1. **The remainder obtained when 7^{84} is divided by 342 is:**

(A) 0 (B) 1 (C) 49 (D) 341

2. $\frac{1}{\sqrt{1}+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \ldots\ldots\ldots + \frac{1}{\sqrt{120}+\sqrt{121}} =$ _____

(A) $\sqrt{120}$ (B) 10 (C) $12\sqrt{12}$ (D) 8

3. **Given n = 1 + x and x is the product of four consecutive integers. Then which of the following is true.**

I. n is an odd integer

II. n is prime

III. n is a perfect square

(A) both I & III are correct (B) both I & II are correct

(C) only I is correct (D) only III is correct

4. **If $2^x = 3^y = 6^{-z}$, then xy + yz + zx =** _____

(A) –1 (B) 0 (C) xyz (D) 2

5. **If $\sqrt[3]{a} + \sqrt[3]{b} + \sqrt[3]{c} = 0$, then $(a + b + c)^3 =$** _____

(A) abc (B) 3abc (C) 2abc (D) None of these

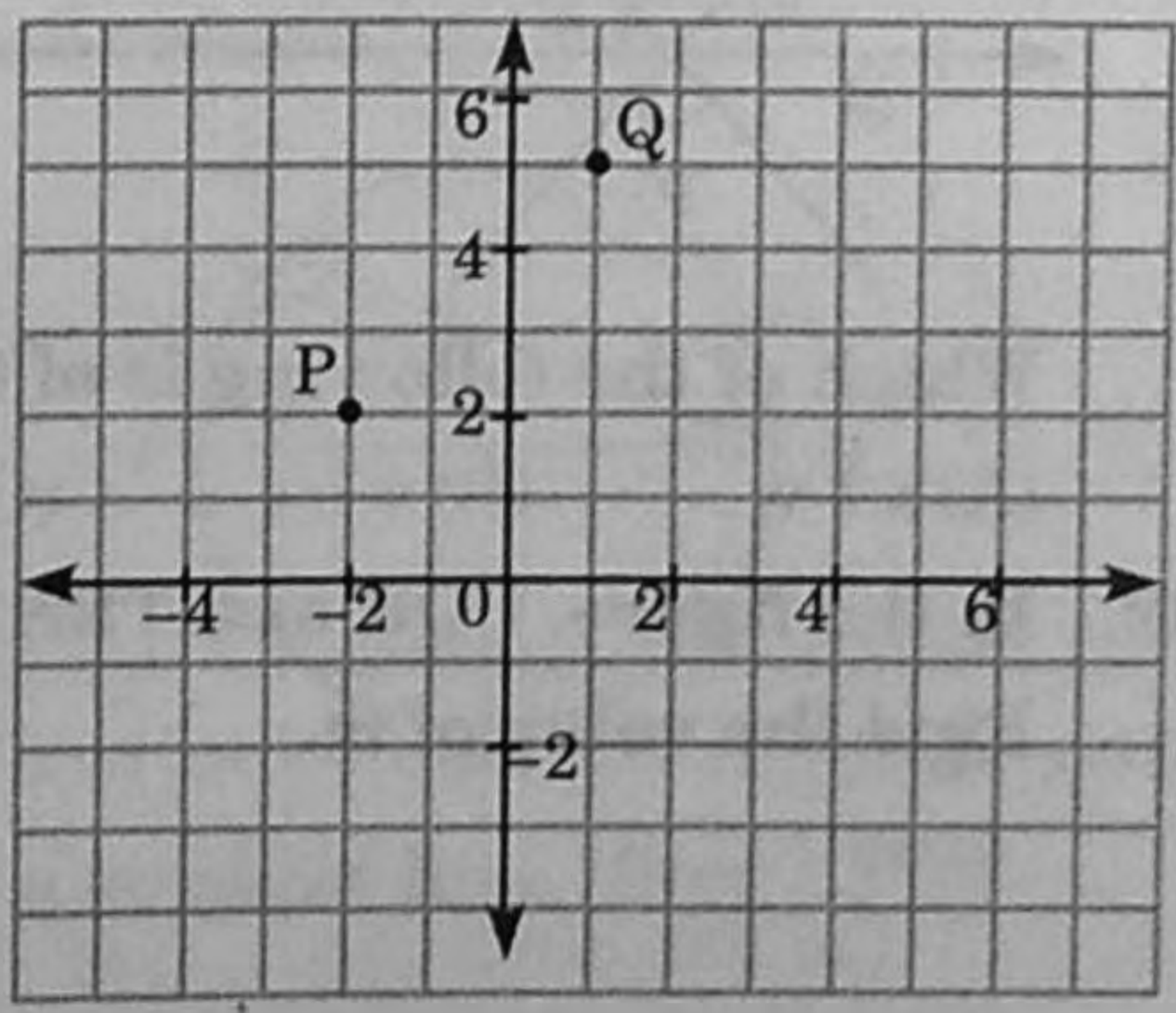
6. **In the graph, P and Q are two vertices of quadrilateral PQRS.**
Given that co-ordinates of R and S are (4, 2) and (1, –1) respectively, the quadrilateral PQRS is a:

