false.

D. Both A and R are false.

SECTION B

This section contains 7 questions with internal choice in two questions. The following questions are very short answer type and carry 2 marks each.

19. At high temperatures, ethyl chloride produces HCl and ethylene by the following first order reaction: CH₃CH₂Cl --> HCl + C₂H₄ (2)

In an experiment, when the initial concentration of ethyl chloride was 0.01 M, the rate of the reaction was found to be 1.6×10^{-8} M/s.

What will be the rate of reaction if the initial concentration of ethyl chloride is 0.07 M?

20. Pineapple contains a protease enzyme that breaks down proteins. If you try to make a jelly with fresh chunks of pineapple, the jelly won't set but it would set if you use canned pineapple. Explain.

OR (2)

The chain structure of Lysine is shown below.



(i) Based on the structure, is Lysine acidic, basic, or neutral overall? Explain.

(ii) What will be the structure of lysine if it is placed in a solution of pH value as 1?

21. 2-bromooctane reacts with alcoholic NaOH to give 2-octanol as shown below.



2-bromooctane

2-octanol

(a) Identify the type of substitution reaction mechanism. Justify your answer.

(b) What effect will it have on the rate of the reaction if:

(i) the concentration of NaOH is reduced by half?

(ii) the concentration of 2-bromooctane is reduced by half?

OR



(b) Two compounds X and Y are enantiomers of each other. Name one physical property that:

(i) is the same for X and Y. (ii) is different for X and Y.

22. (i) The complex [PtCl₂(NH₃)₂] has two isomers whereas [CoCl₄]₂- does not show geometrical isomerism and has no isomers why? (2)

(2)

- (ii) When NaOH solution is added to aqueous copper (II) sulphate solution, hydroxide ions displace water molecules forming a pale blue precipitate, X. If excess ammonia is now added, water molecules and hydroxide ions are exchanged by ammonia molecules, forming a deep blue solution, Y. Identify X and Y
- 23. The half equation for a redox reaction represents an equilibrium between two sides of an equation such as: $Cu^{2+}(aq) + 2e - --> Cu(s); E_0 = +0.34 v$ (2)
- (i) How will the value of E_0 change if the concentration of Cu₂₊ increases?
- (ii) Will the conversion of Cu₂₊ to Cu become more or less feasible if the concentration of Cu₂₊ increases? Give reason(s).
- 24. A first order reaction is found to have a half-life of 1.15×104 s.
 - What will be the time required for completion of 99% of the reaction?
- 25. Esterification of a carboxylic acid with an alcohol in the presence of mineral acid as catalyst is a reversible reaction.
 - (i) Suggest two things that can be done with the products formed to push the reaction in the forward direction.
 - (ii) If one mole of ethanoic acid and one mole of ethanol are allowed to reach equilibrium at 298K, how many moles of ethyl ethanoate and ethanoic acid are present at equilibrium?
 (Assume K_c = 4 at 298K)

SECTION C

This section contains 5 questions with internal choice in two questions. The following questions are short answer type and carry 3 marks each.

- 26. (a) Is benzaldehyde less or more reactive to electrophilic substitution reactions than benzene (C6H6)? Give an explanation for your answer. (3)
 - (b) State the position on the ring at which electrophilic substitution is likely to predominate in enzaldehyde. Explain why.
 - (c) Between 2-methyl-butan-2-ol and 2-methyl-butan-1-ol, which cannot be produced by the reduction of either an alcohol or an aldehyde? Why?
- 27. In 20th century, German scientist Werner succeeded in clarifying the structures of the five compounds consisting of platinum, chlorine, and ammonia. Some of the properties of these compounds are shown below in the table.(3)
- 28.

Compound	Formula	Total number of free ions in the formula	Number of free CI ⁻¹ ions in the formula
А	PtCl ₄ •6NH ₃	5	4
В	PtCl ₄ •5NH ₃	4	3
С	PtCl ₄ •4NH ₃	3	2
D	PtCl ₄ •3NH ₃	2	1
E	PtCl ₄ •2NH ₃	0	0
· . · · · · ·	1	11 J CD J	1.00

(i) What is the oxidation state and coordination number of Pt in compound C?

(3)

(2)

(ii) Which of the complexes formed for the compounds A, B, C, and D have structural isomers?(iii) Predict the shape of each compound.

28. Suman took two glasses of water from a water filter. She cools one glass in a fridge and warms the other glass on a stove.

Which glass of water will hold more dissolved oxygen? Explain using Henry's law.



(a) What evidence is there for a chemical reaction between ethylamine and hydrochloric acid?

- (b) Why does the smell of ethylamine disappear when hydrochloric acid is added?
- (c) Why does the smell of ethylamine reappear when sodium hydroxide is added?
- 30. A mixture of 0.5 moles acetaldehyde and 0.5 moles diethyl ketone is treated with 1 mole of sodium cyanide (NaCN).

What will be the major product in this reaction? Give two reasons for your answer.

(3)

- (a) Show steps to convert nitrobenzene to phenol.
- (b) The table below shows the observation when sodium reacts with ethanol and phenol.

Ethanol	Solution of phenol in ethanol		
Sodium sinks, evolves	Sodium sinks, evolves		
hydrogen steadily	hydrogen rapidly		

- (i) The reaction in each case involves reduction of hydrogen ion by sodium. Write down an ionic reaction for both the cases.
- (ii) Which is stronger acid- phenol or ethanol? Why?

SECTION D

This section contains two questions and carry 4 marks each.

31. The image below shows the double helix structure of a DNA. (4)



- (i) The double helix structure is easily destroyed by change in (a) temperature and (b) pH value. Explain the reason for both the cases.
- (ii) Suppose the bonds holding the DNA strands for double helix together were (a) covalent bonds (b) London dispersion force. What would be the problem in each case?
- 32. During a titration, 240 ml of NaOH reacted completely with 100 ml of H2SO4 solution. (4) The weight of H2SO4 taken was 9.8 g.
 - i) What is the molarity of the NaOH used?
 - ii) Calculate the amount of NaOH dissolved in solution.
- iii) How many grams of NaOH should be added to the original NaOH solution to make one litre of 0.5M NaOH solution?

(Molecular mass of NaOH is 40g/mol and molecular mass of H2SO4 is 98 g/mol.)

SECTION E

Each question carries 5 marks each. Read the group text or image carefully and answer the questions that follow.

33. One of the most common cells that's been used in our daily life is Duracell, also known as an alkaline cell. The image below shows the internal structure of a Duracell.



This cell uses a zinc half-cell and another half-cell containing a carbon (graphite) electrode in contact of moist manganese oxide.

Given that the electrode potential for $Zn_{2+}/Zn = -0.76$ V and $Mn_{4+}/Mn_{3+}(aq_{.}) = +0.74$ V.

(i) Write down the half-cell reactions for this cell at each electrode.

(ii) Calculate the overall cell potential.

- (iii) Which of the two will be the positive electrode and why?
- (iv) Draw the cell diagram, representing the direction in which reaction occurs in this cell.

OR

Imagine you are in a chemistry lab and the teacher is explaining the electrolysis of CuSO₄ solution and the products liberated after electrolysis. The teacher made two Setups for the electrolysis process. In Set up-I electrolysis of CuSO₄ solution is done by using Pt electrodes and in Set up-II electrolysis of CuSO₄ solution is done by using Cu electrodes. Answer the following questions based on this:

(5)

i) In which Set up I or II will the colour of CuSO4 solution fades away and why?

ii) Write the chemical reaction taking place at the Cu anode in Set up II.

iii) Name the product obtained at the anode in Set up I.

