

Half Yearly Examination 2025 – 2026

Time - 3:00 Hrs.

M.M. 70

General instructions:

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

SECTION – A

- Q.1 Biological name of wheat is;
(a) Solanum tuberosum (b) Homo sapiens (c) Triticum aestivum (d) Mangifera indica
- Q.2 Disease caused by prions in cattles
(a) AIDS (b) Tobacco Mosaic Disease (c) Mad cow disease (d) Mumps
- Q.3 Frog respire through:
(a) skin & gills (b) skin & lungs (c) both (a) & (b) (d) buccal cavity
- Q.4 Second largest phylum of kingdom Animalia.
(a) Porifera (b) Arthropoda (c) Mollusca (d) Annelida
- Q.5 Brown algae is also known as :
(a) Chlorophyceae (b) Rhodophyceae (c) Phaeophyceae (d) None of These
- Q.6 Protein storage bodies found in chlorophyceae :
(a) Heterocyst (b) Pyrenoid (c) Capsule (d) Sporangium
- Q.7 Female sex organ is called :
(a) Archegonium (b) Sporophyte (c) Gametophyte (d) Antheridium
- Q.8 Non flowering plant :
(a) Bryophytes (b) Pteridophytes (c) Gymnosperms (d) Angiosperms
- Q.9 Biological names are generally written in :
(a) English (b) Hindi (c) Latin (d) Urdu
- Q.10 ----- are the sites of aerobic respiration.
(a) Nucleus (b) Golgi bodies (c) Mitochondria (d) Plastids
- Q.11 When the margins of sepals or petals overlap one another but only in any particular direction such type of aestivation is called
(a) Valvate (b) twisted (c) imbricate (d) Vexillary
- Q.12 Bulliform cells are present in:
(a) Dicot stem (b) dicot leaf (c) monocot leaf (d) monocot stem

Question 13 to 16 are assertion reason questions and consist of two statements-

ASSERTION and REASON. Answer these questions by selecting the appropriate option given below.

- (a) both A & R are true and R is the correct explanation of A
- (b) Both A & R are true but R is not the correct explanation of R
- (c) A is true but R is false
- (d) A is false but R is true.

Q.13 **Assertion:** Bacteria are prokaryotic.

Reason : Bacteria do not possess true nucleus and membrane bound cell organelles.

Q.14 **Assertion :** Sponges belongs to porifera.

Reason : Sponges have water canal system.

Q.15 **Assertion :** Members of Phaeophyceae vary in colour from olive green to various shades of brown.

Reason : Phaeophyceae possess chlorophyll a, c, carotenoids and zanthophyll fucoxanthin.

Q.16 **Assertion :** The science of classifying organism is called taxonomy.

Reason : Systematics and taxonomy have same meaning.

SECTION – B

Q.17 Write the taxonomic categories showing hierarchical arrangement in ascending order.

Q.18 Define algal bloom & red tides.

OR

Draw the diagram of any one example from phylum Annelida

Q.19 How is the study of plant anatomy useful to us?

Q.20 What is epipetalous condition? Define it.

Q.21 Draw the diagram of the following:

(i) Nerve cell (ii) RBC (iii) WBC (iv) Mesophyll cell

OR

What is Mesosomes in a prokaryotic cell? Mention the function that it performs.

SECTION – C

Q.22 Draw the diagram of Nostoc.

Q.23 What is Syngamy and Triple fusion?

Q.24 What is closed type of blood circulation? Define it.

Q.25 Describe the various types of vascular bundle.

Q.26 Write the three universal rules of nomenclature.

Q.27 Mention the one function of the following:

(i) Lysosome (ii) Cell Wall (iii) Ribosome

OR

Draw the Well labelled diagram of “power house of the cell”

Q.28 Draw a well labelled diagram that shows female reproductive system of frog.

SECTION – D

Ques. 29 & 30 are Case study questions :

Q.29 Plastids are found in all plant cells and in euglenoids. These are easily observed under the microscope as they are large. They bear some specific pigments, thus imparting specific colours to the plants. Plastids consist of numerous membrane layers embedded in a material called the stroma. They have their own genome and ribosomes.

(A) Name the colourless plastid.

(B) Define plastids. Name the two organelles which have their own DNA. and ribosomes.

(C) Which type of plastids store proteins in grains.

OR

Which type of plastid stores carbohydrates in potatoes?

Q.30 Androecium is composed of stamens. Each stamen which represents the male reproductive organ consists of a stalk or a filament and an anther. Each anther is usually bilobed and each lobe has two chambers, the pollen-sacs. The pollen grains are produced in pollen-sacs. A sterile stamen is called staminode. Stamens of flower may be united with other members such as petals or among themselves. When stamens are attached to the petals, they are epipetalous as in brinjal, or epiphyllous when attached to the perianth as in the flowers of lily. The stamens in a flower may either remain free (polyandrous) or may be united in varying degrees. The stamens may be united into one bunch or one bundle (monadelphous) as in China rose, or two bundles (diadelphous) as in pea, or into more than two bundles (polyadelphous) as in citrus. There may be a variation in the length of filaments within a flower, as in Salvia and mustard.

Gynoecium is the female reproductive part of the flower and is made up of one or more carpels. A carpel consists of three parts namely stigma, style and ovary. Ovary is the enlarged basal part, on which lies the elongated tube, the style. The style connects the ovary to the stigma. The stigma is usually at the tip of the style and is the receptive surface for pollen grains. Each ovary bears one or more ovules attached to a flattened, cushion-like placenta. When more than one carpel is present, they may be free (as in lotus and rose) and are called apocarpous. They are termed syncarpous when carpels are fused, as in mustard and tomato. After fertilisation, the ovules develop into seeds and the ovary matures into a fruit. The arrangement of ovules within the ovary is known as placentation. The placentation are of different types namely, marginal, axile, parietal, basal, central and free central.

