Class –X
Pre-Board I Examination
(2024-2025)
Science

RIMT WORLD SCHOOL

Date: 28.11.24 **M.M: 80**
Time: 3 Hr **Roll No.:**

General Instructions:

i. This question paper consists of 39 questions in 5 sections.
ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
iii. Section A consists of 20 objective type questions carrying 1 mark each.
iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
vii. Section E consists of 3 case study based questions of 04 marks each with sub-parts.

Section-A

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20.

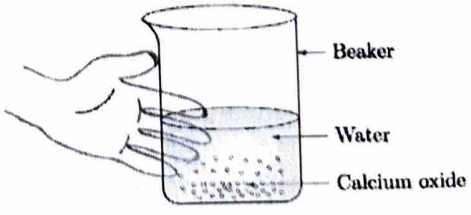
1. Ankit observed that the stain of curry on a white shirt becomes reddish-brown when soap is scrubbed on it,.but it turns yellow again when the shirt is washed with plenty of water. What might be the reason for his observation?

i) Soap is acidic in nature.
ii) Soap is basic in nature.
iii) Turmeric is a natural indicator which gives reddish tinge in bases.
iv) Turmeric is a natural indicator which gives reddish tinge in acids.

a) (ii) and (iii) b) (i) and (ii)
c) (ii) and (iv) d) (i) and (iv)

2. Following observations are observed when calcium oxide reacts vigorously with water. Identify the incorrect observations.

i) It is an endothermic reaction.
ii) Slaked lime is produced.
iii) Quick lime is produced.
iv) It is an exothermic reaction.
v) It is a combination reaction.

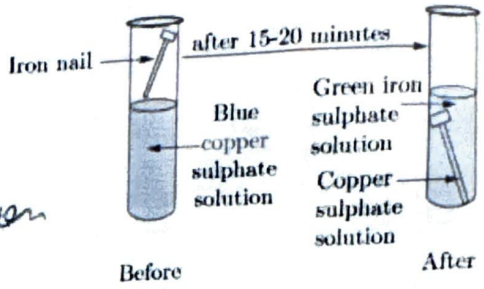


a) (iii) and (iv) b) (i) and (ii)
c) (ii), (iv) and (v) d) (i) and (iii)

3 Iron nail dipped in copper sulphate solution for about half an hour
Which of the following is the correct observation of the reaction shown in the above set up?

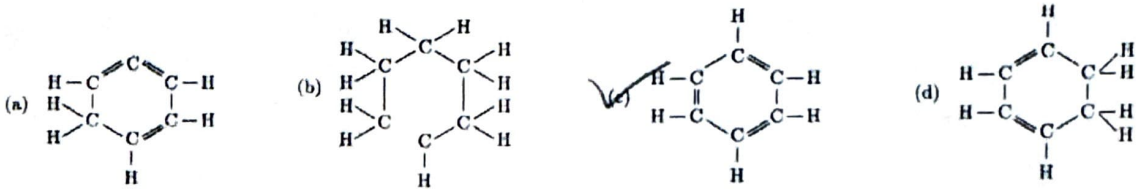
a) Blue colour of copper sulphate solution is obtained
b) Copper displaces iron
c) Reaction is exothermic
d) Iron displaces Copper

$Fe + CuSO_4$ (Blue) → $Cu + FeSO_4$, Green



4. Brass is an alloy of :
a) Cu and Sn
b) Cu and Pb
c) Pb and Sn
d) Zn and Cu

5. Structural formula of benzene is



6. You are given the solution of lead nitrate. In order to obtain a yellow precipitate you should mix with it a solution of :

$Pb(NO_3)_2 + KI \rightarrow PbI_2 + KNO_3$

a) Potassium chloride
b) Potassium nitride
c) Potassium sulphide
d) Potassium iodide

7 Select the incorrect option.

	Indicator	Colour in acidic medium	Colour in Basic medium
A.	Litmus (purple)	Red	Blue
B.	Flower of hydrangea plant (Blue)	Blue	Pink
C.	Red cabbage juice (Purple)	Red or Pink	Green
D.	Turmeric Juice (Yellow)	Colourless	Yellow

a) A
b) B
c) C
d) D

8. Which of the following is not a digestive enzyme contained in the pancreatic juice?
i) Lipase (ii) Hydrochloric acid (iii) Mucus (iv) Trypsin
a) (i) and (ii)
b) (i) and (iv)
c) (ii) and (iii)
d) (i) and (iii)

