

Half Yearly Examination 2025 – 2026**Time - 3:00 Hrs.****M.M. 80****General Instructions:**

Read the following instructions very carefully and strictly follow them:

1. This question paper has 13 questions are compulsory.
2. This question paper contains three sections:
Section A : Reading Skills Section B : Creative Writing Skills SectionC : Literature.
3. Attempt all questions based on specific instructions for each part. Write the correct question number and part thereof in your answer sheet.
4. Separate instructions are given with each question/ part , wherever necessary.
5. Adhere to the prescribed word limit while answering the questions.

SECTION – A READING SKILLS (22 MARKS)

Q.1 Read the following passage carefully :

12

1. The name of Florence Nightingale lives in the memory of the world by virtue of the lurid and heroic adventure of the Crimea. Had she died — as she nearly did — upon her return to England, her reputation would hardly have been different; her legend would have come down to us almost as we know it today — that gentle vision of female virtue which first took shape before the adoring eyes of the sick soldiers at Scutari. Yet, as a matter of fact, she lived for more than half a century after the Crimean War; and during the greater part of that long period all the energy and all the devotion of her extraordinary nature were working at their highest pitch. What she accomplished in those years of unknown labour could, indeed, hardly have been more glorious than her Crimean triumphs; but it was certainly more important. The true history was far stranger even than the myth. In Miss Nightingale's own eyes the adventure of the Crimea was a mere incident—scarcely more than a useful stepping-stone in her career. It was the fulcrum with which she hoped to move the world; but it was only the fulcrum. For more than a generation, she was to sit in secret, working her lever: and her real life began at the very moment when, in the popular imagination, it had ended.
2. She arrived in England in a shattered state of health. The hardships and the ceaseless efforts of the last two years had undermined her nervous system; her heart was pronounced to be affected; she suffered constantly from fainting-fits and terrible attacks of utter physical prostration. The doctors declared that one thing alone would save her—a complete and prolonged rest. But that was also the one thing with which she would have nothing to do. She had never been in the habit of resting; why should she begin now? Now, when her opportunity had come at last; now, when the iron was hot, and it was time to strike? No; she had work to do; and, come what might, she would do it. The doctors protested in vain; in vain her family lamented and entreated, in vain her friends pointed out to her the madness of such a course. Madness? Mad — possessed perhaps she was. A demoniac frenzy had seized upon her, As she lay upon her sofa, gasping, she devoured dictated letters, and, in the intervals of her palpitations, cracked her febrile jokes. For months at a stretch she never left her bed. For years she was in daily expectation of death. But, she would not rest. At this rate, the doctors assured her, even if she did not die, she would become an invalid for life, She could not help that; there was the work to be done; and, as for rest, very likely she might rest . . . when she had done it.

3. Wherever she went, in London or in the country, the in the hills of Derbyshire, among the rhododendrons at Embley, she was haunted by a ghost. It was the spectre of Scutari – the hideous vision of the organization of a military hospital. She would lay that phantom, or she would perish. The whole system of the Army Medical Department, the education of the Medical Officer, the regulations of hospital procedure rest? How could she rest while these things were as they were, while, if the like necessity were to arise again, the like results would follow? And, even in peace and at home, what was the sanitary condition of the Army? The mortality in the barracks was, she found, nearly double the mortality in civil life. "You might as well take 1,100 men year out upon Salisbury Plain and shoot them," she said. After inspecting the hospitals at Chatham, she smiled grimly. "Yes, this is one more symptom of the system which, in the Crimea, put to death 16,000 men." Scutari had given her knowledge; and it had given her power too: her enormous reputation was at her back—an incalculable force. Other work, other duties, might lie before her; but the most urgent, the most obvious of all was to look to the health of the Army.
4. One of her very first steps was to take advantage of the invitation which Queen Victoria had sent her to the Crimea, together with the commemorative brooch. Within a few weeks of her return, she visited Balmoral, and had several interviews both with the Queen and the Prince Consort. "She put before us," wrote the Prince in his diary, "all the defects of our present military hospital system and the reforms that are needed." She related the whole story of her experiences in the East; and, in addition, she managed to have some long and confidential talks with His Royal Highness on metaphysics and religion. The impression which she created was excellent. "We like her very much," noted the Prince, "She is very modest." Her Majesty's comment was different—"Such a head! I wish we had her at the War Office."
5. But Miss Nightingale was not at the War Office, and for a very simple reason: she was a woman. Lord Panmure, however, was (though indeed the reason for that was not quite so simple); and it was upon Lord Panmure that the issue of Miss Nightingale's efforts for reform must primarily depend. That burly Scottish nobleman had not, in spite of his most earnest endeavours, had a very easy time of it as Secretary of State for War. He had come into office in the middle of the Sebastopol campaign, and had felt himself very well fitted for the position, since he had acquired in former days an inside knowledge of the Army—as a Captain of Hussars.

Answer the following questions, based on the given passage.

1. The word 'lurid' in the first paragraph most likely means ----- **1**
 (a) righteous (b) ineluctable (c) effervescent (d) . grisly
2. According to the first paragraph, when compared with Florence Nightingale's work in the Crimea, the work done during the last fifty years of her life was all of the following EXCEPT----- **1**
 (a) more significant (b) less onerous (c) less sensational (d) more obscure
3. According to paragraph 1, how did Florence Nightingale see her adventure of the Crimea? **2**
4. Based on your reading of the second paragraph, how would you describe Florence Nightingale's condition after returning to England? **1**
 (a) Psychologically shattered (b) Physically fragile but mentally indefatigable
 (c) Obstinate and petulant (d) Resolute yet cumbersome
5. All of the following statements about Florence Nightingale are true EXCEPT _____. **1**
 (a) she was regarded as the epitome of moral rectitude
 (b) she was promoted to a position at the War Office by Queen Victoria
 (c) she did not return from her Crimean adventure unscathed
 (d) she considered her Crimean adventure to be enormously important

6. Read and complete the sentence suitably : 1
The phrase "shattered state of health- refers to the miserable health of Florence Nightingale. Choose the correction response from the options to complete the sentence.
The statement was a result of ----- .
(a) Nightingale's continuous effort of the past two years.
(b) environmental changes affecting the health of the people due to the crimean war.
7. The string of questions in the second and third paragraphs are ----- . 1
(a) a rhetorical device used to transcribe miss Nightingale's thought process
(b) Miss Nightingale's replies to a corporeal questioner
(c) Miss Nightingale wrestling with her own conscience
(d) an oratorical device used to convey the author's own feelings through the figure of Miss Nightingale.
8. Complete the analogy with ONE word from paragraph-2. 1
hardship : impediment : : exhaustion :
(a) prolonged (b) prostration (c) remuneration (d) recompense
9. Provide evidence from the text in about 40 words to support the view that Nightingale's statement in the paragraph 3 is designed to highlight the enervating conditions of ordinary soldiers. 2
10. Which of the following statements is true? 1
(a) Miss Nightingale would be a far more marginal historical figure if she had died upon her return from the Crimean war.
(b) Miss Nightingale sought to exercise the apparition of the fatalities she witnessed in Scutari.
(c) Lord Panmure expected to have an arduous time transitioning into his position as Secretary of State for war.
(d) Lord Panmure was the contact point for Miss Nightingale's campaign for wholesale reform of the army.

- Q.2 Read the following passage given below : 10
1. In a rapidly changing world. transition from school to work has become more complex and challenging for young people, as finding employment is difficult for the youth. If academic studies may be an excellent path as successful career and lives, other types of education like 'Vocational education and training (VET) programmes are more than ever being emphasized by governments globally to support work-ready professionals with relevant on-the-job experience to match the needs of various industries.
2. According to the National Skill Development Corporation (NSDC), India aims to skill 400 Million people by 2025. Vocational training programmes, such as Industrial Training Institutes (ITIs) provide training in fields such as engineering, health care, hospitality, construction and more. According to NSDC estimates, to witness significant job creation. With the help of this training, opportunities for self-employment have been enhanced. As of July 2021, over 1.5 million candidates have been placed in various jobs after acquiring vocational training.
3. Vocational training programmes also encourage entrepreneurship by providing aspiring entrepreneurs with the knowledge and skills required to establish and operate their own businesses. The NSDC states that out of the 12 million people entering the workforce in India every year, only 4.5 million are skilled, highlighting the need for further vocational training initiatives. Vocational training plays a significant role in India by addressing the skill gap, improving employability, fostering entrepreneurship, and driving economic growth. This contributes to the nation's overall development and individual prosperity.

Answer the following questions, based on the above passage :

1. What are the problems faced by young people when they shift from the school to work? 1
(a) Finding employment (b) Transition (c) Loneliness (d) Social Anxiety
2. Why are governments promoting Vocational Education and training programme? 1
3. Infer why the National Skill Development Corporation of India has increased its efforts to skill 400 million people in 2025. Answer in about 40 words. 2
4. Share evidence from the text, in about 40 words, to support the view that vocational training improves self-employment. 2
5. Identify the entrepreneur from the three people who has acquired vocational training. 1
(a) Ravi: I am working as a carpenter and getting very high wages.
(b) Narian: I have acquired the skill of cooking and will work for an established hotel.
(c) Bani : After doing a course in fashion designing, I have opened my own boutique.
6. How does vocational training help in bridging the skill gap? 1
7. Complete the sentence appropriately. 1
The NSDC states that less than half the people entering the workforce in India are skilled so ---
----- .
8. State TRUE or FALSE : 1
The title 'Improve Your Skills, Gain Better Jobs' is appropriate for this passage.