(A) Name the outermost whorl of flower.

(B) Define placentation and fertilization .

(C) Write the function of stigma and style.

OR

What do you understand by term epipetalous condition .

SECTION – E

Q.31 Why are living organisms classified?

OR

Write a note on ascomycetes and basidiomycetes.

Q.32 Draw the life cycle of angiosperm

OR

Explain the following terms:

(i) Isogamy

(ii) Anisogamy

(iii) Antheridium

(iv) Archegonium

Q.33 Describe the vegetative and floral characteristics of solanaceae.

OR

What is flower. Describe the parts of a typical angiosperm flower with diagram.

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

1. This paper is divided into three sections: A, B & C. All sections are compulsory.
2. Separate instructions are given with each part & question wherever necessary.
3. Read these instructions very carefully and follow them faithfully.
4. Do not exceed the prescribed word limit while answering the questions.

Section – A
Reading skills

Q1. Read the passage given below

These days, it is not unusual to see people listening to music or using their electronic gadgets while crossing busy roads or travelling on public transport, regardless of the risks involved. I have often wondered why they take such risks: is it because they want to exude a sense of independence or is it that they want to tell the world to stop bothering them? Or is it that they just want to show how cool they are?

Whether it is a workman or an executive, earphones have become an inseparable part of our lives, sometimes even leading to tragicomic situations. The other day, an electrician had come to our house to fix something. We told him in detail what needed to be done. But after he left, I found that the man had done almost nothing. It later turned out that he could not hear out directions clearly because he had his earphones on. Hundreds of such earphones addicts commute by the Delhi metro every day. While one should not begrudge anyone their moments of privacy or their love for music, the fact is 'iPod oblivion' can sometimes be very dangerous. Recently, I was travelling with my wife on the Delhi Metro. Since the train was approaching the terminus, there weren't too many passengers. In our compartment, other than us, there were only two women sitting on the other side of the aisle. And then suddenly, I spotted a duffel bag. The bomb scare lasted for several minutes. Then suddenly, a youth emerged from nowhere and picked up the bag. When we tried to stop him, he looked at us, surprised. Then he took off his earpieces, lifted the bag, and told us that the bag belonged to him and that he was going to get off at the next station.

We were stunned but recovered in time to ask him where he was all this while? His answer : he was in the compartment, leaning against the door, totally immersed in the music. He had no clue about what was going on around him. When he got off, earplugs in his hand, we could hear strains of the song.

On the basis of your reading of the passage, answer the following questions : 1x10=10

- 1. The reason for people listening to music or using their electronic gadgets while crossing busy roads or travelling on public transport is that they-**
- | | |
|-------------------------------------|---|
| (a) Do not want to be disturbed | (b) Want to show how fashionable they are |
| (c) Want to show their independence | (d) All of these |

2. Why had the electrician done nothing?

- (a) Because he hadn't heard them (b) Because he was listening to music
(c) Because he was not interested in the job
(d) Because he couldn't understand what needed to be fixed

3. The electrician episode is explained by the narrator as

- (a) Exasperating (b) Infuriating (c) Tragicomedy (d) Disgusting

4. Which of the following correctly lists the tone with which the author had written the passage?

- (i) Humorous (ii) Sarcastic (iii) Serious (iv) Informative (v) Resentful
(a) 1 and 5 (b) 2 and 4 (c) 3 and 5 (d) 1 and 4

5. The author says that we should not resent people

- (a) Indulging in their love for music (b) Wanting privacy
(c) Both (a) and (b) (d) Neither (a) nor (b)

6. The passengers were stunned because

- (a) The youth was careless (b) The bag contained a bomb
(c) The youth had not been visible anywhere near the bag earlier
(d) None of the above

7. Pick the option showing the CORRECT use of 'stunned' as used in the passage.

- (a) The animals are stunned before slaughter
(b) The robber stunned the guard by banging him on the head.
(c) Many cinema-goers were stunned by the film's violent and tragic end.
(d) The impact of the ball had stunned her.

8. The word _____ in the passage is an antonym of absorb.

- (a) Exude (b) Bothering (c) Commute (d) Stunned

9. Why did the bomb scare happen?

10. How can 'I pod oblivion' be defined?

Q.2 Read the following passage given below :

8

- Introduction:** In the hasty lifestyle of today's world, the choice of snacks can greatly impact one's health and well-being. This case study aims to analyse the preference for seasonal fruits compared to packaged snacks among different age groups and the implications for overall health.
- Methodology:** A survey was conducted among individuals across various age groups, ranging from children to seniors, to determine their snacking preferences. Participants were asked to indicate their preferred snack choices and provide reasons for their preferences. The data was then analyzed to identify trends and patterns among different age demographics.
- Surveys Examination:** The survey encompassed a comprehensive examination of snacking habits, including not only preferred snack choices but also delving into the underlying motivations and influences guiding these choices. Beyond mere preference, participants were encouraged to articulate the reasons behind their selections, providing invaluable insights into the multifaceted nature of snacking behaviour.