9. A Mendelian experiment consisted of breeding tall pea plants bearing violet flowers with short pea plants bearing white flowers. The progeny all bore violet flowers, but almost half of them were short. This suggests that the genetic make-up of the tall parent can be depicted as

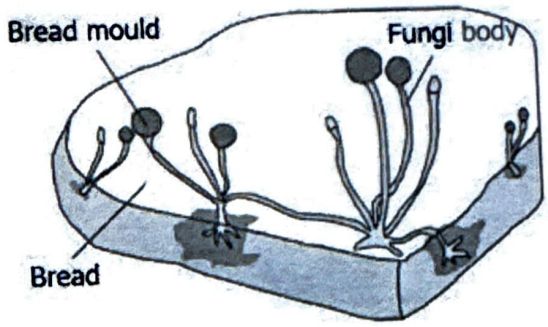
TTWW × ttww

a) TTWW
b) TTWW
c) TtWW
d) TtWw

10. The Mimosa pudica plant is an example of which type of tropic movement.
    a) Negative gravitropism
    b) Positive phototropism
    c) Thigmotropism
    d) None of these

11. During respiration exchange of gases take place in
    a) Trachea and larynx
    b) Alveoli of lungs
    c) Alveoli and throat
    d) Throat and larynx

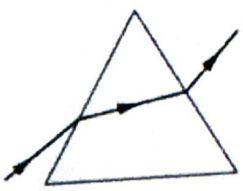
12. The image shows the bread moulds on a bread. How these fungi obtain nutrition?



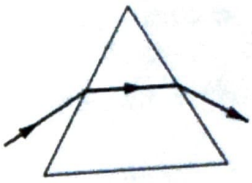
    a) By using nutrients from the bread to prepare their own food.
    b) By allowing other organisms to grow on the bread and then consuming them.
    c) By breaking down the nutrients of bread and then absorbing them.
    d) By eating the bread on which it is growing.

13. Cross between hybrid and one of the parents is called:
    a) Back cross
    b) Mono-hybrid cross
    c) Dihybrid cross
    d) None of these

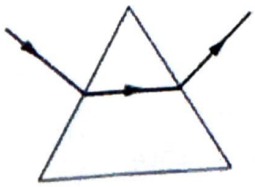
14. In which of the following diagrams is the path of a ray of light passing through a glass prism shown correctly?



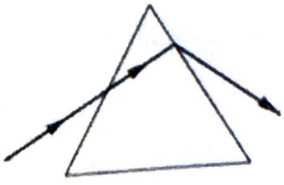
(I)



(II)



(III)



(IV)

    a) I
    b) II
    c) III
    d) IV

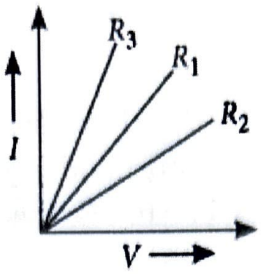
15. A student plots V-I graphs for three samples of Nichrome wire with resistances R_1, R_2 and R_3. Choose from the following the statements that holds true for this graph.