- iv) Which out of Set up I or II depict refining of crude copper?
- 34. The image below shows the boiling point of first seven straight chain primary alcohols

and first seven straight chain primary alkanes.



The boiling point of both the series increase monotonically with increasing size of the molecules. However, the slope of increment is different for both the series.

Observe the above graph and answer the following questions:

- (i) Why are the boiling point of alcohols higher than that of corresponding alkanes?
- (ii) Why do the differences in boiling point between corresponding alcohols and alkanes get less as the number of carbon atoms increase?
- (iii) Can the two graphs ever intersect?
- (iv) Will the graph look like almost the same if boiling point is replaced with melting point?
- (v) How will the boiling point graph for straight chain primary amines fare as compared to alcohols and alkanes?
- 35. i) Write the outer shell electronic configuration of an element with atomic number 24. Why is this different from the elements that are adjacent to it in the periodic table?
 - ii) Why is Hg not considered as a transition element?
 - iii) The third ionisation enthalpy of a few transition elements are given below:

Element	Sc	Ti	V	Cr	Mn	Fe	Co
lonisation enthalpy (kJ mol ^{−1})	2393	2657	2833	2990	3260	2962	3243

Explain the reason for the break in the trend of steady increase in third ionization enthalpy as shown in the table. Based on this, what can be said about the second ionisation energy of Cr as compared to that of Mn?

(5)

JAWAHAR HIGHER SECONDARY SCHOOL, CBSE - NEYVELI II FULL PORTION EXAM (2022 – 2023) DATE: 01.02.2023 BIOLOGY

i) All questions are compulsory.

CLASS: XII

ii) The question paper has five sections and 33 questions. All questions are compulsory.

- iii) Section-A has 16 questions of 1 mark each; Section-B has 5 questions of 2 marks each; Section C has 7 questions of 3 marks each; Section- D has 2 case-based questions of 4 marks each; and Section-E has 3 questions of 5 marks each.
- iv) There is no overall choice. However, internal choices have been provided in some questions. student has to attempt only one of the alternatives in such questions.
- v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION - A

- 1. Which one of the following technique is used in DNA fingerprinting for the detection of DNA?
- c) Southern blotting b) Western blotting d) In-situ hybridization a) Northern blotting
- 2. Which of the following statements regarding IUDs is correct?
 - a) It suppresses the process of gametogenesis.
 - b) They once inserted need not be replaced.
 - c) They are generally inserted by the user itself.
 - d) It increases phagocytosis of sperms within the uterus.
- 3. Which of the following statement is correct?
 - a) Injecting microbes during immunization induces passive immunity.
 - b) Cell-mediated immune response is responsible for graft rejection.
 - c) Colostrum during initial days of lactation provides active immunity to infant.
 - d) None of the above
- 4. Which of the following is best suited for codominance?
- a) Both are recessive b) One is recessive c) One is dominant d) Both are dominant 5. Which of the following cause of biodiversity loss is not included in evil guartet ?
- a) Coextinction b) Pollution c) Alien species invasion d) Habitat loss and fragmentation 6. The second trophic level in a lake is
 - a) Phytoplankton b) Zooplankton c) Benthos d) Fishes
- 7. The given diagram shows the uterine tubes of four women P, Q, R and S.



In which two women is fertilization impossible at present ?

- a) P and Q b) Q and R c) R and S d) S and P
- 8. The bacterium "Propionibacterium sharmanii is used in the production of
- c) Roquefort cheese a) Toddy b) Swiss cheese
- d). Dough for bread 9. Seeds of an orange when taken out and squeezed, show many embryos of different sizes and shapes The reason for this is as many embryos have developed from
 - a) Egg cells fusing with different male gametes forming embryos.
 - b) PEN fusing with different male gametes forming embryos
 - c) Nucellar cells dividing and developing into embryos
 - d) Synergids dividing and developing into embryos

10. In laboratory experiments, two species of the protist Paramecium were grown alone and in the presence of the other species. The following graphs show growth of species 1 (left) and species 2 (right), both along and when in mixed culture



Interpretation of these graphs shows that

- a) competitive exclusion occurred in these experiments
- b) both species are affected by interspecific competition but species 1 is less affected.
- c) both species are affected by interspecific competition but species 2 is less affected
- d) both species are affected equally by inter specific competition

11. Identify the correct match for the given apparatus



OPTIONS	Apparatus	Function
А	Gene gun	Vectorless direct gene transfer
В	Column Chromatography	Separation of chlorophyll pigments
С	Sparged stirred tank	Carry out fermentation process
D	Respirometer	Finding out rate of respiration

12. Energy flow in an ecosystem is

a) unidirectional b) bidirectional c) multidirectional d) all of these

Question No. 13 to 16 consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not the correct explanation of A
- C. A is true but R is false
- D. A is False but R is true.
- 13. Assertion: Drugs like Barbiturates and Benzodiazepines normally used as medicine to help the patients to cope up with mental illness.
 - Reason: When these substances are taken for a purpose other than medical use, constitute the drug abuse.
- 14. Assertion: Genetically modified microbes help in crop protection.
- Reason: Transgenic bacteria control insects by producing endotoxins.
- 15. Assertion: Clown fish maintains a commensalistic relation with the sea anemone
- Reason: In this interaction, one species benefits and the other is neither benefitted nor harmed.
- 16. Assertion: Homologous organ represent divergent evolution. Reason: Homology indicate common ancestry.

SECTION - B

17. Where are fimbriae present in human female reproductive system? Give their function.

OR

Where are leydig cells present? What is their role in reproduction?

- 18. In a typical monohybrid cross the F2 population ratio is written as 3: 1 for phenotype but expressed as 1:2:1 for genotype. Explain with the help of an example.
- 19.



The diagram above shows a part of human immune system. Identify the parts (A) and (B). How do they differ in their function?

- 20. (a) Name the deficiency for which first clinical gene therapy was given.
- (b) Mention the cause of and one cure for this deficiency.
- 21. Identify the type of given ecological pyramid and give one example each of pyramid of number and pyramid of biomass in such cases.



SECTION - C

- 22. a) What do Y and 'B' stand for in 'YAC' and 'BAC' used in Human Genome Project (HGP).? Mention their role in the project.(3)
 - b) Write the percentage of the total human genome that codes for proteins and the percentage of discovered genes whose functions are known as observed during HGP.
 - c) Expand 'SNPs identified by scientists in HGP.
- 23. a) List any four characteristic features of wheat flowers that make it a good example of wind pollination.b) It is observed that plant breeders carrying out wheat hybridization often take pollen grains from the 'pollen banks'. Do you agree? Give one reason in support of your answer.
- 24. (i) What is the given diagram representing?
 - (ii) Name the parts a, b, c and d.
 - (iii) In the eukaryotes the DNA molecules are organized within the nucleus. How is the DNA molecule organized in a bacterial cell in absence of a nucleus?

(3)



- 25. Which law states that the sum of allelic frequencies in a population is constant? Write its mathematical formula used to derive allelic frequency. List the two factors that influence the law,
- 26. A person suffering from AIDS dies of opportunistic infections (ARC) i.e... infections that could have been otherwise overcome.
 - (i) State one reason as to why an 'HIV patient dies of opportunistic infections
 - (ii) Give the scientific name of one bacterium and one parasite which mainly attack a person.
 - (iii) Write the full form of the name of the widely used diagnostic test for AIDS.

