ST. COLUMBUS SCHOOL
DAYALBAGH, FBD.
HOLIDAY HOMEWORK FOR WINTER BREAK (2025-26)
CLASS –XII (SCIENCE)

Dear Parent,

Greetings!!

Holiday is the time that all students eagerly wait for. We all make plans to enjoy, relax and to empower ourselves during these days. This winter vacation, the holiday homework is designed as a medium for you all to achieve the motto of “Fun and Learn”.

We have made this winter break homework only activity-based. We are looking forward to the children coming back with smiling and joyous faces . All of us at St. Columbus School wish happy and enjoyable holidays and Happy New Year to one and all.

Regards

Columbian Family

SUBJECT – ENGLISH

ASSIGNMENT - I

SECTION A: READING SKILLS (22 MARKS)

Reading Comprehension Through Unseen Passages

Q1. Read the passage text carefully:
12m

1. History books often praise the bold—the generals who commanded armies, the inventors who reshaped technology, the leaders whose speeches stirred nations. Yet, if one looks closely at society, it becomes clear that the true backbone of a community is neither the loudest nor the most celebrated. It is the ordinary individual whose unnoticed acts of responsibility, kindness and persistence sustain the rhythms of daily life. These people rarely receive awards, nor do they expect them. Their contributions are quiet but essential, forming the invisible foundation upon which great achievements stand.
2. Consider the simple act of reliability. While innovations may catapult humanity forward, it is the dependable individual—the teacher who shows up every morning, the bus driver who starts his route at dawn, the nurse who offers a reassuring smile to every patient—who ensures that life keeps moving steadily. Their constancy allows others the freedom to dream, plan and pursue ambitious goals. Without this base of predictability, society would quickly descend into chaos, for dreams require stability in which to grow.
3. But quiet strength is not limited to reliability. It is also found in the courage of individuals who face personal difficulties with dignity. The grandmother who raises her grandchildren despite her limited income, the young student who studies under the dim light of a street lamp because electricity is unreliable at home, or the shopkeeper who continues serving customers even after a natural disaster has wiped out half the town—these people carry a kind of bravery that does not make headlines. Still, it inspires those who witness it, for it shows that resilience is often forged in the fires of everyday struggle rather than dramatic heroism.
4. Modern society, however, tends to overlook this strength. Social media amplifies the spectacular, the glamorous, and the exceptional. The world celebrates viral achievements, instant success, and overnight fame, creating an illusion that greatness must always be dazzling. As a result, many fail to appreciate the profound value of the ordinary. But if the glamorous achievements vanished tomorrow, the world would not collapse; if the quiet workers disappeared, society would crumble within hours.
5. It is also worth noting that ordinary people often influence others more deeply than public figures do. A student may forget a famous motivational speech but remember forever the teacher who explained a difficult chapter patiently. A child may not recall the name of a world leader but will always cherish the neighbour who stitched their torn schoolbag. These gestures, though small, have an enduring impact because they are personal and real. They touch human emotion in ways that grand gestures often cannot.
6. Moreover, quiet strength is closely linked to empathy. Ordinary people tend to understand the struggles of others because they experience many of the same challenges themselves. It is the clerk who shares her umbrella with a stranger during a sudden downpour, the farmer who distributes a portion of his harvest to needy families, or the bus conductor who waits an extra minute because he notices a schoolboy running desperately toward the vehicle. These small decisions, born out of compassion rather than obligation, ripple outward to create a more humane society.
7. In essence, the extraordinary lies hidden within the ordinary. When we open our eyes to the subtle ways people support one another—through steady work, silent resilience, or simple

acts of care—we begin to appreciate that human greatness is not always loud. It is often humble, steady, and unremarkable on the surface. Yet its effects are enduring.

8. The world would be wiser, perhaps gentler, if we recognized and celebrated these quiet contributors more often. Instead of idolizing only those who rise to dramatic heights, we could learn to honour the millions who rise each morning determined to do their best, even when no one is watching. The true strength of society, after all, does not lie solely in its towering achievements but in the countless ordinary hands that hold it up every day.

Answer the following questions, based on the passage above.

1. According to the essay, ordinary individuals: (1m)
 i. Seek recognition for their efforts
 ii. Form the unnoticed yet essential base of society
 iii. Are less important than innovators
 iv. Avoid responsibility

2. What does the author mean by the "invisible foundation" of society? Answer in 30 – 40 words. (2m)
3. Identify the word from the passage that means **"excessive admiration or praise"**. (1m)

4. The grandmother raising her grandchildren represents: (1m)
 i. Technological progress ii. Silent resilienceiii. Overnight fame iv. Ritualistic duty

5. According to the passage, social media distorts society's understanding of greatness by ____. (1m)
6. What does the author imply about the relationship between struggle and resilience? Answer in 30-40 words.(2m)

7. Read the given assertion (A) and reason (R) and choose the option that correctly analyses the statements.
 Assertion (A): Modern society often overlooks quiet strength. (1m)
 Reason (R): Social media highlights only dramatic or glamorous achievements.
 i. Both assertion and reason are true, and the reason correctly explains the assertion.
 ii. Both are true, but the reason does NOT explain the assertion.
 iii. Assertion is true, but the reason is false.
 iv. Assertion is false, but the reason is true.

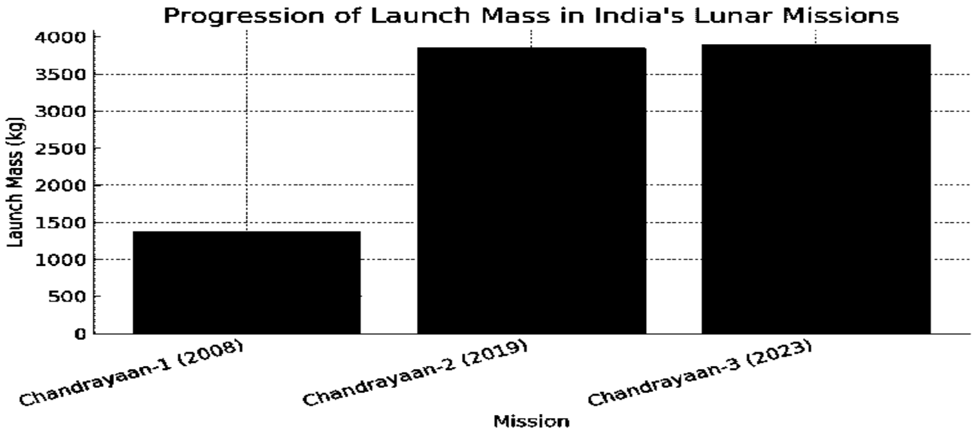
8. The phrase "human greatness is not always loud" implies that: (1m)
 i. Most achievements must be announced publicly ii. True greatness can be quiet and subtle
 iii. Greatness depends on popularity iv. Silence is preferred in society

9. How does empathy manifest in small everyday decisions as mentioned in the text? Answer in 30 -40 words. 2m

Q2.Readthefollowingpassage carefully. 10 m

(1) India's journey in lunar exploration marks one of the most compelling scientific success stories of the 21st century. The Indian Space Research Organisation (ISRO) entered the global

arena of lunar science with the launch of Chandrayaan-1 in 2008, a mission that fundamentally reshaped humanity's understanding of the Moon. Carrying 11 scientific instruments from India and international partners, the spacecraft made the landmark discovery of water molecules and hydroxyl on the lunar surface—an achievement that placed India firmly among the world's most innovative space-faring nations.



(2) Asignificant indicator of India's progression in this domain is the increasing technological complexity andlaunch massof itslunarspacecraft.Thediagrambelow,based onpubliclydocumentedmassdataof Chandrayaan missions, highlights the scale and ambition of India's developments over time:

(3) The chart clearly illustrates a dramatic leap from Chandrayaan-1's modest 1,380 kg to the much more sophisticated 3,850 kg Chandrayaan-2 mission, launched in 2019. This expansion in mass reflects not onlytheinclusionofanorbiter,lander,androver, but alsothegrowthofIndia'sengineeringcapabilities in deep-space navigation, autonomy, thermal management, and precision landing technologies.

(4) Although the lander Vikram of Chandrayaan-2 did not achieve a soft landing, the orbiter continues to functionwithexceptionalefficiency,sendinghigh-resolutionimagesandspectroscopicdatathatsupport studies on lunar geology, exosphere mapping, and mineral composition.

(5) TheChandrayaan-3mission(2023)demonstratedIndia'sresilienceandscientificmaturity.Withalaunch mass of around 3,900 kg, only slightly higher than Chandrayaan-2, the mission focused solely on delivering a lander (Vikram) and rover (Pragyan) safely to the lunar surface. Its successful soft landing near the Moon's south polar region made India the first nation to land in this area and the fourth ever to achievealunarsoftlanding.Thismilestonehasexpandedglobalinterestintheregionduetoitspotential reserves of water ice, which could be crucial for future human habitation.

(6) India's progression in lunar exploration reflects a clear trajectory: increasing mission complexity, enhanced scientific objectives, and a steady climb in engineering confidence. The consistent growth captured in the diagrammatic survey data mirrors ISRO's long-term vision—making India a leading contributor to global lunar science and future interplanetary exploration efforts.

Answerthefollowingquestions,basedonthepassage above.

1. Whichdiscoverymade duringChandrayaan-1significantlyadvancedgloballunar research?(1m)
   i. Existenceofvolcanicglassii.Presenceof watermoleculesonthelunar surface
   iii.Presenceofmethaneinlunar cratersiv.Anewtypeoflunarmineral

2. Writeasynonymfor**“modest”**asusedinthepassage.(1m)
3. Basedonthepassage, thesouthpolarregionof theMoonisconsideredscientificallysignificantbecause____(1m)
4. Whatcanbeinferred aboutIndia’sscientificapproachfromitscontinuationwithChandrayaan-3afterChandrayaan-2facedasetback?Answerin30 –40 words.(2m)
5. Read the given assertion (A) and reason (R) and choose the option that correctly analyses the statements.

   Assertion (A): Chandrayaan-2’s orbiter continues to contribute valuable scientific data.(1m)

   Reason (R): It failed to enter lunar orbit successfully.

   i. BothAandR aretrue,and Risthecorrectexplanation ofA
   ii. BothAandRaretrue,butRisnotthecorrect explanation
   iii. Aistrue,but Risfalse
   iv. Aisfalse,butRistrue

6. How does the survey data support ISRO’s long-term vision for lunar exploration?Answer in 30 – 40 words (2m)
7. Whatdoestheincrease inlaunchmassfromChandrayaan-1toChandrayaan-2mainlyindicate?(1m)
   i. Indiastartedusingheavierlaunch vehicles
   ii. Growthinspacecraft complexityandinstrumentation
   iii. Additionofforeignpayloadsonly
   iv. Ashiftfromlunarsciencetoplanetary science

8. Whatwastheprimaryfocusof theChandrayaan-3 mission? (1m)

SECTION B: CREATIVE WRITING SKILLS (18 MARKS)

Q3. Attempt any ONE of the two, (A) and (B) given below in about 50 words: (4m)

(A) Draft a notice in about 50 words, urging students of classes IX and XI to be volunteer teachers for a three- week literacy camp to be held in your school from Monday, the 15th of December to Friday, the 2nd of January as part of the community service internship. Children from the neighbourhood slums would be taught basic reading, writing, listening, speaking and numerical skills. Mention the timings and the venue of the camp. You are Rita/Kailash Teacher-in-charge of community service.

OR

(B) You are Renuka/Rahul Bhatia, President of J M Colony, Pawanshahr, Residents Welfare Association. You are planning to organise a free eye care camp in collaboration with a reputed hospital for the senior citizens of your locality. Draft a notice informing the residents about the camp. Include all necessary details. Put your notice in a box.

Q4. Attempt any ONE of the two, (A) and (B) given below in about 50 words: (4m)

(A) You are TarlaDutta, proprietor of Child’s Planet — The Kids’ Learning Store, a showroom of children’s educational toys. Draft a formal printed invitation (50 words) to be sent to your patrons, friends, and relatives, inviting them to the inauguration of your new showroom. Include essential details such as day, date, time, venue, and any special guest, if applicable.

OR

(B) Draft a formal invitation letter in not more than 50 words from Dr. Singh, Director of the Clean Water Initiative, for a panel discussion on 'Access to Safe Drinking Water', inviting DrMuruganChedda to be one of the panellists. Mention a compelling highlight of the panel discussion along with other necessary details.

Q5. Attempt any ONE from (A) and (B) given below in 150 words: (5m)

(A) You are Bhaskar/Bharti of 77 Block C, Rose Avenue, Meerut. You are very disturbed to see young children begging at traffic signals which is very dangerous for their lives as well as for the commuters. Write a letter in 150 words to the editor of a national daily expressing your concern and suggesting ways and remedies to prevent this menace. You may use some of the given cues along with your own ideas.

BEGGING – A CRIME SAVE THE CHILDREN –- TAKE ACTION
• AT TRAFFIC INTERSECTIONS • AT MARKET PLACES
THEY NEED CARE
GIVE THEM BASIC NECESSITIES FOOD, SHELTER, EDUCATION PREVENT CHILD ABUSESTOP CHILD EXPLOITATION
• TEACH THEM SKILLS

OR

(B) You are Aaira/Aaryan Sharma of #1447 'Arjun Block' Vikrant Apartments, Mumbai. Write a job application along with your bio-data, in response to the following advertisement that you came across in a newspaper.

ARCADE ARCHITECTS Require ▪ Creative and detail-oriented Junior Architect to assist in designing residential and commercial buildings ▪ Candidate must have a Bachelor's degree in Architecture ▪ 1 – 3 years relevant experience ▪ Proficiency in CAD software ▪ Experience in project design, drafting and site supervision ▪ A passion for innovative design and sustainable architecture is a must Apply within 15 days to: hr_manager@sujbuildwell.com

Q6. Attempt any ONE from (A) and (B) given below in about 120-150 words: (5m)

(A) Reflecting on the disturbing realties observed in old age homes, write an article titled 'From Neglect on the need to care for elderly parents rather than abandoning them'. Discuss the various implications of

neglecting elderly family members and how we can promote a culture of compassion and responsibility towards ageing parents. You may use some of the given cues along with your own ideas. You are
Shree/ShreejiSaha of class XII SuryodayaSr Sec School.

- *Emotional impact on elderly people*
- *Physical neglect, effect on mental health*
- *Ethical need for children to take responsibility*
- *Social implications of neglecting elders*
- *Alternative solutions– family and community support*

OR

(B) You are Fatima/Firdous Khan. Your school's Community Outreach Club, in association with Rotary Club, recently set-up a library for slum children in the Seemapuri, district of Baranagar. The library was inaugurated by the local councillor, ShriBiswajit Das. Wite a detailed report on the event for the club newsletter. You may organise the report by following:

- Who–What–When–Where–Why– How

SECTION C: LITERATURE (40 MARKS)

Q7. Read the given extracts to attempt the questions with reference to context: 6x1= 6m

(A) *"Some shape of beauty moves away the pall*
From our dark spirits.
Such the sun, the moon,
Trees old, and young, sprouting a shady boon
For simple sheep; and such are daffodils
With the green world they live in." *(A Thing of Beauty)*

1. *State whether the given statement is TRUE or FALSE.*
   The poet suggests that beauty has the ability to lift human spirits.
2. *Fill in the blank with a suitable word/phrase.*
   The poet refers to ordinary natural objects like the sun, moon, trees, and daffodils because they offer a____form of joy accessible to everyone.
3. *How does this extract support the Romantic belief in nature's healing power?*
4. *What can be inferred about the poet's attitude towards nature.*

i. Heseesit merelyasabackdropforhuman activity.
ii. Hebelievesnatureholdsspiritualandemotional value.
iii. Hethinksnaturedistractspeoplefrom responsibilities.
iv. Heconsidersnatureordinaryandunremarkable.

5. *Identifythefigureofspeechin"movesawaythepall."*
6. *Thephrase"shadyboon"refersto:*

i. Darknessat night ii.Ablessing of shade
iii.Aharmful shadow iv.Amagicalobject

OR

(B) *"What I want should not be*
confused with total inactivity.
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. *(Keeping Quiet)*

1. *What does the use of the word 'silence' in the line, "perhaps a huge silence" suggest?*
2. *In terms of tone and attitude, how does the line, "life is what it is about, I want no truck with death" compare to the poet's message?*

i. It is confrontational in tone. ii. It is more cynical than the poet's tone.
iii. It carries the same contemplative but hopeful tone. iv. It is detached and indifferent.

3. *Complete the sentence appropriately.*
There should be no war because the poet does not want to see trucks laden _.
4. *Select the correct option from those given in the brackets, to fill in the blank.*
According to the poet, lack of **__**______(understanding/enthusiasm/hierarchy) is to be blamed for the condition of threatening ourselves with death.
5. *The speaker implies that all of the following may result from a moment of silence in the given extract except*

i. Reduction in sadness ii. Peaceful reflection
iii. A break from constant motion iv. Continued misunderstanding of self

6. *How are human beings single-minded?*

Q8. Read the given extracts to attempt the questions with reference to context: 4x1= 4m

(A) *Sometimes I think Grand Central is growing like a tree, pushing out new corridors and staircases like roots. There's probably like a tree, pushing out new corridors way under the city right now, on its way to Times Square, and maybe another to Central Park. And maybe — because for so many people through the years Grand Central has been an exit, a way of escape how the tunnel I got into… But I never told mypsychiatrist friend about that idea.* *(The Third Level)*

1. *How does the author convey the idea that Grand Central Station serves as a metaphor for escape and transition in urban life?*
2. *The writer says, "think Grand Central is growing like a tree, pushing out new corridors and staircases like roots." What is the most likely reason for it?*

(i) The station has many levels as it is constantly under construction.
(ii) The station has many trees.
(iii) He finds the station like a huge tree, which keeps on spreading its roots and branches all over.
(iv) It is a hub for urban exploration and discovery, much like the intricate network of roots and branches in a tree.

3. *Complete the following suitably.*
The Grand Central Station was 'an exit and an escape' for many people through the years. This is because
_.
4. How might understanding the theme of escapism mentioned in the extract reflect on the scenario of seeking refuge in the past?

OR

(B) *Human civilisations have been around for a paltry 12,000 years — barely a few seconds on the geological clock. In that short amount of time, we've managed to create quite a ruckus, etching ourdominance over Nature with our villages, towns, cities, megacities. The rapid increase of human populations has left us battling with other species for limited resources, and the unmitigated burning of fossil fuels hasnow created a blanket of carbon dioxide around the world, which is slowly but surely increasing the average global temperature. (Journey to the end of the World)*

1. *What ruckus has human civilization created on our planet earth?*
2. *Limited resources today, is the result of ______.*
   (i) God's anger (ii) corruption
   (iii) unmitigated burning of fossil fuels (iv) sins of human beings
3. *Give one reason why the writing style of the extract can be called descriptive.*
4. *Read the assertion and the reason below, with reference to the given extract:*
   Assertion (A): Human beings have caused serious environmental damage in a very short span of time. **Reason (R):** Human civilizations have existed for millions of years, giving them enough time to disturb the planet.

(i) Both A and R are true, and R is the correct explanation of A. (iii) A is true but R is false.
(ii) Both A and R are true, but R is not the correct explanation of A. (iv) A is false but R is true.