a) $R_1 = R_2 = R_3$

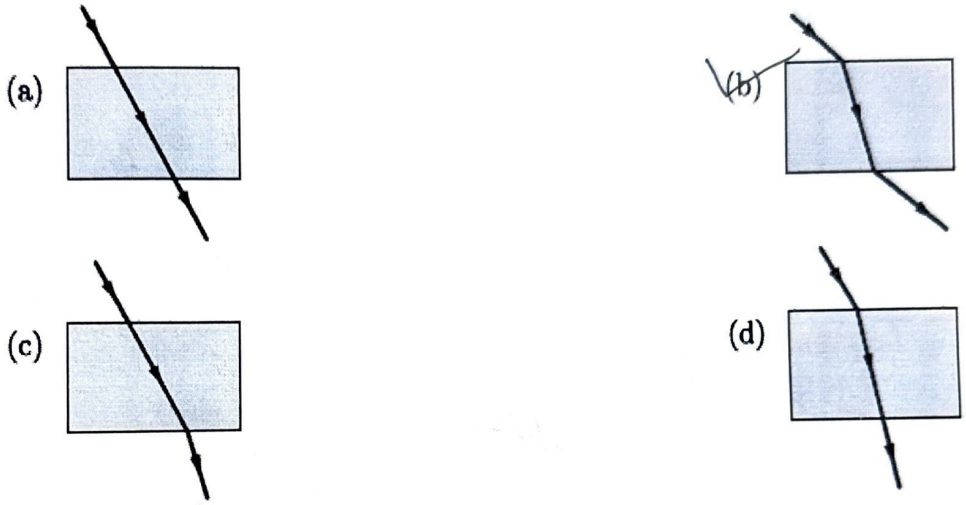
b) $R_1 > R_2 > R_3$

c) $R_3 > R_2 > R_1$

d) $R_2 > R_1 > R_3$



16. The path of a ray of light coming from air passing through a rectangular glass slab traced by four students are shown in figure. Which one of them is correct?



Assertion-Reason Type Questions: For below questions two statements are given—one labeled as Assertion and the other labelled as Reason Select the correct answer to these questions from the codes: (i), (ii), (iii) and (iv) as given below:

i) Both 'A' and 'R' are true and 'R' is correct explanation of the assertion.

ii) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.

iii) 'A' is true but 'R' is false.

iv) 'A' is false and 'R' is true

17. Assertion (A) : Hydrogen gas is not evolved when a metal reacts with nitric acid
Reason (R) : Nitric acid is a strong oxidising agent. (A)

18. Assertion(A) : White light is dispersed into its seven-colour components by a prism.
Reason (R) : Different colours of light bend through different angles with respect to the incident ray as they pass through a prism. A)

19. Assertion(A): The effect of auxin hormone on the growth of root is exactly opposite to that on a stem. (iii)

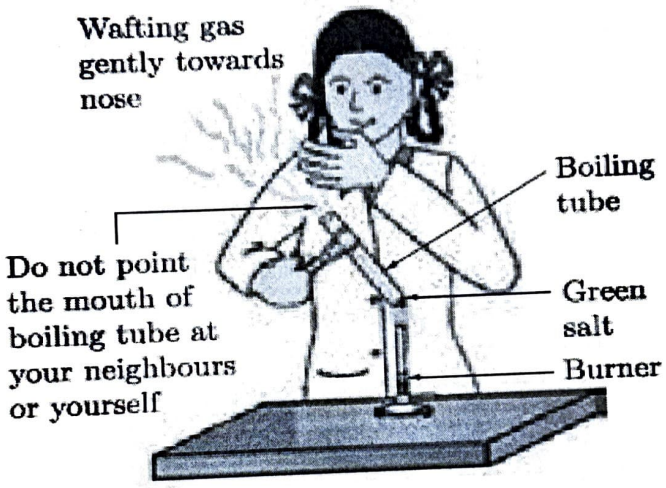
Reason (R) : Auxin hormone increases the rate of growth in root and decreases the rate of growth in stem.

20. Assertion (A): In human beings, the respiratory pigment is haemoglobin

Reason (R) : It is a type of protein which has high-affinity carbon dioxide. (ii)

Section-B

21 A green salt on heating decomposes to produce a colourless suffocating gas and leaves behind a reddish brown residue. Name the salt and write the decomposition reaction.



22. List any four disadvantages of using fossil fuels for the production of energy.

23. Give the name of the enzymes present in fluid in our mouth cavity. State the gland which produces it. What would happen to the digestion process if this gland stops secreting this enzymes ?

24. In a food chain, if 10,000 joules of energy is available to the producer, how much energy will be available to the secondary consumer to transfer it to the tertiary consumer? 10

25. i) Two conductors *A* and *B* of resistances 5 ohms and 10 ohms respectively can be arranged in parallel and later on in series. In each arrangement, the total voltage applied across it is 220 volts. In which arrangement will the voltage across *A* and *B* be the same and in which case will the current flowing through *A* and *B* be the same?

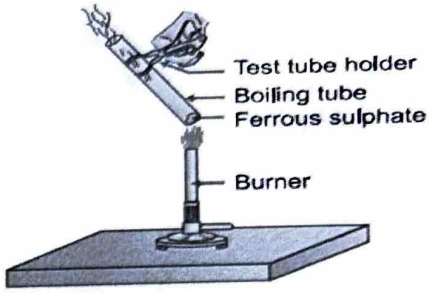
ii) Calculate the total resistance for each arrangement. 15 , 3.34

26. Three 2 Ω resistors A, B and C are connected in such a way that the total resistance o the combination is 3 Ω. Show the arrangement of the three resistors and justify your answer.