SECTION – B CREATIVE WRITING SKILLS (18 MARKS)

- Q.3 Attempt **ANY ONE** of the two, (A) or (B), in about 50 words : **1x4=4**
- A.** Your school is organizing a talent search in music and dance. As Co-ordinator of cultural activities, draft a notice inviting the names of those who are interested in the competition. Also give other necessary details, to be placed on your school notice board. Sign as Uday/Vijaya of G.P Senior Secondary School, Agra.
- OR**
- B.** You are Babul/Bubbli of S.R.M. Vidyalaya, Agra. As Co-ordinator of Red Cross Society wing of your school, you propose to organise a one-day blood donation camp at your school. Draft a notice to be placed on your school notice board appealing to the students to motivate their parents and neighbours to participate in this noble cause.
- Q.4 Attempt **ANY ONE** of two, (A) or (B), in about 50 words : **1x4=4**
- A.** As the Principal of a reputed college, you have been invited to inaugurate a Book Exhibition in your neighbourhood. Draft a reply to the invitation in not more than 50 words, expressing your inability to attend the function You are Tarun/Tanvi.
- OR**
- B.** You are Manoj /Mini. You have been invited to attend a birthday party of your closest friend. Respond to this invitation.
- Q.5. Attempt **ANY ONE** of two, (A) or (B), in about 120-150 words. **1x5=5**
- A.** Read the advertisement given below and write a letter applying for the job. Also give your detailed resume to be sent along With the letter. You are Praveen Kumar of 95, HAL Colony, Bangalore.
- Applications are invited for the post of Junior Engineer. The candidate must have at least a diploma in Civil Engineering from a recognized institute. He should have at least 3 years experience of field work salary commensurate with qualification and experience. Apply to the Manager, Parsya Constructions Ltd. 24, Sector 10, Mysore, within 10 days, with detailed resume.

OR

- B.** You are Anu/ Arun, 13, W. E. A. Karol Bagh, New Delhi. You feel very strongly about the ill-treatment meted out to stray dogs at the hands of callous and indifferent people, Write a letter to the Editor of a national daily giving your views on why some people behave in such a manner and how these dogs should be treated.

Q.6 Attempt **ANY ONE** of two, (A) or (B), in about 120-150 words :

1x5=5

- A.** Teenage is commonly perceived as the most joyful period of an individual's life. Vidya who represents the teenagers of today feels that the pressure of the competitive world they live in has made teen years less exciting and expresses her ideas in an article entitled, 'On Being a Teenager' for the 'Youth Times'.

OR

- B.** Alpha School recently organised a course in First Aid for students of senior classes. As Vivek of Class XII write a report on the programme giving necessary details for the school magazine. Write the report in 100-125 words.

SECTION – C LITERATURE (40 MARKS)

Q.7 Read the given extracts and answer the questions or **ANY ONE** of the given two, (A) or (B). **1x6=6**

Put that thought away and looked out at Young
Trees sprinting, the merry children spilling out of their homes.....

(i) Why did the poet look out of the moving car?

- (a) To enjoy the scenery (b) To put the distressing thoughts away
(c) To film the scenery. (d) To see whether it's raining or not

(ii) What did the poet see when she looked out of her car?

(iii) How do you know that the joyful scene didn't help her drive away the painful thoughts from her mind?

- (a) Again, at the airport, she was haunted by the same fear of losing her mother.
(b) She started praying.
(c) She started eating to forget her pain.
(d) She fell asleep immediately.

(iv) What are the merry children symbolic of?

- (a) Ageing (b) Exuberance of youth (c) Memories (d) Education

(v) Which literary device is used in the given line?

"looked out at young trees sprinting,"

(vi) State whether the given statement is **TRUE** or **FALSE** with reference to the extract.

The poet chose to look at the young children merrily enjoying life so that she won't have to say goodbye to her mother.

OR

- B.** 'Gainst the hot season; the mid forest brake,
Rich with a sprinkling of fair musk-rose blooms;
And such too is the grandeur of the dooms
We have imagined for the mighty dead;
All lovely tales that we have heard or read;
An endless fountain of immortal drink,
Pouring unto us from the heaven's brink...

(i) Based on the extract, complete the following analogy:

have heard : alliteration : : _____ : oxymoron

- (ii) Which of these best indicates the phrase 'mid forest brake'?
(a) mass of shrubs (b) hidden pond (c) Canopy of trees (d) sparkling stream
- (iii) According to the extract, which of these bring joy to human life?
(a) shady trees (b) delightful drinks (c) fragrant flowers
(d) changing seasons (e) enchanting stories
A. (a) and (c) B. (c) and (e) C. (a), (d) and (e) D. (b), (c) and (d)
- (iv) Complete the given sentence appropriately,
When the poet mentions 'an endless fountain of immortal drink', he refers to_____.
- (v) Based on the extract, choose the correct option with reference to the two statements given below.
(1) Beautiful things are blessings from the divine.
(2) Beauty is an outcome of imagination
(a) Only (1) can be inferred from the extract.
(b) Only (2) can be inferred from the extract.
(c) Both (1) and (2) can be inferred from the extract.
(d) Neither (1) nor (2) can be inferred from the extract.
- (vi) Which of these best describes the tone of the poet in the given extract?
(a) Nostalgic (b) Generous (c) Passionate (d) Contemplative

Q.8 Read the given extracts and answer the questions for **ANY ONE** of the given two (A) or (B). **4x1=4**

A. The dewan himself drove the car straight to the forest where the Maharaja was hunting. When they reached the forest, the tiger launched its satyagraha and refused to get out of the car. The dewan was thoroughly exhausted in his efforts to haul the beast out of the car and push it down to the ground. On the following day, the same old tiger wandered into the Maharaja's presence and stood as if in humble supplication, "Master, what do you command of me?" It was with boundless joy that the Maharaja took careful aim at the beast. The tiger fell in a crumpled heap.

- (i) According to the extract, how is the author's portrayal of the tiger different from real life?
- (ii) Which of these best describes the Maharaja and the Dewan, based on the extract?
(a) Dewan: gullible; Maharaja: narcissistic
(b) Dewan: conscientious; Maharaja: cruel
(c) Dewan: submissive; Maharaja: perceptive
(d) Dewan: unremarkable; Maharaja: unrealistic
- (iii) Which of these can be best used as a title for this extract?
(a) The Big cat (b) The Shrewd King
(c) The Tiger's Legacy (d) The Perils of Kingship
- (iv) In one sentence, explain what the author means when he says that 'the tiger launched its satyagraha'.

OR

B. "For a sun-worshipping South Indian like myself, two weeks in a place where 90 percent of the Earth's total ice volumes are stored is a chilling prospect." (not just for circulatory and metabolic functions, but also for the imagination). It's like walking into a giant ping-pong ball.

- (i) Who is the speaker of the given extract?
- (ii) Why did she say it?

- (iii) What did she mean by 'chilling prospect'?
 - (a) She meant she was happy.
 - (b) She meant she was thrilled.
 - (c) She meant the uncertainty and fear of being surrounded by ice.
 - (d) She meant a very interesting experience.
- (iv) How did she describe the place?
 - (a) It is a place untouched by humans and their inventions.
 - (b) It is a place filled with parks and malls.
 - (c) It is a place that is so joyous.
 - (d) It is a place filled with factories.

Q.9 Read the given extracts and answer the questions for **any one** of the given two, (A) or (B). **1x6=6**

- A.** No one can imagine how sad and monotonous life can appear to such a vagabond, who plods along the road, left to his own meditations. But one day this man had fallen into a line of thought, which really seemed to him entertaining. He had naturally been thinking of his rattraps when suddenly he was struck by the idea that the whole world about him — the whole world with its lands and seas, its cities and villages — was nothing but a big rattrap. It had never existed for any other purpose than to set baits for people.
- (i) According to the extract, which of these words best describes the man?
 - (a) reflective (b) impulsive (c) indifferent (d) simpleminded
 - (ii) Rewrite the given sentence after replacing the underlined phrase with its synonym. It had never existed for any other purpose than to set baits for people.
 - (iii) On the basis of the extract, choose the correct option with reference to the two statements given below.
 - (1) The world offers living beings a life full of pleasure.
 - (2) However, only compassionate people can enjoy those pleasures.
 - (a) (2) has been caused by (1).
 - (b) (2) is a hypothesis based on (1).
 - (c) (1) cannot be inferred from the extract but (2) can be.
 - (d) (1) can be inferred from the extract but (2) cannot be.
 - (iv) In one sentence, rationalise the given statement. It is challenging for others to be able to understand the despair of a vagabond's life.
 - (v) Replace the underlined word with its antonym from the extract. The man who thought that the world was a rattrap lived a life that was interesting.
 - (vi) The mood of the extract can be best described as _____.
 - (a) cautious (b) malicious (c) melancholic (d) apprehensive

OR

- B.** Unaware of what his name represents, he roams the streets with his friends, an army of barefoot boys who appear like the morning birds and

disappear at noon. Over the months, I have come to recognize each of them.

Why aren't you wearing chappals?" I ask one.

My mother did not bring them down from the shelf," he answers simply.

"Even if she did, he will throw them off ',' adds another who is wearing shoes that do not match.

When I comment on it, he shuffles his feet and says nothing. "I want shoes," says a third boy who has never owned a pair all his life. Travelling across the country I have seen children walking barefoot, in cities, on village roads. It is not lack of money but a tradition to stay barefoot, is one explanation.

- (i) What is the writer's purpose in allowing the boys to speak for themselves via dialogue, as opposed to only a writer's commentary ?

- (ii) The line, "It is not lack of money but a tradition to stay barefoot" can be best classified as:
 (a) fact (b) An opinion (c) A theme (d) A plot point
- (iii) Explain any one possible inference that can be drawn from the line, "an army of barefoot boys who appear like the morning birds and disappear at noon".
- (iv) Identify the line from the text that bears evidence to the fact that the writer's association with the boys is not a recent one.
- (v) Based on the context provided in the extract, select the most likely comment that the writer would have made, based on the boys reaction to the mismatched shoes.
 (a) "Why are your shoes mismatched? That's not a good look."
 (b) "Don't worry about your shoes, you can wear a matching pair later."
 (c) "I like your shoes. What matters is that they protect your feet ?"
 (d) "Have you chosen to mismatch your shoes?"
- (vi) Complete the sentence with ONE word.
 The phrase "he answers simply," suggests that the boy's response to the writer's question about why he wasn't wearing chappals was _____.