(A) rectangle

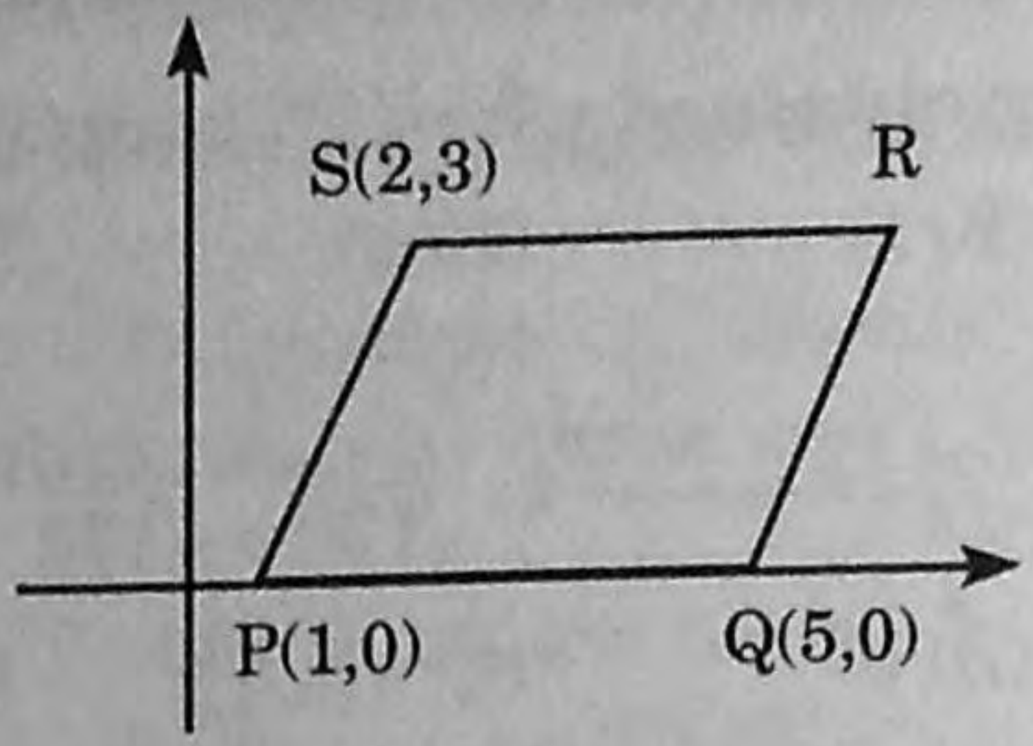
(B) square

(C) rhombus

(D) trapezium



7. In the diagram PQRS is a parallelogram.



The coordinates of R are:

(A) (5, 2) (B) (5, 3) (C) (6, 2) (D) (6, 3)