OR

An electric iron consumes energy at the rate of 880W when heating is at the maximum rate and 440W when the heating is at the minimum rate. The applied voltage is 220 V. Calculate the current and resistance in each case.

Section-C



27. Observe the given activity and answer the following:

a) Identify the type of chemical reaction.

b) Write a chemical equation for the observed change.

c) Why the colour of ferrous sulphate crystals change on heating?

d) Name the pungent smelling gases formed in the above reaction.

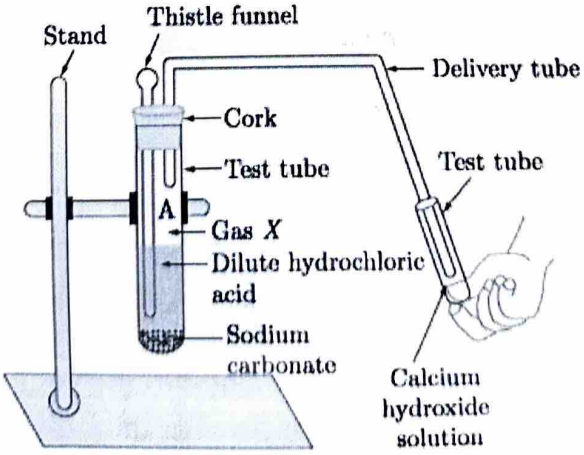
OR

i) Show diagrammatically the electrons between the atoms in the formation of MgO. Write symbols of cation and anion present in MgO.

ii) Name the solvent in which ionic compounds are generally soluble.

iii) Why are aqueous solution of ionic' compounds able to conduct electricity?

28. Observe the given figure and answer the following questions:



i) Which gas is evolved?

ii) How will you test for the presence of gas evolved?

iii) What will happen to the lime water?

iv) What happens when the gas is passed for a longer time?

29. Smita's father has been advised by a doctor to reduce his sugar intake.

a) Name the disease he is suffering from and name the hormone whose deficiency is?

b) Identify the gland that secretes it and mention the function of this hormone.

c) Explain how the time and amount of secretion of this hormone is regulated in human system.

OR

Name the following :

a. The process in plants that links light energy with chemical energy

b. Organisms that can prepare food on their own

c. The cell organelle where photosynthesis occurs

d. Cells that surround the stomatal pore

e. Organisms that cannot prepare their own food

f. An enzyme secreted from the gastric glands in the stomach that acts on proteins

30. In pea plant, round seed is dominant over wrinkled. If a cross is carried between these two plants, give answer to the following questions.

a) Mention the genes for the traits of parents.

b) State the trait of F1 hybrids.

c) Write the ratio of F2 progeny obtained from this cross. What is the name of the cross?

31 i) Water has refractive index 1.33 and alcohol has refractive index 1.36. Which of the two mediums is optically denser? Give reason for your answer.

ii) Draw a ray diagram to show the path of a ray of light passing obliquely from water to alcohol.

iii) State the relationship between angle of incidence and angle of refraction in the above case.

OR

i) An object 4 cm in height is placed at 15 cm in front of a concave mirror of focal length 10 cm. At what distance from the mirror should a screen be placed to obtain a sharp image of the object. Calculate the height of the image.

ii) Name the kind of lens that can form;

a) An inverted magnified image.

b) An erect diminished image.

32. i) List the factors on which the resistance of a conductor in the shape of a wire depends.

ii) Why are metals are good conductors of electricity whereas glass is a bad conductor of electricity? Give reason.

iii) Why are alloys commonly used in electrical heating devices? Give reason.

33. i) Least distance of distinct vision of a long-sighted person is 40 cm. He wishes to reduce it to 25 cm by using spectacles. Find the power and nature of the lens used by him.

ii) Draw a ray diagram to show the correction of the defect by using an appropriate lens.

Section-D

34. a) A reddish brown metal 'X' does not react with dilute sulphuric acid but reacts with conc. H_2SO_4 on heating and liberates a pungent smelling gas (Y) and the solution becomes blue in colour 'Z'. Identify 'X', 'Y' and 'Z' and write the balanced chemical equation involved.

b) Name a compound CH_3COOH and identify its functional group. Give a chemical test to identify this compound.

c) Write two differences between diamond and graphite.