Q9. Read the given extracts to attempt the questions with reference to context: 6x1= 6m

(A) *Then from one thing to another, M. Hamel went on to talk of the French language, saying that it was the most beautiful language in the world — the clearest, the most logical; that we must guard it among us and never forget it, because when a people are enslaved, as long as they hold fast to their language it is as if they had the key to their prison. Then he opened a grammar and read us our lesson. I was amazed to see how well I understood it. All he said seemed so easy, so easy! I think, too, that I had never listened so carefully, and that he had never explained everything with so much patience. It seemed almost as if the poor man wanted to give us all he knew before going away, and to put it all into our heads at one stroke. (The Last Lesson)*

1. Complete the following suitably.
   A language gives a cultural and national ______________.
2. Explain any one possible inference that can be drawn from the line, "M. Hamel went on to talk of the French language, saying that it was the most beautiful language in the world — the clearest, the mostlogical; that we must guard it among us and never forget it."
3. According to M Hamel, why must the people hold fast to their language?

(a) It is the most beautiful language in the world.
(b) It is the key to their prison when enslaved.
(c) It is the easiest language.
(d) It helps them communicate internationally.
(e) It is not an understandable language.

i. (a) and (b) ii. (c) and (d) iii. (c), (d) and (e) iv. (b), (c) and (d)

4. What advice of M Hamel shows that he was a patriot indulging in sentimental exaggeration?

5. *Select the correct option from those given in brackets to fill in the blank.*
According to M Hamel, the French is the most ______(logical/illogical) language in the world.

6. *Look at the table below. Column A provides instances from the story 'The Last Lesson'. Column B provides titles of some famous English language poems. Choose the option that correctly match items of Column A with Column B.*

ColumnA	**ColumnB**
1.M.Hameldistributednewcopiesthatlookedlike LittleFrenchflags,andendedtheclasswithanemphatic "Viva La France!"	a)'Remorseismemory awake'(Emily Dickinson)
2.Hauser satat the endof theclass, thumbing his primer,desperatelytryingtolearnwiththechildren, even as he cried.	b)'A House called Tomorrow'(Alberto Rios)
3.M.HamelsharedhowAlsacealwaysputofflearning, and how its people always thought they had plenty of time.	c)'ForWhomtheBell Tolls'(JohnDonne)
4.Classendedwhenthechurchclockstrucktwelve. AndthentheAngelus.Simultaneously,Prussian trumpets sounded under the school windows.	d)'Do Not Go gentle into that Good night'(Dylan Thomas)

i.1 – (a);2– (b);3 – (c);4– (d)
ii.1 –(b); 2– (c);3 –(d); 4–(a)
iii.1 – (c);2– (d);3 – (a);4– (b)
iv.1–(d);2–(a);3–(b);4–(c)

OR

(B) *...it was a big and confusing forest which he had gotten into. He tried, to be sure, to walk in a definite direction, but the paths twisted back and forth so strangely! He walked and walked without coming to the end of the wood, and finally he realised that he had only been walking around in the same part of the forest. All at once he recalled his thoughts about the world and the rattrap. Now his own turn had come. He had let himself be fooled by a bait and had been caught. The whole forest, with its trunks and branches, its thickets and fallen logs, closed in upon him like an impenetrable prison from which he could never escape.* (The Rattrap)

1. How would you characterise the mood of the above extract?
i. mysterious, restful ii. ominous, despairing
iii. thoughtful, whimsical iv. philosophical, anguished
2. By what bait had the peddler been fooled?
3. The consequence of 'his own turn' having come was that the peddler had __.
i. got irreversibly lost in the thick, warped forest.
ii. been fooled and imprisoned in a hopeless prison.
iii. been walking around the same part of the forest.
iv. walked the whole forest without finding the end.
4. The above extract richly employs literary devices. Look at the table below. Choose the option that correctly matches the instances/ examples in Column A with the literary devices in Column B:

Column A	Column B
1. The forest closed in upon the peddler like an impenetrable prison.	a) imagery
2. The big and confusing forest with its twisted paths, trunks, branches, thickets and fallen logs.	b) metaphor
3. It was a big and confusing forest which he had gotten into. The peddler had been fooled and was trapped in the forest.	c) simile

i. 1 - (a) ; 2 – (b) ; 3 – (c)   ii. 1 – (c) ; 2 – (a) ; 3 – (b)

iv.1 – (c) ; 2 – (b) ; 3 – (a)   iv. 1 – (b) ; 2 – (c) ; 3 – (a)

5. *Imagine that the peddler from 'The Rattrap' turned his life around, and decided to write of his experience. Which of the following is likely to be the peddler's book, from the popular books shown below?*

(i)   (ii)   (iii)   (iv)

i) Option (i)   ii) Option (ii)   iii) Option (iii)iv) Option (iv)

6. Whatcanweinferaboutthepeddler'sthoughtintheline,"Thewholeforest,withitstrunksandbranches, itsthicketsandfallenlogs,closedinuponhimlikeanimpenetrableprisonfromwhichhecouldneverescape."

i. that hewasindifferent   ii.that hehad no fear

iii. thatherealizedhismistakeiv.thatheisdeterminedtofindhisway.

Q10. Answer any five of the following six questions, in about 40 -50 words. 5x2=10m

1. In the lesson, 'Deep Water', the YMCA pool was ironically thought to be safe for learning to swim. Explain.
2. The author Ashokamitran has literary inclinations from the account in the lesson, 'Poets and Pancakes'. Give some evidences from the text.
3. What does Umberto Eco mean by the concept of 'Interstices' in our lives? Elaborate based on the lesson, 'The Interview'.
4. How does Kamala Das help her readers visualise her mother's condition in her poem, 'My Mother at Sixty- Six'?
5. Though money holds the same value everywhere, the poet in 'The Roadside Stand' draws a distinction between city money and country money. Elaborate.
6. Aunt Jennifer uses embroidery as her form of expression, just as Adrienne Rich uses poetry. Do you agree? Support your response with reference to the poem 'Aunt Jennifer's Tigers'.

Q11. Answer any two of the following three questions, in about 40 – 50 words. 2x2=4m

1. How do both Zitkala-Sa and Bama highlight the humiliation faced due to their social identity?
2. Pearl Buck depicts the servants in a way to convey a message about Japanese people and culture. Support your answer with textual evidence from the lesson ‘The Enemy’.
3. Why does TishaniDoshi refer to Antarctica as “a time machine”? Support your answer with two arguments.

Q12. Answer any one of the following two questions in about 120-150 words: 1x5=5m

(A) Both Indigo and Lost Spring portray how individuals respond differently to social injustice and exploitation. Keeping this in mind, analyse how RajkumarShukla’s persistent fight against oppression contrasts with the quiet endurance of the bangle makers of Firozabad. How do their choices highlight the values of courage, agency, and social responsibility?

OR

(B) Sophie’s world is shaped by a mix of dreams, desires, and the harsh realities around her. Keeping this in mind, examine how Sophie’s fantasies influence her decisions and relationships. How does the story highlight the importance of balancing aspirations with practicality in real life?

Q13. Answer any one of the following two questions in about 120-150 words: 1x5=5m

(A) The story ‘On the Face of It’ conveys the value that genuine human connection can transform loneliness into confidence and help individuals look beyond their physical limitations. Keeping this in mind, examine how the characters of Derry and Mr. Lamb reflect the themes of alienation and loneliness in the story.

OR

(B) You are an animal welfare activist. Today you learned about the deliberate killing of tigers by the ‘Tiger King’. Write a diary entry expressing your shock, concern, and thoughts on protecting animal rights. (150 words)

You may begin:

Today, I came across a deeply disturbing piece of news that has shaken me to the core. I learned that …….

ASSIGNMENT – II

SECTION AReading Skills (22 marks)

1. Read the following passage carefully: 12

(1) “My aunt will be down presently, Mr. Nuttel,” said a very self-possessed young lady of fifteen; “in the meantime you must try and put up with me.”

(2) FramtonNuttelendeavoured to say something which should duly flatter the niece of the moment without unduly discounting the aunt that was to come. Privately he doubted more than ever whether these formal visits on a succession of total strangers would do very much towards helping the nerve cure which he was supposed to be undergoing.

(3) “I know how it will be,” his sister had said when he was preparing to migrate to this rural retreat; “you will bury yourself down there and not speak to a living soul, and your nerves will be worse than ever from moping. I shall give you letters of introduction to all the people I know there. Some of them, as far as I can remember, were quite nice.”

(4) “Do you know many of the people around here? asked the niece, when she judged that they had had sufficient silent communion.

(5) “Hardly a soul,” said Framton. “My sister was staying here, at the rectory, you know, some four years ago, and she gave me letters of introduction to some of the people here.”

(6) He made the last statement in a tone of distinct regret.
(7) "Then you know practically nothing about my aunt?" pursued the self-possessed young lady.
(8) "Only her name and address," admitted the caller. He was wondering whether Mrs. Sappleton was in the married or widowed state. An undefinable something about the room seemed to suggest masculine habitation. **- "The Open Window" By H H Munro (Saki)**

1. Answer the following questions, based on the above passage:

(i) What does the narrator mean when he describes the girl as "very self-possessed'? 1
(a) She is shy and quiet (b) She is confident and in control
(c) She is nervous and distracted (d) She is rude and unfriendly

(ii) Complete the sentence. 1
FramtonNuttel was in the countryside because he was seeking a __________.

(iii) How does Framton feel about his visit to the niece and her aunt? 1
1. Hopeful 2. Cheerful 3.Nervous 4.Doubtful 5. Calm
(a) 1 and 2 (b) 3 and 4
(c) 1 and 5 (d) 5 only

(iv)What does the line, "He made the last statement in a tone of distinct regret", suggest about Framton's feelings? 1

(v) In the context of the passage, what does "moping" mean? 1
(a) Sleeping too much (b) Being restless
(c) Feeling gloomy and lonely (d) Walking quickly

(vi) State whether the following statement is True or False 1
FramtonNuttel feels excited about meeting new people.

(vii) How is the niece's behaviour different from FramtonNuttel's? Use evidence from the passage.2

(viii) Why do you think Framton notices something "masculine" about the room? What does this show about his thoughts? 2

(ix) What does the phrase "she judged that they had had sufficient silent communion" suggest about the niece?1

(x) Which headline best fits the tone and events in this passage? 1
(a) "An Awkward Introduction in the Country" (b) "The Curious Case of Mrs Sappleton"
(c) "A Tragic Past Revealed" (d) "A Letter That Changed Everything"

2. Read the following passage carefully: 10

(1) People below the age of 20 and above the age of 50 are more likely to believe fake news. Those relatively new to the use of the Internet still do not grasp the concept of fake information over these platforms, reveals a new survey 'Countering Misinformation in India'. This survey has been conducted jointly by Internet and Mobile Association of India (IAMAI).

(2) At least 40% of the respondents believed in 'misinformation' received over social media if it came with leading backgrounds and evidence, while 34% of them believe the information when it is shared by a trustworthy organisation.

(3) The dominant factor that drives people to forward such information is their belief that it might benefit others and help in their safety. In fact, that was the response of almost 50% of the respondents. This was compounded by the fact that at least 20% of the respondents expressed their lack of trust in conventional media, thus their faith in contents shared by common people over social media.

(4) But even then, newspapers still remain the top source of information for most. At least 53% of the respondents trust what is generally perceived as neutral media and only 29% trust technology and social media platforms.

(5) However, what was surprising was that almost 45% of the respondents did not even know about the existence of fact-checking organisations and most did not even know that journalists had to verify data before they let it out. Only 26% of the respondents believe that it is the responsibility of the media to curb or identify fake news. Many respondents also put the responsibility of identifying such fake news on an individual.

(6) The survey has found that first time or early users of the Internet platforms are more susceptible to fake news than others. There is a need for building capacities and creating a National Civic Digital Literacy Strategic Plan.

Answer the following questions, based on the above passage:

(i) Select the option that comes under conventional media. 1

(a) Instagram (b) Newspaper (c) Facebook (d)E-mail

(ii) Select the correct option

One factor that prompts people to believe fake news is that: 1

(a) it supports their point of view (b) they are biased

(c) it is from a reliable site (d) it has more 'likes' and 'shares'

(iii) What according to the passage are the intentions of people who share information? 1

(iv) Which reason do you infer from the passage is responsible for journalists spreading misinformation?1

(v) Complete the sentence appropriately: 1

The threat faced by the new entrants in social media is __________ .

(vi) Explain your understanding of the difference between 'misinformation' and 'fake news'. 2

(vii) As per your inference drawn from para 1, which category of people fall as victims to fake news?1

(viii) What is the blame game that goes on in fixing the onus of identifying fake news? 2

SECTION BCreative Writing Skills (18 marks)

3. Attempt any one of the two, (a) or (b), in about 50 words. 1x4=4

(a) You are Surya/Sarita, the school pupil leader of Adarsh Public School, Adarsh Nagar. Draft a notice informing students of class XII about the "Career Fair" scheduled in your school in January 2026. Invent other details. Put the notice in a box.

OR

(b) You are Kishore/Ketaki, the Secretary of Sukhdev Colony, Shanti Nagar. Draft a notice informing the residents about the Newyear's Eve celebrations in your colony. Invent other details. Put the notice in a box.

4. Attempt any one of the two, (a) or (b), in about 50 words. 1x4=4

(a) You are Sohail Khan of MehtabManzil, 33 MG Road, Ahmed Nagar. Write an invite to your friend SikandarBhakt for the engagement ceremony of your daughter Chandni, at 3 Khaleel Road, Ahmed Nagar. Invent other details.

OR

(b) You are Keerthi/Kavin, personal assistant to Rohit Sharma, former Indian cricket captain. Write a reply on behalf of Rohit Sharma to the Principal, Siddharth Public School – GautamBudh Nagar, informing her that Rohit Sharma will not be able to attend the school annual sports day citing a valid reason. Mention other necessary details.

5. Attempt any one of the two, (a) or (b), in about 120 -150 words. 1x5=5

(a) Write a letter to the Editor of a leading national daily highlighting the problems faced by the pedestrians, as the pavements are encroached upon by unauthorized peddlers, hawkers and other street vendors. These pedestrians (elderly/children) are vulnerable to road accidents as the vehicles run at high speeds on the roads. Suggest at least one solution to this problem. You are Amit/Amrita of Badal Nagar.

OR

(b) You are Abhishek/Ambica of J-113, Phase III, Sarathi Road, Shubh Nagar. You came across the following advertisement for the job of a PGT Mathematics Teacher in Shubh Public School, Shubh Nagar. Write your application along with your bio-data.

Situation Wanted

Required, qualified, experienced, M/F, dynamic, PGT Mathematics Teacher – must be fluent in English and Hindi, good pay package – must have taught XII board students – soft skills and computer literacy must – Contact, HRM (Human Resource Manager), Shubh Public School, Shubh Nagar with full bio-data within 15 days of the publication of this advertisement.

6. Attempt any one of the two, (a) or (b), in about 120 to 150 words. 1x5=5

(a) Artificial Intelligence is the future of the 21st century. This will help mankind unravel the mysteries of life, making man more powerful. All the same, Artificial Intelligence has a few drawbacks too. Write an article for your school magazine. You may use the following cues along with your own ideas. You are Portia/Antonio of Akash Public School, Akash Nagar.

AI can do the work more efficiently, faster and economically. Used in a wide spectrum – medical science – transportation – weather forecasting etc. AI – can take over all human activities – making them vulnerable – dictated by the robot – humans will become robots.

OR

(b) You are Aiswarya/Alok, a student of class XII, of St. Peter's Public School, Prabhat Nagar. You visited Anand Grounds and witnessed a vintage car rally. Write a detailed report to be published in a local daily. You may organize your report by using the following cues: [what – when – where – why – how].

SECTION CLiterature (40 marks)

7. Read the following extracts and answer the questions for any one of the given two,(a) or (b): 1x6=6

(a) What I want should not be
Confusedwith total inactivity.
Life is what it is about;
I want no truck with death.
If we were not so single-minded
about keeping our lives moving. (Keeping Quiet)

(i) Explain – "What I want should not be confused with total inactivity". 1

(ii) Explain – "I want no truck with death". 1

(iii) Complete the analogy 1

activity :______::______: death

(iv) If you were the poet, what advice would you give to mankind? 1

(v) Read the assertion and the reason below, with reference to the given extract: 1

Assertion: The poet values an active and meaningful life.

Reason : Inactivity is equated with leisure, which the poet rejects. Choose the correct option.

(a) Both the assertion and the reason are true.

(b) The assertion is true, but the reason is false.

(c) Both the assertion and the reason are false

(d) Both the assertion and the reason are true, but the reason is not the correct explanation of the assertion.

(vi) The poet himself is confused about life and death. (True/False). 1

OR

(b) Driving from my parent's home
to Cochin last Friday morning,
I saw my mother, beside me,
doze, open mouthed,
her face ashen like that of a corpse
and realized with pain
that she was as old as she looked (My Mother at Sixty-Six)

(i) What is the narrator's state of mind as she was driving to Cochin? 1

(a) Thrilled (b) Depressed (c) Angry (d) Motivated

(ii) Fill in the blank with appropriate words with reference to the extract: 1

The phrase 'her face ashen like that of a corpse' suggests……………………

(iii) Fill in the blank with appropriate words with reference to the extract: 1

The author means sheis________when she says 'realized with pain'.

(a) Physically in pain (b) Emotionally upset (c) Relieved of hurt (d) Happy with realization

(iv) Nametheliterarydeviceusedtodepicttheemotionsandatmosphereofthesceneinthecar.

(v) Which of the following is an example of ominous foreshadowing in the extract? 1

(a) It was a Friday (b) The mother is dozing

(c) The mother's face is like a corpse (d) The poet expresses pain

(vi) Complete the following analogy correctly: 1

She is a shining star: Metaphor

My mother leads a lonely life: _______.

3. Read the following extracts and answer the questions for any one of the given two,(a) or (b): 1x4=4

(a) But at this moment the door opened and she looked out, a dark-blue woollen haori over her kimono. She came to him affectionately and put her arm through his as he stood, smiled and said nothing. He had met Hana in America, but he had waited to fall in love with her until he was sure she was Japanese. His father would never have received her unless she had been pure in her race.

(i) Complete the sentence appropriately. 1

Hana was attired in ___________.

(ii) With reference to the above, how will you describe Dr.Sadao as a son? 1

(a) Indifferent (b) Obedient (c) Defiant (d) Practical

(iii) What is 'this moment' all about? 1

It is a moment of ______:

(a) Emotional turmoil (b) Tranquility (c) Agitation (d) Conflict

(iv) From the extract, what can you infer about Dr Sadao and Hana's relationship? 1

OR

(b) When I heard this, I didn't want to laugh any more, and I felt terribly sad. How could they believe that it was disgusting if one of us held that package in his hands, even though the vadai had been wrapped first in a banana leaf, and then parcelled in paper? I felt so provoked and angry that I wanted to touch those wretched vadais myself straight away. Why should we have to fetch and carry for these people, I wondered. Such an important elder of ours goes meekly to the shops to fetch snacks and hands them over reverently, bowing and shrinking, to this fellow who just sits there and stuffs them into his mouth. The thought of it infuriated me.