Q.10 Answers **Any Five** of the following six questions in 40-50 words each : **2x5=10**

- (i) How did Douglas struggle when he was thrown into the pool by the bully?
 (ii) Who did M.Hamel blame for the neglect of learning on the part of boys like Franz?
 (iii) What does Asokamitrans's narrative demonstrate about Subbu in Poets and Pancakes?
 (iv) What is the 'sadness' that the poet refer in the poem 'keeping quiet'?
 (v) What image does Keats use to describe the beautiful bounty of the earth?
 (vi) Why did the servants think Gandhiji to be another peasant?

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

- (i) How did 'The World' help Charley to confirm his doubts regarding the existence of a third level?
 (ii) How did the Dewan manage to arrange the hundredth tiger for the Maharaja?
 (iii) What does the play 'on the face of it' suggest about the importance of empathy in overcoming prejudice and stereotypes?

Q.12 Answer **any one** of the following two in about 120-150 words- **1x5=5**

- (i) Write an essay on what could be a possible scenario where the bangle maker and the owner of the roadside stand encounter each other.
 (ii) Give an account of Gandhiji's efforts to secure justice for the poor Indigo share croppers of Champaran.

Q.13 Answer **any one** of the following two questions in about 120-150 words. **1x5=5**

In the story, 'The third level' by Jack Finney, Charley is obsessed with finding the third level. In an attempt to thrash out whether this obsession is a good quality or a harmful one, Charley's wife express her thoughts in a diary entry.

As, Louisa, Charley's wife, write this diary entry. Support your response with reference to the story. You may begin this way:

You have been married to Charley for a few years now and I have always known him to be an intelligent man with an imaginative mind. However, his recent obsession with finding the Third level has.....

OR

'Antarctica, because of her simple ecosystem and lack of biodiversity, is the perfect place to study how little changes in the environment can have big repercussions.' Explain how the study of Antarctica helps in understanding the history of our planet.

Roll No. _____

NLCS/12/Physics/26

Half Yearly Examination 2025 – 2026

Time - 3:00 Hrs.

M.M. 70

General Instructions:

1. There are 33 questions in all. All questions are compulsory.
2. This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
3. All the sections are compulsory.
4. Section A contains sixteen questions, twelve MCQ and four Assertion Reasoning based of 1 mark each, Section B contains five questions of two marks each, Section C contains seven questions of three marks each, Section D contains two case study based questions of four marks each and Section E contains three long answer questions of five marks each.
5. There is no overall choice. However, an internal choice has been provided in one question in Section B, one question in Section C, one question in each CBQ in Section D and all three questions in Section E. You have to attempt only one of the choices in such questions.
6. Use of calculators is not allowed.
7. You may use the following values of physical constants where ever necessary

$$C = 3 \times 10^8 \text{ m/s}$$

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

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

$$\mu_0 = 4 \times 10^{-7} \text{ TmA}^{-1}$$

$$h = 6.63 \times 10^{-34} \text{ Js}$$

$$\text{Avogadro's number} = 6.023 \times 10^{23} \text{ per gram mole}$$

Section – A

- Q.1 The electric field intensity due to an infinite cylinder of radius R and having charge q per unit length at a distance r ($r > R$) from its axis is:
- (a) Directly proportional to r^2 (b) Directly proportional to r^3
(c) Inversely proportional to r (d) inversely proportional to r^2
- Q.2 The electric potential inside a conducting sphere:
- (a) Increases from centre to surface (b) Decreases from centre to surface
(c) Remains constant from centre to surface (d) is zero at every point inside
- Q.3 The internal resistance of an ideal cell is:
- (a) Zero (b) Infinite (c) Very high (d) Very low but not zero
- Q.4 A proton and an alpha particle enter a uniform magnetic field with the same velocity perpendicular to the field. The ratio of their radii of circular paths is:
- (a) 1 : 1 (b) 1 : 2 (c) 2 : 1 (d) 1 : 4
- Q.5 An electron with angular momentum L moving around the nucleus has a magnetic moment given by
- (a) $e^2/2m$ (b) e/m^2 (c) $e/4m$ (d) $e/2m$
- Q.6 An emf of 0.08 V is induced in a metal rod of length 10 cm held normal to a uniform magnetic field of 0.4 T, when moves with a velocity of :
- (a) 2m/s (b) 3.2m/s (c) 0.5m/s (d) 20m/s
- Q.7 What is the ratio of inductive and capacitive reactance in an a.c. circuit?
- (a) $\omega^2 LC$ (b) LC^2 (c) LC/ω^2 (d) $\omega^2 L$
- Q.8 The power delivered by the source of circuit is maximum when :
- (a) $\omega L = \omega C$ (b) $\omega L = 1/\omega C$ (c) $\omega L = 0$ (d) $\omega C = 0$

- Q.9 The emf induced in a coil rotating in a magnetic field does not depend upon the following:
 (a) Area of the coil (b) Resistance of the coil
 (c) Number of turns in the coil (d) Angular speed of rotation of the coil
- Q.10 The SI unit of pole strength is
 (a) A /m (b) Am (c) v/m (d) Am²
- Q.11 Current sensitivity of a moving coil galvanometer is 1.5 divisions/ mA and its voltage sensitivity are 20 division/ Volt. The resistance of the galvanometer is
 (a) 40 ohm (b) 500 ohm (c) 250 ohm (d) 25 ohm
- Q.12 On the basis of conductivity which one of the following material has the smallest resistivity?
 (a) Germanium (b) Silver (c) Glass (d) Silicon

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

(a) If both Assertion and Reason are true and Reason is 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.

- Q.13 **Assertion :** Electric potential of earth is taken zero.
Reason : No electric field exists on earth surface.
- Q.14 **Assertion :** Net electric field inside a conductor is zero.
Reason : Total positive charge equals to total negative charge in a charged conductor
- Q.15 **Assertion :** Transformers are used only in alternating current source not in direct current.
Reason : Only a.c. can be stepped up or down by means of transformers.
- Q.16 **Assertion :** Faraday's laws are consequence of the conservation of energy.
Reason : In a purely resistive ac. Circuit, the current is in same of emf phase.

Section – B

- Q.17 Plot a graph showing the variation of coulomb force (F) versus ($1/r^2$), where r is the distance between the two charges of each pair of charges: (1nC, 2nC) and (2nC, - 3nC) Interpret the graphs obtained.
- Q.18 Two wires A and B of the same metal and of the same length have their areas of cross-section in the ratio of 2:1.If the same potential difference is applied across each wire in turn, what will be the ratio of the currents flowing in A and B?
- Q.19 A 3.0 cm wire carrying a current of 10 A is placed inside a solenoid perpendicular to its axis. The magnetic field inside the solenoid is given to be 0.27 T. What is the magnetic force on the wire?
- Q.20 What happens if a bar magnet is cut into two pieces (i) transverse to its length (ii) along its length.
- Q.21 A bar magnet falls from height 'h' through a metal ring. Will its acceleration be equal to 'g'? Give reason for your answer.

OR

“Repulsion is the surest test of magnetization”justify the statement?

Section – C

- Q.22 Apply Gauss's theorem to calculate the electric field intensity due to an infinite plane sheet of charge.
- Q.23 Deduce the expression for the capacitance of parallel plate capacitor when a dielectric slab of thickness t is inserted between its plates. Assume the slab thickness less than the plate separation ($t \ll d$).

24. Two cells of different emfs E_1 and E_2 and internal resistances r_1 and r_2 are connected in parallel with one another. Find the expressions for the equivalent emf and equivalent internal resistance of the combination.
25. A straight thick long wire of uniform cross-section of radius 'a' is carrying a steady current I. Use Ampere's circuital law to obtain a relation showing the variation of the magnetic field (B) inside and outside the wire with distance r, ($r < a$) and ($r > a$) of the field point from the centre of its cross-section. Plot a graph showing the variation of field B with distance r.
- Q.26 The susceptibility of magnetic material is 0.9853. Identify the type of magnetic material. Draw the magnification with the field pattern on keeping the piece of this material in a uniform magnetic field.
- Q.27 Derive an expression for the mutual inductance of two long coaxial solenoids. State the factor on which mutual inductance depends.

OR

Derive an expression for the self-inductance of a long solenoid. State the factors on which the self-inductance of a coil depends

- Q.28 A series LCR-circuit with $R = 20\Omega$, $L = 15H$ and $C = 35\mu F$ is connected to a variable-frequency 200 V a.c. supply. When the frequency of the supply equals the natural frequency of the circuit, what is the average power transferred to the circuit in one complete cycle?

Section – D

- Q.29 **Case Study (Q. 29 and Q. 30)**

Read the following paragraph and answer the questions that follow:

When the terminals of a cell are connected to a conductor of resistance R, an electric current flows through the circuit. The electrolyte of the cell also offers some resistance in the path of the current, like the conductor. This resistance offered by the electrolyte is called internal resistance of the cell (r). It depends upon the nature of the electrolyte, the area of the electrodes immersed in the electrolyte and the temperature. Due to internal resistance, a part of the energy supplied by the cell is wasted in the form of heat.

When no current is drawn from the cell, the potential difference between the two electrodes is known as emf of the cell (E). With a current is drawn from the cell, the potential difference between the two electrodes is termed as terminal potential difference (V).