OR

a) A white salt on heating decomposes to give brown fumes and a residue is left behind.

i) Name the salt,

ii) Write the equation for the reaction

b) An organic compound 'X' on heating with conc. H_2SO_4 forms a compound 'Y' which on addition of one molecule of hydrogen in the presence of nickel forms a compound

'Z'. One molecules of compound 'Z' on combustion forms two molecules of CO_2 and three molecules of H_2O. Identify giving reasons the compounds 'X', 'Y' and 'Z'. Write the chemical equations for all the chemical reactions involved

35. a) List the three events that occur during the process of photosynthesis. Explain the role of stomata in this process.

b) Describe an experiment to show that "sunlight is essential for photosynthesis."

OR

a) "The sex of a newborn individual in some species is largely determined genetically while in other it is otherwise." Give three different examples to justify this statement?

b) A blue flower plant denoted by BB is crossed with that of white coloured flower plant denoted by bb.

i)State the colour of flower you would expect in their F1 generation plants.

ii)What must be the percentage of white flower plants in F2 generation if flower of F1 plants are self – pollinated?

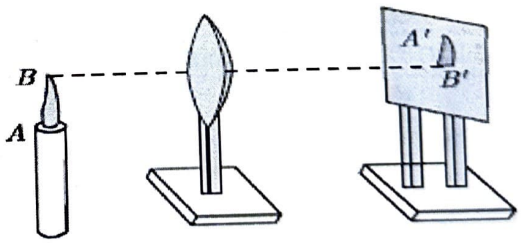
iii)State the expected ratio of the genotypes BB in the F2 progeny?

36. Aditya and his friend Manoj placed a candle flame in front of a convex lens at various distances from it and obtained the image of the candle flame on a white screen. He noted down the position of the candle, screen and the lens as under.

Position of candle = 20 cm

Position of convex lens = 50 cm

Position of the screen = 80 cm



i) What is the position of the image formed from the convex Lens?

ii) What is the focal length of the convex lens?

iii)Where will the image be formed, if he shifts the candle towards the lens at a position of 35 cm?

iv)What is the nature of the image formed if Aditya shifts the candle towards the lens to 36 cm?

OR

i) State Fleming's Left-hand rule.

ii) List three characteristic features of the electric current used in our homes.

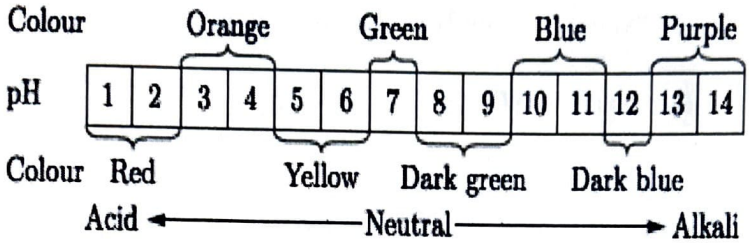
iii) What is a fuse? Why is it called a safety device?

iv) Why is it necessary to earth metallic electric appliances?

SECTION – E

37. Read the paragraph and answer the questions given after paragraph:

The table below shows the colour of universal indicator paper (UI paper) at different pH values.



i) UI paper turns purple in oven cleaner solution. What is the pH of oven cleaner solution?

ii) Suggest the substance in oven cleaner solution that turns UI paper purple.

iii) UI paper turns yellowish-green in milk. What is the pH of milk?

iv) The milk was left outside for five days. When the milk was re-tested with UI paper, the paper turned orange. What has happened to the milk?

38. Read the passage carefully and answer the questions given below

Some plants like the pea plant climb up other plants or fences by means of tendrils. These tendrils are sensitive to touch. When they come in contact with any support, the part of the tendril in contact with the object does not grow as rapidly as the part of the tendril away from the object. This causes the tendril to circle around the object and thus cling to it. More commonly, plants respond to stimuli slowly by growing in a particular direction. Because this growth is directional, it appears as if the plant is moving.

i) How many type of tropism are shown by plants? Name them.

ii) The touch me not plant is an example of which tropism?

iii) Give one example of chemotropism?

iv) Name the plants hormone which promotes cell division?

OR

Name the plant hormone which inhibits growth?