4. **Results:** The survey results revealed interesting insights into snacking preferences among different age groups:

AGE-GROUP	%	PREFERRED SNACK	REASONS FOR PREFERENCE
Children	77	Seasonal fruits	Taste, Health benefits, Parental guidance
Teenagers	65	Packaged snacks	Conveniences, Taste, Peer influence
Young adults	52	Seasonal fruits and packaged snacks	Transitional lifestyle (college, beginning careers, and establishing independence), Health consciousness, Convenience
Middle-aged	83	Seasonal fruits	Freshness, Nutrition, Health consciousness
Elderly	90	Seasonal fruits	Health benefits, Digestive ease

5. **Implications for Interventions:** By discerning the diverse preference among different age groups, policymakers and health practitioners can tailor interventions to address specific demographic needs. For instance, targeting educational campaigns towards parents could empower them to instill healthy eating habits in their children from an early age. Concurrently, efforts to mitigate the influence of advertising and peer pressure on teenagers could involve regulatory measures and educational initiatives aimed at promoting critical thinking and informed decision-making. Furthermore, the prominence of seasonal fruits as a preferred snack choice among middle-aged adults and senior's points towards the importance of promoting access to fresh produce and nutritional education across all age demographics.
6. **Conclusion:** The survey outcomes serve as a roadmap for designing targeted interventions that not only cater to diverse demographic needs but also nurture a culture of health and well-being. By harnessing the insights gleaned from this study, stakeholders can collaboratively work towards building healthier communities and promoting sustainable practices for generations.

Answer the following questions, based on given passage:

- Complete the following suitably.
In the introduction, the researcher links a hasty lifestyle with the choice of snacks in the study to highlight ----- 1
- What would the following be classified as? 1
To examine snacking preference across various age groups in detail, and assess health implications.
Select the appropriate response.
(a) Primary purpose (b) Secondary objective
(c) Method of analysis (d) Research outcome
- Complete the following suitably.
One reason that fresh fruits were given as an option to the survey participants to choose from in the study on snacking preference can be ----- 2
- Although children, middle-aged, and elderly groups all prefers seasonal fruits, the preference percentage is highest among the elderly due to ----- 2
- State TRUE or FALSE : 1

Targeted interventions can effectively address specific health needs by focusing on the unique factors influencing each demographic's snacking choices. (Paragraph 5)

6. What is the ultimate goal for stakeholders, based on the insights from the study? 1

- (a) Increasing profitability through enhanced snack marketing.
- (b) Building healthier communities
- (c) Reducing the cost of health care services
- (d) Expanding the range of available snack product.

Q.3 Read the passage given below -

The problem of unemployment is a serious problem in our country. If millions of people are without any jobs, its effect is very bad. A man without any employment is a burden on others. If he has got to maintain a family, the situation is worse. Such unemployed persons are reduced to poverty. It demoralizes them and they are forced to do undesirable things. They may commit crimes. They may create trouble and spread discontent. In fact, they are a source of danger to society and the state.

The causes of unemployment are mainly the rapid growth of population, the prevailing system and underdevelopment of industry and trade. The population of India is growing very rapidly. It is very difficult to get jobs for all who are in need of it. The British Government had introduced a system of education in this country for carrying on administration only. It is being continued in free India also with very slight changes. The system of education prepares most young men to be clerks. But neither the Government nor the private firms can absorb all the educated unemployed persons in their offices for clerical work. Industry and trade have not yet properly developed.

Cottage industries in the village have been ruined owing to the establishment of large mills and factories in towns. Consequently, many artisans have been thrown out of employment. There has been great pressure on agricultural land because of the growth of population; consequently, many cultivators have got no land for cultivation. All these are mainly responsible for this acute problem of unemployment.

The acute problem of unemployment is a cause of unrest in the country. So the Government is seriously thinking over the matter and trying to find out a remedy. The remedy is to find work for the people. The Government had earlier undertaken five-year plans for the material prosperity of the country. For carrying out these plans many mills and factories had been set up both by the Government and by industrialists. Many new offices one line missing as clerks and in mills and factories as labourers. But these measures have been proved inadequate.

Our Government is now encouraging the revival of cottage industries in the villages. This will help many villagers to earn a living. Our Government is also trying to develop agriculture. But as yet, it has not been able to cope with the situation fully. The number of

unemployed persons is increasing. So our Government should allow establishment of a large number of large and small technical and vocational institutions in the country. Only a limited number of bright young men should try to get higher education in the universities. Most young men try to enter technical or vocational institutions. After coming out of these, they may find jobs in factories and commercial firms. For this, of course, more factories must be set up throughout the country. Unskilled labourers should be taught various traits in technical institutes. They may find jobs in factories as skilled labourers. They may also set up cottage industries in their villages. Government will have to help them with loans to start their work. It is heartening to find that our Government has already taken some steps in this direction. Nationalized banks are now giving lump sum loans to intending young persons under self employment schemes.

Questions

(a) On the basis of your reading of the above passage make notes on it using headings and sub-headings. Use recognizable abbreviations wherever necessary. Supply an appropriate title to it. 5

(b) Write a summary of the above passage in up to 50 words. 3

Q.4 Choose the correct option (Answer Any Three) : 1x3=3

(i) ----- I wasn't feeling well, I went to school

(a) when (b) hence (c) although (d) whether

(ii) I wonder ----- she doesn't want to go the picnic.

(a) Why (b) how (c) where (d) when

(iii) Before I got the end of his article I feel that I knew everything there and eagerly _____ about the North American free trade Agreement.

(a) is known (b) was to know (c) has been known (d) has to be known

(iv) In recent decades, the efficiency of the United Nations ----- by a growing number of countries.