OR

A patient complains of suffering from constipation, stomach ache, stool with blood clots and excess mucous. The physician diagnosed it as amoebiasis, after stool test

- a) Write the scientific name of the microbe identified in the stool sample.
- b) How do you think, the patient must have contacted it?
- c) Write your suggestions to the patient to avoid infection in future.
- 27. (a) Name the technique used for separation of DNA fragments.
 - (b) Write the type of matrix used in this technique
 - (c) How is separated DNA visualized and extracted for use in recombinant technology?
- 28. Bio-diversification of life started to occur almost 3 billion years ago. Since then new species have been evolving and then disappearing in masse from Earth
- (a) How many episodes of mass extinctions of species have already taken place and which one is in progress in the current era?
- (b)How is current episode in progress different from the previous episodes and why? Explain

SECTION-D

Q. no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart

29. Haemophilia is a genetic disorder of humans. The pedigree chart given below shows the inheritance of Haemophilia in one family. Study the pattern of inheritance and answer the questions given



- (a) What is the most likely mode of inheritance for this pedigree!
- (b) Give all the possible genotypes of the members 4, 5 and 6 in the pedigree chart.
- (c) 'A blood test shows that the individual 14 is a carrier of Haemophilia. The member numbered 15 has recently married the member numbered 14. What is the probability that their first child will be a haemophiliac male? How will you characterize this disorder? OR
- (d) Why is Haemophilia generally observed in human males? Explain the conditions under which a human female can be haemophiliac.

30. When bacteria get through the mechanical and chemical barriers, the body has two more lines of 4 defence - white blood cells and antibodies, produced by white blood cells. One type of white blood cells fights infection by engulfing bacteria (a process called phagocytosis) and digesting them. The body's defences can be enhanced by vaccination. The presence of the pathogen triggers white blood cells to make specific antibodies to combat possible infection. If the person is exposed to the disease later, defences are already in place to prevent it developing (the person is immune to that disease). The figure shows the changes in the levels of antibody in response to an inoculation of a vaccine, followed by a booster injection 3 weeks later.



- a) What is vaccination?
- (b) Name any two diseases against which vaccination is done.
- (c) Where do you find antibodies in the blood? How does antibodies level increase after vaccination in the body?

OR

(d) What is the importance of booster injection? Name one disease against which booster injection is suggested.

SECTION - E

31. The graph given below shows the variation in the levels of ovarian hormones during various phases of menstrual cycle:



- (a) Identify A and 'B'.
- (b) Specify the source of the hormone marked in the diagram.
- (c) Reason : out why A peaks before B.
- (d) Compare the role of A and B.
- (e) Under which condition will the level of B continue to remain high on the 28th day ?

OR

- (a) Draw the embryo sac of a flowering plant and label (i) central cell (ii) Chalazal end of the embryo sac (iii) synergids.
- (b) Name the cell that develops into the embryo sac and explain how this cell leads to the formation of Embryo sac. Also mention the role played by the various cells of the embryo sac.
- 32. (a) Describe the experiment conducted by Alfred Hershey and Martha Chase for identification of genetic material.
 - (b) Why is it considered path breaking in the field of Molecular Biology?



Look at the figure above depicting lac operon of E. coli

- (a) What could be the series of events when an inducer is present in the medium in which E. coli is growing? (b) Name the Inducer.
- 33. Read the paragraph given below and answer the questions that follow:

Enzyme Taq polymerase, is extracted from a eubacterial microorganism Thermus aquaticus from Yellowstone National Park in Montana, USA and isolated by Chien et al. (1976). Taq polymerase successfully replaced the DNA polymerase from E.coli that was being used in PCR earlier and this shift revolutionized the PCR technique.

- (i) Taq polymerase after its discovery replaced E.coli DNA polymerase in PCR technique. Explain giving reasons why was the need felt for the change?
- (ii) What is a primer and its importance in PCR?
- (iii) Write the importance of PCR as a diagnostic tool.

OR

Development of recombinant DNA technology has opened gates to many breakthroughs in the field of medicine and agriculture. This has enabled scientists to isolate, sequence and manipulate individual genes obtained from diverse living or dead cells. Given below is a diagram showing the basic step involved in genetically modifying an organism. Study the given diagram and answer the questions that follow:



(i) Are two different types of restriction endonucleases used, one to cut the vector DNA and another to cut the desired DNA to be cloned? Support your answer, giving reason.

- (ii) Which enzyme is used at step (X) to integrate the foreign DNA with the vector DNA?
- (iii) What is the term used for step (Y) showing multiple copies of the foreign DNA being formed in transformed E. coli?
- (iv) Draw a diagram of E. coli cloning vector pBR322 to show the following:
 - (I) Any one restriction endonuclease site in tetracycline resistance gene
 - (II) Any one restriction endonuclease site in ampicillin resistance gene
 - (III) "ori" site
- (v) What does rop code for in plasmid pBR322?

JAWAHAR HIGHER SECONDARY SCHOOL, CBSE – NEYVELI II FULL PORTION EXAM (2022 – 2023) BIOLOGY

MARKS : 70 TIME: 3 Hrs

CLASS: XII

i) All questions are compulsory.

- ii) The question paper has five sections and 33 questions. All questions are compulsory.
- iii) Section-A has 16 questions of 1 mark each; Section-B has 5 questions of 2 marks each; Section C has 7 questions of 3 marks each; Section- D has 2 case-based questions of 4 marks each; and Section-E has 3 questions of 5 marks each.
- iv) There is no overall choice. However, internal choices have been provided in some questions. student has to attempt only one of the alternatives in such questions.
- v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION - A

- 1. C-peptide of human insulin is
 - a) removed during maturation of pro-insulin to insulin
 - b) responsible for the formation of disulphide bridge
 - c) a part of mature insulin molecule
 - d) responsible for its biological activity

2. Atmosphere of earth just before the origin of life consisted of:

- a) CH_4 , NH_3 , H_2 and water vapours.
- b) CO₂, NH₃, and CH₂

c) water vapours, CH_4 , NH_3 and oxygen. 3. The term 'precipitation' includes

- c) Both (a) and (b) a) rain b) snow 4. Methanogenic bacteria are present in

 - a) anaerobic sludge b) rumen (a part of stomach) of cattle
 - c) Both (a) and (b) d) None of these
- 5. Who proposed that the first form of life come from pre-existing non-living molecules?
 - a) Darwin and Lamarck b) de Vries and Sturtevant
 - c) Oparin and Haldane d) Louis Pasteur and Miller
- 6. Asexual reproduction is common among
 - a) single celled organisms only.
 - b) single celled animals, plants and animals with simple organizations.
 - c) animals with simple organization.
 - d) plants only.
- 7. Which one of the following pair is a purine pair?
- a) Adenine, Guanine b) Cytosine, Thymine c) Uracil, Guanine d) Adenine, Thymine
- 8. The trigger for activation of toxin of Bacillus thuringiensis is
 - b) high temperature a) alkaline pH of gut
 - c) acidic pH of stomach d) mechanical action in the insect gut
- 9. The law of segregation of characters postulated by Mendel can be related to
 - a) the presence of two genes for each character in a somatic cell.
 - b) presence of both genes on the same chromosome.
 - c) a gamete receiving only one of the two homologous chromosomes during gamete formation. d) None of the above
- 10. The figure below is the diagrammatic representation of the E.Coli vector pBR 322. Which one of the given options correctly identifies its certain component (s)?