(i) 'I felt terribly sad'. The reason for the speaker's sadness is because it was an act of ---------------. 1

(ii) Choose the correct option: 1
'The thought of it infuriated me' with reference to the above line, what do you think is the impact of the incident on the speaker?
(a) The speaker was sympathetic and helpless. (b) The speaker was angry and condemning
(c) The speaker was excited to see the incident. (d) The speaker was very impressed and motivated
(iii) Complete the sentence suitably: 1
'I wanted to touch those wretched vadais myself'
The above expression indicates the speaker's _________.
(iv) Select the correct option from those given in brackets, to fill in the blanks: 1
The incident made the speaker realise that the discrimination was________(dehumanizing/elevating)

4. Read the following extracts and answer the questions for any one of the given two,(a) or (b): 1x6=6

(a)They thought he would demand repayment in full of the money which they had illegally and deceitfully extorted from the sharecroppers. He asked only 50 per cent. "There he seemed adamant", write ReverendJ.Z. Hodge, a British missionary in Champaran, who observed the entire episode at close range, "thinking probably that he would not give way, the representatives of the planters offered to refund to the extent of 25 per cent, and to his amazement Mr Gandhi took him at his words thus breaking the deadlock."

(i) Choose the correct option: 1
'There he seemed adamant', reflects Gandhi's trait of being:
(a) Arrogant (b) Uncompromising (c) Argumentative(d) Courageous
(ii) The status of sharecroppers as inferred from the above line is: 1
(a) law abiding citizens (b) followers of Gandhi
(c) victims of exploitation (d) contract labourers
(iii) Complete the following sentence: 1
Gandhi surprised them by ________________________.
(iv) The inference that can be drawn from the line "Mr Gandhi took him at his word" is 1
(v) 'Deadlock' in the last line means _______ 1
(a) Agreement (b) Impasse (c) breakthrough (d) continuation
(vi) What do we infer about the attitude of planters towards sharecroppers? 1
(a) The planters were gentle and kind.
(b) The planters were unfair and greedy.
(c) The planters were helpful and compassionate.
(d) The British planters were naïve.

(b) The next day both men got up in good season. The crofter was in a hurry to milk his cow, and the other man probably thought he should not stay in bed when the head of the house had gotten up. They left the cottage at the same time. The crofter locked the door and put the key in his pocket. The man with the rattraps said good bye and thank you, and thereupon each went his own way.

OR

But half an hour later the rattrap peddler stood again before the door. He did not try to get in, however. He only went up to the window, smashed a pane, stuck it in his hand, and got hold of the pouch with the thirty Kronor. He took the money and thrust it into his pocket. Then he hung the leather pouch very carefully back in its place and went away.

(i) Select the correct option from those given in the bracket, to fill in the blank. 1

The behaviour of the peddler as described in the above extract is an act of .

(deceit/obedience).

(ii) "Both men got up in good season." The author uses the expression 'good season' to denote that: 1

(a) They slept for a long time. (b) They got up in a good mood.

(c) They got up early and timely. (d) They got up hurriedly

(iii) State the irony in the peddler's response. "The man with the rattraps said good bye and thank you". 1

(iv) Choose the correct option: 1

The flaw in the peddler's character as reflected in the above extract is:

(a) He is jealous of rich people. (b) He indulges in self-pity

(c) He can rob his benefactor. (d) He can sleep anywhere without any hesitation.

(v) Complete the following sentence: 1

The role of the cow in the crofter's life is ____________ .

(vi) Choose one instance from the above extract to show that peddler acting like a well-mannered person. 1

10. Answer any five of the following six questions in 40-50 words each. 5x2=10

(i) Why did the villagers attend the last lesson? (The Last Lesson)

(ii) Aunt Jennifer is good at art work. Justify (Aunt Jennifer's Tigers)

(iii) Saheb and Mukesh, both are victims of exploitation. How? (Lost Spring)

(iv) How did the American publisher react to `The Name of the Rose' initially? (The Interview)

(v) A thing of Beauty is a joy forever. What is Keats trying to convey here? (A Thing of Beauty)

(vi) Compare and contrast the characters of Sophie and Jansie. (Going Places)

11. Answer any two of the following three questions in 40-50 words each. 2x2=4

(i) Diwan was a very resourceful person. Justify (The Tiger King)

(ii) Why did Geoff Green choose school students for the Antarctica expedition? (Journey to the End of the Earth)

(iii) Why did Lamb not have curtains in his windows? (On the Face of It)

12. Answer any one of the following questions in 120-150 words: 1x5=5

(i) K Subbu was a highly versatile person in Gemini Studios. Elaborate (Poets and Pancakes)

OR

(ii) Imagine if Gandhi had visited Firozabad, what social services he would have volunteered there and how do you think he would have inspired the young men of Firozabad to fight for their rights (Lost Spring & Indigo)

13. Answer any one of the following questions in 120-150 words: 1x5=5

(i) Describe briefly the scene at the third level of the Grand Central as seen (or seems to be seen) by Charley. (The Third Level)

OR

(ii) Imagine you are TishaniDoshi, and you have been invited by Rajiv Public School, New Delhi, to deliver a speech on your experience in Antarctica and how small things can make a big difference in our lives. Share your views on how polluted air, water and land has affected Delhi. (Journey to the End of the Earth)

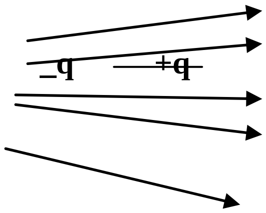
SUBJECT – PHYSICS

ASSIGNMENT - I

You may use the following values of physical constants where ever necessary
$c = 3 \times 10^{8}$ m/s $m_e = 9.1 \times 10^{-31}$ kg $m_p = 1.7 \times 10^{-27}$ kg $e = 1.6 \times 10^{-19}$ C $\mu_0 = 4\pi \times 10^{-7}$ TmA^{-1} $h = 6.63 \times 10^{-34}$ J s $\varepsilon_0 = 8.854 \times 10^{-12} C^2N^{-1}m^{-2}$ Avogadro's number = $6.023 \times \mathbf{10^{23}}$ per gram mole

[SECTION – A]   (16x1=16 marks)

Q1. Given Fig. shows electric field lines in which an electric dipole is placed as shown. Which of the following statement is correct.



(a) The dipole will not experience any force
(b) The dipole will experience a force towards right
(c) The dipole will experience a force towards left
(d) The dipole will experience a force upwards.

Q2.Two parallel infinite line charges with linear charge density $+\lambda$ C/m and $-\lambda$ C/m are placed at a distance of 2R in free space. What is the electric field midway between the two line charges.
(a) Zero (b) $2\lambda/\pi \varepsilon_0 R$ N/C (c)) $\lambda/\pi \varepsilon_0 R$ N/C (d) $\lambda/2\pi \varepsilon_0 R$ N/C

Q3. When a potential difference V is applied across a conductor at temperature T, the drift velocity of the electrons is proportional to
(a)T (b) $\sqrt{T}$ (c) V (d) $\sqrt{V}$

Q4.A circular loop of conducting wire of radius'a' carries a steady current I. The ratio of magnitudes of the magnetic field at a point along its axis at distances '2a' and '3a' from its centre is
(a) 2:1 (b) $2\sqrt{2}$:1 (c) $\sqrt{2}$: 1 (b)3:$\sqrt{2}$

Q5. The voltage across a resistor, an inductor and a capacitor connected in series to an a..c. source are 20 V, 15 V and 30 V respectively. The resultant voltage in the circuit is
(a)5 V (b) 20 V (c) 25 V (d) 65 V

Q6. Correct match of column I with column II is

Column -l (waves)	**Column -ll (use)**
(1) Infra-red	P . Mobile communication
(2) Radio	Q . Human eye
(3) Light	R . Radar system
(4) Microwave	S . Green Houses

(a) 1-P, 2-R, 3-S, 4-Q (b) 1-S, 2-P, 3-O, 4-R
(c) 1-Q, 2-P, 3-S, 4-R (d) 1-S. 2-R, 3-P, 4-Q

Q7. The wavelength of an electromagnetic wave is 500 nm. It's frequency in free space is-

(a)6 x 10^{14}Hz (b) 3 x 10^{14} Hz (c) 3 x 10^{12} Hz (d)9 x 10^{12} Hz

Q8. Pencil in a beaker filled with water seems bent due to –

(a) Reflection (b) Refraction

(c) Diffraction (d) Total Internal Reflection

Q9.A thin convex lens of glass (n=1.5) has focal length+10 cm is immersed in water (n=1.33). The focal length of lens in water is –.

(a) 12cm (b) 20 cm (c) 40 cm (d) 48 cm

Q10. In young's double slit experiment the separation between the slits is halved and the distance between the slits and screen is doubled.The fringe width –

(a)Unchanged (b) halved (c) doubled (d) quadrupled

Q11. The distance of closest approach of an alpha particle is *d* when it moves with kinetic energy 'K' towards a nucleus. Another alpha particle is projected with higher energy such that the new distance of the closest approach is *d*/2. What is the kinetic energy of projection of the alpha particle in this case?

(a) K /2 (B) $\sqrt{2}$ K (c) 2 K (d) 4K

Q12. The p-n junction diode is connected to a battery of e.m.f.5.5 V and external resistance 5.1 kΩ. The barrier potential in the diode is 0.4 V. The current in the circuit is

(a) 1A (b) 1 mA (c) 2 mA (d) 0.08 mA

For Questions 13 to 16, two statements are given –one labelled Assertion (A) and other labelled Reason (R). Select the correct answer to these questions from the options as given below.

a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c) If Assertion is true but Reason is false.

d) If both Assertion and Reason are false.

Q13. Assertion (A): The impedance offered by an ideal inductor to the flow of direct current is zero.

Reason(R): The frequency of direct current is zero.

Q14. Assertion (A): The Lyman series of hydrogen atomgives spectral line of wavelength 258nm.

Reason (R): The Lyman series in hydrogen atom lies in ultra violet region.

Q15. Assertion (A): The binding energy per nucleon for nuclei with atomic mass A>120 decreases with A**.**

Reason (R): The nuclear force are weak for heavier nuclei.

Q16. Assertion (A): The de Broglie wave length of an electron is greater than proton, when both are moving with same speed.

Reason (R): de Broglie's wavelength of a particle is directly proportional to its linear momentum. .

[SECTION – B] (5x2=10 marks)

Q17. An alpha-particle and a proton are accelerated from rest by the same potential. Find the ratio of their de-Broglie wavelengths.

Q18. For a plano-concave lens of radius of curvature 10 cm, the focal length in air is 25 cm. Find the refractive index of the material of the lens.

OR

Light from a point source in air falls on a spherical glass surface (n = 1.5 and radius of curvature = 10 cm). The distance of the light source from the glass surface is 100 cm. At what position the image is formed?

Q19. A straight wire of length 4 m carrying a current of 0.5 A can be turned into either a square or a circular loop of 2 turns, before placing it in a magnetic field of intensity 0.1 T. Which loop do you think will require less counter torque in order to hold it in a position such that the axis of the loop is perpendicular to magnetic field. Justify your answer.

Q20. Using the curve for the binding energy per nucleon as a function of mass number A, state clearly how the release of energy in the processes of nuclear fission and nuclear fusion be explained.

Q21. Two wires have same resistance. One is made of copper and other manganin. If they are equally thick which of the two must be longer.

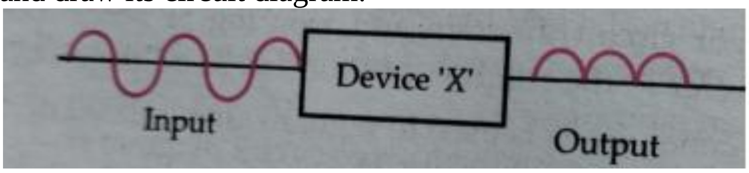
[SECTION – C] **(07x3=21 marks)**

Q22. Two semiconductor materials A and B shown are made by doping germanium crystal with arsenic and indium respectively. The two are joined end to end and connected with battery. (a) Will the junction be forward biased or reverse biased. Justify (b) Sketch the VI graph for this arrangement.

Q23. Find the expression for the capacitance of a parallel plate capacitor of plate area A and plate separation d when (I) a dielectric slab of thickness t and (II) a metallic slab of thickness t, where (t < d) are introduced one by one between the plates of the capacitor. In which case would the capacitance be more and why?

Q24. (I) Draw a ray diagram for the formation of image by a Cassegrain telescope.
(II)Why these types of telescopes are preferred over refracting type telescopes. (Write 2 points)

Q25. (a) Explain the formation of depletion layer and potential barrier in a p-n junction.
(b) In fig input waveform is converted into output waveform by device X. Name the device and draw its circuit diagram.



Q26. In a moving coil galvanometer. Why is it necessary to use (i) a radial magnetic field and (ii) a cylindrical soft iron core in a galvanometer? Write the expression for current sensitivity of the galvanometer. Can a galvanometer as such be used for measuring the current? Explain.

Q27. A light ray entering a right-angled prism undergoes refraction at the face AC as shown in Fig. 1.

(I) What is the refractive index of the material of the prism in Fig. 1?

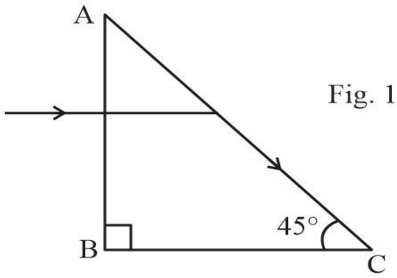


Fig. 1

(II) (a) If the side AC of the above prism is now surrounded by a liquid of refractive index $2/\sqrt{3}$ shown in Fig. 2, determine if the light ray continues to graze along the interface AC or undergoes total internal reflection or undergoes refraction into the liquid.

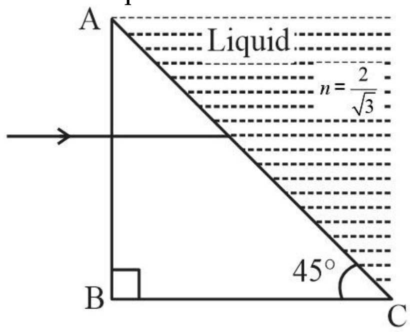


Fig. 2

(b) Draw the ray diagram to represent the path followed by the incident ray with the corresponding angle values.

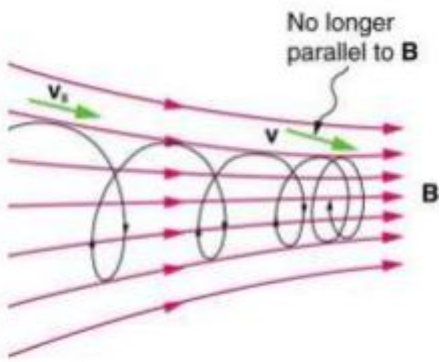
(Given, $sin^{-1}(\frac{\sqrt{2}}{\sqrt{3}}) = 54.6^{\circ}$)

Q28. (a) Define electric flux and write its SI unit.
(b) Using Gauss theorem, derive an expression for the electric field due to an infinitely long straight wire of linear charge density λ.

OR
(a) State Gauss theorem in electrostatics
(b) Use Gauss theorem to obtain the expression for the electric field due to a uniformly charged infinite plane sheet of charge of surface charge density **σ**

[SECTION D]
Case Study Based Question (2x4=08marks)

Q29.:



A point charge q (moving with a velocity v and located at r at a given time t) in the presence of both the electric field E and magnetic field B. The force on an electric charge q due to both of them can be written as**F** = q **[E** + **v**x**B**] = F_{ef} + F_{mf}It is called Lorentz force.**(i).**If the charge q is moving under a field, the force acting on the charge depends on the magnitude of field as well as the velocity of the charge particle, what kind of field is the charge moving in? (a) Electric field (b) Magnetic field (c) Both electric and magnetic field perpendicular to each other (d) None of these**(ii).** The magnetic force acting on the charge 'q' placed in a magnetic field will vanish if (a) if v is small (b) If v is perpendicular to B (c) If v is parallel to B (d) None of these **(iii).** If an electron of charge –e is moving along +X direction and magnetic field is along +Z direction then the magnetic force acting on the electron will be along (a) + X axis (b) - X axis (c) –Y axis (d) +Y axis **(iv).** The vectors which are perpendicular to each other in the relation for magnetic force acting on a charge particle are (a) F and **v**(b) **F** and **B** (c) **v** and **B**(d) Both (a) and (b)

OR

A particle moves in a region having a uniform magnetic field and a parallel, uniform electric field. At some instant, the velocity of the particle is perpendicular to the field direction. The path of the particle will be

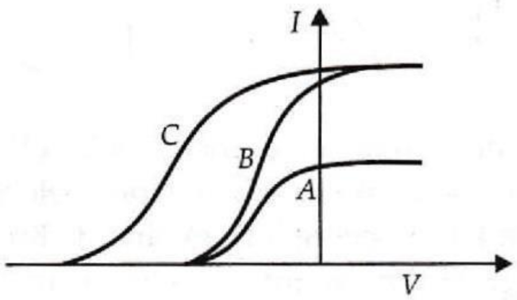
(a) A straight line (b) A circle

(c) A helix with uniform pitch. (d) A helix with non-uniform pitch

Q30. It is the phenomenon of emission of electrons from a metallic surface when light of a suitable frequency is incident on it. The emitted electrons are called photoelectrons.

Nearly all metals exhibit this effect with ultraviolet light but alkali metals like lithium, sodium, potassium, cesium etc. show this effect even with visible light. It is an instantaneous process i.e. Photoelectrons are emitted as soon as the light is incident on the metal surface. The number of photoelectrons emitted per second is directly proportional to the intensity of the incident radiation. The maximum kinetic energy of the photoelectrons emitted from a given metal surface is independent of the intensity of the incident light and depends only on the frequency of the incident light. For a given metal surface there is a certain minimum value of the frequency of the incident light below which emission of photoelectrons does not occur.

(i) In a photoelectric experiment plate current is plotted against anode potential.



(a) A and B will have same intensities while B and C will have different frequencies

(b) B and C will have different intensities while A and B will have different frequencies

(c)A and B will have different intensities while B and C will have equal frequencies

(d)B and C will have equal intensities while A and B will have same frequencies.

(ii) Photoelectrons are emitted when a zinc plate is

(a) Heated (b) hammered

(c) Irradiated by ultraviolet light (d) subjected to a high pressure

(iii) The threshold frequency for photoelectric effect on sodium corresponds to a wavelength of 500 nm.

Its work function is about

(a) $4x10^{-19}$J (b) 1 J (c) $2x10^{-19}$ J (d) $3x10^{-19}$J

(iv) The maximum kinetic energy of photoelectrons emitted from a surface when photons of energy 6 eV fall on it is 4 eV. The stopping potential is

(a) 2 V (b) 4 V (c) 6 V (d) 10 V

OR

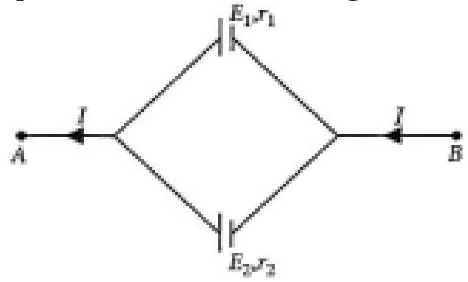
The minimum energy required to remove an electron from a substance is called its

(a) work function (b) kinetic energy (c) stopping potential (d) potential energy

[SECTION E] (3X5=15)

Q31.(a) State the two Kirchhoff's rules used in the analysis of electric circuits and explain them.

(b) Two cells of emf E1 and E2 and internal resistances $r_1$and r_2 respectively are connected in parallel as shown in the figure. Deduce the expression for:



(i) equivalent emf of the combination.