QUESTIONS (Answer any four of the following questions)

- (i) Two wires of the same material have lengths L and 2L and areas of cross-section 4 A and A respectively. The ratio of their specific resistances would be
 (a) 1 : 2 (b) 8 : 1 (c) 1 : 8 (d) 1 : 1
- (ii) A certain wire A has resistance 81 Ω . The resistance of another wire B of same material and Equal length but of diameter thrice the diameter of A will be :
 (a) 81 Ω (b) 92 Ω (c) 729 Ω (d) 243 Ω
- (iii) Two cells of emfs 2.0 V and 6.0 V and internal resistances 0.1 Ω and 0.4 Ω respectively, are Connected in parallel. The equivalent emf of the combination will be

- (a) 2.0 V (b) 2.8 V (c) 6.0 V (d) 8.0 V
- (iv) Five identical cells, each of emf 2 V and internal resistance 0.1 ohm are connected in parallel. This combination in turn is connected to an external resistor of 9.98 Ω , the current flowing through the resistor is
- (a) 0.05 A (b) 0.1 A (c) 0.15 A (d) 0.2 A
- (v) Potential difference across a cell in the open circuit is 6 V. It becomes 4 V when a current of 2 A is drawn from it. The internal resistance of the cell is
- (a) 1.0 Ω (b) 1.5 Ω (c) 2.0 Ω (d) 2.5 Ω

Q.30 Before nineteenth century, scientists believed that magnetic properties were confined to a few materials like iron, cobalt and nickel. But in 1846, Curie and Faraday discovered that all the materials in the universe are magnetic to some extent. These magnetic substances are categorized into two groups. Weak magnetic materials are called diamagnetic and paramagnetic materials. Strong magnetic materials are called ferromagnetic materials. According to the modern theory of magnetism, the magnetic response of any material is due to circulating electrons in the atoms. Each such electron has a magnetic moment in a direction perpendicular to the plane of circulation. In magnetic materials all these magnetic moments due to the orbital and spin motion of all the electrons in any atom, vectorially add upto a resultant magnetic moment. The magnitude and direction of these resultant magnetic moment is responsible for the behaviour of the materials. For diamagnetic materials χ is small and negative and for paramagnetic materials χ is small and positive. Ferromagnetic materials have large χ and are characterised by non-linear relation between B and H.

QUESTIONS (Answer any four of the following questions)

- (i) The universal (or inherent) property among all substances is
- (a) Diamagnetism (b) par magnetism (c) Ferromagnetism (d) both (a) & (b)
- (ii) When a bar is placed near a strong magnetic field and it is repelled, then the material of bar is -
- (a) Diamagnetic (b) ferromagnetic (c) Paramagnetic (d) anti-ferromagnetic.
- (iii) Magnetic susceptibility of a diamagnetic substance :
- (a) decreases with temperature (b) is not affected by temperature
- (c) Increases with temperature (d) first increases then decreases with temperature,
- (iv) For a paramagnetic material, the dependence of the magnetic susceptibility χ on the Absolute Temperature is given as
- (a) χ proportional to T (b) χ proportional to $1/T^2$ (c) χ proportional to $1/T$ (d) independent.
- (v) The value of the magnetic susceptibility for a superconductor is
- (a) Zero (b) infinity (c) +1 (d) -1

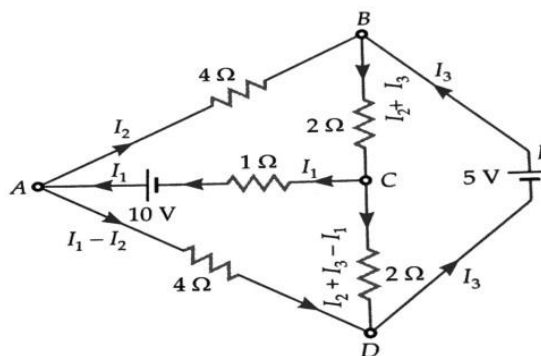
Section – E

- Q.31 (a) Derive an expression for the electric potential at any general point at angle θ at a distance r from the centre of a dipole.
- (b) Electric field intensity at point due to a point charge “Q” kept at point ‘A’ is 24 N/C and electric potential at point ‘B’ due to same charge is 12 J/C. Calculate the distance AB and also the magnitude of charge

OR

(a) State Kirchhoff's first law and second law.

(b) Determine the current in given circuit



- Q.32 Apply Biot-Savart law to find the magnetic field due to a circular current-carrying loop at a point on the axis of the loop. State the rules used to find the direction of this magnetic field

OR

Derive an expression for the force per unit length between two infinitely long straight parallel current carrying wires. Hence define one ampere.

- Q.33 An alternating emf is applied to a series LCR circuit using phasor diagram, to drive an expression for the impedance of LCR circuit?

OR

What is a transformer? Explain the principle, construction, working and theory of a transformer. How is current affected in a transformer? What are the various energy losses in a transformer? How can they be reduced? Define the type of transformer?

Half Yearly Examination 2025 – 2026**Time - 3:00 Hrs.****M.M. 70****General Instructions:** Read the following instructions carefully and follow them:

- (i) This question paper contains 33 questions. All questions are compulsory.
- (ii) This question paper is divided into five sections Section A, B, C, D and E.
- (iii) Section A questions number 1 to 16 are multiple choice type questions. Each question carries 1 mark
- (iv) Section B questions number 17 to 21 are very short answer type questions. Each question carries 2 marks
- (v) Section C questions number 22 to 28 are short answer type questions. Each question carries 3 marks
- (vi) Section D questions number 29 and 30 are case-based questions. Each question carries 4 marks
- (vii) Section E questions number 31 to 33 are long answer type questions. Each question carries 5 marks
- (viii) There is no overall choice given in the question paper. However, an internal choice has been provided in few questions in all the sections except Section A.
- (ix) Kindly note that there is a separate question paper for Visually Impaired candidates.
- (x) Use of calculators is not allowed.

SECTION – A

Questions no. 1 to 16 are Multiple Choice Type Questions :

Q.1 Which of the following is diamagnetic ion?

- (a) Co^{+2} (b) Ni^{+2} (c) Cu^{+2} (d) Zn^{+2}

Q.2 Correct name of $\text{K}_4[\text{Fe}(\text{CN})_6]$ is :

- (a) potassium ferricyanide (b) potassium ferrocyanide
(c) Potassium hexacynoferrate(II) (d) potassium hexacyanoferrate(III)

Q.3 Which complex has maximum paramagnetic moment value amongst the following:

- (a) $[\text{Cr}(\text{H}_2\text{O})_6]^{+3}$ (b) $[\text{Fe}(\text{H}_2\text{O})_6]\text{Cl}_2$ (c) $[\text{Fe}(\text{CN})_6]^{-4}$ (d) $[\text{Ni}(\text{CO})_4]$

Q.4 Which of the following Compounds is used as a refrigerant?

- (a) Acetone (b) CCl_4 (c) CF_4 (d) CCl_4F_2

Q.5 C-X bond is strongest in

- (a) CH_3Cl (b) CH_3Br (c) CH_3F (d) CH_3I

Q.6 The compound which reacts fastest with lucas reagent at room temperature is :

- (a) butanol-1-ol (b) butanol-2-ol (c) 2-methylpropan-1-ol (D) 2-methylpropan-2-ol

Q.7 Phenol can be converted into salicyclic acid by:

- (a) Etard reaction (b) Kolbe reaction (c) Reimer-tiemann reaction (d) Cannizzaro's reaction

Q.8 The catalyst used in Rosenmund's reduction is :

- (a) HgSO_4 (b) Pd/BaSO_4 (c) anhydrous AlCl_3 (d) anhydrous ZnCl_2

- Q.9 Among the following the strongest acid is :
 (a) CH_3COOH (b) $\text{CH}_2\text{ClCH}_2\text{COOH}$ (c) CH_2ClCOOH (d) $\text{CH}_3\text{CH}_2\text{COOH}$
- Q.10 Gabriel's phthalimide synthesis used for the preparation of :
 (a) Primary aromatics amines (b) secondary amines
 (c) primary aliphatic amines (d) tertiary amines
- Q.11 $\text{CH}_3\text{CH}_2\text{CONH}_2$ on reduction with lithium aluminium hydride gives:
 (a) 4° ammonium salt (b) 1° amine (c) 2° amine (d) 3° amine
- Q.12 The pyrimidine bases present in DNA are :
 (a) cytosine and thymine (b) cytosine and uracil
 (c) cytosine and adenine (d) cytosine and guanine

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

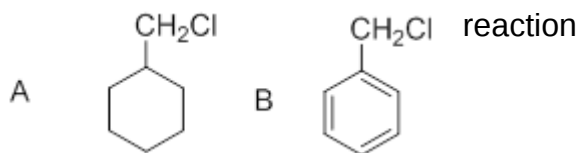
- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
 (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
 (c) Assertion (A) is true, but Reason (R) is false.
 (d) Assertion (A) is false, but Reason (R) is true.
- Q.13 Assertion : ethyl phenyl ether on reaction with HBr form phenol and ethyl bromide.
 Reason : cleavage of C-O bond takes place on ethyl-oxygen bond due to the more stable phenyl- oxygen bond.
- Q.14 Assertion : amines are basic in nature.
 Reason : presence of lone pair of electrons on nitrogen atom.
- Q.15 Assertion : maltose is a reducing sugar which gives two moles of D-glucose on hydrolysis.
 Reason : maltose has 1,4- β -glycosidic linkage.
- Q.16 Assertion : vitamin D cannot be stored in our body.
 Reason : vitamin D is fat soluble vitamin and excreted from the body in urine.

SECTION – B

- Q.17 Write the structure of 2, 4-dinitrochlorobenzene.

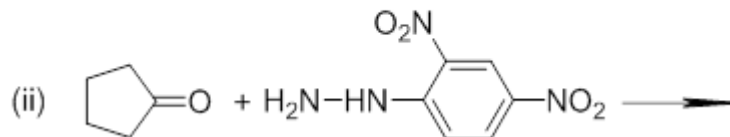
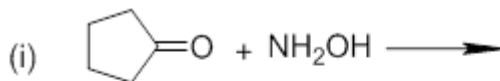
OR

Which of following compounds would undergo SN^1 faster and why?

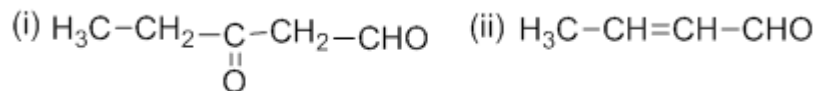


Q.18 You are given benzene, conc. H_2SO_4 and NaOH . Write the equations for the preparation of phenol using these reagents.

Q.19 Predict the products of the following reactions-



Q.20 Give the IUPAC names of the following compounds



Q.21 What is Heinsberg reagents?