(a) have been questioned (b) was questioned
(c) had been questioned (d) has been questioned

Q.5 Rearrange these phrases to form a meaningful sentence : 1x4=4

(i) containing memorable letters of churchchill/ Recently a book/ has been published/ by a reputed publisher

(ii) to borrow some sugar/ when he came to her home/ to make amends/ she saw her opportunity

(iii) despite a loss in profits/ was not scared/ The CEO/ of making the right decision

(iv) small / When meat/ the food poisoning occurred/ added in the food preparations/ of low quality was

Creative Writing Skills

Q.6 Attempt ANY ONE of the following : 3

1. You are the director of Eco-center, Bangalore. Draft an advertisement in 50 words about diploma courses in waste water management.
2. You are Harish / Harshita of 12, Seva Nagar, Pune. You want to sell your flat as you are shifting to another city for work. Draft a suitable advertisement in not more than 50 words to be published in The Pune times under the classified column.

- Q.7** (i) You are the secretary of the Best Friends Animal society. Prepare a poster on Kindness to animals to be displayed in the city at public places appealing to people to join the society and show kindness towards animals. (50 words) 3

OR

- (ii) Design a poster for promoting space saving furniture. (50 words)
- Q.8** (i) Write a speech in 120-150 words on "The problem of Terrorism in India." Use the clues given in the lose below. 5
- Terrorism a cowardly act disturbs the peace
 - Creates a state of panic
 - Major impact on tourism and economy
 - Loss of life and property
- (ii) Manish has to speak in debate supporting the motion that life in the country (a village) is preferable to life in the city. Use the clues given below to develop Manish's speech in 120-150 words.
- Country (a village) peace and quiet-soothing air-fresh and pure green fields all arounds- lovely sight helpful neighbours.
- City
- Vehicles-Smoke
- Industries-Smoke-Pollution
- Crowded streets
- People hurry-never relax
- Q.9** (i) "Video games promoting violence should be banned," Write a debate in about 120-150 words, in either for or against the topic. 5
- (ii) Are celebs responsible for the products they endorse? Taking a clue from the headlines given below and using your own ideas. Write a debate for or against the topic. (120-150 words)
- Amitabh Bachchan steps back from promoting Pepsi after a school girl questions the health impact of the drink.
 - Brief ban on Maggi noodles causes trouble for its celebrity brand ambassadors.
- Q.10** Read the given extracts carefully and answer the following questions (Do Any One) : 1x3=3
- A.** Although we shared the same room, my grandmother no longer came to school with me. I used to go to an English school in a motor bus. There were no dogs in the streets and she took to feeding sparrows in the courtyard of our city house. As the years rolled by we saw less of each other. For sometime she continued to wake me up and get me ready for school. When I came back she would ask me what the teacher had taught me. I would tell her, English words and little things of Western Science and learning, the law of Gravity, 'Archimedes' Principle, the world being round, etc. This made her unhappy.
- (i) The given extract DOES NOT talk about
- (a) the grandmother's dissatisfaction with Western education
 - (b) the narrator's nostalgia about his village school
 - (c) the narrator learning at the new school
 - (d) the increasing loneliness of the new school
- (ii) Choose the option that gives the correct significance of the given lines
- (a) It talks about the ortho dose views of the grandmother
 - (b) It talks about the lack of Indian scriptural education
 - (c) It talks about the gradually changing relationship between the author and the grandmother
 - (d) It talks of the effects of city life on the grandmother

(iii) What made the grandmother unhappy?

B. Regardless of his fame and the speculation about his fate. Tut is one mummy among many in Egypt. How many? No one knows. The Egyptian mummy project, which began an inventory in late 2003, has recorded almost 600 so far and is still counting. The next phase: scanning the mummies with a portable CT machine donated by the national Geographic society and Siemens, its manufacturer. King Tut is one of the first mummies to be scanned in death, as in life, moving regally ahead of his countrymen.

(i) In which of the following options is the word 'regally' not used correctly?

- (a) In those days, we lived regally, practically doing nothing.
- (b) As Rosa spoke, her words came out so regally, just like a queen.
- (c) She is tall and ate regally in front of the guest.
- (d) I welcome you most regally.

(ii) The given extract does not talk about

- (a) The new advanced CT scanner discoveries about Tut.
- (b) The Egyptians' tradition of mummifying.
- (c) Speculations of Tut's death.
- (d) The inaccuracy of the data presented prior to the CT.

(iii) What is the significance of the CT Scan done on King Tut?

Q.11 Read the given extracts carefully and answer the following questions (Do any 1) : 1x3=3

A. Eternal I rise impalpable out of the land
and the bottomless sea, upward to heaven, whence,
Vaguely found altogether changed, and yet the same.

(i) What does 'eternal I rise' mean here?

- (a) It is a continuous process
- (b) It rises to eternity
- (c) It keeps on rising until it reaches heaven
- (d) None of the above

(ii) The word 'impalpable' in the extract means.

- (a) Something that can be touched
- (b) Something that cannot be heard
- (c) Something that can be heard
- (d) Something that cannot be touched

(iii) How is 'I' altogether changed and yet the same?

B. The cardboard shows me how it was
when the two girl cousins went Paddling.
Each one holding one of my mother's hands,
And she the big girl- some twelve years or so

(i) What is the 'cardboard'?

- (a) A piece of cardboard
- (b) A photograph
- (c) A display board
- (d) A piece of craft

(ii) Who is the 'Big Girl'?

- (a) The poet
- (b) One of the cousins of poet's mother
- (c) Poet's mother
- (d) Poet's friend

(iii) Name the poem and the poet?