(ii) equivalent internal resistance of the combination

(iii)potential difference between the points A and B.

OR

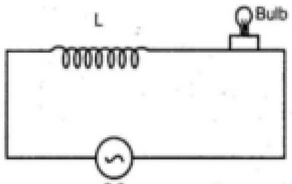
(a) Write two limitations of ohm's law. Plot their I-V characteristics.

(b) A heating element connected across a battery of 100 V having an internal resistance of 1 Ω draws an initial current of 10 A at room temperature 20.0 °C which settles after a few seconds to a steady value. What is the power consumed by battery itself after the steady temperature of 320.0 °C is attained? Temperature coefficient of resistance averaged over the temperature range involved is

3.70×10^{-4} °C^{-1}.

Q32.(a) State the working principle of an AC generator. With the help of a neat and labelled diagram, explain its working and obtain the expression for the emf generated in the coil.

(b) An inductor L of reactance $X_L$is connected in series with a bulb B to an ac source as shown in the figure. Explain briefly how the brightness of the bulb changes when



(i) number of turns of the inductor is reduced

(ii) an iron rod is inserted in the inductor.

OR

(a) With the help of a diagram, explain the principle of a device which changes a low ac voltage into a high voltage. Deduce the expression for the ratio of secondary voltage to the primary voltage in terms of the ratio of the number of turns of primary and secondary winding.

For an ideal transformer, obtain the ratio of primary and secondary currents in terms of the ratio of the voltages in the secondary and primary coils.

(b)Write any two sources of the energy losses which occur in actual transformers.

(c) A step-up transformer converts a low input voltage into a high output voltage. Does it violate law of conservation of energy? Explain.

Q33. (a) State Huygens principle.

(b) A plane wavefront is incident obliquely from denser to a rarer medium. Draw suitable Huygens construction for the same and hence deduce the Snell's law of refraction

(c) Also show using the above that the frequency of the wave does not change with change in the medium

OR

(a) Draw a labeled diagram of compound microscope when final image is formed at least distance of distinct vision.

(b) A compound microscope consists of an objective lens of focal length 2.0 cm and an eyepiece of focal length 6.25 cm separated by a distance of 15 cm. How far from the objective should an object be placed in order to obtain the final image at (a) the least distance of distinct vision (25 cm) and (b) infinity? What is the magnifying power of the microscope in each case?

ASSIGNMENT - II

You may use the following values of physical constants where ever necessary

I. $c = 3 \times 10^8$ m/s

II. $m_e = 9.1 \times 10^{-31}$ kg

III. $m_p = 1.7 \times 10^{-27}$ kg

IV. $e = 1.6 \times 10^{-19}$ C

V. $\mu_0 = 4\pi \times 10^{-7}$ T m A^{-1}

VI. $h = 6.63 \times 10^{-34}$ J s

VII. $\varepsilon_0 = 8.854 \times 10^{-12} C^2 N^{-1} m^{-2}$

VIII. Avogadro's number = 6.023×10^{23} per gram mole

Section A

1 Out of the following which one is not a property of field lines: **[1]**

a) Field lines are continuous curves without any breaks

b) Field lines start at positive charges and end at negative charges

c) Two field lines cannot cross each other

d) They form closed loops

2 Dimension of resistivity (or specific resistance) is: **[1]**

a) $ML^3\ T^{-2}\ I^{-1}$

b) $ML^2\ T^{-2}\ I^{-1}$

c) $ML^2\ T^{-2}\ I^{-2}$

d) $ML^3\ T^{-3}\ I^{-2}$

3 Two horizontal thin long parallel wires, separated by a distance r carry current I each in the same directions. The net magnetic field at a point midway between them, will be **[1]**

a) $\left(\frac{\mu_0 I}{2\pi r}\right)$ vertically downward

b) zero

c) $\left(\frac{\mu_0 I}{\pi r}\right)$ vertically downward
d) $\left(\frac{2\mu_0 \mathrm{I}}{\mathrm{r}}\right)$ vertically upward

4 The ratio of magnetic fields due to a small bar magnet in the end on position to the broad side on position is **[1]**
a) 1 : 1
b) 1 : 4
c) 2 : 1
d) 1 : 2

5 In a coil of self - induction 5 H, the rate of change of current is 2 A s^{-1} . Then, e.m.f. induced in the coil is **[1]**
a) 10V
b) - 10 V
c) - 5 V
d) 5 V

6 For a medium with permittivity ε and permeability μ , the velocity of light is given by: **[1]**
a) $\sqrt{\frac{\varepsilon}{\mu}}$
b) $\frac{1}{\sqrt{\mu\varepsilon}}$
c) $\sqrt{\mu\varepsilon}$
d) $\sqrt{\frac{\mu}{\varepsilon}}$

7 A microscope is focused on a mark. Then a glass slab of refractive index 1.5 and thickness 6 cm is placed on the mark. To get the mark again in focus the microscope should be moved **[1]**
a) 9 cm upward
b) 2 cm downward
c) 4 cm upward
d) 2 cm upward

8 For a concave mirror of focal length **f** , the minimum distance between the object and its real image is: **[1]**
a) f
b) 2f
c) zero
d) 4f

9 Two waves of intensities I and 4I superpose. Then, the maximum and minimum intensities are **[1]**
a) 9 I and I
b) 5 I and I
c) 9 I and 3 I
d) 5 I and 3 I

10 The radius of nucleus is: **[1]**
a) not related to its mass number
b) inversely proportional to its mass number
c) proportional to its mass number
d) proportional to the cube root of its mass number

11 The binding energy per nucleon is almost constant for many nuclei. It shows that nuclear forces are **[1]**

a) charge independent
b) short range in nature
c) attractive in nature
d) saturated in nature

12 At 0 K, the resistivity of an intrinsic semiconductor is: **[1]**
a) same as that at 0^o C
b) zero
c) infinite
d) same as that at 300 K

13 **Assertion:** If a proton and an α - particle enter a uniform magnetic field perpendicularly with the same speed, the timeperiod of revolution of α - particle is double that ofproton. **[1]**
Reason: In a magnetic field, the period of revolution of a charged particle is directly proportional to the mass of the particle and is inversely proportional to charge of particle.
a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c) Assertion is correct statement but reason is wrong statement.
d) Assertion is wrong statement but reason is correct statement.

14 **Assertion:** In a simple microscope, the image formed is virtual, erect and magnified. **[1]**
Reason: The object to be seen is held between the optical centre and focus of the convex lens.
a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c) Assertion is correct statement but reason is wrong statement.
d) Assertion is wrong statement but reason is correct statement.

15 **Assertion (A):** Light from two coherent sources is reaching the screen. If the path difference at a point on the screen for yellow light is $\frac{3\lambda}{2}$, then the fringe at that point will be coloured. **[1]**
Reason (R): Two coherent source always have constant phase relationship.
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 **Assertion (A):** The resistivity of a semiconductor decreases with temperature. **[1]**
Reason (R): As temperature increases, the electrons gain sufficient energy and jump from valence band to conduction band.
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.

Section B

17 Define mutual inductance. Write its SI unit. Give two factors on which **[2]**

the coefficient of mutual inductance between a pair of coils depends.

18 Identify the electromagnetic waves whose wavelengths lie in the range. **[2]**

(i) 10^{-12} m $<\lambda<$ 10^{-9} m

(ii) 10^{-3} m $<\lambda<$ 10^{-1} m

Write one use of each.

19 Define wavefront of a travelling wave. Using Huygens principle, obtain the law of refraction at a plane interface when light passes from a denser to rarer medium. **[2]**

OR

What is a wavefront? Using Huygens' principle, explain reflection of a plane wavefront from a surface and verify the laws of reflection.

20 Plot suitable graphs to show the variation of photoelectric current with the collector plate potential for the incident radiation of **[2]**

(i) the same intensity but different frequencies ν_1 , ν_2 and ν_3 ($\nu_1<\nu_2<\nu_3$)

(ii) the same frequency but different intensities I_1 , I_2 and I_3 ($I_1< I_2< I_3$)

21 Draw energy band diagrams of n -type and p - type semiconductors at temperature T > 0K, depicting the donor and acceptor energy levels. **[2]**

Section C

22 (i) Two electric field lines cannot cross each other. Also, they cannot form closed loops. Give reasons. **[3]**

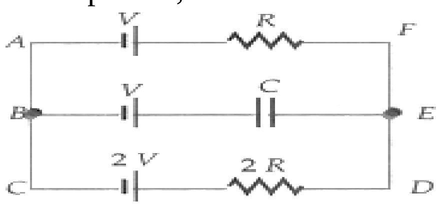
(ii) A particle of charge 2μ C and mass 1.6 g is moving with a velocity 4 $\hat{\imath}$ ms $^{-1}$. At t = 0 the particle enters in a region having an electric field $\vec{E}$ (in NC $^{-1}$) = 80 $\hat{\imath}$ + 60 $\hat{\jmath}$. Find the velocity of the particle at t = 5 s.

23 In the given circuit in the steady - state, obtain the expressions for **[3]**

(i) the potential drop

(ii) the charge and

(iii) the energy stored in the capacitor, C.



24 Draw a plot showing the variation of resistivity of a (i) conductor and (ii) semiconductor, with the increase in temperature. How does one explain this behaviour in terms of number density of charge carriers and the relaxation time? **[3]**

25 (i) Define current sensitivity of a galvanometer. Write its expression. **[3]**

(ii) A galvanometer has resistance G and shows full scale deflection for current I_g

a. How can it be converted into an ammeter to measure current up to I_0 ($I_0 > I_g$)?

b. What is the effective resistance of this ammeter?

26 (i) The interference pattern is not observed in Young's double slit experiment when the two sources S_1 and S_2 are far apart. Explain. **[3]**

(ii) Mention the conditions for the two sources to be coherent.

(iii) What is the effect on the interference pattern in a Young's double slit experiment, if the source of wavelength $\boldsymbol{\lambda}$ is replaced by another source of wavelength 1.5 $\boldsymbol{\lambda}$, with the interference pattern still observable?

27 The work function of a metal is 2.31 eV. Photoelectric emission occurs **[3]**

when light of frequency 6.4×10^{14} Hz is incident on the metal surface.
Calculate:
(i) the energy of the incident radiation,
(ii) the maximum kinetic energy of the emitted electron and
(iii) the stopping potential of the surface.

OR

A proton is accelerated through a potential difference V. After acceleration, the de Broglie wavelength associated with it is λ . If the proton is replaced by an alpha particle, then find the de Broglie wavelength associated with it if it were accelerated through the same potential difference V. What will be the momentum of the alpha particle?

28 With the help of a suitable diagram, describe briefly the two important processes involved in the formation of a p - n junction. Define the terms depletion region and potential barrier. **[3]**

Section D

Question No. 29 and 30 are based on the given text. **[4]**
Read the text carefully and answer the questions:

29 A charged particle moving in a magnetic field experiences a force that is proportional to the strength of the magnetic field, the component of the velocity that is perpendicular to the magnetic field and the charge of the particle.

This force is given by $\vec{\boldsymbol{F}} = \boldsymbol{q}\left(\vec{v} \times \vec{B}\right)$ where **q** is the electric charge of the particle, **v** is the instantaneous velocity of the particle, and B is the magnetic field (in tesla). The direction of force is determined by the rules of cross product of two vectors. Force is perpendicular to both velocity and magnetic field. Its direction is given as $\vec{v} \times \vec{B}$ if q is positive and opposite of $\vec{v} \times \vec{B}$ if q is negative.

The force is always perpendicular to both the velocity of the particle and the magnetic field that created it. Because the magnetic force is always perpendicular to the motion, the magnetic field can do no work on an isolated charge. It can only do work indirectly, via the electric field generated by a changing magnetic field.

(i) When a magnetic field is applied on a stationary electron, it
a) moves in the direction of the field
b) remains stationary
c) moves perpendicular to the direction of the field
d) spins about its own axis

(ii) A proton is projected with a uniform velocity **v** along the axis of a current - carrying solenoid, then
a) the proton will be accelerated along the axis
b) the proton will continue to move with velocity **v** along the axis
c) the proton moves along helical path
d) the proton path will be circular about the axis

(iii) A charged particle experiences magnetic force in the presence of magnetic field. Which of the following statement is correct?
a) The particle is moving and magnetic field is parallel to velocity.
b) The particle is stationary and magnetic field is perpendicular.
c) The particle is moving and magnetic field is perpendicular to the

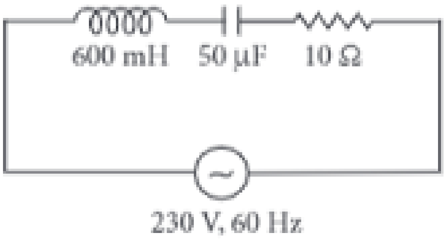
velocity.
d) The particle is stationary and magnetic field is parallel.
(iv) A charge **q**moves with a velocity 2 ms^{-1} along x - axis in a uniform magnetic field $\vec{B} = (\hat{\imath} + 2\hat{\jmath} + 3\hat{k})$T , then charge will experience a force
a) along - z axis
b) in z - y plane
c) along +z axis
d) along - y axis

OR

An electron is moving along positive x- axis in a magnetic field which is parallel to the positive y- axis. In what direction will the magnetic force be acting on the electron?

a) along -x axis
b) along -z axis
c) along +z axis
d) along -y axis

30 **Read the text carefully and answer the questions:** In an a.c. circuit, values of voltage and current change every instant. Therefore, power of an a.c. circuit at any instant is the product of instantaneous voltage (E) and instantaneous current (I). The average power supplied to a pure resistance R over a complete cycle of a.c. is P =$E_v I_\gamma$. When circuit is inductive, average power per cycle is $E_v I_v \cos\phi$ **[4]**



In an a.c. circuit, 600 mHinductor and a 50 μ F capacitor are connected in series with 10 Ω resistance. The a.c. supply to the circuit is 230 V, 60 Hz.

(i) The average power transferred per cycle to resistance is
a) 10.42 W
b) 15.25 W
c) 15 W
d) 17.42 W

(ii) The average power transferred per cycle to the capacitor is
a) 15 W
b) 10.42 W
c) 17.42 W
d) zero

(iii) The total power transferred per cycle by all the three circuit elements is
a) 17.42 W
b) zero
c) 12.45 W
d) 10.45 W

(iv) The average power transferred per cycle to inductor is
a) zero

b) 17.42 W
c) 25 W
d) 16.52 W

OR

The electrical energy spend in running the circuit for one hour is

a) 7.5×10^{5} Joule
b) 10×10^{3} Joule
c) 9.4×10^{3} Joule
d) 6.2×10^{4} Joule

Section E

31 (i) Define the capacitance of a capacitor. Obtain the expression for the capacitance of a parallel plate capacitor in vacuum in terms of plate area A and separation d between the plates. **[5]**

(ii) A slab of material of dielectric constant K has the same area as the plates of a parallel plate capacitor but has a thickness $\frac{3d}{4}$. Find the ratio of the capacitance with dielectric inside it to its capacitance without the dielectric.

OR

(i) Derive an expression for the potential energy of an electric dipole in a uniform electric field. Explain conditions for stable and unstable equilibrium.

(ii) Is the electrostatic potential necessarily zero at a point where the electric field is zero? Give an example to support your answer.

32 (i) Draw a ray diagram showing refraction of a ray of light through a triangular glass prism. Hence, obtain the relation for the refractive index (μ) in terms of angle of prism (A) and angle of minimum deviation (δ_{m}) . **[5]**

(ii) The radii of curvature of the two surfaces of a concave lens are 20 cm each. Find the refractive index of the material of the lens if its power is -5.0 D.

OR

(i) Draw a ray diagram for the formation of the image of a point object by a thin double convex lens having radii of curvatures R_1 and R_2 and hence, derive lens maker's formula.

(ii) Define power of a lens and give its SI unit. If a convex lens of length 50 cm is placed in contact coaxially with a concave lens of focal length 20 cm, what is the power of the combination?

33 (i) State the postulates of Bohr's model of hydrogen atom and derive the expression for Bohr radius. **[5]**

(ii) Find the ratio of the longest and the shortest wavelengths amongst the spectral lines of Balmer series in the spectrum of hydrogen atom.

OR

(i) Draw the plot of binding energy per nucleon (BE/ A) as a function of mass number A. Write two important conclusions that can be drawn regarding the nature of nuclear force.

(ii) Use this graph to explain the release of energy in both the processes of nuclear fusion and fission.

SUBJECT – CHEMISTRY

ASSIGNMENT – I

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. Out of the following transition elements, the maximum number of oxidation state are shown by :

(a) Sc
(b) Mn
(c) Cr
(d) Fe

2. The formula of the complex dichloridobis(ethane-1,2-diamine) platinum(IV) nitrate is :

(a) $[PtCl_2(en)_2(NO_3)_2]$
(b) $[PtCl_2(en)_2](NO_3)_2$
(c) $[PtCl_2(en)_2(NO_3)]NO_3$
(d) $[Pt(en)_2(NO_3)_2]Cl_2$

3. On the basis of crystal field theory, electronic configuration of d^5complex . when Δ_o>P is :

(a) $t_{2g}^3e_g^2$
(b) $t_{2g}^2e_g^3$
(c) $t_{2g}^1e_g^4$
(d) $t_{2g}^5e_g^0$

4. $(CH_3)_2CH\text{-}O\text{-}CH_3$ reacts with HI to give :

(a) $(CH_3)_2CH\text{-}OH + CH_3\text{-}OH$
(b) $(CH_3)_2CH\text{-}OH + CH_3\text{-}I$
(c) $(CH_3)_2CH\text{-}I + CH_3\text{-}OH$
(d) $(CH_3)_2CH\text{-}I + CH_3\text{-}I$

5. Propanenitrile may be prepared by heating:

(a) Ethyl chloride with KCN
(b) Propyl chloride with KCN
(c) Ethyl alcohol with KCN
(d) Propyl alcohol with KCN

6. Which of the following is most acidic?

(a) Ethanol
(b) Water
(c) Phenol
(d) 3-nitrophenol

7. The colligative property used for the determination of molar mass of polymers and proteins is :

(a) Osmotic pressure.
(b) Depression in freezing point.
(c) Relative lowering in vapour pressure.
(d) Elevation in boiling point.

8. A compound (X) with molecular formula C_3H_8O can be oxidized by strong oxidizing agents to another compound (Y) whose molecular formula is $C_3H_6O_2$. The compound (X) is :
(a) $CH_3-CH_2-O-CH_3$
(b) $CH_3-CH-CH_3$
|
OH
(c) $CH_3-CH_2-CH_2-OH$
(d) None of the above

9. If a current of 0.5 ampere flows through a metallic wire for 2 hours, then the number of electrons flow through the wire is :
(a) 2.246×10^{22} electrons
(b) 3.246×10^{24} electrons
(c) 4.246×10^{20} electrons
(d) 5.246×10^{52} electrons

10. The slope in the plot of ln[R] vs time for a first order reaction is :
(a) + K/2.303
(b) - K
(c) – K/2.303
(d) + K

11. Which of the following is affected by catalyst?
(a) ΔH
(b) ΔG
(c) E_a
(d) ΔS

12. Which of the following aqueous solutions should have the highest boiling point?
(a) 1.0 M Glucose
(b) 1.0 M KCl
(c) 1.0 M NaOH
(d) 1.0 M Na_2SO_4

13. Given below are two statements labelled as Assertion (A) and Reason (R).
Assertion (A) : Nucleophilic substitution of iodoethane is easier than chloroethane.
Reason (R) : Bond enthalpy of C-I bond is less than that of C-Cl bond.
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.