8. The equation of the straight line passing through the points (–1, 3), (0, 2) and (2, 0) is:

(A) $y = x + 2$ (B) $y = x - 2$ (C) $y = -x + 2$ (D) None of these

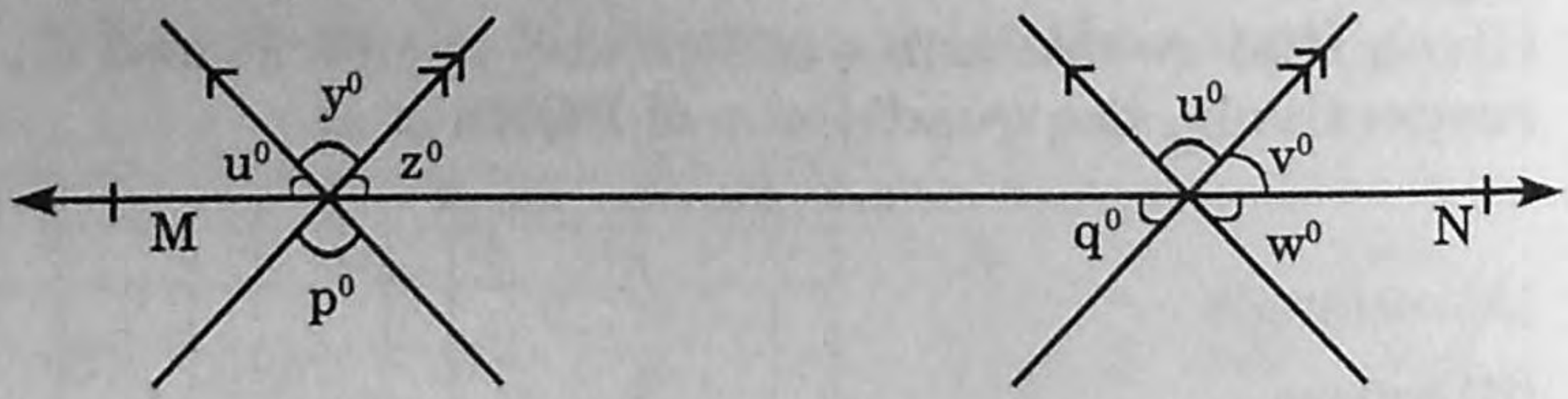
9. Given that $d - 2e = 4$ and $3d + e = -9$. Find the value of d.

(A) –3 (B) –2 (C) 1 (D) 3

10. C is the mid-point of the line segment AB. P and Q are the mid-points of the line segments AC and BC respectively, then CQ = _____

(A) $\frac{1}{2}$ AB (B) $\frac{1}{2}$ BP (C) $\frac{1}{4}$ AB (D) $\frac{1}{4}$ AC