Q.12. Read the given extracts carefully and answer the following questions (Do any 1) : 1x4=4

A. One day back there in the good old days when I was nine and world was full of every imaginable kind of magnificence, and life was still a delightful and mysterious dream, my cousin Mourad, who was considered crazy by everybody who knew him except me, came to my house at four in the morning and woke me up tapping on the window of my room.

Aram, he said. I jumped out of bed and looked out of the window. I couldn't believe what I saw. It wasn't morning yet, but it was summer and with daybreak not many minutes around the corner of the world it was light enough for me to know. I wasn't dreaming. My

cousin Mourad was sitting on a beautiful white horse. I stuck my head out of the window & rubbed my eyes.

- (i) The opening lines of the extract depict _____.
 - (a) The beauty of white horse
 - (b) The beauty of life
 - (c) The beauty of childhood
 - (d) The beauty of summer morning
- (ii) 'Mourad', who was 'considered crazy' is an example of
 - (a) A belief
 - (b) An opinion
 - (c) A myth
 - (d) A fallacy
- (iii) Why does the narrator call 'his childhood' good old days?
- (iv) Why did the narrator rub his eyes?

B. Perhaps I was mistaken, I thought, perhaps it isn't her. I had seen her only once, fleetingly, and that was years ago. It was most probable that I had rung the wrong bell. The woman let go of the door and stepped to the side. She was wearing my mother's green knitted cardigan. The wooden buttons were rather pale from washing. She saw that I was looking at the cardigan and half hid herself again behind the door. But I knew now that I was right.

'Well, you knew my mother?' I asked.

'Have you come back?' Said the woman. 'I thought that no one had come back.'

- (i) How did the narrator ensure that she was talking to the right woman?
 - (a) She had recognized her.
 - (b) The lady was wearing her mother's cardigan.
 - (c) The lady told her that she was at the right place.
 - (d) She had her photograph with her.
- (ii) 'I thought that no one had come back'. What does this convey?
 - (a) Destruction and sadness brought about by the war
 - (b) Selfishness of the lady
 - (c) Social conditions of the time
 - (d) None of these
- (iii) Why did the lady hide behind the door?
- (iv) Why has the narrator come to visit this woman?

Q.13 Answer (Any one) out of 2 sets given in 40-50 words. 3x2=6

A. (i) Why was it hard for the author (Khushwant Singh) to believe that his grandmother was once young and pretty?

(ii) "Sue was a brave girl". Give evidence in support of this statement.

B. (i) What message does the poem "The laburnum top" give?

(ii) What revelations were made by Carter on investigating King Tut's coffins?

Q.14 Answer (Any one) of the following questions in 40-50 words : 3x1=3

(i) Did the boy Aram succeed in learning horse riding?

(ii) Describe the impact of the war on the narrator and Mrs. S.

Q.15 Answer (Any one) of the following questions in 120-150 words : 1x6=6

(i) "Knowledge of the past is useful to complete our knowledge of the world we live in".

Discuss with reference to the chapter "Discovering Tut: The saga continues".

(ii) Explain the three stages in life described by Shirley Toulson in the poem "A Photograph".

Q.16 Answer (Any one) of the following questions in 120-150 words : 1x6=6

(i) What valuable lessons can we learn from the play "Mother's Day"?

(ii) Describe the narrator's second visit to Mrs. Dorling's house.

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 MCQ's 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**Questions 1 to 20 carry 1 mark each.**

- Q.1 Find the total number of parallelogram in an 8 by 8 chess board respectively.
(a) 1234 (b) 1246 (c) 1236 (d) 1296
- Q.2 If $(x + 1, y - 4) = (4, 11)$ then write the value of x and y.
(a) $x = 3, y = 3$ (b) $x = 3, y = 2$ (c) $x = 2, y = 2$ (d) None of these
- Q.3 Let $A = \{x, y, z\}$ and $B = \{4, 2\}$. Find the number of relations from A to B.
(a) 0 (b) 5 (c) 45 (d) 64
- Q.4 $(\sin^2 6x - \sin^2 4x) = ?$
(a) $\sin 10x \sin 2x$ (b) $\sin 3x$ (c) $\sin 2x$ (d) $\sin 10x$
- Q.5 Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real functions. then $(f + g)(x)$ equals
(a.) $x^2 + 2x + 1$ (b) $3x + 7$ (c) $4x + 9$ (d) $x^2 + 2x + 1$
- Q.6 If the letter of the word 'CHALK' be arranged in all possible order in English dictionary, what is the rank of word 'CHALK'
(a) 11 (b) 21 (c) 43 (d) 32
- Q.7 $(1.01)^{10000}$ is _____ 1000
(a) greater than (b) less than (c) equal to (d) None of these
- Q.8 $\tan 765^\circ$ EQUALS
(a) 1 (b) 4 (c) 7 (d) None of these
- Q.9 Evaluate i^{1000}
(a) 1 (b) 2 (c) 27 (d) None of these
- Q.10 The multiplicative inverse of $2 - 3i$ is :
(a) $2 + 3i$ (b) $4 + 6i$ (c) $9 + 8i$ (d) $\frac{2 + 3i}{13}$

