Exploring, Learning & Growing-

Home Assignment-2025-26

(A Thoughtful Mix of Study, Play & Values)

Name :_____

Roll No. _____

Grade – XI SCIENCE

Note to Parents and Guardians

1. Marks for these assignments will be included in the Terminal Assessment.
2. Kindly encourage your child to complete the work independently. Gentle support is welcome, but let the learning be child-led.
3. You may use loose sheets for tasks requiring extra space or creativity.
4. The Best Assignment of the Year will be awarded and recognized during school events.

Guidelines for a Balanced and Enriching
Learning Experience at Home

Dear Parents and Guardians

Thank you for being an essential partner in your child's learning journey. Here are a few tips to make the most of this Home Assignment:

Academics and Term I Preparation

- Encourage a daily routine that includes time for reading, writing and activity-based learning.
- Focus on basic and conceptual skills.
- Revise the concepts covered in class as shared through circulars and communication.
- Prepare gradually for the Term I Exam in September — avoid last-minute stress.
- Create a study corner that's well-lit, quiet, and cheerful.

Play & Creative Time

- Ensure your child gets ample free play, which boosts brain development.
- Engage in art and craft using eco-friendly materials.
- Storytelling, singing rhymes and dancing together create joyful bonds.

Seva & Social Responsibility

- Introduce the child to values of compassion and sharing:
- Visit an old age home or Blind Ashram occasionally. Let the child offer fruits, biscuits or a handmade card.
- Encourage small acts of kindness like donating old toys/clothes.
- Explain the importance of Seva (selfless service) through simple examples.

Family Time & Social Visits

- Plan weekend visits to relatives or grandparents to strengthen family ties.
- Share stories from your own childhood — this builds emotional connection and moral learning.

Stay Connected with Teachers

- Don't hesitate to reach out for academic support or even emotional guidance.
- Teachers are here to help — schedule a brief chat during PTMs or via school communication channels.

Final Tips

- Assignments are meant to be child-led. Offer guidance but let the child explore.
- All submissions will be graded and the Best Assignment of the Year will be rewarded.
- Keep things light — learning should be joyful, not stressful

Let's raise not just a student, but a good human being — one kind act, one thoughtful task at a time.

ENGLISH

BBC Compacta
Reading Skills-Practice Assignment (1,2,3) - Pg.No.30-40

Writing Skills - Advertisement writing - Classroom Assignment (15,16,18,19,20) - Pg.No(155-158),(161-166)

Poster Writing - Practice Assignment (12,13)Pg.No 139-141

Speech Writing - Practice Assignment (14,15,16) - Pg.No (205-209)

Project Work
1. Explore the theme of poem 'The Laburnum Top' & create your own poem based on beauty of nature.
2. Create a project based on 'The Portrait of a Lady' focussing on the relationship between author and his grandmother. Write the character sketch of any family member who always inspires you to be a better person.
3. Make a comic strip or creative writing piece inspired by the story of 'The Summer of the beautiful white horse'.
4. Write an email to the Principal of your school proposing new initiatives for your school.

Physical Education

Assignment file on introduction Of Yoga , Any 4 Yoga Asanas (procedure and benefits) and 2 Yogic Kriyas With Their Procedure And Benefits.

PUNJABI

1. ਹੇਠ ਲਿਖੇ ਵਿਸ਼ਿਆਂ ਵਿੱਚੋਂ ਕਿਸੇ ਦੋ ਵਿਸ਼ਿਆਂ ਤੇ ਸੁੰਦਰ ਲਿਖਾਈ ਵਿੱਚ ਕਵਿਤਾ ਲਿਖੋ।

(1) ਪੰਜਾਬੀ ਮਾਂ ਬੋਲੀ
(2) ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ
(3) ਦੇਸੀ ਮਹੀਨੇ
(4) ਰੁੱਤਾਂ ਤੇ ਤਿਉਹਾਰ
(5) ਪੰਜਾਬ ਦੇ ਮੇਲੇ
(6) ਭੁੱਲ ਰਹੇ ਪੰਜਾਬੀ ਮਾਂ ਬੋਲੀ
(7) ਅਧਿਆਪਕ
(8) ਮਾਂ

BIOLOGY

MULTIPLE CHOICE QUESTIONS:-

1. Largest herbarium of India is at
(a) Lloyd Botanical Garden,   (b) National Botanical Garden,
(c) Indian Botanical Garden, Sibpur   (d) Forest Research Institute, Dehradun

2. A condition in which internal environment of the body remains constant is
(a) Hematoma   (b) Haemopoiesis   (c) Homeostasis   (d) Hemostasis

3. Which one is taxonomic aid for identification of plants and animals based on similarities and dissimilarities
(a) Flora   (b) Keys   (c) Monographs   (d) Catalogues

4. nigrum is one species of genus
(a) Mangifera   (b) Solanum   (c) Triticum   (d) Pisum

5. Black rot of crucifers is caused by a:
(a) Fungus   (b) Bacterium   (c) virus   (d) None of these.

6. Pusa Komal variety of cow pea is resistant to disease:
(a) Hill bunt   (b) White rust   (c) Leaf curl   (d) Bacterial blight

7. Due to which of the following organisms, yield of rice is increased?
(a) Sesbania   (b) Bacillus popilliae   (c) Anabaena   (d) Bacillus subtilis