SECTION – C

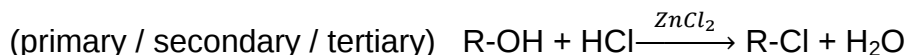
Q.22 Give important differences between Lanthanoids and actinoids.

Q.23 (i) IUPAC names of the following - (a) $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ (b) $\text{K}_3[\text{Fe}(\text{C}_2\text{O}_4)_3]$

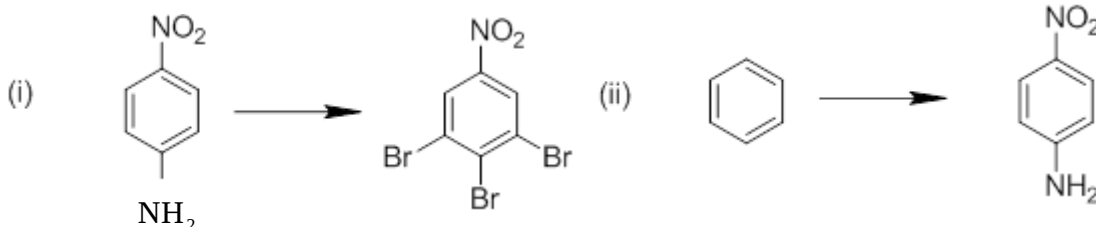
(ii) Names of following coordination entities and draw the structures of their stereoisomers: (a) $[\text{Cr}(\text{C}_2\text{O}_4)]^{3-}$ (b) $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$

Q.24 (i) How is phenol converted to benzene?

(ii) What is the correct order of reactivity of alcohol in the following reaction?



Q.25 A. How will you bring out the following conversion?

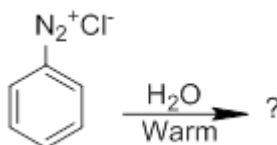


OR

B. (i) short notes on Gabriel – phthalimide reaction.

(ii) comment on “isocynide test”.

(iii) complete the following reaction.



Q.26 (i) Give an example of coupling reaction.

(ii) Write short notes on “carbylamine reaction”.

Q.27 What happens when D-glucose is treated with the following reagents?

(i) HI

(ii) Br_2 water

(iii) HNO_3

OR

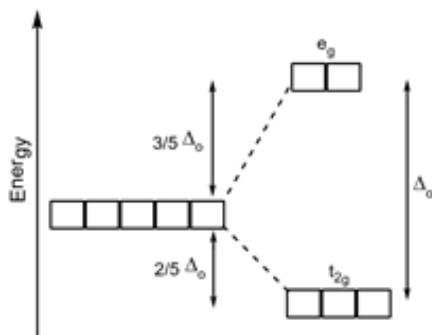
Draw the structure of - (i) Maltose (ii) Lactose

Q.28 (i) What do you mean by invert sugar?

(ii) What are essential and non-essential amino acids? Give two examples of each type.

SECTION – D

Q.29 Observe the diagram of splitting of d-orbitals in octahedral field and answer the questions based on the diagrams and related studied concepts.



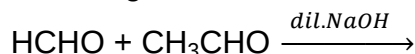
- (a) What is crystal field splitting energy?
(b) Why dx^2-y^2 , dz^2 have higher energy than dxy , dyz , dxz orbitals in octahedral crystal field?
(c) What is relationship between CFSE Δ_o and strength of ligand?
(d) What is electronic configuration of d^5 ion if $\Delta_o < p$?

OR

(d) What is spectrochemical series?

Q.30 Aldehyde and ketone containing at least one α -hydrogen on treatment with a dilute alkali (NaOH , $\text{Ba}(\text{OH})_2$, K_2CO_3 etc.) undergo self-condensation to form β -hydroxy aldehyde or β -hydroxy ketone are also called aldols. Therefore, this reaction is referred to as aldol condensation. Aldehyde and ketones which do not have α -hydrogen atom they do not undergo aldol condensation. They undergo cross aldol condensation.

- (i) Which type carbonyl compound undergo aldol condensation?
(ii) Complete the following reaction.



- (iii) Name the compound formed when two molecules of acetaldehydes undergo in self condensation.

OR

- (iii) Write IUPAC name of :

SECTION – E

Q.31 Account for the following :

- (i) E° value for $\text{Mn}^{+3}/\text{Mn}^{+2}$ couple is much more positive than that for $\text{Cr}^{+3}/\text{Cr}^{+2}$
(ii) Sc^{+3} is colourless whereas Ti^{+3} is coloured in an aqueous solution.
(iii) Actinides show wide range of oxidation states.

OR

Explain giving reasons :

- (i) Transition metals and many of their compounds show paramagnetic behaviour
(ii) The enthalpies of atomisation of the transition metals are high.
(iii) The transition metals and their many compounds act as good catalyst.

Q.32 What are haloalkanes and haloarenes? gives their classification.

OR

Write the following :

- (i) hunsdiecker reaction
- (ii) Sandmeyer reaction
- (iii) preparation of iodobenzene
- (iv) balz-schiemann reaction
- (v) Gattermann reaction

- Q.33
- (i) Draw the structure of amylose and amylopectin
 - (ii) Why are vitamin A and Vitamin C essential to us? Give their important sources.

OR

- (i) What happens when D-glucose is treated with the following reagents? 3+2
 - (a) NH_2OH
 - (b) HNO_3
- (ii) Draw the structural of α -D-glucose & β -D-glucose (cyclic).

Roll No. _____

NLCS/12/Mathematics Core/14

Half Yearly Examination 2025 – 2026

Time - 3:00 Hrs.

M.M. 80

General Instructions:

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

Section – A

- Q.1 The principal value of $\sec^{-1} \left(\frac{-2}{\sqrt{3}} \right)$ is : 1
- (a) $\frac{5\pi}{6}$ (b) $\frac{7\pi}{6}$ (c) $\frac{\pi}{6}$ (d) None of these
- Q.2 If $A = \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$, and $A + A' = I$, if the value of α is : 1
- (a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$ (c) $\frac{3\pi}{2}$ (d) None of these
- Q.3 If A is a square matrix such that $A^2 = A$, then $7A - (I + A)^3$ is equal to : 1
- (a) $-I$ (b) $I - A$ (c) $I + A$ (d) 0
- Q.4 If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then $A^8 =$ 1
- (a) $\begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$
- Q.5 If $A = \begin{bmatrix} 1 & \lambda & 2 \\ 1 & 2 & 5 \\ 2 & 1 & 1 \end{bmatrix}$ is not invertible then $\lambda \neq ?$ 1
- (a) 1 (b) 2 (c) 0 (d) -1
- Q.6 If A is a 2×2 matrix such that $|A| = 4$, then $|3A|$ equals. 1
- (a) 36 (b) 72 (c) 216 (d) None of these
- Q.7 $f(x) = \begin{cases} \frac{\sqrt{1+px} - \sqrt{1-px}}{x} & -1 \leq x < 0 \\ \frac{2x+1}{x-2} & , 0 \leq x \leq 1 \end{cases}$ is continuous in the interval $[-1, 1]$, then p is equal to : 1
- (a) 1 (b) $\frac{1}{2}$ (c) $-\frac{1}{2}$ (d) -1

Q.8 If $y = \cot^{-1} \left(\frac{1-\sin x}{\cos x} \right)$ then $\frac{dy}{dx} = ?$

- (a) 1 (b) $\frac{1}{2}$ (c) -1 (d) None of these

Q.9 $\int \frac{dx}{\sin^2 x \cos^2 x}$ is equal to :

1

- (a) $\tan x + \cot x + c$ (b) $\tan x - \cot x + c$ (c) $\tan x \cot x + c$ (d) $\tan x - \cot 2x + c$

Q.10 The solution of the differential equation $\frac{dy}{dx} = \frac{x+1}{2-y}$ is :

1

- (a) $x^2 + y^2 + 2x - 4y + c = 0$ (b) $x^2 + y^2 + 2x + 4y + c = 0$ (c) $x^2 + y^2 - 2x - 4y + c = 0$ (d) $x^2 + y^2 + 6x - 4y + c = 0$

Q.11 If $\vec{a}, \vec{b}$ and $\vec{c}$ are mutually perpendicular unit vector then $|\vec{a} + \vec{b} + \vec{c}| = ?$

1

- (a) 1 (b) $\sqrt{2}$ (c) $\sqrt{3}$ (d) 2

Q.12 If $\vec{a}$ is a non zero vector of magnitude 'a' and λ a non zero scalar, then $\lambda \vec{a}$ is a unit vector if :

1

- (a) $a = |\lambda|$ (b) $a = \frac{1}{|\lambda|}$ (c) $\lambda = 1$ (d) None of these

Q.13 Find the sum of the vectors

$$\vec{a} = \hat{i} - 2\hat{j} + \hat{k}, \vec{b} = -2\hat{i} + 4\hat{j} + 5\hat{k} \text{ and } \vec{c} = \hat{i} - 6\hat{j} - 7\hat{k} :$$

1

- (a) $-\hat{i} + 4\hat{j} - \hat{k}$ (b) $-4\hat{j} - \hat{k}$ (c) $-\hat{i} - 4\hat{j} - \hat{k}$ (d) $\hat{i} - 4\hat{j} - \hat{k}$

Q.14 The angle between the vectors $\vec{a} = \hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{b} = 3\hat{i} - 2\hat{j} + \hat{k}$ is :

1

- (a) $\cos^{-1} \frac{3}{5}$ (b) $\cos^{-1} \frac{3}{\sqrt{14}}$ (c) $\cos^{-1} \frac{5}{7}$ (d) None of these

Q.15 A line makes equal angles with co - ordinate axis. Direction cosines of this line are :

1

- (a) $\pm \left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}} \right)$ (b) $\pm \left(\frac{1}{3}, \frac{1}{3}, \frac{1}{3} \right)$ (c) $\pm (1, 1, 1)$ (d) $\pm \left(\frac{1}{\sqrt{3}}, \frac{-1}{\sqrt{3}}, \frac{-1}{\sqrt{3}} \right)$

Q.16 Maximize $Z = 3x + 4y$, subject to the constraints : $x + y \leq 1, x \geq 0, y \geq 0$.