11. In the figure MN is a straight line.

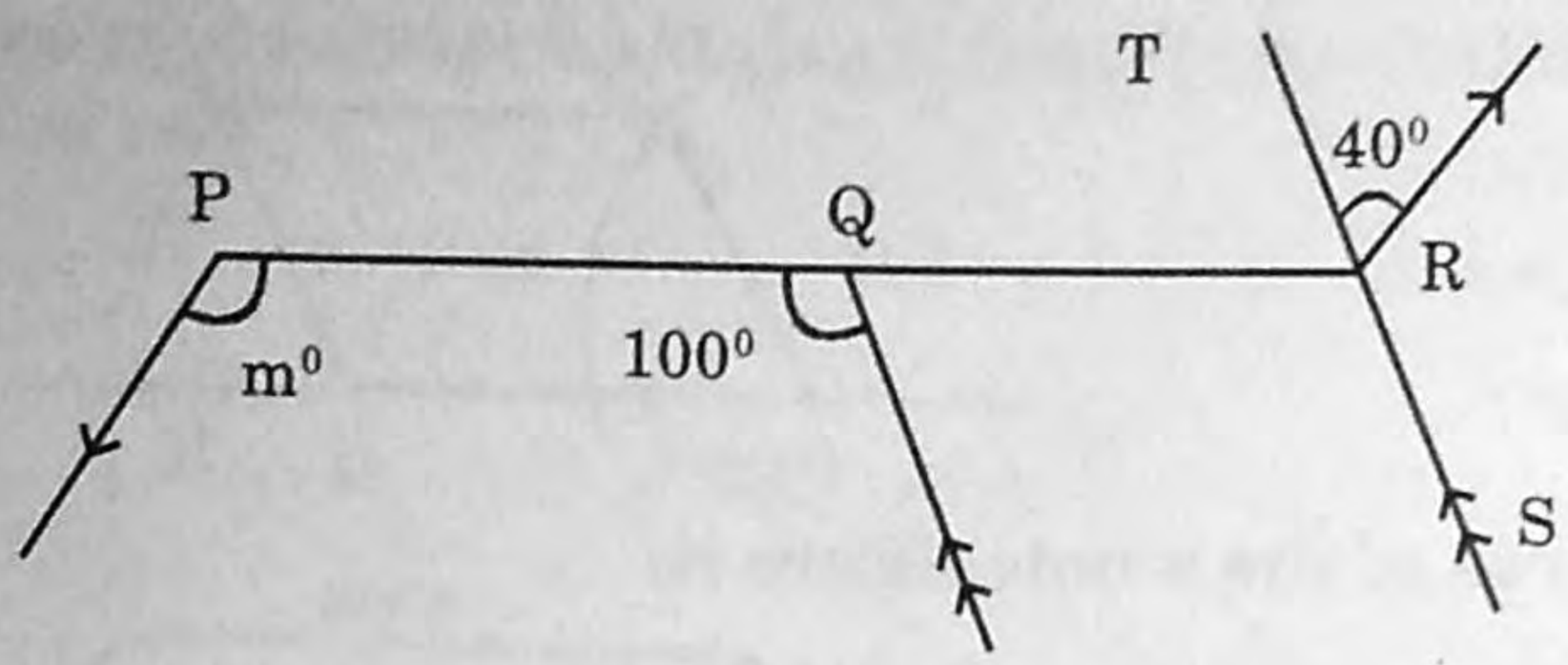


Which of the following is of the same value as p + q?

(A) x + w (B) v + y (C) u + w (D) w + v

12. In the figure, PQR and TRS are straight lines.

Find the value of m.



(A) 110^0 (B) 120^0 (C) 140^0 (D) 130^0

13. In ΔABC, we have $\angle A > \angle B > \angle C$, then:

(A) $AB > AC$ (B) $AB < AC$ (C) $BC < AB$ (D) None of these

14. "O" is any point in the interior of a ΔABC, then:

(A) $(AB + BC + C(A) = 2(OA + OB + OC)$

(B) $(AB + BC + C(A) < 4(OA + OB + OC)$

(C) $(OA + OB + O(C) > 2(AB + BC + CA)$

(D) $2(OA + OB + O(C) < (AB + BC + CA)$

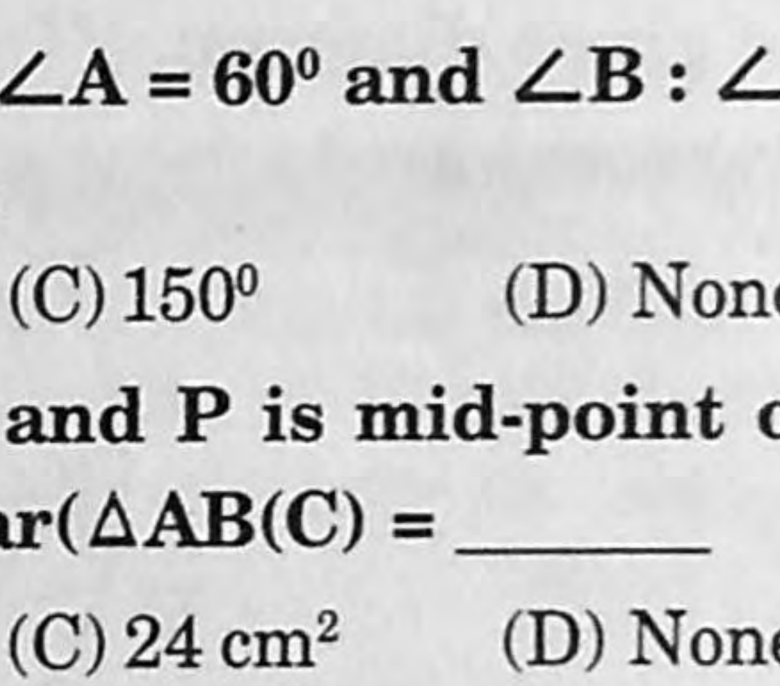
15. In quadrilateral ABCD, if $\angle A = 60^0$ and $\angle B : \angle C : \angle D = 2 : 3 : 7$, then $\angle D =$ _____