8. Which of the following kingdoms includes unicellular eukaryotes?
(a) Monera   (b) Fungi   (c) Protista   (d) Plantae

9. How many organisms in the list given below are autotrophs?
Lactobacillus, Nostoc, Chara, Nitrosomonas, Nitrobacter, Streptomyces, Saccharomyces, Trypanosoma, Porphyra, Wolffia.
(a) Four   (b) Five   (c) Six   (d) Three

10.Yellow-green pigment is found in
(a) Xanthophyta   (b) Chlorophyta   (c) Phaeophyta   (d) Rhodophyta

11. Mannitol is the stored food in :
(a) Chara   (b)Porphyra   (c)Fucus   (d)Gracillaria

12. Which one of the following has haplontic life cycle ?
(a) Funaria   (b) Polytrichum   (c) Ustilago   (d) Wheat

13. Which one of the following plants is monoecious ?
(a) Marchantia   (b) Pinus   (c) Cycas   (d) Papaya

14. Which one is the wrong pairing for the disease and its causal organism?
(a) Late blight of potato-Alternaria solani   (b) Black rust of wheat-Puccinia graminis
(c) Loose smut of wheat-Ustilago nuda   (d) Root-knot of   vegetables-Meloidogyne sp

15 . Which one of the following is a vascular cryptogam?
(a) Ginkgo   (b) Equisetum   (c) Marchantia   (c) Cedrus

16. Replum is present in the ovary of flower of :
(a) Sunflower   (b) Pea   (c) Lemon   (d) Mustard

17. Thorn of Bougainvillea and tendril of Cucurbita are examples of
a) Vestigial organs   (b) Retrogressive evolution   (c) Analogous organs (d) Homologous organs

18. Dry indehiscent single-seeded fruit formed from bicarpellary syncarpous inferior ovary is :
(a) Berry   (b) Cremocarp   (c) Caryopsis   (d) Cypsella

19. The fleshy receptacle of syconous of fig encloses a number of:
(a) Berries   (b) Mericarps   (c) Achenes   (d) Samaras

20. Pneumatophores are present in
(a) Xerophytes   (b) Hygrophytes   (c) Mesophytes   (d) Halophytes

ASSERTION/ REASON
A. Both assertion and reason are true, and reason is the correct explanation of assertion.
B.Both assertion and reason are true, but reason is not the correct explanation of assertion.
c.Assertion is true but reason is false.
D. Both assertion and reason are false.
1. ASSERTION:-Leaves are pinnately arrange in poppy plant
REASON:-incisions are less than half way from margin to Madrib.

2. ASSERTION:- Parthenocarpy involves formation of seedless fruits
REASON:-apomixis occurs without fertilisation

3. ASSERTION:-Red algae contribute in producing coral reefs
REASON:-some red algae secret and deposit calcium carbonate over their cell wall.

4. ASSERTION:-cyanobacteria is the new name for myxophyceae or blue green algae.
REASON:-Brown algae is the new name for chlorophyceae.

5. ASSERTION:-Plant manufactures food only during the daytime.
REASON:- During day time metabolism is high.

ANSWER THE FOLLOWING QUESTIONS:-
1. Algae are known to reproduce asexually by a variety of spores under different environmental
conditions. Name these spores and the conditions under which they are produced
2. Biological classification is a dynamic and ever evolving phenomena which keeps changing with our
understanding of life forms. justify the statement taking any two examples.

3. 'Zoological parks are centre for recreation and education'. comments.

4. Explain the structure of bacteriophage.

5. Gametophyte is a dominant phase in the life cycle of bryophyte. Explain.

6. Draw well labelled diagram of   i)female and male Thallus of liverwort
ii) Gametophyte and sporophyte of in Funaria

7. Justify the following statement on the basis of external features:
a)Underground parts of a plant are not always roots.
b) Flower is a modified shoot.

8. Seeds of some plants germinate immediately after shedding from the plants while in other plants they require a period of rest before germination. The lateral phenomena is called dormancy. Give the reasons for seed dormancy and some methods to break it.

9. 'Sunflower is not a flower'. explain.

10. Classify the plant Kingdom
PROJECT
1. To prepare project of 35-40 pages on the topic already discussed It should include:
• Cover page
• Index
• Acknowledgement
• Introduction
• Details about the project
• Bibliography

PRACTICAL FILE:- Complete Your Practical File.
NOTE :-Complete Your Notes.   Complete Your Practical File.   Learn Full Syllabus

CHEMISTRY

I.MULTIPLE CHOICE QUESTIONS
1) A chemical equation is balanced according to the law
(a) Definite proportion   (b) Multiple proportion   (c) Avogadro Law   (d) Conservation of mass

2) 1 amu is equal to
(a) 1.008 g   (b) 0.00059 g   (c) 1.66×10^{-24} g   (d) 6.023×10^{23} g

3) Which of the following contain highest number of molecules
(a) 7 g N_2 (b) 4 g H_2 (c) 8 g O_2 (d) 71 g Cl_2

4) The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. What will be the molecular formula of the compound?
(a) CH_3COOH (b) HCHO   (c) CH_3OH (d)$C_6H_{12}O_6$

5) Which of the following is dependent on temperature?
(a) Molarity   (b) Molality   (c) Mole fraction   (d) Mass percentage

6) Which one of the following is not equal with 1 mol O_2
(a) 16 g Oxygen   (b) NA no of molecules of O_2 (c) 22.4 L of Oxygen gas   (d) None of these