39. Read the passage carefully and answer any four questions given below.

An insulated copper wire wound on a cylindrical cardboard tube such that its length is greater than its diameter is called a solenoid. When an electric current is passed through the solenoid, it produces a magnetic field around it. The magnetic field produced by a current-carrying solenoid is similar to the magnetic field produced by a bar magnet. The field lines inside the solenoid are in the form of parallel straight lines. The strong magnetic field produced inside a current-carrying solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the solenoid. The strength of magnetic field produced by a current carrying solenoid is directly proportional to the number of turns and strength of current in the solenoid.

i)The strength of magnetic field inside a long current -carrying straight solenoid is

a) more at the ends than at the centre

b) minimum in the middle

c) same at all points

d) found to increase from one end to the other.

ii) The north-south polarities of an electromagnet can be found easily by using

a) Fleming's right-hand rule

b) Fleming's left-hand rule

c) Clock face rule

d) Left-hand thumb rule

iii) For a current in a long straight solenoid N-and S-poles are created at the two ends Among the following statements, the incorrect statement is

a) The field lines inside the solenoid are in the form of straight lines which indicates that the magnetic field is the same at all points inside the solenoid.

b) The strong magnetic field produced inside the solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the coil.

c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet.

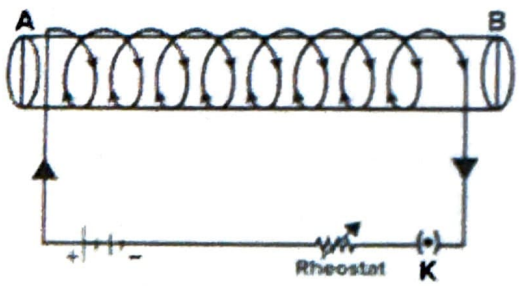
d) The N- and S-poles exchange position when the direction of current through the solenoid is reversed.

iv) A long solenoid carrying a current produces a magnetic field B along its axis. If the current is double and the number of turns per cm is halved, then new value of magnetic field is

a)B b) 2B

c) 4B d) B/2

v) A soft iron bar is enclosed by a coil of insulated copper wire as shown in figure. When the plug of the key is closed, the face B of the iron bar marked as



a) N-pole b) S-pole

c) N-pole if current is large d) S-pole if current is small

f = -ve

u =

v =

Class – X
Pre- Board I Examination
(2024-2025)
Standard Mathematics

Date : 02.12.2024 **Roll No:**
Time : 3 hrs **M.M. : 80**

General Instructions:

Read the following instructions carefully and follow them :

i) This question paper contains 38 questions. All questions are compulsory.

ii) This question paper is divided into five Sections A, B, C, D and E.

iii) In Section A, Questions no. 1 to 18 are multiple choice questions (MCQs) and questions number 19 and 20 are Assertion-Reason based questions of 1 mark each.

iv) In Section B, Questions no. 21 to 25 are very short answer (VSA) type questions, carrying 2 marks each

v) In Section C, Questions no. 26 to 31 are short answer (SA) type questions, carrying 3 marks each.

vi) In Section D, Questions no. 32 to 35 are long answer (LA) type questions carrying 5 marks each.

vii) In Section E, Questions no. 36 to 38 are case study based questions carrying 4 marks each. Internal choice is provided in 2 marks questions in each case-study.

viii) There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and 3 questions in Section E.

ix) Draw neat diagrams wherever required. Take $\pi = \frac{22}{7}$ wherever required, if not stated.

x) Use of calculators is not allowed.

Section-A

1) If a and b are the zeroes of the polynomial $p(x) = kx^2 - 30x + 45k$ and $a + b = ab$, then the value of k is :

A) $\frac{-2}{3}$ B) $\frac{-3}{2}$

C) $\frac{3}{2}$ D) $\frac{2}{3}$

2) The pair of linear equations $x+2y+5=0$ and $(-3x=6y-1)$ has:

A) unique solution B) exactly two solutions

C) infinitely many solutions D) no solution

3) The next (4th) term of the A.P. $\sqrt{18}, \sqrt{50}, \sqrt{98}, \ldots$ is :

A) $\sqrt{128}$ B) $\sqrt{140}$

19) **Assertion (A)**: The point which divides the line segment joining the Points A(1,2) and B(–1,1) internally in the ratio1:2 is $\left(\frac{1}{3}, \frac{5}{3}\right)$

Reason(R): The coordinates of the point which divides the line segment joining the points A(x, y) and B(a, b) in the ratio m : n are $\left(\frac{ma+nx}{m+n}, \frac{mb+ny}{m+n}\right)$

20) **Assertion (A)**: If HCF of two numbers is 'p' and LCM is 'q', then $\frac{q}{p}$ is always a natural number.