14. Given below are two statements labelled as Assertion (A) and Reason (R).
Assertion (A) : Acetylation of aniline gives a monosubstituted product.
Reason (R) : Activating effect of $-NHCOCH_3$ group is more than that of $-NH_2$ group
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.

15. Given below are two statements labelled as Assertion (A) and Reason (R).
Assertion (A) : $-NH_2$ group is o- and p-directing in electrophilic substitution reaction.
Reason (R) : Aniline cannot undergo Friedel-Crafts reaction.
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) : Vitamin C cannot be stored in our body.
Reason (R) : Vitamin C is water soluble and readily excreted in urine.
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.

SECTION – B

This section contains 5 questions with internal choice in one question. The following questions are very short answer type and carry 2 marks each.

17. The rate constant for a first order reaction is 60 s^{-1}. How much time will it take to reduce the initial concentration of the reactant to its 1/16th value?
[Given : log 2 = 0.3010]

OR

A reaction is second order with respect to a reactant. How is the rate of reaction affected if the concentration of the reactant is :
(i) Doubled
(ii) Reduced to half

18. (a) Which one of the following pairs of substance undergo S_N2 reaction faster and why?
2-Bromo-2-methylbutane or 2-Bromobutane
(b) Give the equation of reaction for the preparation of n-octane from 1-chlorobutane.
19. Calculate the mass of ascorbic acid (VitaminC, $C_6H_8O_6$) to be dissolved in 75g of acetic acid to lower its melting point by 1.5^0C. $K_f = 3.9$ K Kg mol^{-1}.
20. (a) Why do the transition elements exhibit higher enthalpies of atomization?
(b) Actinoid contraction is greater from element to element than lanthanoid contraction. Why?
21. (a) Give the basic structural difference between starch and cellulose.
(b) Write the chemical reaction to show that open chain structure of D-glucose contains an aldehydic group.

SECTION – C

This section contains 7 questions with internal choice in one question. The following questions are short answer type and carry 3 marks each

22. Give the equations of reactions for the preparation of : (any three)
(a) Picric acid from phenol
(b) 2-Methoxyacetophenone from anisole
(c) Phenol from chlorobenzene
(d) Salicylaldehyde from phenol
23. (a) Why is t-butyl bromide more reactive towards S_N1 reaction as compared to n-butyl bromide?

OR

Why p-dichlorobenzene has higher melting point than those of ortho- and meta- Isomers?
(b) Arrange the compounds in order of increasing boiling points:
Bromoform , Bromomethane , Dibromomethane
(c) What happens when $(CH_3)_3CBr$ reacts with alcoholic KOH? Write the reaction involved in it?
24. Write the structures of A,B and C in the following reactions:

(a) $CH_3COOH \xrightarrow[\Delta]{NH_3} A \xrightarrow{NaOBr} B \xrightarrow{NaNO_2/HCl} C$

(b) $C_6H_5NO_2 \xrightarrow{Fe\ /\ HCl} A \xrightarrow[273\ K]{HNO_2} B \xrightarrow{C_6H_5OH} C$

25. Write the reaction involved in the following:
(a) Hell-Volhard- Zelinsky reaction
(b) Cannizzaro reaction
(c) Etard reaction

26. (a) For the reaction :
$2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$ at 318K.
Calculate the rate of reaction if rate of disappearance of $N_2O_5(g)$ is 1.4×10^{-3} mol L^{-1}s^{-1}.

(b) For a first order reaction, derive the relationship $t_{99\%} = 2t_{90\%}$

27. Determine the osmotic pressure of a solution prepared by dissolving 25 mg of K_2SO_4 in 2 litres of water at $25^{O}C$ assuming it to be completely dissociated.
(Atomic masses : K = 39 u , S = 32 u , O = 16u)

28. Calculate emf of the following cell :
$Zn(s) \mid Zn^{2+} (0.1\ M) \parallel Sn^{2+} (0.001\ M) \mid Sn(s)$
Given : $E^0_{Zn^{2+}/Zn} = -0.76\ V$, $E^0_{Sn^{2+}/Sn} = -0.14\ V$, Log 10 = 1

SECTION – D

The following questions are case – based questions. Each question has an internal choice and carries 4 (1 + 1 + 2) marks each. Read the passage carefully and answer the questions that follow.

29. Transition metals have incomplete d-subshell either in neutral atom or in their ions.The presence of partly filled d- orbitals in their atoms makes transition elements different from that of the non-transition elements.

Answer the following questions:

(a) Which is a stronger reducing agent – Cr^{2+} or Fe^{2+} and why?

OR

Why is the highest oxidation state of a metal exhibited in its oxide or fluoride only?

(b) Complete and balance the given equation:

$MnO_4^- + I^- + H^+ \rightarrow$

(c) Write any two differences between lanthanoids and actinoids.

30. Living system are made up of various complex biomolecules like carbohydrates, proteins, nucleic acids, lipids etc. Proteins and carbohydrates are essential constituents of our food. These biomolecules interact with each other and constitute the molecular logic of life processes.

Answer the following questions:

(a) What is the difference between a glycosidic linkage and peptide linkage?

(b) Which amino acids are called essential amino acids?

(c) (i) What are the common types of secondary structures of proteins?

(ii) Write the main forces which stabilize the secondary and tertiary structure of proteins.

OR

Enumerate the reactions of D-glucose which cannot be explained by the open chain structure.

SECTION – E

The following questions are long answer type and carry 5 marks each. All questions have an internal choice.

31. (a) Give a chemical test to distinguish between propanal and propanone.

OR

Draw structure of the semicarbazone of cyclobutanone.

(b) Write the products in the following reaction :

(i) $(C_6H_5CH_2)_2Cd + 2CH_3COCl \rightarrow$

(ii) $H_3C\text{-}C\equiv C\text{-}H \xrightarrow{Hg^{2+},\ H_2SO_4}$

(c) Account for the following :

(i) Aromatic carboxylic acids do not undergo Friedel-Crafts reaction.

(ii) There are two $-NH_2$ groups in semicarbazide .However only one is involved in the formation of semicarbazones.

32. Answer any five of the following:

(a) Draw the structures of the optical isomers of $[PtCl_2(en)_2]^{2+}$.

(b) When a coordination compound $PtCl_4.6NH_3$ is mixed with $AgNO_3$, 4 moles of AgCl are precipitated per mole of the compound. Write the structural formula of the complex.

(c) Using IUPAC norms , write the formula of Potassium trioxalatochromate(III)

(d) Write the geometry and magnetic behaviour of the complex $[Fe(CN)_6]^{4-}$on the basis of valence bond theory (VBT).

(e) Why is geometrical isomerism not possible in tetrahedral complexes having two different types of unidentate ligands coordinated with the central metal ion?

(f) What type of isomerism is exhibited by the following complex: $[Co(NH_3)_5SO_4]Cl$.

33. (a) Name the cell which :

(i) Was used in Apollo space programme.

(ii) Is used in automobiles and inverters.

(iii) Is suitable for hearing aids and watches.

(iv) Is used in transistors.

(b) The conductivity of 0.001028 mol L^{-1} acetic acid is 4.95 x 10^{-5} S cm^{-1}. Calculate the dissociation constant if Λ_m^o for acetic acid is 390.5 S cm^2 mol^{-1}.

OR

The standard electrode potential for Daniel cell is 1.1 V. Calculate the standard Gibbs energy for the reaction :

$$Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$$

ASSIGNMENT - II

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. Zr and Hf have almost equal atomic and ionic radii because of :

(a) Diagonal relationship

(b) Lanthanoid contraction

(c) Actinoid contraction

(d) Belonging to the same group

2. Ethylene diamine is a :

(a) Monodentate ligand

(b) Tridentate ligand

(c) Hexadentate ligand

(d) Bidentate ligand

3. On the basis of crystal field theory, electronic configuration of d^5complex . when Δ_o<P is :
(a) $t_{2g}^3 e_g^2$
(b) $t_{2g}^2 e_g^3$
(c) $t_{2g}^1 e_g^4$
(d) $t_{2g}^5 e_g^0$

4. C_6H_5-O-C_2H_5 reacts with HBr to give :
(a) $C_6H_5Br + C_2H_5OH$
(b) $C_6H_5Br + C_2H_5Br$
(c) $C_6H_5OH + C_2H_5Br$
(d) $C_6H_5OH + C_2H_5OH$

5. **Toluene reacts with a halogen in the presence of iron (III) chloride giving ortho and para halo compounds. The reaction is :**
(a) **Electrophilic elimination reaction**
(b) **Electrophilic substitution reaction**
(c) **Free radical addition reaction**
(d) **Nucleophilic substitution reaction**

6. Reaction of propanone with methylmagnesium bromide followed by hydrolysis gives the product :
(a) 2- Methylpropan-2-ol
(b) 2- Methylbutan-2-ol
(c) Propan-2-ol
(d) Butan-2-ol

7. The reagent used for the oxidation of primary alcohol to aldehyde is :
(a) Acidified $KMnO_4$
(b) PCC
(c) Aqueous bromine
(d) None of these

8. Which of the following condition is not satisfied by an ideal solution?
(a) $\Delta H_{mixing} = 0$
(b) $\Delta V_{mixing} = 0$
(c) Raoult's Law is obeyed
(d) Formation of an azeotropic mixture

9. In a dry cell, which of the following is the electrolyte?
(a) Potassium hydroxide
(b) Sulphuric acid
(c) Ammonium chloride
(d) Manganese dioxide

10. What will be the fraction of molecules having energy equal to or greater than activation energy, Ea?

(a) K

(b) A

(c) $Ae^{-Ea/Rt}$

(d) $e^{-Ea/Rt}$

11. For the reaction $N_2 + 3H_2 \rightarrow 2NH_3$,if Δ[NH3] /Δt = 2×10^{-4} mol $L^{-1}s^{-1}$, the value of −Δ[H2] / Δt would be :

(a) 1×10^{-4} mol $L^{-1}s^{-1}$

(b) 3×10^{-4} mol $L^{-1}s^{-1}$

(c) 4×10^{-4} mol $L^{-1}s^{-1}$

(d) 6×10^{-4} mol $L^{-1}s^{-1}$

12. Which has the lowest boiling point at 1 atm pressure?

(a) 0.1 M KCl

(b) 0.1 M Urea

(c) 0.1 M $CaCl_2$

(d) 0.1 M $A1Cl_3$

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

Assertion (A) : Aryl halides undergo nucleophilic substitution reactions with ease.
Reason (R) : The C-X bond in aryl halides has partial double bond character.
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.

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

Assertion (A) : Aromatic primary amines cannot be prepared by Gabriel phthalimide synthesis.
Reason (R) : Aryl halides donot undergo nucleophilic substitution reaction with anion formed by phthalimide.
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.

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

Assertion (A) : $-NH_2$ group is o- and p-directing in electrophilic substitution reaction.
Reason (R) : Aniline cannot undergo Friedel-Crafts reaction.
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) : Sucrose is a non-reducing sugar.
Reason (R) : Sucrose has glycosidic linkage.
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.

SECTION – B

This section contains 5 questions with internal choice in one question. The following questions are very short answer type and carry 2 marks each.

17. (a) Calculate the overall order of a reaction which has the rate expression:
$$\text{Rate} = k\,[A]^{1/2}\,[B]^{3/2}$$
(b) A reaction is first order in A and second order in B. How is the rate affected on increasing the concentration of B three times?

18. (a) **Among the isomeric alkanes of molecular formula C_5H_{12}, identify the one that on photochemical chlorination yields a single monochloride.**
(b) Predict all the alkenes that would be formed by dehydrohalogenation of the 2-Chloro-2-methylbutane with sodium ethoxide in ethanol and identify the major alkene.

19. Calculate the mass of ascorbic acid (VitaminC, $C_6H_8O_6$) to be dissolved in 75g of acetic acid to lower its melting point by 1.5^0C. [$K_f = 3.9$ K Kg mol^{-1}]

20. (a) **Silver atom has completely filled d orbitals ($4d^{10}$) in its ground state. How can you say that it is a transition element?**
(b) The transition metals generally form coloured compounds. Give reason.

OR

The lowest oxide of transition metal is basic and the highest is amphoteric/ acidic. Give reason.

21. (a) **What do you understand by the term glycosidic linkage?**
(b) Write the chemical reaction to show that open chain structure of D-glucose contains carbonyl group.

SECTION – C

This section contains 7 questions with internal choice in one question. The following questions are short answer type and carry 3 marks each

22. (a) Write the equations involved in the following reactions:
(i) Reimer - Tiemann reaction
(ii) Kolbe's reaction

(b) Write the equation of the reaction of hydrogen iodide with methoxybenzene.

23. (a) Haloalkanes react with KCN to form alkyl cyanides as main product while AgCN forms isocyanides as the chief product. Explain.

(b) Write the structure of the major organic product in the following reaction:

$$(CH_3)_3CBr + KOH \xrightarrow[\text{heat}]{\text{ethanol}}$$

(c) Arrange the compounds of each set in order of reactivity towards SN_2 displacement:

1-Bromo-3-methylbutane, 2-Bromo-2-methylbutane, 2-Bromo-3-methylbutane

24. (a) Give one chemical test to distinguish between Methylamine and dimethylamine.

(b) Although amino group is o– and p– directing in aromatic electrophilic substitution reactions, aniline on nitration gives a substantial amount of m-nitroaniline.Give reason.

(c) Arrange the following In increasing order of basic strength:

$C_6H_5NH_2$, $C_6H_5N(CH_3)_2$, $(C_2H_5)_2NH$, CH_3NH_2

25. An organic compound (A) with molecular formula C_8H_8O forms an orange-red precipitate with 2,4-DNP reagent and gives yellow precipitate on heating with iodine in the presence of sodium hydroxide. It neither reduces Tollens' or Fehlings' reagent, nor does it decolourise bromine water or Baeyer's reagent. On drastic oxidation with chromic acid, it gives a carboxylic acid (B) having molecular formula $C_7H_6O_2$. Identify the compounds (A) and (B) and explain the reactions involved.

OR

(a) Give names of the reagents to bring about the following transformations:

(i) Cyclohexanol to cyclohexanone

(ii) But-2-ene to ethanal

(b) Which acid of each pair shown here would you expect to be stronger?

$CH_2FCH_2CH_2CO_2H$ or $CH_3CHFCH_2CO_2H$

(c) Predict the products formed when cyclohexanecarbaldehyde reacts with Zinc amalgam and dilute hydrochloric acid

26. (a) What will be the effect of temperature on rate constant ?

(b) The rate constant for a first order reaction is $60\ s^{-1}$. How much time will it take to reduce the initial concentration of the reactant to its 1/16th value? [log2=0.3010]

27. Vapour pressure of water at 293 K is 17.535 mm Hg. Calculate the vapour pressure of water at 293 K when 25 g of glucose is dissolved in 450 g of water.

28. A solution of $CuSO_4$ is electrolysed for 10 minutes with a current of 1.5 amperes. What is the mass of copper deposited at the cathode?

SECTION – D

The following questions are case – based questions. Each question has an internal choice and carries 4 (1 + 1 + 2) marks each. Read the passage carefully and answer the questions that follow.

29. The d-block of the periodic table contains the elements of the groups 3-12 in which the d orbitals are progressively filled in each of the four long periods. The elements constituting the f -block are those in which the 4 f and 5 f orbitals are progressively filled in the latter two long periods; these elements are formal members of group 3 from which they have been taken

out to form a separate f-block of the periodic table. The names transition metals and inner transition metals are often used to refer to the elements of d-and f-blocks respectively.

Answer the following questions:

(d) Cr^{2+} is a stronger reducing agent. Give reason.

OR

Why is Cu^{+} not stable in aqueous solution?

(e) What is the effect of increasing pH on a solution of $K_2Cr_2O_7$?

(f) Write the ionic equations for the oxidizing action of MnO_4^- in acidic medium with:

(i) I^- ion

(ii) Fe^{2+} ion

30. Proteins are the most abundant biomolecules of the living system. Chief sources of proteins are milk, cheese, pulses, peanuts, fish, meat, etc. They occur in every part of the body and form the fundamental basis of structure and functions of life. They are also required for growth and maintenance of body. The word protein is derived from Greek word, "proteios" which means primary or of prime importance.

Answer the following questions:

(d) What are the expected products of hydrolysis of lactose?

(e) What is the difference between a nucleoside and a nucleotide?

(f) (i) Differentiate between globular and fibrous proteins

(ii) Define denaturation of proteins

OR

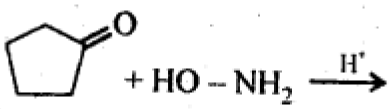
Enumerate the reactions of D-glucose which cannot be explained by the open chain structure.

SECTION – E

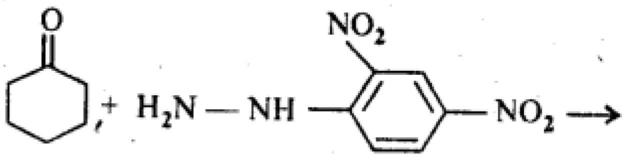
The following questions are long answer type and carry 5 marks each. All questions have an internal choice.