7) One Gram Molecule of Benzene is equal to
(a) 72 g Benzene   (b) 18 g Benzene   (c) 76 g of Benzene   (d) 78 g Benzene

8) A compound was found to contain Nitrogen and Oxygen in the ratio 28 g and 80 g.
The formula of the compound is
(a) NO   (b) NO2   (c) N2O5   (d) N2O3

9) If the concentration of glucose ($C_6H_{12}O_6$) in blood is 0.9 g/L, molarity of glucose in blood?
a) 5M   b) 50 M   c) 0.005 M   d) 0.5

10)Which expression represents de Broglie relationship:
a) h/mv = p   b) λ = h/mv   c) λ = h/mp   d) λm = v/p

11. Which of the following series of transitions in the spectrum of hydrogen falls in visible region ? a) Paschen series b) Lyman series.   d) Balmer series   d) Brackett series

12. Rutherford's gold foil experiment drew the following conclusion:
a) mass of the atom is assumed to be uniformly distributed over the atom
b) an atom possesses a spherical shape in which the positive charge is uniformly distributed
c) most of the space in the atom is empty
d) none of these

II.SHORT ANSWER TYPE QUESTIONS:

(1) Differentiate between molarity and molality.
(2) Convert into mole. (i) 5.6 L of CO_2 at STP (ii) 1023 atoms of Na
(3) Give one example each of a molecule in which empirical formula and molecular formula are (i) same (ii) Different.
(4) How many moles of methane are required to produce 22g CO_2 (g) after combustion?
(5) Calculate the molarity of NaOH in the solution prepared by dissolving its 4 g in enough water to form 250 mL of the solution.

III. SHORT TYPE QUESTIONS CARRYING
(1) A compound on analysis was found to contain C = 34.6%, H = 3.85% and O = 61.55%.
Calculate the empirical formula.

(2) What is the percentage of carbon, Hydrogen and oxygen in ethanol?

(3) What do mean by molarity. Calculate the molarity of Noah in the solution prepared by dissolving its 4 g in enough water to form 250 mL of the solution.

4. a) Write de Broglie equation. b) What will be the wavelength of a ball of mass 0.1 kg moving with a velocity of 10 meter per second? Given: Planck's constant (h) = 6.626 x10-34 Js.

5. State two postulates of Bohr model of atom and it's any two limitations.

6. a. Why do we observe large number of spectral lines in hydrogen sample? b. Which series of hydrogen spectrum lies in the visible region? c. Differentiate Absorption and Emission Spectra? d. State first five series of lines in hydrogen spectrum. e. Write Rydberg formula for line spectrum of hydrogen atom. 7. Write Major postulates of Rutherford Atomic model. What was its major drawback?

IV. ASSERTION-REASONING QUESTIONS

These consist of two statements – Assertion (A) and Reason (R).
 Answer these questions selecting the appropriate option given below:
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true and R is not the correct explanation of A
(c) A is true but R is false
(d) A is False but R is true

1. Assertion- All isotopes of a given element show the same type of chemical behaviour.
Reason- The chemical properties of an atom are controlled by the number of electrons in the atom.

2. Assertion-Rutherford postulated that electrons revolve around nucleus in fixed circular paths.
 Reason- As long as electron moves in its orbit, it does not loose or gain energy.

3. Assertion- It is impossible to determine the exact position and exact momentum of an electron simultaneously.
Reason -The path of an electron in an atom is clearly defined.

4. Assertion- No two electrons in an atom can have same values of all four Quantum numbers.
Reason- An orbital cannot hold more than two electrons which should have opposite spin.

V. CASE BASED QUESTIONS

1. Nature of matter was proposed by the de Broglie in 1923. It was experimentally verified by Davisson in Germer by diffraction experiment .Wave character of matter has significance only for microscopic particles de Broglie hypothesis suggested that electron waves were being diffracted by target, much as X rays are diffracted by planes of atoms.

1. Write the expression to calculate the de Broglie wavelength.
2. According to de Broglie formula, calculate mass of a microscopic particle of wavelength 3.6×10^{-6}m and moving at a velocity of 100 cm per second.
3. According to de Broglie, matters exhibits dual behaviour that is both particle like and wave like properties. How a cricket ball of mass 100 gram does not move like a way when it is thrown by a bowler at is speed of 100 km per hour. Calculate the wavelength of the ball and explain why it do not show wave nature.

4. Calculate the momentum of a particle having de Broglie wavelength of 0.1nm. (Given $h=6.62 \times 10^{-34}$Js)
 a. 6.62×10^{-24}kgm/s   b. 6.62×10^{-14}kgm/s   c. 6.62×10^{-34}kgm/s   d. None of the above.