1

- (a) 4 (b) 5 (c) 6 (d) 3

Q.17 The corner points of the feasible region determined by the system of linear inequalities are (0, 0), (4, 0), (2, 4), and (0, 5). If the maximum value of $z = ax + by$, where $a, b > 0$ occurs at both (2, 4) and (4, 0), then:

1

- (a) $3a = b$ (b) $2a = b$ (c) $a = 2b$ (d) None of these

Q.18 Magnitude of unit vector is :

1

- (a) 1 (b) 2 (c) 0 (d) None of these

Q.19 **Assertion (A)** : The matrix $A = \begin{bmatrix} 3 & -1 & 0 \\ 3 & 3\sqrt{2} & 1 \\ 4 & 3 & -1 \end{bmatrix}$ is rectangular matrix of order 3.

Reason (R): If $A = [a_{ij}]_{m \times 1}$, then A is column matrix.

1

- (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.

Q.20 **Assertion (A) :** $\int \left(\frac{1}{1+x^2} \right) dx = \tan^{-1} (x^2) + c$

Reason (R) : $\int \frac{1}{1+x^2} dx = \tan^{-1} x + c$

1

(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

Q.21 Evaluate: $-\tan^{-1} \left(-\frac{1}{\sqrt{3}} \right) + \cot^{-1} \left(\frac{1}{\sqrt{3}} \right) + \tan^{-1} \left(\sin \left(-\frac{\pi}{2} \right) \right)$.

2

OR

Find the value of $\tan^{-1} \left(\tan \frac{2\pi}{3} \right)$.

Q.22 Differentiate $\tan x^3$ w.r.t $\sin x$.

2

Q.23 Check the continuity of the function, $f(x) = |x + 4| - 1$ at $x = 4$.

2

Q.24 Differentiate the following function f given by $f(x) = 3x^3y - 2x^2y - \cos xy + 6$ w.r.t. x .

2

OR

Differentiate the following function f given by $f(x) = 5xy - \frac{1}{4}x^4 + \cot x$, w.r. to x .

Q.25 Evaluate: $\int \frac{dx}{1 - \tan x}$.

2

Section – C

Q.26 If $x = \left(\frac{1-t^2}{1+t^2} \right)$ and $y = \frac{2t}{1+t^2}$, find $\frac{dy}{dx}$ at $t=2$.

3

Q.27 Evaluate: $\int \left[(\log x) + \frac{1}{(\log x)^2} \right] dx$.

3

OR

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

Q.28 Evaluate: $\int_0^{\pi/2} \log \sin x dx$.

3

OR

Evaluate: $\int_{-3}^3 |x+2| dx$

Q.29 Verify that the function $xy = \log y + C$ (explicit or implicit) is a solution of differential equation $y' = \frac{y^2}{1-xy}$ ($xy \neq 1$).

3

OR

Find the general solution of the differential equation $(x^3 + x^2 + x + 1) \frac{dy}{dx} = 2x^2 + x$.

Q.30 Maximise and Minimise $Z = 3x - 4y$. subject to $x - 2y \leq 0$, $-3x + y \leq 4$, $x - y \leq 6$, $x, y \geq 0$.

3

Q.31 Evaluate $\int \frac{1}{\cos(x+a)\cos(x+b)} dx$.

3

Section – D

Q.32 $\int (\sqrt{\tan x} + \sqrt{\cot x}) dx$.

5

Q.33 Evaluate: $\int \frac{(x+2)}{2x^2 + 6x + 5} dx$.

OR

Evaluate $\int \frac{\sin 2x \cos 2x}{\sqrt{9 - \cos^2 2x}} dx$.

5

Q.34 If $A = \begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{bmatrix}$, find A^{-1} . Using A^{-1} solve the system of equations

$$2x - 3y + 5z = 11; 3x + 2y - 4z = -5; x + y - 2z = -3.$$

5

Q.35 Sketch the graph of $y = |x + 4|$ and evaluate $\int_{-6}^0 |x + 4| dx$.

5

OR

Using integration find the area of the region bounded by the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$.

Section – E

(case study 1+1+2 =4)

Q.36 Since, area is a positive quantity, so we always take the absolute value of the determinant A. Also, the area of the triangle formed by three collinear points is zero.

Area of a triangle whose vertices are (x_1, y_1) , (x_2, y_2) and (x_3, y_3) is given by the determinant.

$$\Delta = \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}.$$

(a) Find the area of the triangle whose vertices are $(-2, 6)$, $(3, -6)$, and $(1, 5)$.

(b) If the points $(2, -3)$, $(k, -1)$ and $(0, 4)$ are collinear, then find the value of $4k$

(c) If the area of a triangle ABC, with vertices $A(1, 3)$, $B(0, 0)$ and $C(k, 0)$ is 3 sq. units, then find k

OR

Using determinants, find the equation of the line joining the points $A(5, 2)$ and $B(3, 4)$.

Q.37 If a real-valued function $f(x)$ is finitely derivable at any point of its domain, it is necessarily continuous at that point. But its converse need not be true. For example, every polynomial, constant function are both continuous as well as differentiable and inverse trigonometric functions are continuous and differentiable in its domains etc.

(1) If $f(x) = \begin{cases} x, & \text{for } x \leq 0 \\ 0, & \text{for } x > 0 \end{cases}$, then at $x = 0$.

(a) $f(x)$ is continuous but not differentiable

(b) $f(x)$ is neither continuous nor differentiable

(c) $f(x)$ is differentiable and continuous

(d) $f(x)$ is non continuous

(2) If $f(x) = |x - 1|$, $x \in \mathbb{R}$, then at $x = 1$

(a) $f(x)$ is continuous

(b) $f(x)$ is continuous and differentiable

(c) $f(x)$ is continuous but not differentiable

(d) $f(x)$ is not continuous

(3) $f(x) = x^3$ is

(a) neither continuous nor differentiable at $x = 3$

(b) continuous but not differentiable at $x = 3$

(c) continuous and differentiable at $x = 3$

(d) noncontinuous but differentiable at $x = 3$

OR

If $f(x) = [\sin x]$, then which of the following is true?

(a) $f(x)$ is continuous at $x = 0$ but not differentiable

(b) $f(x)$ is continuous and differentiable at $x = 0$

(c) $f(x)$ is discontinuous at $x = 0$

(d) $f(x)$ is differentiable but not continuous at $x = \frac{\pi}{2}$

Q.38 Let $x = f(t)$ and $y = g(t)$ be parametric forms with t as a parameter, then

$$\frac{dy}{dx} = \frac{dy}{dt} \times \frac{dt}{dx} = \frac{g'(t)}{f'(t)}, \text{ where } f'(t) \neq 0.$$

(1) The derivative of $f(\tan x)$ w.r.t. $g(\sec x)$ at $x = \frac{\pi}{4}$, where $f'(1) = 2$ and $g'(\sqrt{2}) = 4$, is :

- (a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) 0 (d) None of these

(2) The derivative of $\tan^{-1} \left(\frac{2x}{1-x^2} \right)$ with respect to $\cos^{-1} \left(\frac{1-x^2}{1+x^2} \right)$ is :

- (a) -1 (b) 2 (c) 4 (d) 1

(3) The derivative of e^{x^3} with respect to $\log x$ is :

- (a) $3x^3 e^{x^3}$ (b) $3x^2 e^{x^3} + 3x$ (c) $3x^2 2e^{x^3}$ (d) e^{x^3}

OR

The derivative of $\cos^{-1} (2x^2 - 1)$ w.r.t. $\cos^{-1} x$ is

- (a) 1 (b) 2 (c) 4 (d) None of these

Roll No. _____

NLCS/12/Biology/15

Half Yearly Examination 2025 – 2026

Time - 3:00 Hrs.

M.M. 70

General Instructions:

1. All questions are compulsory.
2. The question paper has four sections :Section – A, Section – B, Section – C and Section – D. There are 33 questions in question paper.
3. Section A has 16 questions of one mark each .
4. Section B has 5 questions of 2 marks each.
5. Section C has 7 questions of 3 marks each
6. Section D has two questions of 4 marks each.
7. Section E has 3 questions of 5 mark each
8. There is no overall choice, however internal choices have been provided in some questions. A student has to attempt only one of the alternative in such questions.
9. Wherever necessary neat and properly labelled diagram should be drawn.

SECTION – A

- Q.1 Example that shows the phenomena of Incomplete Dominance.
(a) *Mirabilis jalapa* (b) blood group (c) sickle cell anaemia (d) Down syndrome
- Q.2 HGP. Stands for:
(a) Human goal project (b) High Genotype project
(c) Human genome project (d) None of these
- Q.3 Surgical method of contraception in males;
(a) Vasectomy (b) Oral pills (c) Tubectomy (d) IVF
- Q.4 Seminal vesicle along with the sperms constitute the ----- .
(a) Spermatogonia (b) Primary spermatocytes
(c) semen (d) secondary spermatocytes
- Q.5 Theory of chemical evolution was given by :
(a) Oparin & Haldane (b) Miller (c) Darwin (d) Hugo de Vries
- Q.6 End products of experiment given by Miller are :
(a) Methane (b) RNA (c) amino acids & sugars (d) H₂ & O₂
- Q.7 Ovulation is induced by a hormone called ----- .
(a) luteinising hormone (b) relaxin (c) testosterone (d) oxytocin
- Q.8 Chromosomal theory of inheritance was proposed by :
(a) Sutton (b) Boveri (c) a & b both (d) Morgan
- Q.9 ZZ/ZW type of sex determination is seen in :
(a) Platypus (b) snails. (c) cockroach (d) peacock
- Q.10 More like man, walked more erect, teeth like modern man are the general features of :
(a) *Homo habilis* (b) *Homo erectus* (c) *Ramapithecus* (d) *Dryopithecus*
- Q.11 ELISA technique is based on the principle of :
(a) antigen - antibody interaction (b) DNA replication
(c) pathogen and antigen interaction (d) antigen and protein interaction.
- Q.12 Why does dough appear puffed up?
(a) acid released cause it to rise (b) there is partial degradation of the dough.
(c) Carbon dioxide is released in the process of fermentation (d) it gets filled with air
- 13 to 16 are : Assertion, Reason based questions and consist of two statements - **ASSERTION AND REASON**. Answer the following questions by selecting appropriate options 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 Assertion is false but Reason is true.