31. **(a) . Predict the products of the following reactions:**

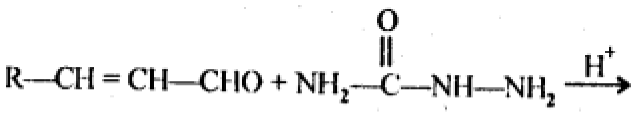
(i)



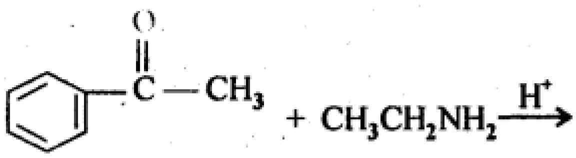
(ii)



(iii)



(iv)



(b) Draw the structure of semicarbazone of cyclobutanone

OR

Arrange the following in increasing order of the reactivity towards HCN:
Acetaldehyde, Acetone, Di tert. butyl ketone, Methyl tert. butyl ketone

32. Answer any five of the following:

(g) **Write the formulae for Amminebromidochloridonitrito-N- palatinate (II).**

(h) **$[Fe(H_2O)_6]^{3+}$ is strongly paramagnetic whereas $[Fe(CN)_6]^{3-}$ is weakly paramagnetic. Explain.**

(i) **Draw all the isomers (geometrical and optical) of $[Co(NH_3)\,Cl\,(en)_2]^{2+}$.**

(j) **What is crystal field splitting energy? How does the magnitude of Δ_0 decide the actual configuration of d-orbitals in a coordination entity?**

(k) **How many ions are produced from the complex $[Co(NH_3)_6]Cl_2$ in solution?**

(l) **What will be the correct order for the wavelengths of absorption in the visible region for the following:**
$[Ni(NO_2)_6]^{4-}$, $[Ni(NH_3)_6]^{2+}$, $[Ni(H_20)_6]^{2+}$

33. (a) Calculate the emf of the following cell at 298 K:

Al(s) | Al^{3+}(0.001 M) || Ni^{2+} (0.1 M) | Ni(s)

[Given : $E^0_{Al^{3+}/Al}$ = -1.66 V , $E^0_{Ni^{2+}/Ni}$ = -0.25 V , log 10 =1]

(b) With the help of graph, explain why it is not possible to determine λ°_m **for a weak electrolyte by extrapolating the molar conductivity (λ_m) versus $C^{1/2}$ curve as for strong electrolyte.**

OR

Calculate the half-cell potential at 298 K for the reaction :

$Zn^{2+} + 2e^- \rightarrow Zn$

If $[Zn^{2+}]$ = 0.1M and $E^0_{Zn^{2+}/Zn}$ = - 0.76 V

<u>SUBJECT –MATHS</u>

ASSIGNMENT – I

<u>SECTION-A</u>

1. The projection of $\vec{a} = \hat{\imath} - 2\hat{\jmath} + 3\hat{k}$ and $\vec{b} = 2\hat{\imath} + \lambda\hat{k}$ is zero, then the value of λ is

a) 0 b) 1 c) $-\frac{2}{3}$ d) $-\frac{3}{2}$

2.If Y = $sec^{-1}\,x$, then

a) $0 \le y \le \pi$ b) $0 \le y < \frac{\pi}{2}$ or $\frac{\pi}{2} < y \le \pi$ c) $-\frac{\pi}{2} < y < \frac{\pi}{2}$ d) None of these

3. Let A= {1,2.3,4} and R = $\{(1,1), (2,2), (3,3), (4,4), (1,2), (2,1), (3,1)\}$ then Ris

a) Reflexiveb) Transitive c)Equivalence d) None of these

4. If f(x) = $\begin{Bmatrix} \frac{x^3+x^2-16x+20}{(x-2)^2}, for\ x \ne 0 \\ k \end{Bmatrix}$ is continuous for all x, then the values of a is

a) 7 b) 3 c) 2d) 5

5. If $(\frac{1}{2}, \frac{1}{3}, n)$ are the direction cosines of a line, then the value of n is

a) $\frac{\sqrt{23}}{6}$ b) $\frac{23}{6}$ c) $\frac{2}{3}$ d) $\frac{3}{2}$

6. Let x be a number which exceeds its square by the greatest possible quantity, then x is

a) ($1/2$ b) 1/4 c) 3/4 d) 1/3

7. If y=e^{3x+7} then the value of $\frac{dy}{dx}$ at x=2 is

a) 1 b)0 c) – 1 d) $3e^{13}$

8. $Find \int \frac{dx}{x^3(1+x^4)^{\frac{1}{2}}}$ equals

a) $\frac{1}{4x^2}\sqrt{1+x^4}+c$ b) -$\frac{1}{2x^2}\sqrt{1+x^4}+c$ c) $\frac{1}{2x}\sqrt{1+x^4}+c$

d)$-\frac{1}{4x}\sqrt{1+x^4}+c$

9. Find the order and degree of the differential equation y = px + $\sqrt{a^2p^2+b^2}$ where p=$\frac{dy}{dx}$

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

10. A coin is tossed and then a die is thrown. Find the probability of obtaining a 6 given that head comes up.

a) $\frac{1}{3}$ b)$\frac{1}{6}$ c) $\frac{2}{3}$ d) $\frac{1}{4}$

11. Area lying between the parabola $y^2 = 4x$ and its latus rectum is

a)$\frac{1}{3}$sq. Unit b)$\frac{2}{3}$sq. Unit c)$\frac{5}{3}$ $sq. unit$ d) $\frac{8}{3}$sq. unit

12. Find the solution of the differential equation y- x $\frac{dy}{dx} = 0$ is equal to

a) x y =cb) y = x c c) x y=0 d) y = x

13. Find the value of $\int e^{xloga}\ e^x$ dx

a)$(ae)^x + c$b)$\frac{(ae)^x}{\log(ae)}$+c c)$\frac{e^x}{1+loga}$+c d None of thhese

14.The events A and B are such that P(A) = $\frac{1}{2}$, P (A$\cup B) = \frac{3}{5}$ and P(B) =p. then find the value of p. if A and B are mutually exclusive.

a)$\frac{1}{8}$ b) $\frac{1}{9}$ c) $\frac{1}{10}$ d) $\frac{1}{11}$

15. If $|\vec{a}| = 3, |\vec{b}| = 4\ and\ |\vec{a}+\vec{b}| = 5, then\ find |\vec{a}-\vec{b}| =$

a) 3 b) 4 c) 5 d) 8

16. Find the value of the sin $\left[\frac{\pi}{3} + sin^{-1}\left(\frac{1}{2}\right)\right]$

a) 1 b) $\frac{1}{2}$ c)$\frac{1}{3}$ d) $\frac{1}{4}$

17. If $\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \frac{1}{40}\begin{bmatrix} 5 & 10 & -5 \\ -5 & -2 & 13 \\ 10 & -4 & 6 \end{bmatrix}\begin{bmatrix} 5 \\ 0 \\ 5 \end{bmatrix}$, then the value of x +y +z is

a) 3 b) 0 c) 2 d) 1

18. Evaluate; $\int_{-2}^{2}(x^3+1)\,dx$

a) 0 b) 2 c) 4 d) 6

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 (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.

19. Assertion(A):The angle between the pair of lines with direction ratios proportional to a, b, c and b-c, c-a, a-b is $\frac{\pi}{4}$.

Reason (R): The two lines will be parallel if either $\theta = 0°$ or $\frac{l_1}{l_2} = \frac{m_1}{m_2} = \frac{n_1}{n_2}$

20. Assertion (A): The relation f;{1,2,3,4} → $\{x, y, z, p\}$ defined by f = $\{(1,x),(2,y),(3,z)\}$ is a bijective function.

Reason (R):The function f: {1,2,3} → $\{x, y, z, p\}$ such that f= $\{(1,x),(2,y),(3,z)\}$ is one-one.

SECTION-B

21. An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement, then the probability that both drawn balls are black.

22. The sum of a matrix and its transpose is $\begin{bmatrix} 6 & -1 \\ -1 & 4 \end{bmatrix}$. Find one such matrix for which this holds true.

OR

Find $(AB)^{-1}$, if A= $\begin{bmatrix} 1 & 0 \\ -4 & 2 \end{bmatrix}$ and B^{-1}=$\begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix}$

23. Evaluate;$\int(2tanx - 3cotx)^2$ dx

24. Find the values of a for which points (8, -7, a), (5,2,4) and (6, -1,2) are collinear.

25. Find a unit vector perpendicular to each of the vectors $\vec{a}$ and$\vec{b}$ where $\vec{a} = 5\hat{\imath} + 6\hat{\jmath} - 2\hat{k}$ and $\vec{b} = 7\hat{\imath} + 6\hat{\jmath} + 2\hat{k}$.

OR

If α, β, γ are the angles made by a line with the co-ordinate axes. Then find the value of $sin^2\alpha + sin^2\beta + sin^2$

SECTION-C

26.If $\sqrt{1 - x^2}$ +$\sqrt{1 - y^2}$ = a (x-y) then prove that $\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{\sqrt{1-x^2}}$.

OR

Differentiate ;$x^x + cos\sqrt{x}$

27.Find the area of the region bounded by the line y=2x+1, x-axis and the ordinatesx = -1 and x =1.

28. Find the shortest distance between the lines $\vec{r} = \left(\hat{\imath} + \hat{\jmath} - \hat{k}\right) + s(2\hat{\imath} + \hat{\jmath} + \hat{k})$

$$\vec{r} = \left(\hat{\imath} + \hat{\jmath} + 2\hat{k}\right) + t(4\hat{\imath} + \hat{2j} + 2\hat{k})$$

29. Solve the differential equation: (1 +x^2) $\frac{dy}{dx}$ +2xy – 4 x^2 $= 0$, subject to initial condition Y (0) =0.

30. Find the intervals in which the function f(x)=$3x^4 - 4x^4 - 12x^2 + 5$ is a) strictly increasing b) strictly decreasing

31. Evaluate :$\int \frac{8}{(x+2)(x^2+4)}$ dx

OR

Evaluate;$\int \frac{dx}{x(x^5+1)}$

SECTION-D

32. If A = $\begin{bmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & -1 & 1 \end{bmatrix}$, then find A^{-1} and hence solve the following system of equations

X-2y = 10,2x-y-z=8, -2y+z=7

OR

Evaluate the product AB, where A=$\begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$ and B=$\begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$ Hence solve the system of equation x-y=3; 2x +3y+4z=17; y+2z=

33.Let N be the set of all natural numbers and R be a relation on NxN defined by
(a, b) R (c,d)$\leftrightarrow$ ad = bc for all (a,b), (c, d)$\in N \times N$. show that Ris an equivalence relation on N$\times$N. Also find the equivalence class of (2,6).

34. Determine graphically the minimum value of the objective function Z= - 50x + 20y
Subject to the constraints; 2x- y ≥ -5 , 3x + y$\geq$ 3 , 2x-3y$\leq$ 12, x$\geq 0, y \geq 0$

35. Find the coordinates of the foot of the perpendicular drawn from the point (2,3,-8) to the line $\frac{4-x}{2} = \frac{y}{6} = \frac{1-z}{3}$. Also find the perpendicular distance of the given point from the line.

OR

Find the vector and cartesian equations of the line which is perpendicular to the lines with equations $\frac{x+2}{1} = \frac{z-3}{2} = \frac{z+1}{4}$ *and* $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and passes through the point (1,1,1). Also find the angle between the given lines.

SECTION-E

(This section comprises of 3 case-study/passage-based question of 4 marks each with two sub-parts. First two case study questions have three sub-parts of marks 1,1,2 respectively. Third case-study has two sub-parts of 2 marks each.)

36. **case study-1**

Read the following passage and answer the question given below:
A bank offers loan to its customers on different types of interest namely, fixed rate, floating rate, variable rate. From the past data it is known that a customer avails loan on fixed rate, floating rate, or variable rate with probabilities 10%, 20% and 70% respectively. A customer after availing loan can pay the loan or default on loan repayment. The probability that a person default on loan after availing it at fixed rate, floating rate, variable rate is 5%, 3% ,1% respectively.
Based on the above information answer the following questions:

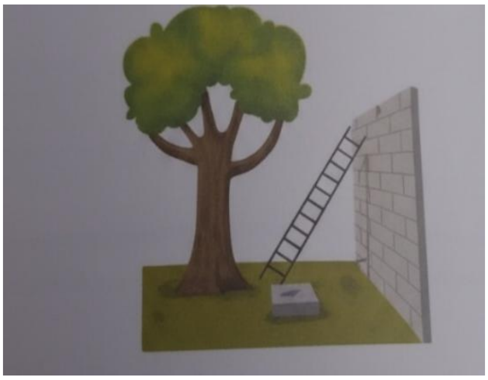
i) What is the probability that a customer after availing a loan will default on loan repayment.

ii) A customer after availing the loan, default on loan repayment. What is the probability that he availed the loan at a variable rate of interest.

37. **Case study-2**

Read the following and answer the question given below;

A ladder of fixed length ‘h’ is to be placed along the wall such that it is free to move along the height of the wall.



Based upon the above information, answer the following question.

(i) Express the distance (y) between the wall and the foot of the ladder in terms of 'h' and height (x) on the wall at a certain instant. Also, write an expression in terms of h and x for area (A) of the right triangle, as seen from the side by an observer.

(ii) Find the derivative of an area (A) with respect to the height on the wall (x), and find its critical point.

(iii) (a) Show that the area (A) of the right triangle is maximum at critical point.

OR

(b) If the root of the ladder whose length is 5m, is being pulled towards the wall such that the rate of decrease of distance (y) is 2m/s, then at what rate is the height on the wall (x) increasing, when the foot of the ladder is 3m away from the wall?

38. **Case study-3**

Read the following and answer the question given below;

On the occasion of children's day, class teacher of class XII Shri Singh, decided to donate some money to students of class XII. If there were 8 students less, every one would have got Rs.10 more. However, if there were 16 students more, every one would have got Rs.10 less.

(i) (a)If number of students in class be x Shri Singh has decided to donate Rs.y to each student, express the information provided in problem in system of linear equation.

(b)Express system of linear equation obtained in (a)in matrix equation.

(ii) Find the number of students in class XII and the amount distribution by Shri Singh.

ASSIGNMENT – II

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SECTION-A

1. If A and B are two independent events with P(A) = $\frac{1}{3}$ and P(B) = $\frac{1}{4}$, then P(B'/A) is

a) $\frac{1}{4}$ b) $\frac{1}{3}$ c) $\frac{3}{4}$ d) 1

2.Find the direction cosines of the line $\frac{x-1}{2} = \frac{1-y}{3} = \frac{2z-1}{12}$ are

a) $\frac{2}{7},\frac{3}{7},\frac{6}{7}$ b) $\frac{2}{\sqrt{157}},\frac{-3}{\sqrt{157}},\frac{12}{\sqrt{157}}$ c) $\frac{2}{7},\frac{-3}{7},\frac{-6}{7}$ d) $\frac{2}{7},\frac{-3}{7},\frac{6}{7}$

3. Find the foot of the perpendicular drawn from the point (2-3,4) on the y-axis is

a) (2,3,4) b) (-2,-3,-4) c) (0,-3,0) d) (2,0,4)

4. Find $\int_{\frac{-\pi}{4}}^{\frac{\pi}{4}} sin^3x\ dx$

a) $2\int_0^{\frac{\pi}{4}} sin^3x\ dx$ b) 1 c) 0 d) $\int_0^{\frac{\pi}{4}} sin^3xdx$

5. Find the value of $tan^{-1}\{\tan\frac{15\pi}{4}\}$ is

a) $\frac{\pi}{4}$ b) $\frac{3\pi}{4}$ c) $\frac{-\pi}{4}$ d) π

6. Find the value of $\int_{-2}^{2}|x|$ dx is

a) 4 b) 6 c) 2 d) 5

7.Find the value of p for which the vectors $2\hat{\imath} + p\hat{\jmath} + \hat{k}$ and $-4\hat{\imath} - 6\hat{\jmath} + 26\hat{k}$ are perpendicular to each other, is

a) 3 b) -3 c) $-\frac{17}{3}$ d) $\frac{17}{3}$

8. If $\begin{bmatrix} x+y & 7 \\ 9 & x-y \end{bmatrix} = \begin{bmatrix} 2 & 7 \\ 9 & 4 \end{bmatrix}$, then find xy.

a) -2 b) 3 c) -3 d) 2

9. If two vectors $\vec{a}$ and $\vec{b}$ are such that $|\vec{a}| = 1, |\vec{b}| = 4$ and $\vec{a}.\vec{b} = 3$ then find $|\vec{a} + 2\vec{b}|$.

a) 77 b) 76 c) $\sqrt{77}$ d) $\sqrt{78}$

10. Let A be a 3x3 matrix such that $|adj\ A|$ =64. Then $|A|$ is equal to

a) 8 only b) -8 only c) 64 d) 8 or -8

11. A right circular cylinder which is open at the top and has a given surface area, will have the greatest volume, its height h and radius r are related by

a) 2h=r b) h=4r c) h=2r d) h=r

12. If for a square matrix A, A^2-3A+I=0 and A^{-1}=Xa+YI , then the value of x +y is

a)-2 b) 2 c)3 d)-3

13. Find the area of region bounded by the curve x= 2y+3 and the lines y=1 , y=-1

a) 4 sq units b) $\frac{3}{2}$sq unit c) 6 sq unit d) 8 sq unit

14. Find the minimum value of function f(x) = $|x+1|$ -1 .

a) 1 b) 0 c) -1 d) -2

15. The solution set of the inequation 3x+5y< 7 is;

a) whole xy-plane except the points lying on the line 3x + 5y =7

b) whole xy-plane along with the points lying on the line 3x + 5y =7

c) Open half plane containing the origin except the points of line 3x + 5y =7

d) open half plane not containing the origin.

16. For two events A and B , if P(A) = 0.4 , P(B) =0.8 and P(A/B)=0.3, then P(B/A) *is*

a) 0.6 b) 0.3 c) 0.06 d) 0.4

17. A box contains 3 orange balls, 3 green balls, and 2 blue balls. Three balls are drawn at random from the box without replacement. Find the probability of drawing 2 green balls and one blue ball is

a) $\frac{3}{28}$ b) $\frac{2}{21}$ c) $\frac{1}{28}$ d) $\frac{167}{168}$

18. Find the maximum value of slope of the curve y=x^3+3x^2+12x-5 is

a) 15 b) 12 c) 9 d) 0

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:

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

f) Both (A) and (R) are true and (R) is not the correct explanation of (A).

g) (A) is true, but (R) is false.

h) (A) is false, but (R) is true.

19. Assertion(A) If R is the relation defined in set { 1,2,3,4,5,6} as R = { (a, b) ; b = a+1} then R is reflexive

Reason (R) The relation R in the set { 1,2,3 } given by R = { (1,2) (2,1) } is symmetric.

20. Assertion (A) The equation of the line joining A (1,3) and B(0,0) is given by y=3x

Reason (R) The area of triangle with vertices (x_1 ,y_1) , (x_2,y_2) and (x_3,y_3) in the form of determinant is $\Delta = \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$

SECTION-B

21. The volume of a cube is increasing at the rate of 6 cm^3/s. How fast is the surface area of cube increasing, when the length of an edge is 8cm.

22. Find $\int \frac{1}{x\,(x^2-1)}$ dx

23. If $\cot^{-1}$(3x+5) $>\frac{\pi}{4}$ then find the range of the values of x.

OR

Find the principal value of $tan^{-1}1 + cos^{-1}\frac{1}{2} + sin^{-1}\frac{-1}{\sqrt{2}}$

24. If y= $cos^3\ (sec^2 2t)$, find $\frac{dy}{dt}$.

OR

If $x^y\ =\ e^{x-y}$, prove that $\frac{dy}{dx} = \frac{logx}{(1+logx\,)^2}$

25. Find the interval in which the function f(x) = $x^4 - 4x^3 + 10$ is strictly decreasing.

SECTION-C

26. A biased dice is twice as likely to show an even number as an odd number. If such a die is thrown twice, find the probability distribution of the number of sixes. Also find the mean of the distribution.

27. Solve the following LPP graphically: Minimise Z= 500 x +300 y
Subject to the constraints x + 2 y$\leq$ 12, 2 X + y$\leq$ 12 , 4x +5y$\geq$ 20,x$\geq$ 0 ,y$\geq$ 0

28. If y=tan x +sec x, then prove that .$\frac{d^2y}{dx^2}=\frac{\cos x}{(1-sinx)^2}$

29.Find the particular solution of the following differential equation $\frac{dy}{dx} = y\cot 2x$ given that y($\frac{\pi}{4}$) $= 2$.

OR

Find the particular solution of the differential equation $\left(x\, e^{\frac{y}{x}} + y\right)\, dx = x\, dy$, given that y=1 when x=1

30.Find $\int \frac{3x+5}{\sqrt{x^2+2x+4}}$ dx

OR

Find $\int \frac{x^2+1}{(x^2+2)(x^2+4)}$ dx

31. Find $\int_0^{\pi} \frac{x}{1+sinx}$ dx

OR

$\int x^2 . sin^{-1}(x^{\frac{3}{2}})$ dx

SECTON-D

32. 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 the point of intersection.

OR

Two vertices of the parallelogram ABCD are given as A (-1 , 2 ,1) and B (1 ,-2,5) . if the equation of the line passing Cand D is $\frac{x-4}{1} = \frac{y+7}{-2} = \frac{z-8}{2}$, then find the distance between AB and CD. Hence find the area of parallelogram ABCD.