**Note:- Learn NCERT questions and answers related to topic mentioned in curriculum.
Complete the practical file as per given instructions.**

NUMERICAL ASSIGNMENT – MOTION IN ONE DIMENSION

1. The displacement x of a particle at time t a log a straight line is given by $x = \alpha - \beta t + \gamma t^2$. Find the acceleration of the particle.   (Ans. 2γ)

2. The displacement x of a particle is dependent on time t according to the relation: $x = 3 - 5t + 2t^2$. If t is measured in seconds and x in metres, find its (i) velocity at t = 2s and (ii) acceleration at t = 4s.
                                                                                          [Ans. (i) $3ms^{-1}$ (ii) $4ms^{-2}$]

3. The displacement x of a particle along X-axis is given by $x = 3 + 8t + 7t^2$. Obtain its velocity and acceleration at t = 2s.   (Ans. $36\ ms^{-1}$, $14\ ms^{-2}$)

4. The distance traversed by a particle moving along a straight line is given by $x = 180t + 50t^2$ metre. Find :

(i) the initial velocity of the particle

(ii) the velocity at the end of 4s and

(iii) the acceleration of the particle.   [Ans. (i) $180\ ms^{-1}$ (ii) $580\ ms^{-1}$ (iii) $100\ ms^{-2}$]

5. A race car accelerates on a straight road from rest to a speed of 180 kmh^{-1} in 25 s. Assuming uniform acceleration of the car throughout, find the distance covered in this time.   (Ans. 625 m)

6. A bullet travelling with a velocity of 16 ms^{-1} penetrates a tree trunk and comes to rest in 0.4 m. Find the time taken during the retardation.   (Ans. 0.05 s)

7. A car moving along a straight highway with a speed of 72 kmh^{-1} is brought to a stop within a distance of 100 m. What is the retardation of the car and how long does it take for the car to stop ?   (Ans. 2 ms^{-2}, 10s)

8. On turning a comer a car driver driving at 36 kmh^{-1}, finds a child on the road 55 m ahead. He immediately applies brakes, so as to stop within 5 m of the child. Calculate the retardation produced and the time taken by the car to stop.   (Ans. 1 ms^{-2}, 10s)

9. The reaction time for an automobile driver is 0.6 s. If the automobile can be decelerated at 5 ms^{-2}, calculate the total distance travelled in coming to stop from an initial velocity of 30 kmh^{-1}, after a signal is observed.   (Ans. 11.94 m)

10. A car starts from rest and accelerates uniformly for 10 s to a velocity of 8 ms^{-1}. It then runs at a constant velocity and is finally brought to rest in 64 m with a constant retardation. The total distance covered by the car is 584 m. Find the value of acceleration, retardation and total time taken.
                                                                          (Ans. 0.8 ms^{-2}, 0.5 ms^{-2}, 86 s)

11. Two trains -one travelling at 72 kmh^{-1} and other at 90 kmh^{-1} are heading towards one another along a straight level track. When they are 1.0 km apart, both the drivers simultaneously see the other's train and apply brakes which retard each train at the rate of 1.0 ms^{-2}. Determine whether the trains would collide or not.   (Ans. No)

12. A burglar's car had a start with an acceleration of 2 ms^{-2}. A police vigilant party came after 5 seconds and continued to chase the burglar's car with a uniform velocity of 20 ms^{-1}. Find the time in which the police van overtakes the burglar's car.   (Ans. 5 s)

13. A ball rolls down an inclined track 2 m long in 4 s. Find (i) acceleration (ii) time taken to cover the second metre of the track and (iii) speed of the ball at the bottom of the track.

                                                                          [Ans. (i) 0.25 ms^{-2} (ii) 1.17 s (iii) 1 ms^{-1}]

14. A bus starts from rest with a constant acceleration of 5 ms^{-2}. At the same time a car travelling with a constant velocity of 50 ms^{-1} overtakes and passes the bus. (i) Find at what distance will the bus overtake the car ? (ii) How fast will the bus be travelling then ?

[Ans. (i) 1000 m (ii) 100 ms^{-1}]

15. A body starting from rest accelerates uniformly at the rate of 10 cms^{-2} and retards uniformly at the rate of 20 cms^{-2}. Find the least time in which it can complete the journey of 5 km if the maximum velocity attained by the body is 72 kmh^{-1}. (Ans. 400 s)

16. A body covers a distance of 20 m in the 7th second and 24 m in the 9th second. How much shall it cover in 15th s ? (Ans. 36 m)

17. A body covers a distance of 4 m is 3rd second and 12 m in 5th second. If the motion is uniformly accelerated, how far will it travel in the next 3 seconds ? (Ans. 60 m)

18. An object is moving with uniform acceleration. Its velocity after 5 seconds is 25 ms^{-1} and after 8 seconds, it is 34 ms^{-1}. Find the distance travelled by the object in 12th second.

(Ans. 44.5 m)

19. A stone is thrown vertically upwards with a velocity of 4.9 ms^{-1}. Calculate (i) the maximum height reached (ii) the time taken to reach the maximum height (iii) the velocity with which it returns to the ground and (iv) the time taken to reach the ground. [Ans. (i) 1.225 m (ii) 0.5 s (iii) 4.9 ms^{-1} (iv) 1 s]

20. A stone thrown upwards from the top of a tower 85 m high, reaches the ground in 5 s. Find (i) the greatest height above the ground (ii) the velocity with which it reaches the ground and (iii) the time taken to reach the maximum height. Take g = 10 ms^{-2}. [Ans (i) 88.2 m (ii) 42 ms^{-1} (iii) 0.8 s]

21. From the top of a multi-storeyed building, 39.2 m tall, a boy projects a stone vertically upwards with an initial velocity of 9.8 ms^{-1} such that it finally drops to the ground, (i) When will the stone reach the ground ? (ii) When will it pass through the point of projection ? (iii) What will be its velocity before striking the ground ? Take g = 9.8 ms^{-2}. (Ans. 4s, 2s, 29.4 ms^{-1})