- Q.11 The value of $\tan 15^\circ$ is :
- (a) 6 (b) $\frac{3}{5}$ (c) $\frac{2}{5}$ (d) None of these
- Q.12 Factorial 8 equals :
- (a) 5040 (b) 40320 (c) 3241 (d) 60240
- Q.13 Evaluate 99^3 equals
- (a) 62345 (b) 223145 (c) 78965 (d) None of these
- Q.14 Find the number of permutation of letter of word "MOTHER:"
- (a) 344 (b) 977 (c) 720 (d) 840
- Q.15 The number of ways 10 digit numbers can be written using the digits 4 and 3 is :
- (a) 2^{10} (b) 10^2 (c) 3^{10} (d) None of these
- Q.16 The number of ways in which 8 students can be seated in a line is
- (a) 40320 (b) 3248 (c) 720 (d) None of these
- Q.17 How many elements are there in the complement of set A?
- (a) 0 (b) 1 (c) All the elements of A (d) None of these
- Q.18 Total number of terms in the expansion of $(2x + 3Y)^n$ is
- (a) n terms (b) (n + 1) terms (c) (n - 1) terms (d) not

ASSERTION-REASON BASED QUESTIONS :

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

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) A is false and R is false.
 (d) A is false but R is true.
- Q.19 **Assertion (A)** : If $Z_1 = 2 + 3i$ and $Z_2 = 3 - 2i$, then $Z_1 - Z_2 = -1 + 5i$.

Reason (R) : If $Z_1 = a + ib$ and $Z_2 = c + id$, then $Z_1 - Z_2 = (a - c) + i(b - d)$.

- Q.20 **Assertion (A)** : The Total no. words with letters of the word civilization (all taken at a time) is 19958393.

Reason (R) : The number of permutation of n distincts objects (r taken at a time) is ${}^n P_r$.

SECTION – B

Questions 21 to 25 carry 2 marks each.

- Q.21 Solve $6x + 3 < 3x + 9$. Show the graph of the solutions on number line.

OR

Solve $2x + 3 < 5x + 4$. Show the graph of the solutions on number line.

- Q.22 A wheel makes 360 revolutions in one minute . Through how many radians does it turn in one second?
- Q.23 Prove that $\cos 4x = 1 - 8\sin^2 x \cos^2 x$.
- Q.24 Find the domain of the function $f(x) = \frac{(x^2 + 6x + 5)}{(x^2 - 5x + 4)}$

OR

Find the domain of the function $f(x) = \frac{(x^2 + 4x + 5)}{(x^2 - 8x + 12)}$

- Q.25 Solve $18x < 109$, when x is a real number.

SECTION – C

Questions 26 to 31 carry 3 marks each.

- Q.26 Prove that $\pi^c = 180^\circ$.

OR

Prove that $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$.

Q.27 To receive Grade A, in a mathematics course, one must obtain an average of 90 marks or more in five examinations (each of 100 marks). If Ragini's marks in first four examinations are 87, 92, 94 and 95, find minimum marks that Ragini must obtain in fifth examination to get Grade A in the course.

Q.28 Let $A = \{0, 1, 2, 3, 4, 5\}$, $B = \{2, 4, 6, 8\}$ and $C = \{1, 3, 5, 7\}$.

Verify $(A \cup B) \cup C = A \cup (B \cup C)$

Q.29 Draw appropriate Venn diagram for: $(A \cup B)'$.

Q.30 Express the complex number $\left(-2 - \frac{1}{3}i\right)^3$ in the form of $a + ib$.

OR

Evaluate $\left[\frac{1}{1-4i} - \frac{2}{1+i}\right] \left[\frac{3-4i}{5+i}\right]$ to the standard form.

Q.31 Find the expansion of $(3x^2 - 2ax + 3a^2)^3$ using binomial theorem.

SECTION – D

Questions 32 to 35 carry 5 marks each.

Q.32 Find the value of $\tan \pi/8$

Q.33 In how many ways can the letters of the word "COMBINATIONS" be arranged if the :

- (i) Words start with P and end with S,
- (ii) Vowels are all together,

OR

A committee of 7 has to be formed from 8 boys and 4 girls. In how many ways can this be done when the committee consists of:

- (i) Exactly 3 girls?
- (ii) At least 2 girls?

Q.34 Prove that $\cos 2x \cdot \cos \frac{x}{2} - \cos 3x \cdot \cos \frac{9x}{2} = \sin 5x \cdot \sin \frac{5x}{2}$

OR

Prove that: $\sin 5x = 5 \sin x - 20 \sin^3 x + 16 \sin^5 x$.

Q.35 If the letter of word "ZENITH" be arranged in all possible order. What is the rank of word "ZENITH" in English dictionary.

SECTION – E (Case Study Based Questions)

Questions 36 to 38 carry 4 marks each.

Q.36 Read the following text carefully and answer the questions that follow:

One evening, four friends decided to play a card game Rummy. Rummy is a card game that is played with decks of cards. To win the rummy game a player must make a valid declaration by picking and discarding cards from the two piles given. One pile is a closed deck, where a player is unable to see the card that he is picking, while the other is an open deck that is formed by the cards discarded by the players. To win at a rummy card game, the players have to group cards invalid sequences and sets.

In rummy, the cards rank low to high starting with Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, and King. Ace, Jack, Queen, and King each have 10 points. The remaining cards have a value equal to their face value. For example, 5 cards will have 5 points, and so on.



Four cards are drawn from a pack of 52 playing cards, then:

1. In how many ways can four cards are drawn from a pack of 52 playing cards? 1
2. In how many ways can four cards are drawn from a pack of 52 playing cards such that all 4 cards are from same suit? 1
3. In how many ways can four cards are drawn from a pack of 52 playing cards such that 2 cards are Ace? 2

OR

In how many ways can four cards are drawn from a pack of 52 playing cards such that all are club cards?

Q.37 Read the following text carefully and answer the questions that follow:

A class teacher Mamta Sharma of class XI write three sets A, B and C are such that $A = \{1, 3, 5, 7, 9\}$, $B = \{2, 4, 6, 8\}$ and $C = \{2, 3, 5, 7, 11\}$.