33. Let A = R –{5} and B = R – {1} . consider the function f : A→ $B\ defined\ by\ f(x) = \frac{x-3}{x-5}$. show that f is one-one and onto.

34. using integration, find the area of ellipse $\frac{x^2}{16} + \frac{y^2}{4} = 1$, included between the x=-2 and x=2.

35. If A = $\begin{vmatrix} 2 & 1 & -3 \\ 3 & 2 & 1 \\ 1 & 2 & -1 \end{vmatrix}$,find A^{-1}

SECTION-E

(This section comprises of 3 case-study/passage-based question of 4 marks each with two sub-parts. First two case study questions have three sub-parts of marks 1,1,2 respectively. Third case-study has two sub-parts of 2 marks each.)

36. case study-1

Read the following passage and answer the question given below:

A Company producing electric bulbs has factories at three location A, B and C and company got a bulk order of electric bulbs. The producing capacities of factories located at places A and C are same but capacity of factory located at place B is double that of at place C. it is known that 4% of bulbs produced at places A and B are defective and 5% of bulbs produced at place C are defective.

i) Find the probability of production capacity of factory at place C.

ii) Find the conditional probability of producing defective bulb by factory at placeB.

iii) Find the probability of producing defective bulb.

Or

Find the probability that bulb is produced at location C, given that defective bulb has been produced.

37.Case study-2

Read the following and answer the question given below:

A Volleyball player serves the ball which takes a parabolic path given by the equation .

h(t)= $-\frac{-7}{2}t^2 + \frac{13}{2}\ t + 1$, where h(t) is the height of ball at any time t (in seconds), t≥ 0

a) Is h(t) a continuous function? Justify.

b) Find the time at which the height of the ball is maximum.

38. Case study-3

If f(x) is a continuous function defined on [0, a] , then $\int_0^a f(x)\,dx = \int_0^a f(\,a - x)\,dx$

On the basis of above information, answer the following questions.

i) If f(x) = $\frac{\sin x - cosx}{1+sinx\ cosx}$, then evaluate $\int_0^{\frac{\pi}{2}} f(x)\ dx$.

ii) If g (x) = log (1 +tan x) , then evaluate $\int_0^{\frac{\pi}{4}} g(x)\ \ dx$

SUBJECT – BIOLOGY

ASSIGNMENT – I

SECTION A

1. Which Artificial Reproductive Technique can help a lady conceive a child if both her fallopian tubes are blocked?

a. SUZI
b. IVF
c. ZIFT
d. GIFT

2. Which of the following is not a copper-releasing IUD?

a. LNG 20
b. CuT
c. Lippes Loop
d. a and c

3. Select the incorrectly matched pairs

a. Purines – Nitrogenous bases cytosine, thymine and uracil
b. Recombinant DNA – DNA formed by joining the DNA segments from two different sources
c. rRNA – RNA found in ribosomes
d. ATP – The energy-carrying compound in the cell

4.**In lac-operon, which protein is not regulated by the repressor?**

a. Galactosidase
b. Lactose Permease
c. Tryptophan
d. Transacetylase

5.**The experiment that simulated conditions thought to be present on the early earth**

a. Hershey–Chase experiment
b. Geiger–Marsden experiment
c. Miller–Urey experiment
d. Schiehallion experiment

6.**Example of a homologous organ**

a. The arm of a human, wing of a bird
b. Wing of an insect, wing of a bird
c. Leg of a dog, leg of a spider
d. None of the above

7.**This entry in the table is wrongly matched**

Option	Name of the Microbe	Product	Purpose

A	*Monascus purpureus*	Statins	Lowers blood cholesterol
B	*Streptococcus*	Streptokinase	Removes clots from blood vessels
C	*Clostridium butylicum*	Lipase	Oil stain removal
D	*Trichoderma polysporum*	Cyclosporin-A	Immunosuppressive drug

8.**This is not an example of performing biological control of diseases/pests using microbes**

a. Trichoderma sp. against some plant pathogens
b. Nucleopolyhedrovirus against insects and other arthropods
c. Ladybird beetle against aphids
d. Bt-cotton to increase yield

9.**This is not a biofertilizer**

a. Agrobacterium
b. Nostoc
c. Rhizobium
d. Mycorrhiza

10.**Immunosuppressants such as _________ prevent transplanted organs from being rejected in recipients.**

a. Thrombin
b. Cyclosporine
c. Aspirin
d. None of the above

11.Vertical distribution of different species occupying different levels in a biotic community is known as

a. Stratification
b. Pyramid
c. Divergence
d. Zonation

12.The breakdown of detritus into smaller particles by earthworms is a process called

a. Catabolism
b. Mineralization
c. Fragmentation
d. Humification

Directions (Q.Nos.13-16): Eachof the following questions consists of two statements, one is Assertion(A) and the other is Reason (R).Give answer:

(a) Both assertion and reason are true, and the reason is correct explanation of the assertion.

(b) Both assertion and reason are true, but reason is not correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

13. (A) Genetic codon is non overlapping.
(R) No single base take part in the formation of more than one codon.

OR

(A) The operon is a unit of gene expression.
(R) Lac operon in E.coli is an inducible control.

14. (A) HIV is a retrovirus.
(R) It can synthesize DNA from RNA

15. (A) Typhoid fever is a viral disease.
(R) It is caused by rhinovirus.

16. (A) A habitat is the actual location in the environment where an organism lives.
® A species cannot survive without its natural habitat.

SECTION B

17. Enter correct devices P,Q,R and S to complete the table given below:

Method of Birth Control	Device
a) Barrier	P
b) IUD	Q
c) Surgical technique	R
d) Hormonal administration	S

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

19. What do you understand by amniocentesis? Why is there a statutory ban on this? Give reason.

20. Draw the figure of pBR322 and label the following:
i.Origin of replication
ii.Ampicillin resistance site.
iii.Tetracycline resistance site
iv.BamHI restriction site

21. Describe the role of $CaCl_2$ in the preparation of competent cell.

SECTION C

22. i) Explain “Birth rate” in a population by taking a suitable example.
ii) Write the two other characteristics which only a population shows but an individual cannot.

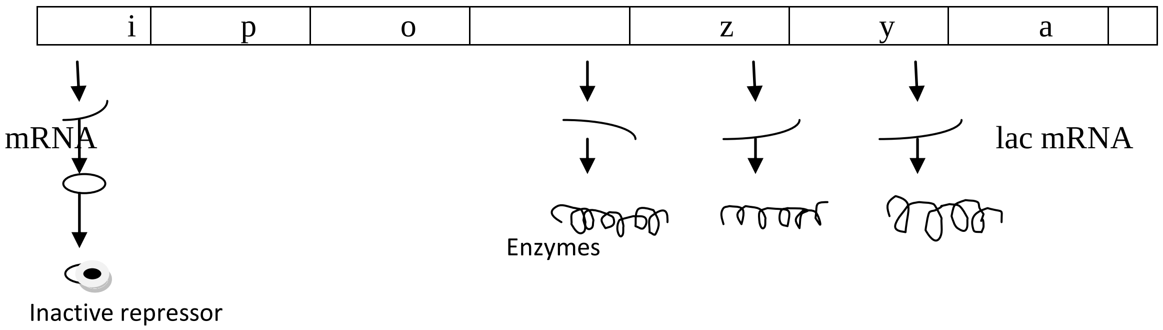
23. Write in brief about Ramsar convention.

24. Differentiate between spermatogenesis and spermiogenesis.

25. Name the two end products of double fertilization in angiosperms. How are they formed?

26. Explain Verhulst-Pearl logistic growth of population.

28.Study the figure given below and answer the questions:



i. How does the repressor molecule get inactivated?
ii. When does the transcription of lac mRNA stop?
iii. Name the enzyme transcribed by the gene 'z'.

SECTION D

29.CASE STUDY I

Answer any 4 of the following questions based on Meselson and Stahl's experiment:
i. Why did the scientists use $^{15}NH_4Cl$ and $^{14}NH_4Cl$ as a source of nitrogen in the culture medium for growing *E.coli* ?
ii. Name the molecules that ^{15}N got incorporated into.
iii. How did they distinguish between ^{15}N labelled molecules from ^{14}N ones?
iv. Write the observations made by them from the samples taken at the end of 20 minutes and 40 minutes respectively.
v. Write the conclusion drawn by them at the end of their experiment.

30.CASE STUDY II

Law of segregation is based on the fact that the alleles not show any blending and that both the characters are recovered as such in the F_2 generation though one of these is not seen at the F_1 stage. Though the parents contain two alleles during gamete formation, the factors or alleles of a pair segregate from each other such that a gamete receives only one of the two factors. Of course, a homozygous parent produces all gametes that are similar while a heterozygous one produces two kinds of gametes each having one allele with equal proportion.

i. Mendel's law of segregation is applicable to________.

ii. Heterozygous parent may have ____genotype:

a) RY b) Rr
c) both d) none

iii. The fact behind Law of segregation is:

a) alleles segregate from each other b) alleles do not show blending
c) all gametes are similar d)one character can recover in F_1 generation

iv. Pink colour of snapdragon flower in F_1 generation is example of :

a) Mendel's first law b) Mendel's second law
c)both laws d)none of the Mendel's law

SECTION E

31.Diagrammatically explain the steps of rDNA technology and PCR.

32. Describe process of translation and transcription in eukaryotic cell.

33.a.List any four goals of human genome project.
b.Write ways the knowledge of HGP is of significance for humans.
c.Expand BAC and mention its importance.

ASSIGNMENT - II

SECTION A

1. PCR and Restriction fragment length polymorphism are the methods for
a) Genetic fingerprinting
b) DNA sequencing
c) Genetic transformation
d) Study of enzymes

2. The plasmid
a) Is the genetic part in addition to DNA in microorganisms
b) Is a component of the cell wall of bacteria
c) Genes found inside the nucleus
d) Helps in respiration

3. Which one of the following techniques made it possible to genetically engineer living organisms?
a) Hybridization
b) Heavier isotope labelling
c) X-ray diffraction
d) Recombinant DNA techniques

4. The sequence that controls the copy number of the linked DNA in the vector, is termed
a) Selectable marker
b) Recognition site
c) Palindromic sequence
d) Ori site

5.Which of the following is not done in a wild life sanctuary?
(a) Fauna is conserved
(b) Flora is conserved
(c) Soil and flora is utilised
(d) Hunting is prohibited

6.In your opinion, which is the most effective way to conserve the plant diversity of an area?

(a) By creating Biosphere reserve
(b) By creating Botanical gardens
(c) By developing seed banks
(d) By tissue culture method

7. The mass of living material at a trophic level at a particular time is called
a) Standing rate
b) Gross primary productivity
c) Standing crop
d) Net primary productivity

8. Plant decomposers are
a) Animalia and Monera
b) Protista and Animalia
c) Fungi and Plants
d) Monera and Fungi

9.An organism that lives in or on another organism and derives nutrients for itself at the expense of the host organism is called _______
a)Scavenger
b)Prey
c)Predator
d)Parasite

10. This is chiefly produced by the activity of an anaerobic bacteria on sewage
a) Laughing gas
b) Propane
c) Mustard gas
d) Marsh gas

11. Both B & T lymphocytes are produced in the bone marrow; however, only the T lymphocytes travel to the ______ and mature there.
a)Spleen
b)Thymus
c)Pituitary gland
d)Adrenal gland

12. The _________ is at its largest in children, but with the onset of puberty, it eventually shrinks and gets replaced by fat.
a)Thymus
b)Hypothalamus
c)Parathyroid gland
d)None

Directions (Q.Nos.13-16): Each of the following questions consists of two statements, one is Assertion(A) and the other is Reason (R).Give answer:

(a) Both assertion and reason are true, and the reason is correct explanation of the assertion.
(b) Both assertion and reason are true, but reason is not correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

13. Assertion: Primary transcripts in eukaryotes are nonfunctional.
Reason: Methyl guanosine triphosphate is attached to 5’ – end of hnRNA.

14.Assertion: An organism with lethal mutation may not even develop beyond the zygote stage.
Reason: All types of gene mutations are lethal.

15.Assertion: E. coli having pBR322 with DNA insert at BamHI site cannot grow in medium containing tetracycline.
Reason: Recognition site for Bam HI is present in tet R region of pBR322.

16.Assertion: In Ophrys one petal of the flower bears an uncanny resemblance to the female bee.
Reason: Two closely related species competing for the same resource can coexist simultaneously.

SECTION B

17. Explain the role of enzymes in the extraction of DNA from Rhizopus in its purest form.

18. What are sticky ends? State their significance in recombination DNA technology.

19.Explain the procedure by which PCR aids in early detection of cancer.

20. Explain how advanced ex-situ conservation techniques assist in preserving threatened species of plants and animals.

21. Define interference competition. Give one example that supports competitive exclusion occurring in nature.

SECTION C

22. The Tropical regions are likely to have more biological diversity than the Temperate ones. Give two reasons to justify the statement.

23. A fully developed foetus initiates its delivery from the mother’s womb. Justifythe statement. Explain parturition.

24. How would you find out the genotype of a pea plant with violet flowers? Explain with the help of Punnets’ square showing crosses.

25. Define flocs and state their importance in biological treatment of waste water.

26. A farmer noticed that nematode infection in tobacco plants has resulted in the reduction in the yield. Suggest a strategy which provides cellular defense for providing resistance to this pest. Explain the technique.

27.Write a brief note on
i.plieotropy
ii.multiple allelism
iii.polygenic inheritance

28.Write short note on

i.Thallasemia
ii.colour blindness
iii.haemophilia

29. CASE STUDY I
Read the following and answer questions from 29(i) to 29(iv) given below:
Sickle cell anemia is a genetic disorder where the body produces an abnormal hemoglobin called hemoglobin S. Red blood cells are normally flexible and round, but when the hemoglobin is defective, blood cells take on a “sickle” or crescent shape. Sickle cell anemia is caused by mutations in a gene called HBB. It is an inherited blood disorder that occurs if both the maternal and paternal copies of the HBB gene are defective. In other words, if an individual receives just one copy of the defective HBB gene, either from mother or father, then the individual has no sickle cell anemia but has what is called “sickle cell trait”. People with sickle cell trait usually do not have any symptoms or problems but they can pass the mutated gene onto their children. There are three inheritance scenarios that can lead to a child having sickle cell anemia:
- Both parents have sickle cell trait
- One parent has sickle cell anemia and the other has sickle cell trait
- Both parents have sickle cell anemia

i. Sickle cell anemia is a/ an ________________________ disease.
a. X linked
b. autosomal dominant
c. autosomal recessive
d. Y linked
ii. If both parents have sickle cell trait, then there is ________________of the child having sickle cell anemia.
a. 25 % risk
b. 50 % risk
c. 75% risk
d. No risk
iii. If both parents have sickle cell trait, then there is ________________of the child having sickle cell trait.
a. 25 % risk
b. 50 % risk
c. 75% risk
d. No risk
iv. If one parent has sickle cell anemia and the other has sickle cell trait, there is___________that their children will have sickle cell anemia and ____________will have sickle cell trait.
a. 25 % risk, 75% risk
b. 50 % risk, 50% risk
c. 75% risk, 25% risk
d. No risk

30. CASE STUDY II
Read the following and answer any four questions from 30(i) to 30(v) given below:
Ecological Indicators
The presence of dragonflies can reveal changes in the water ecosystems more quickly than studying other animals or plants. In fact, from the nymph to the adult stage, the dragonfly has

a significant, positive ecological impact.Dragonfly eggs are laid and hatched in or near water, so their lives impactboth water and land ecosystems. Once hatched, dragonfly nymphs can breathe
underwater which enables them to eat mosquito larvae, other aquatic insects and worms, and even small aquatic vertebrates like tadpoles and small fish and in the air. Adult dragonflies capture and eat adult mosquitoes.Community wide mosquito control programs that spray insecticides to kill adult mosquitoes also kill dragonflies.

i. The approach to biological control includes:
a. Import and release of an insect pest to a new area to provide hosts for natural enemies
b. Import and release of natural enemies from the native home of an alien insect pest that has invaded a new area
c. Preservation of natural enemies (predators & parasitoids) that are already established in an area
d. Use of insecticides to reduce alien insect pests to establish new equilibrium position.
ii. Two diseases less likely to occur in a region with plenty of dragonflies are______
a. Yellow fever and amoebic dysentery
b. Malaria and Yellow fever
c. Anthrax and typhoid
d. Cholera and typhoid

iii. Dragonflies indicate positive ecological impact as-
a. The presence of dragonflies indicates polluted water.
b. Dragonfly nymphs selectively eat mosquito larvae.
c. They help to decrease the probability of diseases spread by vectors.
d. Dragonfly do not cause any harm to beneficial species.
iv. The most effective stages in the life cycle of dragonfly that eradicate mosquitoes are-
a. Larvae and Adult
b. Caterpillar and Adult
c. Nymph and Adult
d. Pupa and Adult
v. Assertion: Releasing dragonflies in areas where there is an outbreak of malarial diseases can be an environment friendly method of control.
Reason: Dragon flies are dominant species and will not allow mosquitoes to reproduce
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
.

SECTION E

31. Evaluate the suitability of DNA and RNA as genetic material and justify the suitability of the one that is preferred as an ideal genetic material.
OR
Explain the mechanism of DNA replication as suggested by Watson and Crick.

32. Identify and name the disease in which the patient's cells lose the property of contact inhibition. State its possible causes and explain any three methods to accurately detect the pathological and physiological changes that take place due to the disease in living tissues.
OR
A patient had tested positive to ELISA Test. Identify the disease and the pathogen responsible, give reasons for the reduced/ weak immunity of the patient and trace the path, spread and effects of this pathogen in the human body.

33.Describe in detail menstrual cycle with all hormones involved.

SUBJECT – ARTIFICIAL INTELLIGENCE

ASSIGNMENT – I

SECTION A – OBJECTIVE TYPE QUESTIONS (24 MARKS)

Q1. Answer any 4 out of 6 questions on Employability Skills (1 × 4 = 4 marks)

i. _______ is the ability to recognize one's own emotions, strengths, and weaknesses.

ii. Match the following:

Skills	Description
1. Problem Solving	a. Ability to express ideas clearly
2. Communication	b. Identifying solutions to challenges
3. Self-Motivation	c. Working without external push

Options:

a. 1 → b, 2 → a, 3 → c
b. 1 → a, 2 → c, 3 → b
c. 1 → c, 2 → b, 3 → a
d. 1 → b, 2 → c, 3 → a

iii. Ravi is delivering a presentation in class. His friend Meera keeps checking her phone, and doesn't make eye contact. Which "E" of the RESPECT model is she failing to follow?

a. Empathy
b. Eye Contact
c. Encourage
d. Engage

iv. _________ is the collection of numerous rows and columns.

a. Worksheet
b. Slide
c. Workbook
d. Sidebar

v. Entrepreneurship encourages creativity and risk-taking. (True/False)

vi.Assertion (A): Green skills help individuals contribute to resource conservation.
Reason (R): Green skills encourage adopting eco-friendly practices in workplaces.
Choose the correct option.

a) Both A and R are correct, and R is the correct explanation of A
b) Both A and R are correct, but R is not the correct explanation of A
c) A is correct, but R is incorrect
d) A is incorrect, but R is correct

Q2. Answer any 5 out of 6 (1 × 5 = 5 marks)

i._________ is the first and most essential step in the computer vision process.

ii. Which is initial key step to begin an AI project?
a. Evaluation
b. Testing
c. Deployment
d. Business Understanding

iii. What is a neural network with two or more hidden layers called?

a. Shallow Neural Network
b. Recurrent Neural Network
c. Deep Neural Network
d. Convolution Neural Network

iv.Match the Data Science Methodology step to the corresponding question.