22. A rocket is fired vertically from the ground with a resultant vertical acceleration of 10 ms^{-2}. The fuel is finished in 1 minute and it continues to move up. What is the maximum height reached ? (Ans. 36.4 km)

23. A balloon is ascending at the rate of 14 ms^{-1} at a height of 98 m above the ground when the food packet is dropped from the balloon. After how much time and with what velocity does it reach the ground ? Take g = 9.8 ms^{-2}. (Ans. 6.12s, 45.98 ms^{-1})

24. A stone is dropped from a balloon rising upwards with a velocity of 16 ms^{-1}. The stone reaches the ground in 4 s. Calculate the height of the balloon when the stone was dropped. (Ans. 14.4 m)

25. From.the top of a tower 100 m in height a ball is dropped and at the same time another ball is projected vertically upwards from the ground with velocity of 25 ms^{-1}. Find when and where the two balls will meet. Take g = 9.8 ms^{-2}. (Ans. 78.4 from top, 4 s)

26. A body is dropped from rest at a height of 150 m, and simultaneously, another body is dropped from rest from a point 100 m above the ground. What is their difference in height after they have fallen (i) 2 s (ii) 3s? How does the difference in height vary with time ? Take g = 10 ms^{-2}.

(Ans. 50 m, difference in height remains constant at 50 m)

27. A body falling freely under gravity passes two points 30 m apart in Is. Find from what point above the upper point it began to fall ? Take g = 9.8 ms^{-2}. (Ans. 32.1 m)

28. Four balls are dropped from the top of a tower at intervals of one-one second. The first ball reaches the ground after 4 s of dropping. What are the distances between first and second, second and third, third and fourth balls at this instant ?   (Ans. 34.3 m, 24.5 m, 14.7 m)

29. Figure shows the position-time graphs of three cars A, B and C. On the basis of the graphs, answer the following questions:

(i)   Which car has the highest speed and which the lowest?
(ii) Are the three cars ever at the same point on the road?
(iii) When A passes C, where is B?
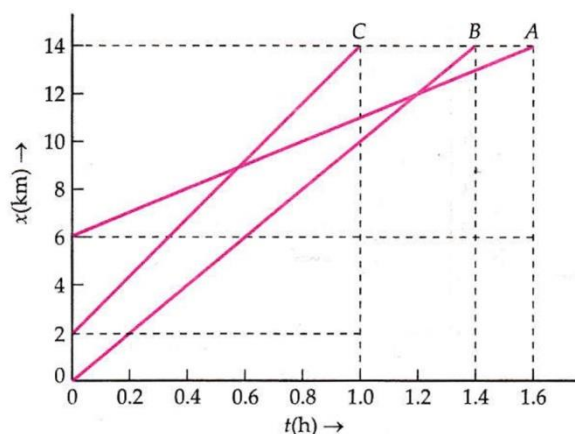
(iv) How far did car A travel between the time it passed cars B and C?
(v) What is the relative velocity of car C with respect to car A?
(vi) What is the relative velocity of car B with respect to car C?

[Ans. (i) C has the highest speed and A has the lowest speed (ii) No (in) 6 km from the origin (iv) 3 km iii) 7 kmh^{-1} (vi) - 2 kmh^{-1}]

30. An insect crawling up a wall crawls 5 cm upwards in the first minute but then slides 3 cm downwards in the next minute. It again crawls up 5 cm upwards in the third minute but again slides 3 cm downwards in the fourth minute. How long will the insect take to reach a crevice in the wall at a height of 24 cm from its starting point? How does the position-time graph of the insect look like?   (Ans. 21 min)

31. A driver of a car travelling at 52 km h^{-1} applies the brakes and decelerates uniformly. The car stops in 5 seconds. Another driver going at 34 kmh^{-1} applies his brakes slower and stops after 10 seconds. On the same graph paper, plot the speed versus time graph for two cars. Which of the two cars travelled farther after the brakes were applied?   (Ans. Second car travelled farther)

32. A motor car, starting from rest, moves with uniform acceleration and attains a velocity of 8 ms^{-1} in 8 s. It then moves with uniform velocity and finally brought to rest in 32 m under uniform retardation. The total distance covered by the car is 464 m. Find iii the acceleration (ii) the retardation and (III) the total time taken.   [Ans. (i) 1 ms^{-2} (ii) 1 ms^{-2} (iii) 66 s]

33. Starting from rest a car accelerates uniformly with 3 ms^{-2} for 5 s and then moves with uniform velocity. Draw the distance-time graph of the motion of the car upto t = 7s.

34. The velocity-time graph of an object moving along a straight line is as shown in fig. Find the net distance covered by the object in time interval between t = 0 to t = 10 s. Also find the displacement in time 0 to 10 s.   (Ans. 100 m, 60 m)
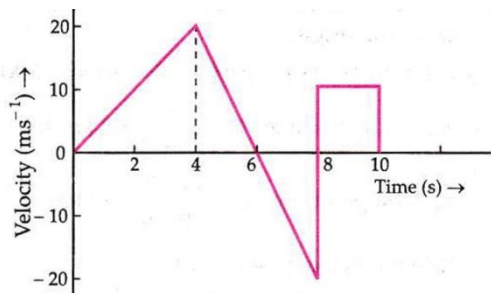
35. As soon as a car just starts from rest in a certain direction, a scooter moving with a uniform speed overtakes the car. Their velocity-time graphs are shown in Fig.. Calculate the difference
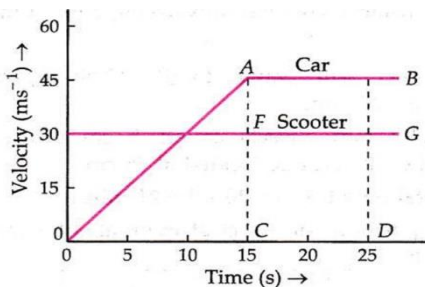
between the distances travelled by the car and the scooter in 15 s (ii) the time when the car will catch up the scooter and (iii) the distance of car and scooter from the starting point at that instant.