a) ori - original restriction enzyme

b) ampR, tetR - antibiotic resistance genes

- c) Hind III, EcoRI selectable markers
- d) rop-reduced osmotic pressure
- 11. The polymerase enzyme used in PCR is
 - a) DNA polymerase I b) restriction endonuclease
 - c) reverse transcriptase d) Taq polymerase
- 12. Which of the following statement confirm the law of dominance
 - a) Alleles do not show any blending and both characters recovered as such in F₂ generation b) It is the conclusion of a dihybrid cross
 - c) 3:1 ratio in F_2 generation
 - d) Alleles of a pair segregate from each other such that gamete receives only one of the two factors

- d) CH_4 , O_3 , O_2 and water vapours.
- d) None of them

Question No. 13 to 16 consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- **13. Assertion:** Phagocyte cells digest microbes and debris
 - Reason: Natural killer cells destroy virus-infected cells and tumor cells.
 - a) Both A and R are true and R is the correct explanation of A.
 - b) Both A and R are true and R is not the correct explanation of A.
 - c) A is true but R is false.
 - d) A is False but R is true.
- **14. Assertion:** Hybrid is formed by cross between two organisms that are different in one or more traits.
 - **Reason:** Mendel crossed two plants differing in one trust to obtain F1 plants in monohybrid cross.
 - a) Both A and R are true and R is the correct explanation of A.
 - b) Both A and R are true and R is not the correct explanation of A.
 - c) A is true but R is false.
 - d) A is False but R is true.
- **15. Assertion:** An antibody is a protein molecule made by the lymphocytes.
 - Reason: An antibody binds to a specific antigen and neutralizes its odd effects.
 - a) Both A and R are true and R is the correct explanation of A.
 - b) Both A and R are true and R is not the correct explanation of A.
 - c) A is true but R is false.
 - d) A is False but R is true.
- **16. Assertion:** Replication and transcription occur in the nucleus but translation takes place in the cytoplasm.
 - **Reason:** mRNA is transferred from the nucleus into cytoplasm where ribosomes and amino acids are available forprotein synthesis.
 - a) Both A and R are true and R is the correct explanation of A.
 - b) Both A and R are true and R is not the correct explanation of A.
 - c) A is true but R is false.
 - d) A is False but R is true.

SECTION - B

- 17. State the role of 'biolistic gun' in biotechnology experiments. Microparticles of which elements are used in thistechnique?
- 18. A region of a coding DNA strand has the following nucleotide sequence: -ATGC-What shall be the nucleotide sequence in the following?
 - i) Sister DNA segment it replicates.
 - ii) m-RNA polynucleotide it transcribes.
- 19. Refer the figure of a part of seminiferous tubule showing different stages of sperm formation and answer the questions:



a) Describe the process of spermatogenesis up to the formation of spermatozoa.

- b) Trace the path of spermatozoa from the testes up to the ejaculatory duct only.
- 20.. Define the term 'health'. Mention any two ways of maintaining it.

(OR)

Microbes play a dual role when used for sewage treatment as they not only help to retrieve usable water but alsogenerate fuel. Write in points how this happens?

21. Cucurbits and papaya plants bear staminate and pistillate flowers. Mention the categories they are put underseparately on the basis of the type of flowers they bear.

SECTION – C

- 22. A large number of married couples in the world are childless. It is shocking to know that in India the femalepartner is often blamed for the couple being childless.
 - i) State any two reasons responsible for the cause of infertility in case of male and female.
 - ii) Suggest a technique that can help the couple to have a child where the problem is with male.
- 23. Name the organic materials exine and intine of an angiosperm pollen grains are made up of.

Explain the role of exine.

- 24. Explain stirring type bioreactors.
- 25. Study the diagram given below and answer the following questions.
 - Wells



i) Why have DNA fragments in band 4 moved far away in comparison to those in band 3?ii) Identify the anode end in the diagram.

iii) How are these DNA fragments visualised.

- 26. Scientists have succeeded in recovering healthy sugarcane plants from a diseased one.
 - i) Name the part of the plant used as explant by scientists.
 - ii) Describe the procedure the scientists followed by recover the healthy parts.
 - iii) Name the technology used for crop improvement.
- 27. (a) State the cause and symptoms of Down's syndrome. Name and explain the event responsible for causing thissyndrome.
 - (b)Haemophilia and Thalassemia are both examples of Mendelian disorder, but show difference in theirinheritance pattern. Explain how.
- 28. Name the ancestors of man based on the features given below:
 - i) Human like, meat-eater with 900 cc brain, lived in Java.
 - ii) More human with brain size 1400 cc, lived in central Asia, used hides and buried their dead.
 - iii) Human like, vegetarian, with brain capacity between 650 cc and 800 cc.

SECTION - D

29. Read the following and answer any four questions from 29(i) to 29(iv) given below: Ex-Situ Conservation:

In this approach, threatened animals and plants are taken out from their natural habitat and placed in special setting where they can be protected and given special care. Zoological parks, botanical gardens and wildlife safari parks serve this purpose. There are many animals that have become extinct in the wild but continue tobe maintained in zoological parks. In recent years ex situ conservation has advanced beyond keeping threatened species in enclosures.

Now gametes of threatened species can be preserved in viable and fertile condition for long periods using cryopreservation techniques, eggs can be fertilised in vitro, and plants can be propagated using tissue culture methods. Seeds of different genetic strains of commercially important plants can be kept for long periods in seedbanks.

Biodiversity knows no political boundaries and its conservation is therefore a collective responsibility of all nations. The historic Convention on Biological Diversity ('The Earth Summit') held in Rio de Janeiro in 1992, called uponall nations to take appropriate measures for conservation of biodiversity and sustainable utilisation of its benefits. In a follow-up, the World Summit on Sustainable Development held in 2002 in Johannesburg, South Africa, 190 countries pledged their commitment to achieve by 2010, a significant reduction in the current rate of biodiversityloss at global, regional and local levels.

- i) What was the outcome of the 1992 Earth Summit in Rio de Janeiro?
- ii) For endangered species, Ex-situ conservation is a method that is?
- iii) Which one of the following is related to ex-situ conservation of threatened animals and plants?
- iv) World summit on sustainable development of 2002 was held in?

30. Read the following and answer any four questions from 30(i) to 30(iv) given below:

Microbes in commercial production of Chemicals, enzymes and Bioactive molecule:

Microbes are also used for commercial and industrial production of certain chemicals like organic acids, alcohols and enzymes. Examples of acid producers are Aspergillus niger (a fungus) of citric acid, Acetobacter aceti (a bacterium) of acetic acid; Clostridium butylicum (a bacterium) of butyric acid and Lactobacillus (a bacterium) of lactic acid. Yeast (Saccharomyces cerevisiae) is used for commercial production of ethanol. Microbes are also used for production of enzymes.

Lipases are used in detergent formulations and are helpful in removing oily stains from the laundry. You must have noticed that bottled fruit juices bought from the market are clearer as compared to those made at home. This is because the bottled juices are clarified by the use of pectinases and proteases.

Streptokinase produced by the bacterium Streptococcus and modified by genetic engineering is used as a 'clot buster' for removing clots from the blood vessels of patients who have undergone myocardial infraction leading to heart attack. Another bioactive molecule, cyclosporin A, that is used as an immunosuppressive agent in organ- transplant patients, is produced by the fungus Trichoderma polysporum. Statins produced by the yeast Monascus purpureus have been commercialised as blood-cholesterol lowering agents. It acts by competitively inhibiting the enzyme responsible for synthesis of cholesterol.

i) Which organisms has been Commercialised as blood cholesterol lowering agent?
ii) Why bottled fruit juices bought from the market are clearer as compared to those made at home?
iii) Identify a, b, c, d, e and fill the given table below

	Organism	Bioactive Molecule	Use
1.	M o n a s c u s purpureus	а	b
2.	С	d	Antibiotic
3.	е	Cyclosporin A	f

iv) Name the enzyme produced by the bacterium Streptococcus?