(A) 175^0 (B) 135^0 (C) 150^0 (D) None of these

16. ABCD is a parallelogram and P is mid-point of AB. If ar(APC(D) = 36 cm^2, then ar(ΔAB(C) = _____

(A) 36 cm^2 (B) 48 cm^2 (C) 24 cm^2 (D) None of these

17. In the diagram given below, POQ is the diameter of the circle with centre O. The value of x + y is:



(A) 120^0

(B) 270^0

(C) 250^0

(D) 200^0

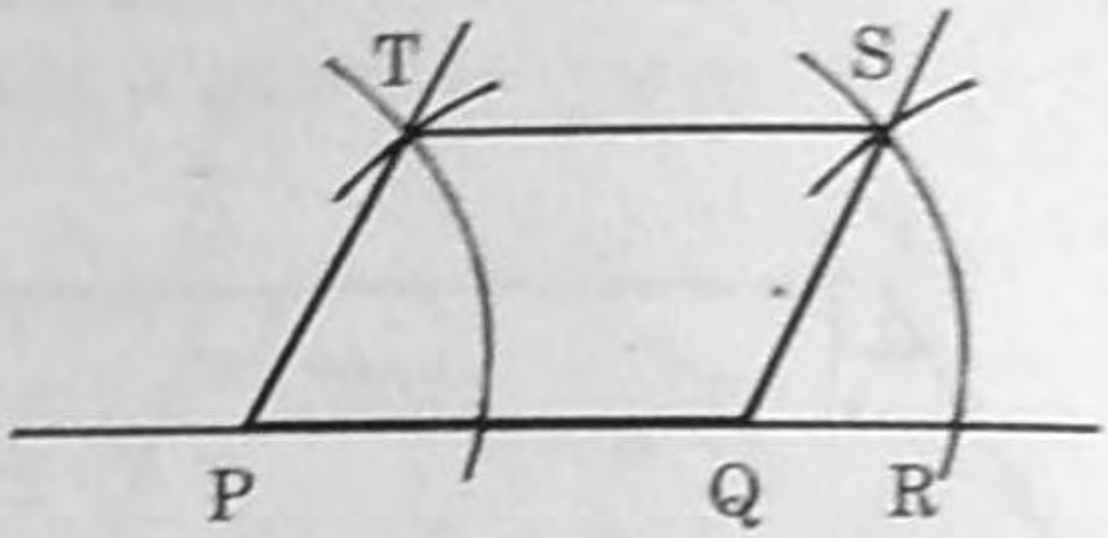
18. In the diagram, PQR is a straight line, then $\angle PTS=$