Reason(R): The HCF is always a factor of LCM.

Section-B

21) a) Find a relation between x and y such that the point P(x, y) is equidistant from the points A(7,1) and B(3,5). $x - y = 2$

OR

b) Points A(–1,y) and B (5,7) lie on a circle with centre O(2,–3y) such that AB is a diameter of the circle. Find the value of y. Also, find the radius of the circle.

22) Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

23) Two numbers are in the ratio 2:3 and their LCM is 180. What is the HCF of these numbers?

24) Find the ratio in which P($\frac{3}{4}, \frac{5}{12}$) divides the line segment joining the points A $\left(\frac{1}{2}, \frac{3}{2}\right)$ and B(2, -5). 1:5

25) a) If $a\cos\theta + b\sin\theta = m$ and $a\sin\theta - b\cos\theta = n$, then prove that $a^2 + b^2 = m^2 + n^2$.

OR

b) Prove that: $\sqrt{\frac{\sec A-1}{\sec A+1}} + \sqrt{\frac{\sec A+1}{\sec A-1}} = 2\ \text{cosec}\ A$

Section-C

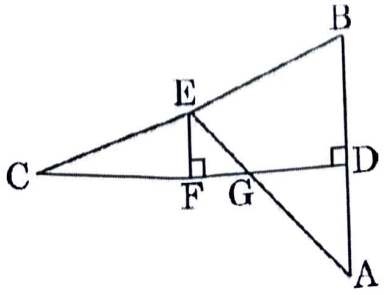
26) Verify whether $\sqrt{3}$ is rational or not. Also, prove that $7-2\sqrt{3}$ is an irrational number.

27) a) If the sum of first 7 terms of an A.P. is 49 and that of first17 terms is 289, find the sum of its first 20 terms. 50

OR

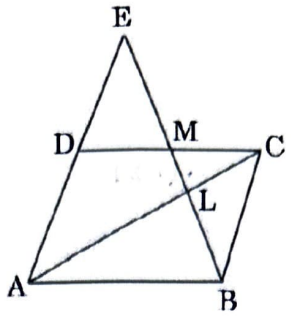
b)The ratio of the 10^{th} term to its 30^{th} term of an A.P. is 1:3 and the sum of its first six terms is 42. Find the first term and the common difference of A.P.

28) a) In the given figure, CD is the perpendicular bisector of AB. EF is perpendicular to CD. AE intersects CD at G. Prove that $\frac{CF}{CD} = \frac{FG}{DG}$



OR

b) In the given figure, ABCD is a parallelogram. BE bisects CD at M and intersects AC at L. Prove that EL = 2BL.



29) a) Solve for x and y: $\frac{ax}{b} - \frac{by}{a} = a + b$; $ax - by = 2ab$

OR

b) A two-digit number is obtained by both multiplying sum of digits by 8 and then subtracting 5 or by multiplying the difference of digits by 16 and adding 3.Find the number.

30) Prove that: $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$

31) From a solid right-circular cylinder of height 14 cm and base radius 6 cm, a right circular cone of same height and same base is removed. Find the volume and total surface area of remaining solid.

Section-D

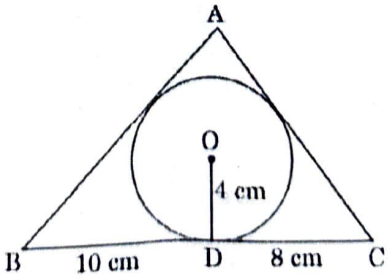
32) One observer estimates the angle of elevation to the basket of a hot air balloon to be 60°, while another observer 100 m away in the same direction of the first observer, estimates the angle of elevation to be 30° . Find :

a) The height of the basket from the ground.

b) The distance of the basket from the first observer's eye.