SECTION - E

31. a) "X" part in the given diagram plays an important role in the formation of pollen grain wall. Identify "X" and explain its role in the formation of pollen grain wall.



b) Describe the characteristics of flowers that are pollinated by wind.

- c) Identify and explain the stage (given below) involved in post-fertilisation event of flowering plants.
 - i) Transfer of pollen grains
 - ii) Embryo development
 - iii) Formation of flower
 - iv) Formation of pollen grains

(OR)

a) Explain the menstrual phase in a human female. State the levels of ovarian and pituitary homones during this phase.

b) Why is follicular phase in the menstrual cycle also referred as proliferative phase? Explain.

c) Explain the events that occur in a graafian folicle at the time of ovulation and thereafter. 32. a) Why are thalassemia and haemophilia categorized as Mendelian disorders ? Write the

symptoms of thesediseases. Explain their pattern of inheritance in humans.

b) Write the genotypes of the normal parents producing a haemophilic son.

(OR)

Describe the experiment that helped demonstrate the semi-conservative mode of DNA replication. 33. How is biodiversity at all levels generally conserved ?

(OR)

What kind of threat to biodiversity may lead to its loss ?

JAWAHAR HIGHER SECONDARY SCHOOL, CBSE - NEYVELI CLASS: XII II FULL PORTION EXAM (2022 - 2023) **MARKS : 70** DATE: 01.02.2023 COMPUTER SCIENCE (CODE - II) TIME: 3 Hrs **GENERAL INSTRUCTIONS:** 1. This question paper contains five sections, Section A to E. 2. All questions are compulsory. 3. Section A have 18 questions carrying 01 mark each 4. Section B has 07 Very Short Answer type questions carrying 02 marks each 5. Section C has 05 Short Answer type questions carrying 03 marks cach 6. Section D has 03 Long Answer type questions carrying 05 marks each 7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q34 again part (iii) only 8. All programming questions are to be answered using Python Language only. SECTION - A 1. Which of the following is not a valid identifier name in Python? a) 5Total b) Radius c) pie d) While 2. Given the list Lat = ['C', 'O', 'M', 'P', 'U', 'T', 'E', 'R"], write the output of: print(Lat[3:6]) a) ['M', 'P', 'U', 'T'] b) ['M', 'P', 'U'] c) ['P', 'U', 'T'] d) ['P', 'U', 'T', 'E'] 3. Consider the following code: t1 = (2,3,7,4.6)print(t1.index(4))

- Output is a) 4 b) 3 c) 6 d) 2
- 4. If a function returns more than one value and the function call is assigned into a single variable, what will be the data type of the variable? a) List b) Tuple
 - c) Dictionary d) String

5. Name the function which is not associated with dictionary data type. d) min()

- a) index() b) get() c) pop()
- 6. What will be the output of the following Python code?
- d = {'S' : "SUM", 'P' : "PROD". 'D': "DIFF"}
 - for i in d:
 - print(i,end=':')
 - b) SUM: PROD:DIFF: a) S:P:D: c) Error d) SUM: PROD: DIFF
- 7. Which of the following will give output as (23, 2, 9, 75). If T= (6, 23, 3, 2, 0, 98, 75)
- b) print(T(0:7:2]) c) print(T[1:8:2]) a) print(T [1:7:2]) d) print(T[0:8:2])
- 8. If we want to know the current file position, which method can be applied:
- a) seck() b) tell() c) read() d) pos() 9. Which of the following is a unique name given to a website?
- a) HTTPS b) WWW c) URL d) HTTP
- 10. Fill in the blank: The

command is used to remove records of a table in SQL

- a) DELETE b) ALTER c) DROP d) UPDATE
- 11. Evaluate the following expressions:
- 12 * (13%4)//7+6
- 12. Find the output of the following:
 - >>>S=1, (2,3,4), (5,), (6,7)
 - >> len(S)
 - a) Error b) 7 d) 5 c) 4
- 13. Alter table command of SQL. belongs to? a) DDL b) DCL
- c) DML d) TCL 14. To remove the data of Pawan from table student which command is used
 - a) Delete* from student where FirstName="Pawan";
 - b) Delete from table student where FirstName="Pawan";
 - c) Delete from student where FirstName="Pawan",
 - d) Delete from student drop FirstName="Pawan",
- 15. All aggregate functions except ignore null values in their input collection.
- b) Count (*) d) Sum () a) Count (attribute) c) Avg ()
- 16. A non-key attribute, whose values are derived from primary key of someother table.
 - b) Foreign Key a) Alternate Key c) Primary Key d) Candidate Key

Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as

- (a) Both A and R are true and R is the correct explanation for A
- (b) Both A and R are true and R is not the correct explanation for A
- (c) A is True but R is False
- (d) A is false but R is True
- 17. Assertion (A): A function may or may not return a value.
- Reason (R): When a function does not have a return statement, the value returned is NULL
- 18. Assertion (A):- File mode 'a' overwrites the data in the file.
 - Reasoning (R):- File mode 'w' is used for writing data to a file.

19. Rewrite the following Python program after removing all the syntactical errors (if any), underlining each correction: Def checkval: x = input("Enter a number") if x % 2 = 0: print (x, "is even") elseif x<0: print (x, "should be positive") else: print (x, "is odd") 20. Write the differences between a hub and a switch. OR Write any two advantages of bus topology. 21 (a) Given is a Python string declaration: myexam="@@CBSE Examination 2022@@" Write the output of print(myexam[::-2]) (b) Write the output of the code given below: my_dict = {"name": "Varun", "age", 32} my_dict['age] =27 my dict['address'] = "Chennai" print(my dict.items()) 22. Define a) degree of a relation b) Equi Join 23. A resultset is extracted from the database using the cursor object (that has been already created) by giving the following statements. n=10 Myrecords = mycursor. fetchmany(n) (a) How many records will be returned by fetchmany(n) method? (b) What will be the datatype of Myrecords object after the given command is executed? 24. a) Write the full forms of the following i) ARPANET ii) GPRS b) What is the function of HTTP? 25. Predict the output of the Python code given below: def replace V(st): newstr=" for character in st: if character in 'aeytuAEPTU': newstr += "*' else: newstr + =character return newstr st = "Hello how are you" st1 = replace V(st)

print("The modified String is:", st1)

What possible output(s) are expected to be displayed on screen at the time of execution of the program from the following code? Justify.

import random Colours= ["VIOLET","INDIGO","BLUE","GREEN","YELLOW","ORANGE","RED"] End = random.randrange(2)+3 Begin = random.randrange(End)+1 for i in range(Begin,End): print(Colours[i],end="&") (i) INDIGO&BLUE&GREEN& (ii) VIOLET&INDIGO&BLUE& (iii) BLUE&GREEN&YELLOW& (iv) GREEN& YELLOW&ORANGE&

OR

SECTION – C 26. a) Differentiate between DDL and DML.

b) Consider the following tables. Write the output of the queries (i) to (iv) based on the tables Table: Emplayee

Emplayeeld	Name	Sales	Jobld	
E1	Sumit Sinha	110000	102	
E2	Vijay Singh Tomar	130000	101	
E3	Ajay Rajpal	140000	103	
E4	Mohit Kumar	125000	102	
E5	Sailja Singh	145000	103	
1		Table : Job		
JobI	d Joi	Title	Salary	
101	Pre	sident	200000	
102	Vice I	President	125000	
103	Admi	nistrator sistant	80000	
104	Accounti	ng Manager	70000	
105	Acc	ountant	65000	
106	Sales	Manager	80000	

Give the output of following SQL statement:

- i) Select max(salary),min(salary) from job;
- ii) Select Name, JobTitle, Sales from Employee, Job where
 - Employee.JobId=Job.JobId
 - and JobId in (101,102);
- iii) Select JobId,count(*) from Employee group by JobId;
- iv) Select * from Job where JobTitle like " %in%";

OR

27. Write a function in Python to read a text file PARA.TXT' and display the number of three letter words in each line of this file.