[(Ans. (i) 112.5 m (ii) 22.5 s (iii) 675 m]

36. The velocity-time graph of an object moving along a straight line is as shown below :
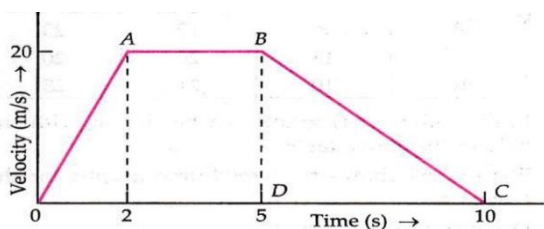
Calculate the distance covered by object between : iii t=0 to t=5s (ii) t = 0tof = 10s.

[Ans. (i) 80 m (ii) 130 m]

Note: Write The Following Practicals On Practical Note Book Section Wise

Section A

1. Two measure diameter of a small spherical/ cylindrical body using vernier calliper.
2. To measure internal diameter and depth of a given beaker/ calorimeter using vernier callipers and hence find its volume.
3. To measure the diameter of a given wire using a screw gauge.
4. To measure thickness of a given sheet using screw gauge.
5. To measure radius of curvature of given spherical surface by a spherometer
6. using a simple pendulum, plot L-T and L- T² graphs.Hence find the effective length of the second 's pendulum using appropriate graphs.

Section B

1. To find the force constant of a helical spring by plotting a graph between load and extension.

MULTIPLE CHOICE QUESTIONS

CHAPTER – 2 RELATIONS AND FUNCTIONS

Q1. If $A = \{1, 2, 4\}, B = \{2, 4, 5\}, C = \{2, 5\}$, then $(A - B) \times (B - C)$ is

(a) $\{(1, 2), (1, 5), (2, 5)\}$ (b) $\{(1, 4)\}$ (c) $(1, 4)$ (d) none of these

Q2. If R is a relation on the set $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ given by $xRy \Leftrightarrow y = 3x$, then R is

(a) $\{(3, 1), (6, 2), (8, 2), (9, 3)\}$ (b) $\{(3, 1), (6, 2), (9, 3)\}$

(c) $\{(3, 1), (2, 6), (3, 9)\}$ (d) none of these

Q3. Let $A = \{1, 2, 3\}, B = \{1, 3, 5\}$. If relation R from A to B is $R = \{(1, 3), (2, 5), (3, 3)\}$. Then R^{-1} is

(a) $\{(3, 3), (3, 1), (5, 2)\}$ (b) $\{(1, 3), (2, 5), (3, 3)\}$ (c) $\{(1, 3), (5, 2)\}$ (d) none of these

Q4. If $A = \{1, 2, 3\}, B = \{1, 4, 6, 9\}$ and R is a relation from A to B defined by 'x is greater than y'. The range of R is

(a) $\{1, 4, 6, 9\}$ (b) $\{4, 6, 9\}$ (c) $\{1\}$ (d) none of these

Q5. If $R = \{(x, y) : x, y \in Z, x^2 + y^2 \leq 4\}$ is a relation on Z, then domain of R is

(a) $\{0, 1, 2\}$ (b) $\{0, -1, -2\}$ (c) $\{-2, -1, 0, 1, 2\}$ (d) none of these

Q6. A relation R from $\{2, 3, 4, 5\}$ to $\{3, 6, 7, 10\}$ is defined as $xRy \Leftrightarrow x$ is relatively prime to y. Then domain of R is

(a) $\{2, 3, 5\}$ (b) $\{3, 5\}$ (c) $\{2, 3, 4\}$ (d) $\{2, 3, 4, 5\}$

Q7. Let R be a relation on N defined by $x + 2y = 8$, then domain of R is

(a) $\{2, 4, 8\}$ (b) $\{2, 4, 6, 8\}$ (c) $\{2, 4, 6\}$ (d) $\{1, 2, 3, 4\}$

Q8. If R is a relation from a finite set A having m elements to a finite set B having n elements, then the number of relations from A to B is

(a) 2^m (b) $2^m - 1$ (c) $2mn$ (d) m^n

Q9. Domain of $\sqrt{a^2 - x^2}$, $a > 0$ is given by

(a) $(-a, a)$ (b) $[-a, a]$ (c) $[0, a]$ (d) $(-a, 0]$

Q10. The range of $f(x) = 1 - |x - 2|$ is

(a) $[1, \infty)$ (b) $(-\infty, 1]$ (c) $(-\infty, 1)$ (d) $(1, \infty)$

Q11. If $f(x) = x^2 - 3x + 1$ and $f(2\alpha) = 2f(\alpha)$ then α is equal to

(a) $\dfrac{1}{\sqrt{2}}$ (b) $-\dfrac{1}{\sqrt{2}}$ (c) $\dfrac{1}{\sqrt{2}}$ or $-\dfrac{1}{\sqrt{2}}$ (d) none of these

Q12. If $f(x) = 4x - x^2$ then $f(a+1) - f(a-1)$ is equal to

(a) $4(2 - a)$ (b) $2(4 - a)$ (c) $2(4 + a)$ (d) $2(4 + a)$

Q13. Let $A = \{1, 2, 3\}$, $B = \{2, 3, 4\}$, then which of the following is a function from A to B?