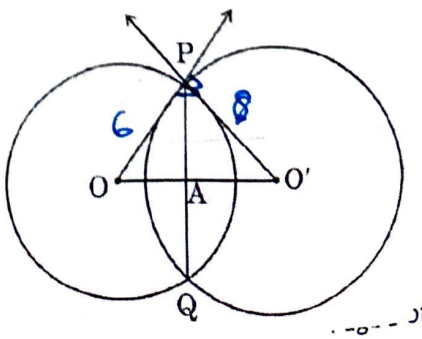
c) The horizontal distance of the second observer from the basket.

33) a) A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC are of lengths 10 cm and 8 cm respectively. Find the lengths of the sides AB and AC, if it is given that area of $\Delta ABC = 90cm^2$



OR

b) Two circles with centres O and O′ of radii 6 cm and 8 cm, respectively intersect at two points P and Q such that OP and O′ P are tangents to the two circles Find the length of the common chord PQ.

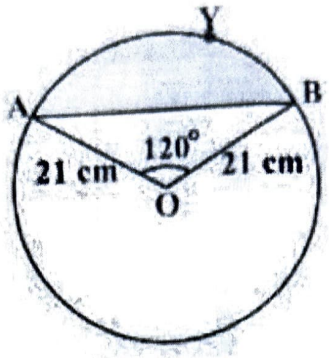


34) a) In a flight of 2800 km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100 km/h and by doing so, the time of flight is increased by 30 minutes. Find the original duration of the flight.

OR

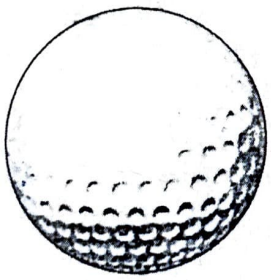
b) The denominator of a fraction is one more than twice the numerator. If the sum of the fraction and its reciprocal is $2\frac{16}{21}$, find the fraction.

35) Find the area of the segment AYB shown in figure, if the radius of the circle is 21 cm and $\angle AOB = 120^0$ (Use $\pi = \frac{22}{7}$)



Section-E

36) A golf ball is spherical with about 300- 500 dimples that help increase its velocity while in play. Golf balls are traditionally white but available in colours also. In the given figure, a golf ball has diameter 4.2 cm and the surface has 315 dimples (hemi-spherical) of radius 2 mm.



Based on the above, answer the following questions:

i) Find the surface area of one such dimple. 1

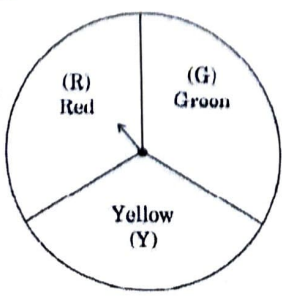
ii) Find the volume of the material dug out to make one dimple. 1

iii) (a) Find the total surface area exposed to the surroundings. 2

OR

b) Find the volume of the golf ball. 2

37) A middle school decided to run the following spinner game as a fund-raiser on Christmas Carnival.



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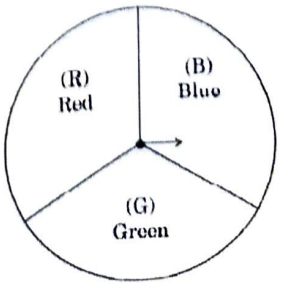

II

Making Purple: Spin each spinner once. Blue and red make purple. So, if one spinner shows Red(R) and another Blue (B), then you 'win'. One such outcome is written as'RB'

Based on the above, answer the following questions:

i) List all possible outcomes of the game. 1

ii) Find the probability of 'Making Purple' 1

iii) a) For each win, a participant gets Rs 10, but if he/she loses, he/she has to pay Rs 5 to the school. If 99 participants played, calculate how much fund could the school have collected. 2

OR

b) If the same amount of Rs 5 has been decided for winning or losing the game, then how much fund had been collected by school ? (Number of participants = 99)

38) Archit starts walking from his house to office. Instead of going to the office directly, he goes to his son's school first, from there to his bank and then reaches the office. The house is situated at A(3, 5), school at B(6, 9), bank at C(12, 17) and office at D(15, 13). (Assuming that all distances covered are in straight lines and coordinates are in km).

Based on the above, answer the following questions:

i) Find the distance between house and school. 5 1

ii) Find the distance between school and bank. 10 1

iii) (a)Find the total distance travelled by Archit to reach office. 20 2

OR

b) If the point P lies on the line segment joining the points A and D such that AP:PD=2:3, then find the coordinates of P.