For example if the file PARA.TXT contains:

Whose woods these are I think I know. His house is in the village though; He will not see me stopping here To watch his woods fill up with snow.

Output should be: 1 2 2 1

Write a function in Python that counts the number of words with more than four characters from the text file "DEMO.TXT".

28. Consider the following tables Sender and Recipient . Write SQL commands for the statements (a) to (c)

	1 4 01	e : Customer	
SenderID	SenderName	SenderAddress	Sendercity
ND01	R Jain	2, ABC Appls	New Delhi
MU02	H Sinha	12 Newtown	Mumbai
MU15	S Jha	27/A, Park Street	Mumbai
ND50	T Prasad	122-K,SDA	New Delhi

Table : Customer

Table: Reciever

			and the second s	1
RecID	SenderID	RecName	RecAddress	recCity
KO05	ND01	R Bajpayee	5, Central Avenue	Kolkata
ND08	MU02	S Mahajan	116, A-Vihar	New Delhi
MU19	ND01	H Singh	2A, Andheri East	Mumbai

display

a) TO

Recipient details in ascending order of RecName

b) To display number of Recipients from each city

c) To display the details of senders whose sender city is 'Mumbai".

29. Write a function listchange(Arr)in Python, which accepts a listArr of numbers, the function will replace

the odd position number by their squares and even position number by their cubes. Sample Input Data of the list is:

a = [(2,4,3,3,5,6] listchange(a)

output: [4,64,9,27,25,216)

30. Write a function in Python, PUSH(Customer) where, Customer is a dictionary containing the details of

Customers- (Name:Age).

35.

The function should push the names of those Customers in a stack STK whose age is greater than

Also write another function POP(STK) to delete and display the element of Stack, STK.

For example:

If the dictionary contains the following data: Fruitbasket = {"Manish":70,"Abhay" :20,"Neeraj" :40,"Sham":45} The stack should contain Sham Neeraj Manish

OR

Write a function in Python, STACKPUSH(Employee) where, Employee is a dictionary containing the details of Employees (Name Salary)

The function should push the Salaries of those Employees in a stack STEMP whose names starts with letter A.

Also write another function POP(STEMP) to remove and display the element of Stack, STEMP **For example**:

If the dictionary contains the following data:

Employee = ("Arun":4000, "Ben":7000, "Patrick" :3500, "Abhay":5000)

The stack, STEMP should contain

5000 4000

SECTION - D

31. PVS Computers decided to open a new office at Ernakulum, the office consist of Five buildings and each contains number of computers. The details are shown below.



Computers in each building are networked but the buildings are not networked so far. The company has now decided to connect the building also.

- (i) Do you think Repeaters are required in the campus? Why
- (ii) The company wants to link this office to their head office at Delhi
 - (a) Which type of transmission medium is appropriate for such a link?(b) What type of network would this connection result into?
- (iii) Where server is to be installed? Why?
- (iv) Suggest cable layout(s) for connecting the buildings.
- (v) Suggest the wired Transmission Media used to connect all buildings efficiently.
- 32. (a) Give the output of the following code:

(b)The code given below inserts the following record in the table PAINTING in the database GALLERY. The table Painting has the following data:



PicID int(input("Enter Picture Number :: ")) Title input("Enter Title:: ") Artist-input("Enter Artist Name :: ") Price int(input("Enter Price :: ")) query=" #Statment 3 Paint.execute(query) # Statement 4 print("Data Added successfully") (or) (a) Give the output of the following code: def deviation(X, Y): if X>Y: return X-Y else: return Y-X NUM=[20,30,34,89,74,23] for CNT in range (4,0,-1): A=NUM[CNT] B=NUM[CNT-1] print(deviation(A,B),'#', end=") (b) The code given below reads the following record from the table named **PAINTING** and displays only those records which belong to the artist 'Van Gogh':

- The table Painting has the following data:
 - PicID integer Title - string Artist - string
 - Price integer

Note the following to establish connectivity between Python and MYSQL:

- Username is root
- Password is tiger
- The table exists in a MYSQL database named GALLERY.

Write the following missing statements to complete the code:

Statement 1- to establish connection

Statement 2- to form the cursor object

Statement 3-create a query that extracts records of artist Van Gogh Statement 4- to read the complete result of the query

import mysql.connector as AR def sql_data():

PIC=AR.connect(_____)#Statement 1 GA=_____#Statement 2 print("Paintings belonging to Van Gogh are: ") _____#Statement 3 GA.execute(QR) GetD=_____#Statement 4 for X in GetD; print(X) print()

33. Explain the seek() function with an example.

Sham is creating a csv file which has records of the following type [Sportname,Coachname] Write a Program in Python that defines and calls the following user defined functions:

- (i) Display (SP) which display the coachname of a sport SP given as parameter from the file 'game.csv'.
 - It should also count the number of coaches coaching the sport SP.
- (ii) Addrec() To accept and add data of Sportname and Coachname to a binary file 'game.csv'.

(or)

Explain the use of tell() function with an example.

Anu is creating a csv file 'music.csv' which contains records with following fields [music_id,artist,rating]. Write a Program in Python that defines and calls the following user defined functions:

- (i) Input()-To accept and add data of a music album to the file 'music.csv'.
- (ii) Showdata()-To display the records of the albums whose rating is above 4.

SECTION – E

34. ABC school is considering to maintain their student's information using SQL to store the data.

As a database administrator Harendra has decided that:

Name of database: SCHOOL

Name of table : STUDENT

Attributes of the table are as follows:

AdmissionNo-numeric, FirstName-character of size 30,

LastName - character of size 20, DOB- date

Table: STUDENT

AdmissionNo	FirstName	LastName	DOB
012355	Rahul	Singh	2005-05-16
012358	Mukesh	Kumar	2004-09-15
012360	Pawan	Verma	2004-03-03
012366	Mahesh	Kumar	2003-06-08
012367	Raman	Patel	2007-03-19

Based on the data given above answer the following questions:

- (i) If 2 columns are deleted and 2 rows are added in the table STUDENT, what will be the new degree and cardinality of the above table?
- (ii) Identify the most appropriate column to be made as primary key. Justify your answer.
- (iii) Write the statements to:
 - (a) Insert a new column called Phonenumber Integer type to the table.
 - (b) Alter the Firstname of Pawan as 'Pavan.'.
 - or (Option for part iii only)
- (iii) Write the statements to:
 - (a) Sort the records in descending order of LastName.
 - (b) Add a new record with the following data 012388, Varun, Shah, 2003-07-14.
- 35. Pooja has been given the following incomplete code for searching for an email from the file "Sender.dat" which contains records of following structure:[name,email_id]. She has written the following code. As a programmer, help her to successfully execute the given task.