(a) $\{(1,2),(1,3),(2,3),(3,3)\}$ (b) $\{(1,3),(2,4)\}$

(c) $\{(1,3),(2,2),(3,3)\}$ (d) $\{(1,2),(2,3),(3,2),(3,4)\}$

Q14. If $f: Q \to Q$ is defined as $f(x) = x^2$, then $f^{-1}(9)$ is equal to

(a) 3 (b) -3 (c) $\{-3, 3\}$ (d) ϕ

Q15. If $2f(x) - 3f\left(\dfrac{1}{x}\right) = x^2$, $x \neq 0$, then $f(2)$ is equal to

(a) $-\dfrac{7}{4}$ (b) $\dfrac{5}{2}$ (c) -1 (d) none of these

Q16. Let $f: R \to R$ be defined by $f(x) = 2x + |x|$. Then $f(2x) + f(-x) - f(x)$ is equal to

(a) $2x$ (b) $2|x|$ (c) $-2x$ (d) $-2|x|$

Q17. If $f(x) = \dfrac{\sin^4 x + \cos^2 x}{\sin^2 x + \cos^4 x}$ for $x \in R$, then value of $f(2019)$ is

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

Q18. Let $A = \{x \in R : x \neq 0, -4 \leq x \leq 4\}$ and $A = \{x \in R : x \neq 0, -4 \leq x \leq 4\}$ $f : A \to R$ be defined as $f(x) = \frac{|x|}{x}$ for all $x \in A$. Then A is

(a) $\{-1, 1\}$　　　　(b) $\{x : 0 \leq x \leq 4\}$　　(c) $\{1\}$　　(d) $\{x : -4 \leq x \leq 0\}$

Q19. If $f : R \to R$ and $g : R \to R$ are defined by $f(x) = 2x + 3$ and $g(x) = x^2 + 7$, then the values of x such that $g(f(x)) = 8$ are

(a) $1, 2$　　　　(b) $-1, 2$　　　　(c) $-1, -2$　　　　(d) $1, -2$

Q20. If $f : R \to R$ be given by $f(x) = \frac{4^x}{4^x + 2}$ for all $x \in R$. Then,

(a) $f(x) = f(1-x)$　(b) $f(x) + f(1-x) = 0$　(c) $f(x) + f(1-x) = 1$　(d) $f(x) + f(x-1) = 1$

Q21. The domain of the function $f(x) = \sqrt{2 - 2x - x^2}$ is

(a) $\left[-\sqrt{3}, \sqrt{3}\right]$　　(b) $\left[-1-\sqrt{3}, -1+\sqrt{3}\right]$　　(c) $[-2, 2]$　(d) $\left[-2-\sqrt{3}, -2+\sqrt{3}\right]$

Q22. The domain of the function $f(x) = \sqrt{x-1} + \sqrt{3-x}$ is

(a) $[1, \infty)$　　　　(b) $(-\infty, 3)$　　　　(c) $(1, 3)$　　　　(d) $[1, 3]$

Q23. The range of the function $f(x) = \frac{x+2}{|x+2|}, x \neq -2$ is

(a) $\{-1, 1\}$　　　　(b) $\{-1, 0, 1\}$　　　　(c) $\{1\}$　　　　(d) none of these

Q24. The range of the function $f(x) = \frac{1}{1 - 2\cos x}$ is

(a) $\left[\frac{1}{3}, 1\right]$　　　(b) $\left[-1, \frac{1}{3}\right]$　　　(c) $(-\infty, -1) \cup \left[\frac{1}{3}, \infty\right)$　　(d) $\left[-\frac{1}{3}, 1\right]$

ANSWERS

1.b	2.d	3.a	4.c	5.c	6.d	7.c
8.a	9.b	10.a	11.c	12.a	13. c	14.c
15.a	16.b	17.a	18.a	19.c	20.c	21.b
22.d	23.a	24.b				

MULTIPLE CHOICE QUESTIONS

CHAPTER – 1 SETS

Q1. Let A and B be two sets in the same universal set. Then, $A - B =$

(a) $A \cap B$ (b) $A' \cap B$ (c) $A \cap B'$ (d) none of these

Q2. The number of subsets of a set containing n elements is

(a) n (b) $2^n - 1$ (c) n^2 (d) 2^n

Q3. Let A and B be two sets in the same universal set. Then, $A \cap (A \cup B) =$

(a) A (b) B (c) ϕ (d) none of these

Q4. If A and B are two given sets, then $A \cap (A \cap B)'$ is equal to

(a) A (b) B (c) ϕ (d) $A \cap B'$

Q5. If $A = \{x : x \text{ is a multiple of } 3\}$ and $B = \{x : x \text{ is a multiple of } 5\}$, then $A - B$ is

(a) $A \cap B$ (b) $A \cap \bar{B}$ (c) $\bar{A} \cap \bar{B}$ (d) $(A \cap B)'$

Q6. For any two sets A and B, $A \cap (A \cup B)'$ is equal to

(a) A (b) B (c) ϕ (d) $A \cap B$

Q7. If $A = \{1, 2, 3, 4, 5\}$, then the number of proper subsets of A is

(a) 120   (b) 30   (c) 31   (d) 32

Q8. Which of the following is an empty set?