1. Write the intersecting of two set A and C? 1
2. Write the condition for two sets A and B to be disjoint? 1
3. Find $A \cap C$. 2

OR

Find $A \cap B$.

Q.38 Read the following text carefully and answer the questions that follow :

The conjugate of a complex number z , is the complex number, obtained by changing the sign of imaginary part of z . It is denoted by $\bar{z}$.

The modulus (or absolute value) of a complex number, $z = a + ib$ is defined as the non - negative real number $\sqrt{a^2 + b^2}$. It is denoted by $|z|$. i.e. $|z| = \sqrt{a^2 + b^2}$

Multiplicative inverse of z is $\frac{\bar{z}}{|z|^2}$. It is also called reciprocal of z . $z\bar{z} = |z|^2$

- 1 If $f(z) = \frac{7-z}{1-z^2}$, where $z = 1 + 2i$, then find $|f(z)|$. 1
- 2 Find the value of $(z + 3)(\bar{z} + 3)$. 1
- 3 If $(x - iy)(3 + 5i)$ is the conjugate of $-6 - 24i$, then find the value of $x + y$. 2

OR

If $z = 3 + 4i$, then find $\bar{z}$.

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 SI unit of physical quantity is Pascal-second. The dimensional formula of this quantity will be
(a) $[ML^{-1}T^{-1}]$ (b) $[ML^{-1}T^{-2}]$ (c) $[ML^2T^{-1}]$ (d) $[ML^{-3}T^0]$
- Q.2 Dimensions of bulk modulus are
(a) $[M^{-1}LT^{-2}]$ (b) $[ML^{-1}T^{-2}]$ (c) $[ML^{-2}T^{-2}]$ (d) $[M^2L^2T^{-1}]$
- Q.3 Velocity-time curve for a body projected vertically upwards is
(a) Ellipse (b) Hyperbola (c) parabola (d) Straight line
- Q.4 A particle starts with an initial velocity of 10m/s along x-direction and accelerates uniformly at the rate of 2m/s^2 The time taken by the particle to reach the velocity of 60m/s is
(a) 6s (b) 3s (c) 30s (d) 25s
- Q. 5 A person can throw a ball up to a maximum range of 100 m. How high above the ground he can throw the same ball?
(a) 25 m (b) 50 m (c) 100 m (d) 200 m
- Q. 6 A cyclist moves in such a way that he takes 60° turn after every 100 metres. What is the displacement when he takes seventh turn?
(a) 100 m (b) 200 m (c) $100\sqrt{3}$ m (d) $100/\sqrt{3}$ m
- Q.7 Same force for the same time for different bodies causes the same change in
(a) Kinetic energy (b) potential energy
(c) Linear momentum (d) angular momentum
- Q.8 If a body is in equilibrium under a set of non-collinear forces, then the minimum number of forces has to be
(a) Four (b) Two (c) Three (d) five
- Q.9 Two bodies of mass m and 4m have equal kinetic energy. What is the ratio of their momentum?
(a) 1:4 (b) 1:2 (c) 1:1 (d) 2:1
- Q.10 When a body moves with constant speed in a circular path, then
(a) Work done will be zero (b) acceleration will be zero
(c) No force acts on the body (d) its velocity remains constant

- Q.11 A couple is acting on a two particle system. The resultant motion will be
 (a) Purely rotational motion (b) purely linear motion
 (c) Both (a) and (b) (d) neither (a) nor (b)
- Q.12 Moment of inertia of an object does not depend upon
 (a) Mass of object (b) mass distribution
 (c) Angular Velocity (d) axis of rotation

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 correct explanation Of Assertion.
 (b) If both Assertion and Reason are true but Reason is not the Correct explanation of Assertion.
 (b) If Assertion is true but Reason is false.
 (D) If both Assertion and Reason are false.
- Q.13 **Assertion.** The size and shape of the rigid body remains unaffected under the effect of external forces.
Reason. The distance between two particles remains constant in a rigid body.
- Q.14 **Assertion.** In an elastic collision between two bodies, the energy of each body is conserved.
Reason. The total energy of an isolated system is conserved.
- Q.15 **Assertion.** A rocket works on the principle of conservation of linear momentum.
Reason. Higher the velocity, smaller is the pressure and vice-versa.
- Q.16 **Assertion.** For a projectile the time of flight of a body becomes n times the original value if its Speed is made n times.
Reason. For a projectile, this is due to the range of the projectile which becomes n times.

Section – B

- Q.17 In the equation: $y = a \sin(bt - kx)$, t and x stand for time and distance respectively. Obtain the dimensional formula for b and k.
- Q.18 The distance x of a particle moving in one dimension, under the action of a constant force is related to time t by the equation, $t = \sqrt{x} + 3$ where x is in metres and t in seconds. Find the displacement of the particle when its velocity is zero.
- Q.19 An aircraft is flying at a height of 3400 m above the ground. If the angle subtended at a ground observation point by the aircraft positions 10 s apart is 30° , what is the speed of the aircraft?
- Q.20 "Friction is necessary evil" comment?

OR

A thief jump from the upper storey of a house with a load on his back. What is the force of the load on his back when the thief is in air? Explain.

- Q.21 State the work-energy theorem. Prove it for constant force?