· ·	
import	# Statement 1
f= open()# Statement 2
data =	# Statement 3
print (rec)	
f.close()	
em=input('Enter E-mail id to be searched: ")
for rec in d	ata:
if	#Statement 4
print (rec)

f.close()

- (a) Name the module she should import in Statement 1.
- (b) Fill in the blank Statement 2 where Pooja should open the file to search the data in the file.
- (c) Fill in the blank in Statement 3 to read the data from the file.
- (d) Fill in the blank in Statement 4 to check for given email id.

	JAWAHAR HIGHER SECONDARY SCHOOL, CBSE - NE	EYVELI
CLASS: XII	II FULL PORTION EXAM (2022 – 2023)	MARKS : 70
DATE: 15.02.2023	COMPUTER SCIENCE (CODE - I)	TIME: 3 Hrs

GENERAL INSTRUCTIONS:

- 1. This question paper contains five sections, Section A to E.
- 2. All questions are compulsory.
- 3. Section A have 18 questions carrying 01 mark each
- 4. Section B has 07 Very Short Answer type questions carrying 02 marks each
- 5. Section C has 05 Short Answer type questions carrying 03 marks cach
- 6. Section D has 03 Long Answer type questions carrying 05 marks each
- 7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q34 again part(iii)only 8. All programming questions are to be answered using Python Language only.

SECTION - A

- 1. Identify the valid statement for list L=[1,2,"a"]: c) del L[2] d) del L["a"] a L.remove("2") b) L.del(2)2. Which is not a constraint in SQL? a) Unique b) Distinct c) Primary key d) Check 3. Consider the following code: t1 = (2,3,7,4,6)print(t1.index(4)) Output is a) 4 b) 3 c) 6 d) 2
- 4. If a function returns more than one value and the function call is assigned into a single variable, what will be the data type of the variable?

d) String a) List b) Tuple c) Dictionary 5. Name the function which is not associated with dictionary data type. a) index() b) get() c) pop() d) min() 6. To remove the data of Pawan from table student which command is used a) Delete* from student where FirstName="Pawan"; b) Delete from table student where FirstName="Pawan"; c) Delete from student where FirstName="Pawan", d) Delete from student drop FirstName="Pawan", 7. Update command of SQL. belongs to? a) DDL c) DML b) DCL d) TCL 8. Fill in the blank: command is used to remove records of a table in SQL The a) DELETE b) ALTER c) DROP d) UPDATE 9. Which of the following is a unique name given to a website? d) HTTP b) WWW c) URL a) HTTPS 10. Which of the following will give output as (23, 2, 9, 75). If T= (6, 23, 3, 2, 0, 9, 8, 75) a) print(T [1:7:2]) b) print(T(0:7:2]) c) print(T[1:8:2]) d) print(T[0:8:2]) 11. If we want to know the current file position, which method can be applied: a) seck() b) tell() c) read() d) pos() 12. Find the output of the following: >>>S=1, (2,3,4), (5,), (6,7) >>> len(S) b) 7 a) Error c) 4 d) 5 13. What will be the output of the following Python code? d = {'D' : "DIFF", S "SUM", 'P' : "PROD"} for i in d: print(i,end=':') d) DIFF:SUM: PROD a) D:S:P: b) DIFF:SUM: PROD: c) Error 14. A non-key attribute, whose values are derived from primary key of someother table. a) Alternate Key b) Foreign Key c) Primary Key d) Candidate Key ignore null values in their input collection. 15. All aggregate functions except b) Count (*) a) Count (attribute) d) Sum () c) Avg () 16. Evaluate the following expressions: 12 * (13%4)//7+6 Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True 17. Assertion (A):- File mode 'a' overwrites the data in the file. Reasoning (R):- File mode 'w' is used for writing data to a file. 18. Assertion (A): A function may or may not return a value. Reason (R): When a function does not have a return statement, the value returned is NULL SECTION - B 19. Rewrite the following Python program after removing all the syntactical errors (if any), underlining each correction: Def checkval: x = input("Enter a number") if x % 2 = 0: print (x, "is even") elseif x<0: print (x, "should be positive") else: print (x, "is odd") 20. What is protocol? Name two commonly used protocols (or) What is the difference between bridge and router? 21 (a) Given is a Python string declaration: myexam="@@CBSE Examination 2022@@" Write the output of print(myexam[::-2]) (b) Write the output of the code given below: my_dict = {"name": "Varun", "age", 32} my_dict['age] =27 my_dict['address'] = "Chennai" print(my dict.items()) 22. A resultset is extracted from the database using the cursor object (that has been already created) by giving the following statements. n=10 Myrecords = mycursor.fetchmany(n) a) How many records will be returned by fetchmany (n) method? b) What will be the datatype of Myrecords object after the given command is executed? 23. Define a) Domain of a relation b) Cross Join

24) a) Write the full forms of the following: i) XML ii) HTTPS iii) SLIP iv) SMTP b) What is the function of a bridge in a network ? 25. Predict the output of the Python code given below: def replace V(st): newstr=" for character in st: if character in 'aeiouAEIOU': newstr += "*' else. newstr + =character return newstr st = "Hello how are you" st1 = replace V(st) print("The modified String is:", st1) OR

What possible output(s) are expected to be displayed on screen at the time of execution of the program from the following code? Justify.

import random

Colours= ["VIOLET","INDIGO","BLUE","GREEN","YELLOW","ORANGE","RED"] End = random.randrange(2)+3 Begin = random.randrange(End)+1 for i in range(Begin,End): print(Colours[i],end="&") (i) INDIGO&BLUE&GREEN& (ii) VIOLET&INDIGO&BLUE& (iii) BLUE&GREEN&YELLOW& (iv) GREEN& YELLOW&ORANGE&

SECTION - C

26. a) Define Primary key and candidate key in a relation.

b) Consider the following tables. Write the output of the queries (i) to (iv) based on the tables Table: Emplayee

	5		
Emplayeeld	Name	Sales	Jobld
E1	Sumit Sinha	110000	102
E2	Vijay Singh Tomar	130000	101
E3	Ajay Rajpal	140000	103
E4	Mohit Kumar	125000	102
E5	Sailja Singh	145000	103

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JobId	JobTitle	Salary
101	President	200000
102	Vice President	125000
103	Administrator Assistant	80000
104	Accounting Manager	70000
105	Accountant	65000
106	Sales Manager	80000

Give the output of following SQL statement:

i) Select * from Job where JobTitle like " %in%";

ii) Select Name, JobTitle, Sales from Employee, Job where

- Employee.JobId=Job.JobId
 - and Jobld in (101,102);
- iii) Select max(salary),min(salary) from job;
- iv) Select JobId,count(*) from Employee group by JobId;

27. Write a function in Python to read a text file 'SAMPLE. TXT and display the number of three letter words in each line of this file.