(a) $\{x : x \in R, x^2 - 1 = 0\}$ (b) $\{x : x \in R, x^2 + 1 = 0\}$

(c) $\{x : x \in R, x^2 - 4 = 0\}$ (d) $\{x : x \in R, x^2 - x - 2 = 0\}$

Q9. If $A = \{1, 3, 5, 7, 9, 11, 13, 15, ., 17\}$, $B = \{2, 4, 6, ..., 18\}$ and N is the universal set, then $A' \cup [(A \cup B) \cap B']$ is

(a) A (b) B (c) N (d) $A' \cup B'$

Q10. If A and B are two non empty sets, then $(A - B) \cup (B - A)$ equals

(a) $(A \cup B) - B$ (b) $A - (A \cap B)$ (c) $(A \cup B) - (A \cap B)$ (d) $(A \cap B) \cup (A \cup B)$

Q11. Two finite sets have m and n elements. The total number of subsets of the first set is 48 more than the total number of subsets of the second set. The value of m and n are

(a) 7,6   (b) 6,3   (c) 6,4   (d) 7,4

Q12. If $A = \{(x, y) : x^2 + y^2 = 25\}$ and $B = \{(x, y) : x^2 + 9y^2 = 144\}$, the $A \cap B$ contains

(a) one point   (b) three points   (c) two points   (d) four points

Q13. Let A and B be two sets such that $n(A) = 16, n(B) = 14, n(A \cup B) = 25$, Then, $n(A \cap B)$ is

(a) 30   (b) 50   (c) 5   (d) none of these

Q14. Let U be the universal set containing 700 elements. If A, B are subsets of U such that $n(A) = 200, n(B) = 300, n(A \cap B) = 100$, then $n(A' \cap B')$ is

(a) 400   (b) 600   (c) 300   (d) none of these

Q15. In a city 20% of the population travels by car, 50% travels by bus and 10% travels by both car and bus. The, persons travelling by car or bus is

(a) 80%   (b) 40%   (c) 60%   (d) 70%

Q16. In a class of 175 students the following data shows the number of students opting one or more subjects. Mathematics 100 ; Physics 70; Chemistry 40; Mathematics and Physics 30; Mathematics and Chemistry 28 ; Physics and Chemistry 23; Mathematics, Physics and Chemistry 18. How many students have offered Mathematics alone?

(a) 35   (b) 48   (c) 60   (d) 22

Q17. In a college of 300 students, every student reads 5 newspapers and every newspaper by 60 by students. The no. of newspapers is

(a) at least 30   (b) at most 20   (c) exactly 25   d) none of these

Q18. Out of 800 boys in a school, 224 played cricket, 240 played hockey and 336 played basketball. Of the total, 64 played both basketball and hockey; 80 played cricket basketball and hockey; and 24 played all the three games. The number of boys who did not play any game is

(a) 128   (b) 216   (c) 240   (d) 160

Q20. If $\cos x = -\dfrac{1}{2}$ and $o < x < 2\pi$, then the solutions are

(a) $x = \dfrac{\pi}{3}, \dfrac{4\pi}{3}$ (b) $x = \dfrac{2\pi}{3}, \dfrac{4\pi}{3}$ (c) $\dfrac{2\pi}{3}, \dfrac{7\pi}{3}$ (d) $x = \dfrac{2\pi}{3}, \dfrac{5\pi}{3}$

Q21. The equation $3\cos x + 4\sin x = 6$ has _____ solution.

(a) finite   (b) infinite   (c) one   (d) no

Q22. If $\cos\theta + \sqrt{3}\sin\theta = 2$, then θ is equal to

(a) $\dfrac{\pi}{3}$ (b) $\dfrac{2\pi}{3}$ (c) $\dfrac{4\pi}{3}$ (d) $\dfrac{5\pi}{3}$

Q23. The number of values of x in $[0, 2\pi]$ that satisfy the equation $\sin^2 x - \cos x = \dfrac{1}{4}$

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

Q24. The general solution of the equation $7\cos^2\theta + 3\sin^2\theta = 4$ is

(a) $\theta = 2n\pi \pm \dfrac{\pi}{6}$, $n \in Z$ (b) $\theta = 2n\pi \pm \dfrac{2\pi}{3}$, $n \in Z$

(c) $\theta = n\pi + \dfrac{\pi}{3}$, $n \in Z$ (d) $\theta = n\pi - \dfrac{\pi}{3}$, $n \in Z$

Q25. The smallest positive angle which satisfies the equation $2\sin^2\theta + \sqrt{3}\cos\theta + 1 = 0$ is

(a) $\dfrac{5\pi}{6}$ (b) $\dfrac{2\pi}{3}$ (c) $\dfrac{\pi}{3}$ (d) $\dfrac{\pi}{6}$

ANSWERS

1.b   2.a   3.b   4.b   5.c   6.b   7.a   8.d   9.c   10.c   11.d   12.d   13.d

14.b   15.d   16.c   17.b   18.d   19.b   20.b   21.d   22.a   23.b   24.d   25.a