(A) 60^0

(B) 120^0

(C) 140^0

(D) 150^0



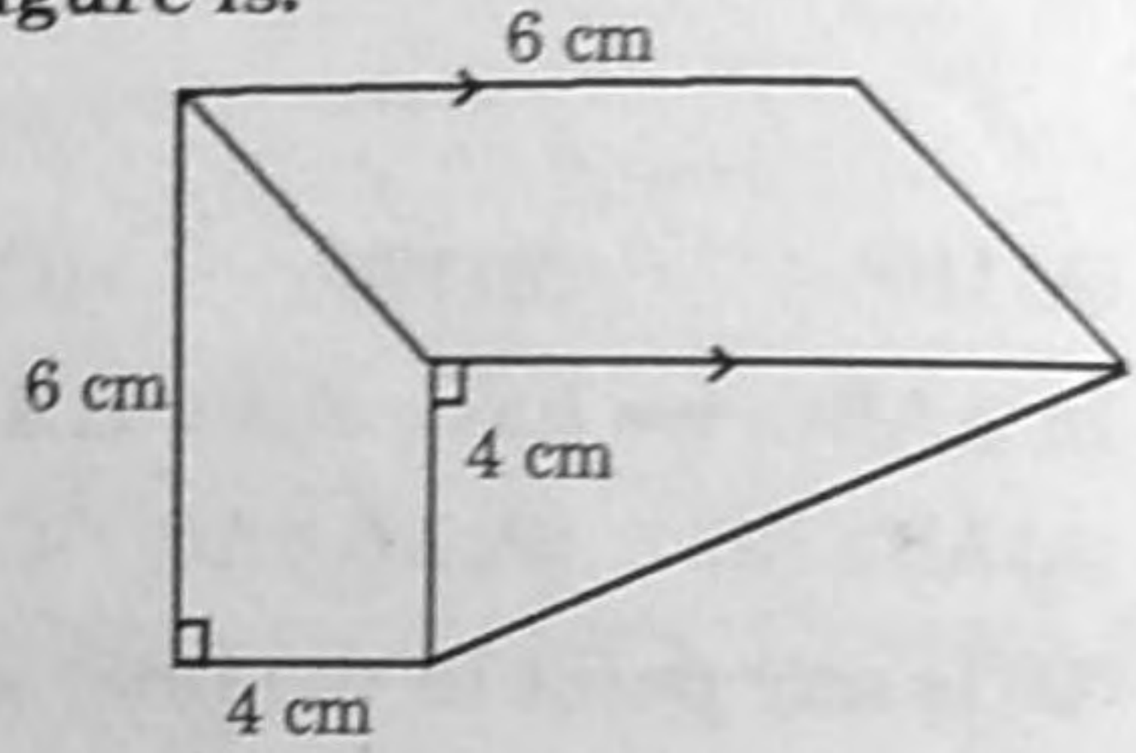
19. The area of the whole figure is:

(A) 40 cm^2

(B) 44cm^2

(C) 42 cm^2

(D) 48cm^2



20. Which of the following sets of measurements can be used to construct a triangle?

(A) 4 cm, 5 cm, 6 cm

(B) 4 cm, 3 cm, 8 cm

(C) 5 cm, 6 cm, 12 cm

(D) 6 cm, 3 cm, 10 cm

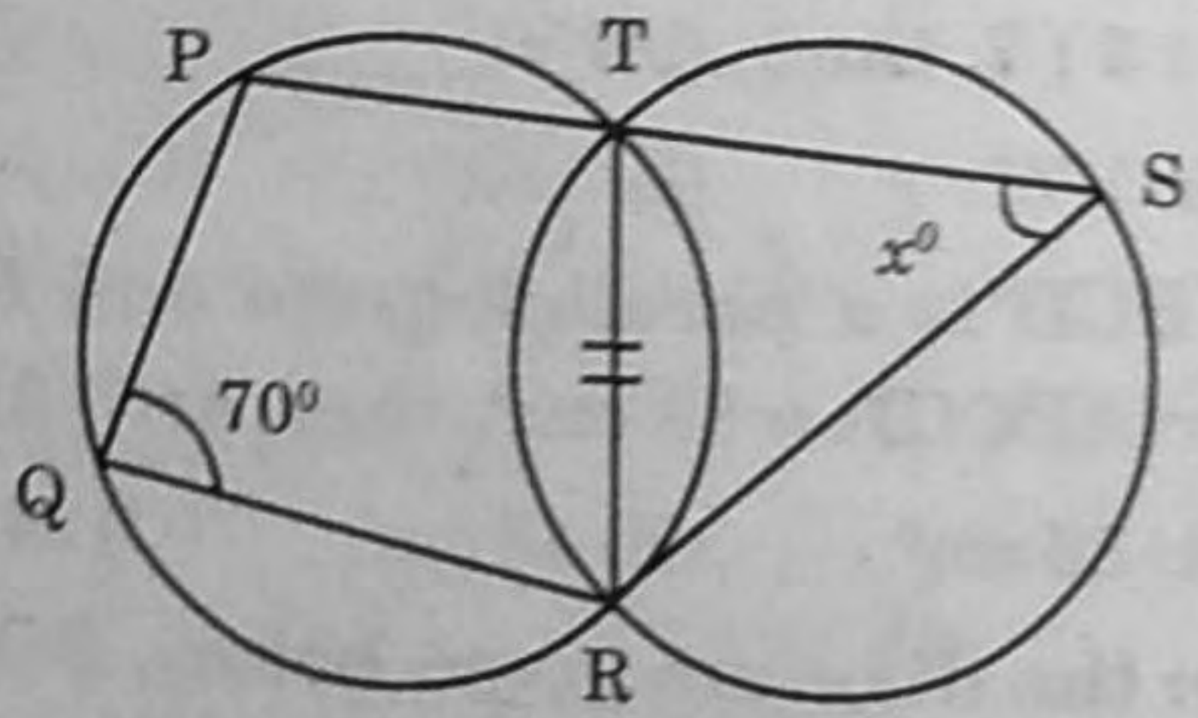
21. In the given diagram, PTS is a straight line and TR = TS. Find the value of x.