For example if the file SAMPLE.TXT contains:

Whose woods these are I think I know. His house is in the village though; He will not see me stopping here To watch his woods fill up with snow. Output should be: 4 1 0 2

Write a function in Python that counts the number of words with more than four characters from the text file "ARTICLE.TXT"

28. Consider the following tables Sender and Recipient . Write SQL commands for the statements (a) to (c)

SandarID	SandarMama	Customer	0.1.1
Sendento	SenderName	SenderAddress	Sendercity
ND01	R Jain	2, ABC Appls	New Delhi
MU02	H Sinha	12 Newtown	Mumbai
MU15	S Jha	27/A, Park Street	Mumbai
ND50	T Prasad	122-K,SDA	New Delhi

Table: Reciever

RecID	SenderID	RecName	RecAddress	recCity
KO05	ND01	R Bajpayee	5, Central Avenue	Kolkata
ND08	MU02	S Mahajan	116, A-Vihar	New Delhi
MU19	ND01	H Singh	2A, Andheri East	Mumbai

a) To display Recipient details in ascending order of RecName

b) To display number of Recipients from each city

c) To display the details of senders whose sender city is 'Mumbai".

29. Write a function listchange(Arr)in Python, which accepts a listArr of numbers, the function will replace

the number divisible by 3 by value 10 and multiply other numbers by 5..

Sample Input Data of the list is: a = [12,21,23,45]

listchange(a)

output: [10, 10, 115, 10]

30. Write a function in Python, PUSH(Customer) where, Customer is a dictionary containing the details of Fruits – {Fruitname:Quantity}:

The function should push the names of those Customers in a stack STK whose age is greater than 100.

Also write another function POP(STK) to delete and display the element of Stack, STK.

For example:

If the dictionary contains the following data: Fruit = {"Apple":70,"Orange" :120,"Pear":80,"Mango":125} The stack should contain

Mango

Orange

OR

Write a function in Python, STACKPUSH(Flight) where, flight is a dictionary containing the details of Flight – {flightid:destination}.

The function should push the destination of those flights in a stack STACK whose flight if >103 Also write another function POP(STACK) to remove and display the element of Stack, STACK **For example**:

If the dictionary contains the following data:

Student = ("104:" Amsterdam",107:"London",102:"Paris",105:"Italy"}

The stack, STACK should contain

Italy

London

Amsterdam

SECTION - D

31. PVS Computers decided to open a new office at Ernakulum, the office consist of Five buildings and each contains number of computers. The details are shown below.

	Building 2	Building 4		
Building 1		Building 5		
	Building 3			
Distance between b	ouildings		Building	No of computers
Building 1 and 2	20 Meters		1	40
Building 2 and 3	50 Meters		2	45
Building 3 and 4	120 Meters		2	1 110
Building 3 and 5	70 Meters			1 70
Building 1 and 5	65 Meters	- Steller	4	1 10
Building 2 and 5	50 Meters		5	60
Junuing 2 care -				

Computers in each building are networked but the buildings are not networked so far. The company has now decided to connect the building also.

- (i) Do you think Repeaters are required in the campus? Why
- (ii) The company wants to link this office to their head office at Delhi
 - (a) Which type of transmission medium is appropriate for such a link?
 - (b) What type of network would this connection result into?
- (iii) Where server is to be installed? Why?
- (iv) Suggest cable layout(s) for connecting the buildings.
- (v) Suggest the wired Transmission Media used to connect all buildings efficiently.

32. (a) Give the output of the following code:

(b)The code given below inserts the following record in the table PAINTING in the database GALLERY. The table Painting has the following data:

PicID - integer Title-string Artist - string Price - integer

(or)

Write the following missing statements to complete the code: Statement 1- to establish connection Statement 2- to form the cursor object Statement 3- query to add the record Statement 4-to add the record permanently in the database. import mysgl.connector as PIC AR=PIC.connect() #Statement 1 #Statement 2 Paint= PicID=int(input("Enter Picture Number :: ")) Title=input("Enter Title:: ") Artist=input("Enter Artist Name :: ") Price=int(input("Enter Price :: ")) query=" #Statment 3 Paint.execute(query) # Statement 4 print("Data Added successfully") (a) Give the output of the following code: def deviation(X, Y): if X>Y: return X-Y else: return Y-X NUM=[20,30,34,89,74,23] for CNT in range (4,0,-1):

A=NUM[CNT] B=NUM[CNT-1] print(deviation(A,B),'#', end='')

(b) The code given below reads the following record from the table named **PAINTING** and displays only those records which belong to the artist 'Van Gogh':

The table Painting has the following data:

- PicID integer Title - string
- Artist string Price - integer

Note the following to establish connectivity between Python and MYSQL:

- Username is root
- Password is tiger
- The table exists in a MYSQL database named GALLERY.

Write the following missing statements to complete the code:

Statement 1- to establish connection

Statement 2- to form the cursor object

Statement 3-create a query that extracts records of artist Van Gogh Statement 4- to read the complete result of the query

import mysql.connector as AR
def sql_data():
 PIC=AR.connect(_____)#Statement 1
 GA=_____#Statement 2
 print("Paintings belonging to Van Gogh are: ")
 _____#Statement 3
 GA.execute(QR)
 GetD=____#Statement 4
 for X in GetD:
 print(X)
 print()

33. a) Explain the use of tell() function with an example.

b) Sham is creating a csv file which has records of the with following type [Sportname,Coachname].

Write a Program in Python that defines and calls the following user defined functions:

- (i) INSERT_ REC() To accept and add data of Sportname and Coachname to a binary file "SPORTS.csv'..
- (ii) SHOW ____ REC (SP) which display the coachname of a sport SP given as parameter from the
- file "SPORTS.csv'. It should also count the number of coaches coaching the sport SP.

(or)

a) Explain the seek() function with an example.

Anu is creating a csv file 'album.csv' which contains records with following fields [music_id, artist, rating]. Write a Program in Python that defines and calls the following user defined functions:

- i) Getdata () To accept and add data of a music album to the file album , csv.
- ii) Dispdata() To display the recprds of the albums whose rating is above 3.

SECTION - E

34. Brightminds school is considering to maintain their student's information using SQL to store the data. As a database administrator Harendra has decided that:

Name of database: SCHOOL

Name of table : STUDENT

Attributes of the table are as follows:

AdmissionNo-numeric, FirstName-character of size 30,

LastName - character of size 20, DOB- date

Table: STUDENT

AdmissionNo	FirstName	LastName	DOB
012355	Rahul	Singh	2005-05-16
012358	Mukesh	Kumar	2004-09-15
012360	Pawan	Verma	2004-03-03
012366	Mahesh	Kumar	2003-06-08
012367	Raman	Patel	2007-03-19

Based on the data given above answer the following questions:

(i) If 3 columns are deleted and 3 rows are added in the table STUDENT, what will be the new degree

and cardinality of the above table?

- (ii) Identify the most appropriate column to be made as primary key. Justify your answer.
- (iii) Write the statements to:
 - (a) Insert a new column called Phonenumber Integer type to the table.
 - (b) Alter the Firstname of Pawan as 'Pavan.'. or (Option for part iii only)
- (iii) Write the statements to:
 - (a) Sort the records in descending order of LastName.
 - (b) Add a new record with the following data 012388, Varun,Shah,2003-07-14.
- 35. Poornima has been given the following incomplete code for searching for an email from the file "Sender.dat" which contains records of following structure:[name,email_id]. She has written the following code. As a programmer, help her to successfully execute the given task.

import______# Statement 1
f= open(_____)# Statement 2
data =_____# Statement 3
print (rec)
f.close()
em=input("Enter E-mail id to be searched: ")
for rec in data:
 if______#Statement 4
 print (rec)
f.close()

- (a) Name the module she should import in Statement 1.
- (b) Fill in the blank Statement 2 where Poornima should open the file to search the data in the file.
- (c) Fill in the blank in Statement 3 to read the data from the file.
- (d) Fill in the blank in Statement 4 to check for given email id.