Q.13 **Assertion :** DNA fingerprinting is also known as genetic fingerprinting.

Reason : It was developed by James Watson, the first director of Human Genome Project.

Q.14 **Assertion :** Ovulation is the release of egg.

Reason : Evolution take place on 14 days after fertilization.

OR

Assertion : The genetic code is degenerate.

Reason : Most amino acid are coded by more than one codon.

Q.15. **Assertion :** The pollen mother cell undergoes meiosis from microspore and this process is called microsporogenesis.

Reason : Some cells of this sporogenous tissue are potential Pollen Mother Cell (PMC)

Q.16 **Assertion :** Introduction of sex education in school should be encouraged.

Reason : This will encourage children to believe in myths about sex related aspects.

SECTION – B

Q.17 Write the names of initiation and termination codons.

Q.18 What are transgenic bacteria Illustrate any one example.

OR

What is trisomy. Give one example.

Q.19 What is crossing over?

Q.20 Give the binomials of two types of yeast and the commercial bioactive products they help to produce.

Q.21 What is dominance and recessive character. Define both of them.

SECTION – C

Q.22 A man with AB blood group marries a woman with O blood group. Find out all the possible phenotype and genotype.

OR

When a cross is made between tall plant with a yellow seeds (TtYy) and tall plant with a green seed (TTyy) find out the proportion of phenotype in the offspring.

Q.23 Mention the experiment given by Griffith in search of genetic material.(With labelled diagram only)

Q.24 Write the functions of adenosine deaminase enzyme. State the cause and cure of ADA deficiency in humans.

OR

Diagrammatically represent the experimental steps in cloning and expressing a human gene into bacterium like E.coli.

Q.25 What are divergent and convergent evolution. Give one -one example of each.

Q.26 Draw the role of all enzymes during DNA replication.

Q.27 Differentiate the following terms: Autogamy, Geitonogamy & Xenogamy.

OR

Draw the well labelled diagram of Ovum surrounded by sperms.

Q.28 What are the measures one has to take to prevent from contracting STD s?

Section – D

Que.29 and 30 Case study based questions:

Q.29 Read the following Passage and answer the questions :

All flowering plants show sexual reproduction. In the flowering plant male, reproductive part is androecium while the female reproduction part is gynoecium. The male reproduction part consists of filament and anther. the proximal end of the filament is attached to the thalamus. A typical end of the filament is attached to the thalamus. A typical angiosperm anther is bilobed. The anther is a four-sided structure consisting of 4 microsporangia appear near-circular in outline. It is surrounded by 4 layers. calls of the sporogenesis anther mature and dehydrated, the microspores dissociate from each other and develop in the pollen grain. pollen grain represents the male gametophytes. pollen grain made up of two-layer.

(A). Name the innermost layer of microsporangium.

1

(B). Define androecium and gynoecium.

1

(C). Write the function of tapetum.

2

OR

How many functional megaspores are formed after megasporogenesis.

Q.30 RNA or Ribonucleic acid is a single chain polyribo nucleotide which function has carrier of coded genetic or hereditary information from DNA to cytoplasm for taking part in protein and enzymes synthesis .Six types of RNA are ribosomal, transfer, messenger, genomic, small nuclear and small cytoplasmic RNA. Out of these, rRNA, mRNA and tRNA are major classes of RNA that are involved in gene expressions.

(A). Which RNA is referred as soluble RNA.

1

(B). Name the nitrogen bases found in DNA and RNA

1

(C). Name The RNA that picks up the specific amino acid from amino acid pool in the cytoplasm during protein synthesis .

2

OR

Name the 3 types of RNA.

Section – E

Q.31 Mention the following disorders with symptoms :

(a) Down syndrome

(b) Haemophilia

OR

Define and design the following:

(a) Test cross and Back cross

(b) F1 and F2 generation.

Q.32 (a) Why are molecular scissors so called? Write their uses in biotechnology.

(b) Explain palindromic nucleotide sequence with the help of suitable example.

OR

(a) Explain the 3 mode of gene transfer .

(b) Name the source organism that possesses Taqpolymerase. What is so special about the function of this enzyme.

Q.33 Explain Miller's experiment regarding chemical evolution with diagrammatic setup.

OR

State the contribution of Louis Pasteur in understanding the origin of life on earth. Explain the procedure that is followed to arrive at his conclusion.

Roll No. _____

NLCS/12/Computer Science (086) / 17

Half Yearly Examination 2025 – 2026

Time - 3:00 Hrs.

M.M. 70

General Instructions :

- This question paper contains 37 questions.
- All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions
- The paper is divided into 5 Sections- A, B, C, D and E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 3 questions (29 to 31). Each question carries 3 Marks.
- Section D consists of 4 questions (32 to 35). Each question carries 4 Marks.
- Section E consists of 2 questions (36 to 37). Each question carries 5 Marks.
- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

SECTION – A

- Q.1** What will be the output of `print(3 ** 2)`?
(a) 6 (b) 8 (c) 9 (d) Error
- Q.2** Which of the following is a mutable data type in Python?
(a) Tuple (b) List (c) String (d) Integer
- Q.3** What does `range(5)` produce?
(a) 0 to 5 (b) 1 to 5 (c) 0,1,2,3,4 (d) 1,2,3,4,5
- Q.4** Which keyword is used to define a function in Python?
(a) `func` (b) `def` (c) `define` (d) `function`
- Q.5** What will be the output of the following?
`def add(x=2, y=3):`
`print(add())`
(a) 2 (b) 5 (c) 0 (d) Error
- Q.6** A function that calls itself is called :
(a) Nested function (b) **Recursive function** (c) Static function (d) Self function
- Q.7** The variables passed to a function at the time of calling are known as :
(a) Formal arguments (b) **Actual arguments** (c) Default arguments (d) None of these
- Q.8** Which mode is used to read a file in Python?
(a) **'r'** (b) `'w'` (c) `'rb'` (d) `'a'`
- Q.9** What will `f.readline()` do?
(a) Read entire file (b) Read all lines (c) **Read only one line** (d) Raise an error
- Q.10** Which method is used to write data into a file?
(a) `writefile()` (b) **`write()`** (c) `add()` (d) `put()`
- Q.11** Which statement is used to close a file?
(a) `stop()` (b) **`close()`** (c) `end()` (d) `terminate()`
- Q.12** What is the output of `f.tell()`?
(a) Name of file (b) **Position of file pointer** (c) Number of lines (d) None of these
- Q.13** Which data structure follows LIFO?
(a) Queue (b) Linked List (c) **Stack** (d) Tree

- Q.14** Which Python list method is used to implement **push** in stack?
 (a) insert() (b) **append()** (c) add() (d) push()
- Q.15** What happens if you pop from an empty stack?
 (a) **IndexError** (b) SyntaxError (c) None (d) FileNotFoundError
- Q.16** Which protocol is used to transfer web pages?
 (a) FTP (b) HTTP (c) SMTP (d) IP
- Q.17** Which of the following is **not** a network topology?
 (a) Ring (b) Star (c) TreeMap (d) Bus
- Q.18** Full form of URL is :
 (a) Universal Resource Log (b) Uniform Resource Locator
 (c) Unified Retrieval Language (d) Uniform Resolution Link
- Q.19** Which device connects different networks and routes data?
 (a) Switch (b) Hub (c) Router (d) Modem
- Q.20 and Q.21** are Assertion(A) and Reason(R) based questions. Mark the correct choice as:
 (a) Both A and R are true and R is the correct explanation for A
 (b) Both A and R are true and R is not the correct explanation for A
 (c) A is True but R is False
 (d) A is False but R is True
- Q.20 Assertion (A) :** Lists are mutable in Python.
Reason (R) : You can change the value of an element in a list after it is created.
- Q.21 Assertion (A) :** Default arguments must be placed after non-default arguments in function definitions.
Reason (R) : Python throws a syntax error if default arguments are placed before non-default arguments.

SECTION – B

- Q.22** Differentiate between actual and formal parameters with examples.
- Q.23** Write a function multiply(x, y) to return the product of two numbers.
- Q.24** Differentiate between append() and extend() functions in Python lists with suitable examples.
- Q.25** Define push and pop operations of a stack using list.
- Q.26** What is a domain name? Give one example.
- Q.27** Differentiate between read() and readline() functions.
- Q.28** Write the difference between a text file and a binary file.

SECTION – C

- Q29.** Write a function in Python to return the factorial of a number using a loop.

OR

Predict the output of the following code:

```
line=[4,9,12,6,20] for l in line:
    for j in range(1,l%5):
        print(j,'#',end=" ")
    print t()
```

- Q.30** You have a stack named BooksStack that contains records of books. Each book record is represented as a list containing book_title, author_name, and publication_year. Write the following user-defined functions in Python to perform the specified operations on the stack BooksStack:

- (I) push_book(BooksStack, new_book): This function takes the stack BooksStack and a new book record new_book as arguments and pushes the new book record onto the stack.
- (II) pop_book(BooksStack): This function pops the topmost book record from the stack and returns it. If the stack is already empty, the function should display "Underflow".

OR

Write a function `count_lines_words()` that opens a text file and prints the total number of lines and total number of words in the file

Q.31 Write a Python program to push 3 values into a stack and then pop 1 value. Display the stack after each operation.

OR

Explain any three differences between star and bus topology.

SECTION – D

Q.32 Consider a list of names. Write a Python program to :

- Display all names
- Count names starting with the letter 'S'
- Display the names in reverse order

OR

Write a Python function that finds and displays all the words longer than 5 characters from a text file "Student.txt".