Section – C

- Q. 22 The frequency " f " of vibration of a stretched string depends upon :
 (i) its length L, (ii) its mass per unit length 'm' and (iii) the tension T in the string.
 Obtain dimensionally an expression for frequency f.
- OR
- Find the value of 100 J on a system which has 20 cm, 250 g and half minute as fundamental units of Length, mass and time.
- Q.23 Deduce the following equations for uniformly accelerated motion by using integration techniques
 (i) $v = u + at$ (ii) $s = ut + \frac{1}{2} at^2$
- Q.24 Two vectors vector A and vector B are inclined to each other at an angle θ . Using triangle law of vector addition, find the magnitude and direction of their resultant.
- Q.25 Why is it easier to pull a lawn roller than to push it? Explain.

- Q.26 A trolley of mass 300 kg carrying a sandbag of 25 kg is moving uniformly with a speed of 27 km/h on a frictionless track. After a while, sand starts leaking out of a hole on the trolley's floor at the rate of 0.05 kg/s. What is the speed of the trolley after the entire sand bag is empty?
- Q.27 Prove that the torque acting on a particle is equal to its rate of change of angular momentum?
- Q.28 A rocket with a lift off mass 20,000 kg is blasted upwards with an initial acceleration of 5m/s. Calculate the initial thrust of the blast.

Section – D

Read the following paragraph and answer the questions that follow:

- Q.29 Every measurement involves errors. The result of a measurement should be reported in a way that indicates the precision of measurement. The reported result is a number that includes all the digits in the number which are known reliably plus the first digit that is uncertain. The reliable digits plus the first uncertain digit are known as significant figures. Significant figures indicate the precision of measurement which, in turn, depends on the least count of the measuring instrument. A choice of change of different units does not change the number of significant figures in a measurement. Only proper significant figures should be retained in reporting measured and computed quantities. Rules for determining the number of significant figures, carrying out arithmetic operations with them, and 'rounding off the uncertain digits.

QUESTIONS (Answer any four of the following questions)

- (i) The significant figures of the number 6.0023 are

(a) 1 (b) 5 (c) 4 (d) 2

- (ii) If $L = 2.331$ cm, $B = 2.1$ cm, then $L + B = ?$

(a) 4.431 cm (b) 4.43 cm (c) 4.4 cm (d) 4 cm

- (iii) The respective number of significant figures for the numbers 23.023, 0.0003 and 2.1×10^{-3} are

(a) 4, 4, 2 (b) 5, 1, 2 (c) 5, 1, 5 (d) 5, 5, 2

- (iv) A student measured the length of a rod and wrote it as 3.50 cm. Which instrument did he use to measure it?

(a) A metre scale

(b) A vernier callipers where the 10 divisions in vernier scale match with 9 divisions in main scale and main scale has 10 divisions in 1 cm

(c) A screw gauge having 100 divisions in the circular scale and pitch as 1 mm

(d) A screw gauge having 50 divisions in the circular scale and pitch as 1 mm

OR

- (iv) The mass of a box measured by a grocer's balance is 2.3 kg. Two gold pieces of masses 20.15 g and 20.17 g are added to the box. What is the total mass of the box and the difference in the masses of the pieces to correct significant figures?

(a) 2.34 kg, 0 g (b) 2.3 kg, 0.02 g (c) 2.34 kg, 0.02 g (d) 2.3 kg, 0 g

- Q.30 A force is conservative (i) if the work done by the force in displacing a body from one point to another is independent of the path followed by the particle and (ii) if the work had done by the force in moving a particle around any closed path is zero. Gravitational force, electrostatic force and elastic force of a spring are all conservative forces. A force F is conservative if it can be defined from the scalar potential energy function $U(x)$ by the relation,

$$F(x) = - dU(x)/dx$$

If the amount of work done in moving an object against a force from one point to another depends on the path along which the body moves, then such a force is called non conservative force.

Forces of friction and viscosity are non-conservative forces.

QUESTIONS (Answer any four of the following questions)

- (i) A particle moves along a curve of unknown shape but magnitude of force F is constant and Always acts along tangent to the curve.

(a) F may be conservative

(b) F must be conservative

(c) F may be non-conservative

(d) F must be non-conservative

- (ii) Which one of the following is not a conservative force?

(a) Gravitational force

(b) Electrostatic force between two charges

(c) Frictional force

(d) Magnetic force between two dipoles

(iii) The potential energy of a body is given by $U = A - Bx^2$ (where x is displacement). The Magnitude of the force acting on the particle is

- (a) Constant (b) proportional to x
(c) Proportional to x^2 (d) inversely proportional to x

(iv) The potential energy of a system increases if work is done

- (a) Upon the system by a non-conservative force
(b) By the system against a conservative force
(c) By the system against a non-conservative force
(d) Upon the system by a conservative force

OR

(iv) A particle is moving in a circular path of radius a under the action of an attractive potential energy $U = -k/2r^2$. Its total energy is

- (a) $-k/4a^2$ (b) $k/2a^2$ (c) zero (d) $-3k/2a^2$

Section – E

Q.31 A projectile is fired with a velocity u making an angle θ with the horizontal. Show that its trajectory is a parabola. Derive expressions for (i) time of maximum height (ii) time of flight (iii) maximum height (iv) horizontal range.

OR

Define centripetal acceleration. Derive an expression for the centripetal acceleration of a particle moving with uniform speed v along a circular path of radius r . Discuss the direction of this acceleration.

Q.32 What do you mean by banking of a curved road? Determine the angle of banking so as to minimise the wear and tear of the tyres of a car negotiating a banked curve.

OR

Define one-dimensional elastic collision between two bodies; find out the final velocities of two bodies after collision.

Q.33 Determine the coordinates of the centre of mass of a right circular solid cone of base radius R and height h .

OR

Derive an expression for the centre of mass of a two particle system.