Column A	**Column B**
1. Data Collection	a. "How do we prepare the data?"
2. Modelling	b. "What sources can provide required data?"
3. Data Understanding	c. "What patterns exist in the data?"
4. Deployment	d. "Where should the model be implemented?"

Options:

a. 1→b, 2→a, 3→c, 4→d
b. 1→c, 2→d, 3→a, 4→b
c. 1→b, 2→c, 3→a, 4→d
d. 1→d, 2→b, 3→c, 4→a

v.A system can automatically tag objects such as cars, trees, or buildings. This technology is also known as _________.

vi._________ is the element of the data story telling which involves stake holders, consumers and internal team. They may or may not be the part of presentation.
a. Characters
b. Setting
c. Conflicts
d. Resolutions

Q3. Answer any 5 out of 6 (1 × 5 = 5 marks)

i.Match the image processing technique:

Column A	**Column B**
1. Smoothing	a. Enhances edges
2. Thresholding	b. Converts pixels into segments
3. Colour Histogram	c. Measures pixel intensity distribution
4. Edge Detection	d. Removes noise

ii._______ is the process of selecting or engineering attributes that improve model performance.

iii.Which is NOT a source of Big Data?

a. Social Media
b. E-commerce transactions
c. Printed books
d. Sensors

iv.Identify the odd one out:
Sigmoid / ReLU / Tanh / Logistic Regression

v. _______ is the final step in AI model life cycle.

vi.The intersection of Narrative + Data + Visuals in a Venn diagram represents _________.

Q4. Answer any 5 out of 6 (1 × 5 = 5 marks)

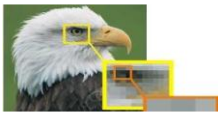
iv.Which component guides weight updates during training?
Activation function / Learning Rule / Epoch / Loss Function

ii.Assertion (A): Evaluation ensures a model is refined before final deployment.
Reason (R): This includes comparing predicted results with known outputs.

a) Both A and R are correct, and R is the correct explanation of A

b) Both A and R are correct, but R is not the correct explanation of A
c) A is correct, but R is incorrect
d) A is incorrect, but R is correct

iii.A digital image is interpreted as a grid of tiny squares called ________.



iv. This type of analytics helps businesses get a clear picture of past events before making decisions.

a. Diagnostic
b. Descriptive
c. Predictive
d. Prescriptive

v.Name the two neural networks used in GANs.

vi.Match the following:

Column A	**Column B**
1. CNN	a. Speech Translation
2. RNN	b. Image Classification
3. Transformer	c. Text Generation

Q5. Answer any 5 out of 6 (1 × 5 = 5 marks)

i.Assertion (A): Image resizing ensures uniformity in training datasets.
Reason (R): Models perform better when images have consistent shapes.

a) Both A and R are correct, and R is the correct explanation of A
b) Both A and R are correct, but R is not the correct explanation of A
c) A is correct, but R is incorrect
d) A is incorrect, but R is correct

ii.The task where models locate and identify multiple items inside an image is called:

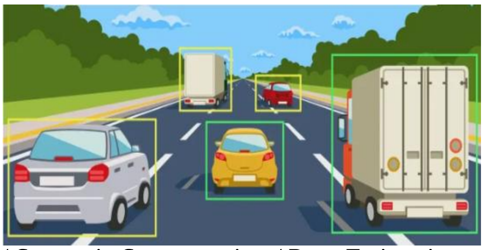


Image Classification / Object Detection / Semantic Segmentation / Pose Estimation

iii.Match the neural network to the use case:

Column A	**Column B**
1. Autoencoder	a. Forecasting
2. RNN	b. Dimensionality Reduction
3. CNN	c. Object Recognition

iv.A graph representing Open-High-Low-Close of stock prices is a ________ chart.
v.In VariationalAutoencoders, the compressed representation is called ________.
vi.The Feedback phase identifies improvements for future model runs. (True/False)

SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS)
(Q6 to Q10: Attempt any 3 (2 × 3 = 6 marks))

Q6. Define the following terms:
a. Spreadsheet   b. Workbook
Q7. Who is an entrepreneur? What are qualities of an entrepreneur?
Q8. What is meant by “Ecotourism”? Explain with an example.

Q9. What is self – motivation? Name the two types of motivation.
Q10. Explain any two personality disorders.

(Q11 to Q16: Attempt any 4 (2 × 4 = 8 marks))

Q11. List factors that make story telling powerful.
Q12. Differentiate between Batch Processing and Stream Processing.
Q13. Consider the following perceptron that predicts whether a person will maintain **good physical fitness** based on inputs, weights, and a bias of –1. Calculate the **Output/Predicted outcome (ŷ)** for the given scenario.

Factor	Input	Weight
Exercise Frequency	1	5
Junk Food Intake	0	4
Hydration Level	1	3

Q14. Briefly explain any two types of Neural Networks.
Q15. List any four applications of Computer Vision.
Q16. In the context of big data, explain 'Veracity'.

(Q17 to Q21: Attempt any 3 (4 × 3 = 12 marks))

Q17. With reference to Computer vision, Explain the following:
a) Classification + Localization b) Instance Segmentation
c) High level processing d) Pixels
Q18. a) Explain Large Language Model (LLM).
b) What are deep fakes? Why are they considered a threat?

Q19. a) Differentiate between Forward Propagation and Backward Propagation.
b) Explain the working of Neural Network.
Q20. a) Explain the possible sources of data collection.
b) Why is model validation important?
Q21. Describe and explain all the stages of Freytag's Pyramid. Also draw the labeled diagram.

ASSIGNMENT - II

SECTION - A

Q1. Answer the questions. (Employability Skills) (1×4=4)
i)R in respect stands for ____________.
a) React b) Repeat
c) Receive d) Remove
ii) In SMART goals, M refers to __________.
a) Measure b) Meaning
c) Measurable d) Material
iii)When we give 'D12' in a formula in Calc, we are referring to _____________.
a) cell reference b) cell name
c) cell range d) function
iv)A ___________ is a business that is in its early stages of development.

a) Business b) Company
c) Startup d) Infrastructure

Q2. Answer the questions. (1×5=5)

i)_________ refers to big and complex datasets that regular computer program cannot handle.
ii)_________ is an AI that creates contents like video, audio, text and more.
iii) Input, Hidden and __________ are the layers of neural network.
iv) A __________ is a picture that is stored on a computer in the form of a sequence of numbers that computers can understand.
v)The __________ process is usually iterative, leading to adjustments in the preparation of data.

Q3. Answer the questions.(1×5=5)

i) _________ learns patterns from data and autonomously generates similar samples.
ii)_________ involves analysing datasets to uncover insights, trends, and patterns.
iii)The data when pictorially represented is known as ___________.
iv) _________ encompasses all activities related to construct the dataset.
v)_________ are the brain of the Network.

Q4. Answer the questions.(1×5=5)

i) __________ ensures that the data is accurate, reliable, and truthful.
ii) ___________ is a neural network architecture that consists of two networks, a generator, and a discriminator.
iii)CSV file is an example of structured data. (True/False)
iv) __________ in computer vision aims to enhance the quality of acquired image.
v) A _________ data source refers to the original source of data.

Q5. Answer the questions.(1×5=5)

i) __________ is the most intense or important point within the story.
ii) ___________ involves identifying and extracting relevant visual patterns or attributes from the pre-processed image.
iii) The ________ questioning method employed to determine the data requirements.
iv) _________ are computer programs designed to learn from data uniquely.
v)ANN stands for ___________.

SECTION – B

Answer the following questions. (Employability Skills)(3×2=6)

Q6. What do you mean by Ecotourism?
Q7. What do you mean by 'goal-setting'?
Q8. What are the advantages of using presentation software?

Answer the following questions.(4×2=8)

Q9. What do you mean by computer vision?
Q10.Explain primary and secondary data sources.
Q11. Describe Generative Adversarial Network.
Q12. Write the steps to create story through data.

Answer the following questions.(3×4=12)

Q13. Explain generative AI and its any three applications.

Q14.a) A machine learning model was developed to predict whether a patient has a certain disease. The model's performance was evaluated using a test dataset, and the following confusion matrix was obtained:

	True	False
Actual True	120(TP)	30(FN)
Actual False	10(FP)	240(TN)

Based on this confusion matrix, calculate the following performance metrics:
i) Accuracy
ii) Precision
iii) Recall
iv) F1-Score
b) What do you mean by data understanding and data preparation?
Q15. a) Explain advantages and disadvantages of big data.
b) Explain the layers of neural network.

SUBJECT – MUSIC

ASSIGNMENT – I

सेक्शन-A

1. 'संगीत रत्नाकर' में अध्यायों की संख्या कितनी है?

A. 7

B. 5

C. 12

D. 8

2. राग बागेश्री में कोमल स्वर कौन से हैं?

A. 'म-सा'

B. 'प - सा'

C. 'रे-ध'

D. 'ग-नि'

3. फ़ैयाज़ खान का घराना कौन सा है?

A. ग्वालियर घराना

B. आगरा घराना

C.पटियाला घराना

D. दिल्ली घराना

4. सही कथन चुनें-

I. धमार ताल में 14 मात्राएँ होती हैं।

II. मध्यम ग्राम में पंचम स्वर 16वीं श्रुति पर पड़ता है

III. द्रुत ख्याल धीमी गति/लय में गाया जाता है

IV. शुद्ध 'रे-ध' स्वर वाले राग 4-7 बजे के बीच गाए जाते हैं।

सही विकल्प चुनें:

A. I और II

B. I और III

C. III और IV

D. I और IV

5. सही कथन चुनें -

I. राग भैरव में कोमल 'ग' और कोमल ' नि ' स्वरों का प्रयोग किया जाता है।

II. 'संगीत पारिजात' के अनुसार शुद्ध और विकृत स्वरों की कुल संख्या 29 है।

III. धमार ताल में खली 8वीं मात्रा में पड़ता है।

IV. संगीत रत्नाकर की रचना 17वीं शताब्दी में हुई थी।

सही विकल्प चुनें:

A. I और II

B. II और III

C. I और III

D. III और IV

6. सूची I को सूची II से सुमेलित करें

सूची I	सूची II
A. कण स्वर	I. कृष्ण राव शंकर पंडित
B. <u>रे</u>-<u>ध</u> कोमल	II. ग सा
C. मींड	III. राग भैरव
D. ग्वालियर घराना	IV. ग^{म}

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

A. a-iv, b-iii, c-ii, d-i

B. a-i, b-ii, c-iii, d-iv

C. a-iii, b-iv, c-i, d-ii

D. a-ii, b-i, c-iv, d-iii

7. कथन I: प्रकीर्णाध्याय संगीत रत्नाकर का तीसरा अध्याय है।

कथन II: षडज ग्राम और मध्यम ग्राम में प्रत्येक में 7 मूर्छनाएँ होती हैं।

सही विकल्प चुनें:

A. कथन I और II दोनों सत्य हैं।

B. कथन I और II दोनों असत्य हैं।

C. कथन I सत्य है लेकिन II असत्य है।

D. कथन I असत्य है लेकिन II सत्य है।

8. कथन I: तानपूरा के दूसरे और तीसरे तार को 'जोड़ी के तार' के नाम से जाना जाता है।

कथन II: राग मालकौंस सुबह के समय गाया जाता है।

सही विकल्प चुनें:

A. कथन I और II दोनों सत्य हैं।

B. कथन I और II दोनों असत्य हैं।

C. कथन I सत्य है लेकिन II असत्य है।

D. कथन I असत्य है लेकिन II सत्य है

सेक्शन-B

9. A. धमार ताल का वर्णन करें और ताल संकेतन में इसका ठाह और चौगुन लिखें।

(या)

B. तानपूरा की ट्यूनिंग की तकनीकों का वर्णन करें।

10. A. निम्नलिखित में से किन्हीं दो का उदाहरण सहित वर्णन करें: अलंकार, मींड, कण

(या)

B. राग भैरव का विस्तृत विवरण दें।

11. A. फैयाज खान के जीवन परिचय और संगीत में उनके योगदान का संक्षिप्त वर्णन करें।

(या)

B. 'रागों के समय सिद्धांत' पर संक्षेप में चर्चा करें।

12. A. निम्नलिखित में से किन्हीं दो का वर्णन करें: ग्राम, मूर्छना, गमक

(या)

B. भारतीय शास्त्रीय संगीत में 'संगीत रत्नाकर' के महत्व पर चर्चा करें।

13. A. निम्नलिखित स्वरों के वाक्यांश से राग को पहचानें और इसे 50 स्वरों तक विस्तार से बताएं-
ग म ध नि, ध म, ग म ग सा

(या)

B. संगीत पारिजात में दी गई संगीत सामग्री पर संक्षेप में चर्चा करें।

सेक्शन-C

14. A. निर्धारित रागों में से किसी एक में धमार की नोटेशन लिखें।

(या)

B. राग भैरव या बागेश्री में दो तानों के साथ द्रुत ख्याल की नोटेशन लिखें।

15. A. "शब्द 'अलंकार' का शाब्दिक अर्थ 'आभूषण' है। भारतीय शास्त्रीय संगीत में 'अलंकार' का तात्पर्य उन संगीत अलंकरणों से है जिनका उपयोग राग की सुंदरता बढ़ाने के लिए किया जाता है। यह स्वरों का एक समूह है जो एक विशिष्ट पैटर्न का पालन करता है। इसे 'पलटा' भी कहा जाता है। यह शुरुआती लोगों को स्वरों के विभिन्न पैटर्न बनाने के कौशल को बढ़ाने में मदद करता है।"
उपरोक्त अनुच्छेद को पढ़ने के बाद, निर्धारित रागों में से प्रत्येक में दो अलंकार बनाएं।

(या)

B. मुखर संगीत (ख्याल/ध्रुपद कलाकार) के किसी भी समकालीन कलाकार की शैली का विश्लेषण करें।

ASSIGNMENT – II

सेक्शन-A

1. संगीत रत्नाकर में वर्णित गमक की संख्या-

1. 12 2. 15 3. 18 4. 21

2. संगीत पारिजात के लेखक हैं-

1. फ़ैयाज़ खान 2. शारंग देव 3. अहोबल 4.भारत

3. राग मालकौंस गाते समय तानपुर का पहला तार बजाया जाता है -

1. मध्यम 2. पंचम 3. षडज 4.निषद

4. सही कथन चुनें-
A. धमार ताल विलम्बित ख्याल के साथ बजाया जाता है
B. झपताल में 10 मात्राएँ और 4 विभाग होते हैं
C. रूपक की ताल पर खली हैं
D. छोटा ख्याल गाया जाता है विलाम्बित लय 1
सही विकल्प चुनें:

1. A और C 2. A और D 3. A और B 4. B एवं C

5. सही कथन चुनें
A. फ़ैयाज़ खान अतरौली घराने से थे
C. संगीत रथकार के सात अध्याय हैं
D. बागेश्री में कोमल ग, ध, नि स्वरों का प्रयोग किया जाता है
E. गा, नी कोमल वाले रागों का गायन समय 10- 4 के बीच दो बार आता है
सही विकल्प चुनें-

1. A और B 2. B एवं C 3. A और C 4. B एवं D

6. कथन I: पं. अहोबल ने पहली बार स्वरों के लिए "कोमल" शब्द का प्रयोग किया।
कथन II: जब षडज ग्राम के पंचम को एक श्रुति कम किया जाता है तो वह मध्यम ग्राम बन जाता है।
सही विकल्प चुनें:

1. कथन I और II दोनों सत्य हैं।
2. कथन I और II दोनों असत्य हैं।
3. कथन I सत्य है लेकिन II असत्य है।
4. कथन I असत्य है लेकिन II सत्य है।

7. सूची I को सूची II से सुमेलित करें

सूची I	सूची II
A. संधि प्रकाश राग	I. विलम्बित लय
B. बड़ा ख्याल	II. ग मे
C. खटाका	III. कोमल रे, कोमल ध
D. मींड	IV. (प)

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

1. A-I, B-II, C-III, D-IV
2. A-III, B-I, C-IV, D-II
3. A-II, B-III, C-I, D-IV
4. A-IV, B-III, C-I, D-II

8. कथन I: कृष्ण राव शंकर पंडित ग्वालियर घराने से संबंधित थे।
कथन II: राग भैरव रात में गाया जाता है।

सही विकल्प चुनें:

1. कथन I और II दोनों सत्य हैं।
2. कथन I और II दोनों असत्य हैं।
3. कथन I सत्य है लेकिन II असत्य है।
4. कथन I असत्य है लेकिन II सत्य है।

सेक्शन-B

9. तानपूरा की ट्यूनिंग की तकनीक का वर्णन करें।

(अथवा)

झपताल का वर्णन करें और ताल संकेतन में तिगुन के साथ इसका थाह लिखें।

10. निम्नलिखित में से किन्हीं दो का उदाहरण सहित वर्णन करें: कण, आलाप, अलंकार

(अथवा)

राग मालकौंस का विस्तृत विवरण दें।

11. रागों के समय सिद्धांत पर संक्षेप में चर्चा करें।

(अथवा)

बड़े गुलाम अली खान के जीवन परिचय और संगीत में उनके योगदान का संक्षेप में वर्णन करें।

12. निम्नलिखित में से किन्हीं दो का वर्णन करें: मूर्छना, ग्राम, गमक

(अथवा)

भारतीय शास्त्रीय संगीत में संगीत रत्नाकर के महत्व पर चर्चा करें।

13. स्वरों के निम्नलिखित वाक्यांश से राग को पहचानें और इसे 60 स्वरों तक विस्तृत करें- मा पा धा मा गा मा गा रे सा

(अथवा)

संगीत पारिजात में दी गई संगीत सामग्री पर संक्षेप में चर्चा करें।

सेक्शन-C

14. निर्धारित रागों में से किसी एक में तराना का नोटेशन लिखिए।

(या)

एक 16 मात्रा के ताना और दो 32 मात्रा के ताना के साथ द्रुत ख्याल का नोटेशन लिखिए।

15. ताना राग के गायन प्रदर्शन में इस्तेमाल की जाने वाली एक तकनीक है। 'ताना' शब्द संस्कृत शब्द 'तन' से लिया गया है जिसका अर्थ है राग के स्वरों को फैलाना। ताना कई प्रकार के होते हैं जैसे सपाट, कूट, वक्र, बोल ताना आदि। कभी-कभी, राग की प्रकृति के अनुसार उस विशेष राग में ताना के कुछ प्रकार लागू किए जाते हैं, इसलिए, ताना के प्रकारों को प्रस्तुत करते समय, राग के चरित्र को उसके चित्रण में भी बनाए रखना आवश्यक है।

ऊपर दिए गए पैसेज को पढ़ने के बाद, निर्धारित रागों में से प्रत्येक में ताना के विभिन्न प्रकारों में दो ताना बनाएं।

(या)

आप तराना या ख्याल के किस आज के कलाकार से सबसे ज़्यादा प्रभावित हैं? उनकी शैली का आलोचनात्मक विश्लेषण करें।


HAPPY
HOLIDAYS!