Q.33 Write a Python program to :

- Create a binary file `employee.dat` containing employee name and salary
- Search and display details of the employee with a specific name entered by the user

Q.34 Read the following case study and answer the questions:

A school has four blocks — Admin, Library, Lab, and Sports. They want to connect these via a LAN. The distances between blocks are :

- Admin–Library: 50m
- Admin–Lab: 60m
- Library–Lab: 40m
- Lab–Sports: 90m

Answer the following:

- Suggest a suitable block for placing the server.
- Suggest the type of network to be formed.
- Name the network device used to connect multiple computers in a LAN.
- Suggest a suitable wired communication medium.
- Suggest a suitable topology for efficient communication.

Q.35 Write a Python program using functions to:

- Accept a number from the user
- Return whether it is prime or not
- If it is prime, write it to a file called `prime.txt`

SECTION – E

Q.36 Surya is a manager working in a recruitment agency. He needs to manage the records of various candidates. For this, he wants the following information of each candidate to be stored :

- Candidate_ID – integer
- Candidate_Name – string
- Designation – string
- Experience – float

You, as a programmer of the company, have been assigned to do this job for Surya.

(I) Write a function to input the data of a candidate and append it in a binary file.

- (II) Write a function to update the data of candidates whose experience is more than 10 years and change their designation to "Senior Manager".
- (III) Write a function to read the data from the binary file and display the data of all those candidates who are not "Senior Manager".

Q.37 Sapphire Global Institute is an education-based organization that is setting up its new campus in **Bengaluru** with its head office in **Hyderabad**. The Bengaluru campus consists of four academic blocks: **RESEARCH**, **LECTURE HALLS**, **LIBRARY**, and **ADMINISTRATION**. You are appointed as the **network consultant** to provide optimal solutions for their networking needs, considering the layout and technical requirements mentioned below.

Block-to-Block Distances (in meters):

From	To	Distance (m)
RESEARCH	LECTURE HALLS	60
RESEARCH	LIBRARY	40
RESEARCH	ADMINISTRATION	100
LECTURE HALLS	LIBRARY	55
LECTURE HALLS	ADMINISTRATION	65
LIBRARY	ADMINISTRATION	35

Distance between Bengaluru campus and Hyderabad head office = 1,200 km

Number of Computers:

Block/Office	No. of Computers
RESEARCH	35
LECTURE HALLS	20
LIBRARY	25
ADMINISTRATION	30
HYDERABAD HO	15

Answer the following questions:

- (I) Which block should be chosen to house the **server**? Justify your answer with two reasons.
- (II) Suggest the **most suitable wired medium** and **topology** for efficient intra-campus connectivity.
- (III) Name the **network device** required to connect all computers in each block.
- (IV) Suggest a **networking device and protocol** to connect the Bengaluru campus to the Hyderabad Head Office.
- (V) Which among **Internet, Intranet, or Extranet** would you recommend for secure internal communication? Justify your answer.

Roll No. _____

NLCS/12/Physical Education (048)/54

Half Yearly Examination 2025 – 2026

Time - 3:00 Hrs.

M.M. 70

General Instructions:

1. The question paper consists of 5 sections and 37 questions.
2. Section A: Questions 1–18 (1 mark each). Multiple Choice. All are compulsory.
3. Section B: Questions 19–24 (2 marks each). Very short answers. Attempt any 5.
4. Section C: Questions 25–30 (3 marks each). Short answers. Attempt any 5.
5. Section D: Questions 31–33 (4 marks each). Case studies. Attempt all.
6. Section E: Questions 34–37 (5 marks each). Long answers. Attempt any 3.

Section – A

Multiple Choice Questions – All Questions are compulsory :

1×18=18

- Q.1 Which component of fitness is tested by the Harvard Step Test?
(a) Speed (b) Flexibility (c) Cardiovascular endurance (d) Strength
- Q.2 The 'Principle of Overload' in training means:
(a) Less rest (b) Balanced diet (c) Increased workload (d) Decreased intensity
- Q.3 Which vitamin is known as the "sunshine vitamin"?
(a) A (b) C (c) D (d) K
- Q.4 What is the normal range of BMI for adults?
(a) 16–18.4 (b) 18.5–24.9 (c) 25–29.9 (d) Above 30
- Q.5 League tournaments are also known as :
(a) Knockout (b) Round robin (c) Challenge (d) Pyramid
- Q.6 Match the following :
(i) Lordosis - (a) Backward spinal curve
(ii) Kyphosis - (b) Forward spinal curve
(iii) Scoliosis - (c) Lateral curve
(a) i-a, ii-b, iii-c (b) i-b, ii-a, iii-c (c) i-c, ii-a, iii-b (d) i-a, ii-c, iii-b
- Q.7 What is the main aim of Intramural activities?
(a) National competition (b) International exposure (c) Mass participation (d) Selection
- Q.8 Identify a psychological benefit of regular exercise:
(a) Hypertension (b) Anxiety (c) Stress relief (d) Obesity
- Q.9 Asanas are helpful in improving :
(a) Speed (b) Flexibility (c) Reaction time (d) Strength
- Q.10 What is a correct posture while sitting?
(a) Bent back (b) Slouched shoulders (c) Straight spine (d) Crossed legs
- Q.11 When was the **Khelo India programme** launched?
(a) 2015 (b) 2016 (c) 2017 (d) 2018
- Q.12 What does the term 'disability etiquette' refer to?
(a) Game rules (b) Manners for disabled people
(c) Medical diagnosis (d) Training schedule
- Q.13 Which nutrient is a quick energy provider?
(a) Protein (b) Fat (c) Carbohydrate (d) Vitamin
- Q.14 Paralympic Games are meant for :
(a) Children (b) Women (c) Athletes with disabilities (d) Senior citizens

- Q.15 Which method is best for measuring flexibility?
 (a) Sit and reach (b) 50m sprint (c) Pull-ups (d) Standing long jump
- Q.16 Which of the following is a micronutrient?
 (a) Protein (b) Carbohydrate (c) Vitamin (d) Fat
- Q.17 What is the full form of RDA in nutrition?
 (a) Regular Diet Association (b) Recommended Daily Allowance
 (c) Registered Diet Allocation (d) Required Diet Analysis
- Q.18 Who is the governing body for Olympic Games?
 (a) FIFA (b) ICC (c) IOA (d) IOC

Section – B

Answer in 60–90 words. Attempt Any Five :

2×5=10

- Q.19 Define endurance and mention its types.
 Q.20 Explain any two objectives of physical education.
 Q.21 What is balance diet?
 Q.22 Write a note on knock-out tournament with one advantage.
 Q.23 List any two advantages of yoga for lifestyle diseases.
 Q.24 Write a short note on disability classification in sports.

Section – C

Answer in 100–150 words. Attempt Any Five :

3×5=15

- Q.25 Explain three components of wellness.
 Q.26 Discuss the procedure and benefits of Bhujangasana.
 Q.27 Describe any three common postural deformities.
 Q.28 Explain the importance of fluid intake during physical activities.
 Q.29 Write a short note on inter-house tournaments and their benefits.
 Q.30 Explain any three types of physical disabilities.

Section – D

Case-based questions. Attempt Any Two :

4×3=12

- Q.31 Mr. Kapoor works in the sports field in which he describes what's happening at sporting events and offers their opinions to listeners and viewers. Identify the career in sports and answer the following question:

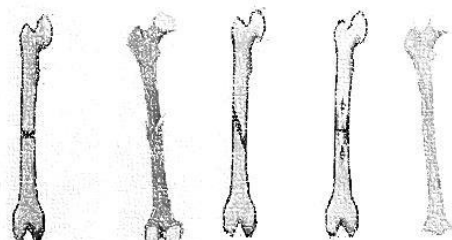
4



- (A) ----- provides a real-time commentary of a game or event.
 (B) He is also known as -----.
 (C) He discusses news, -----, weather, or the like, as on television or radio.
 (D) They give ----- commentary on a event.

OR

than the given career, there is a career in which ---



sporting

Other

----- teacher teaches health education.

Q.32 Adam was injured while playing cricket. He was taken to hospital. In the doctor's room, he saw the following picture related to a fracture.

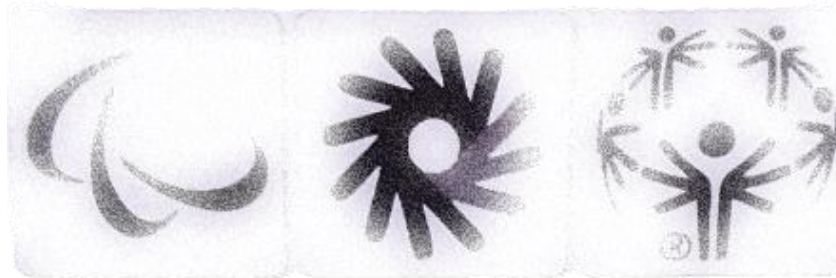
On the basis of the given picture answer the following.

- (A) When the two ends of the bone enter into each other it is ----- .
- (B) ----- is a slanted fracture.
- (C) When the bone is broken into many pieces at one place or different places , it is called ----- .
- (D) ----- is a fracture in which bone gets bent.

OR

----- fracture occurs in a straight line at a right angle to the shaft of the bone. Usually caused by direct blow.

Q.33 In relation to the pictures, answer the following questions -



- (i) Logo shown in picture _____ refers to Special Olympics.
- (ii) Who was the founder of Special Olympics?
- (iii) According to figure B the hand shape 'OK', 'Good' and 'Great' that overlap each other in a circle , represent the original sign for _____.
- (iv) How many countries participated in the first Paralympic Games in Rome (Italy) in 1960?

OR

The Motto of the Paralympic is -----.

Section – E

Answer in 200–300 words. Attempt Any Three :

5×3=15

- Q.34 Define physical fitness. Explain its components in detail with examples.
- Q.35 Discuss the causes, symptoms, and preventive measures of obesity.
- Q.36 What are the responsibilities of a leader in physical education and sports?
- Q.37 Describe the functions of nutrients in detail. Classify them with suitable examples.