(A) 35°

(B) 45°

(C) 55°

(D) 65°



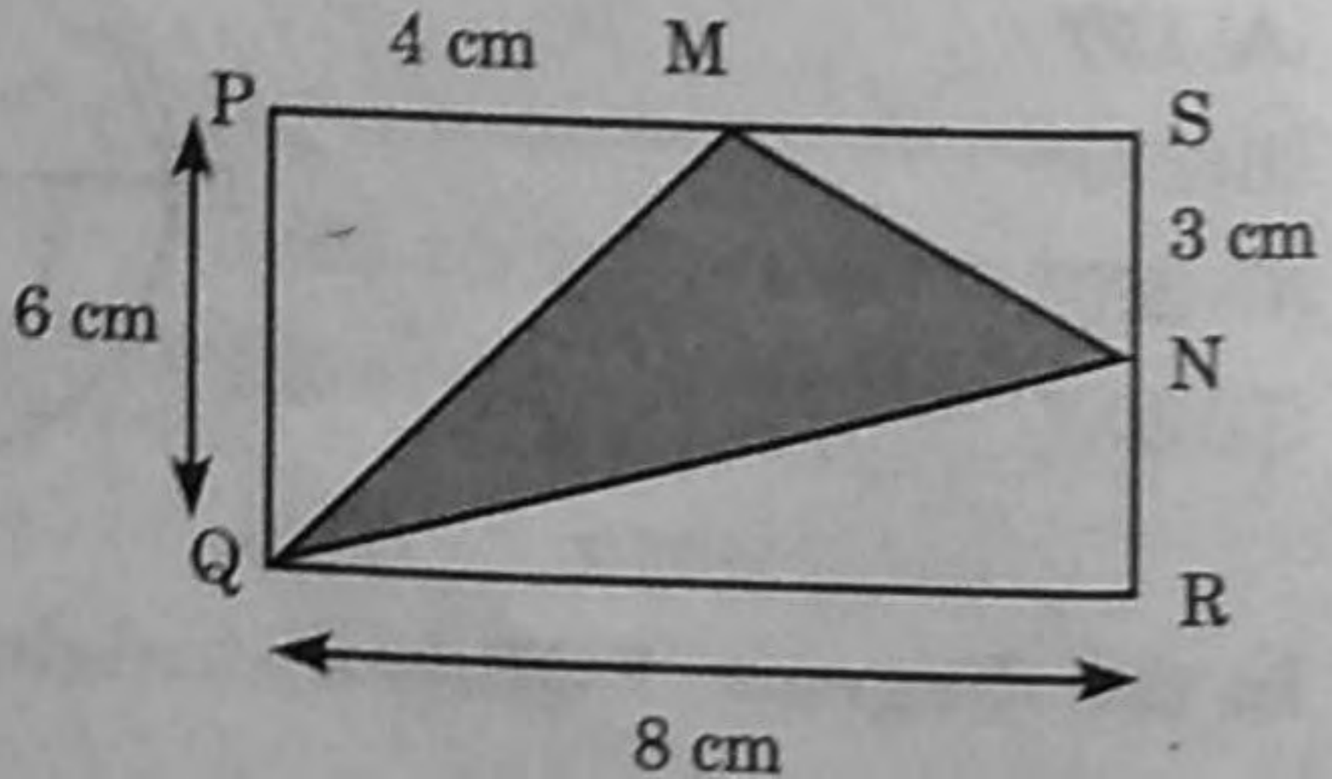
22. PQRS is a rectangle. Calculate the area of the shaded region:

(A) 18 cm^2

(B) 20 cm^2

(C) 16 cm^2

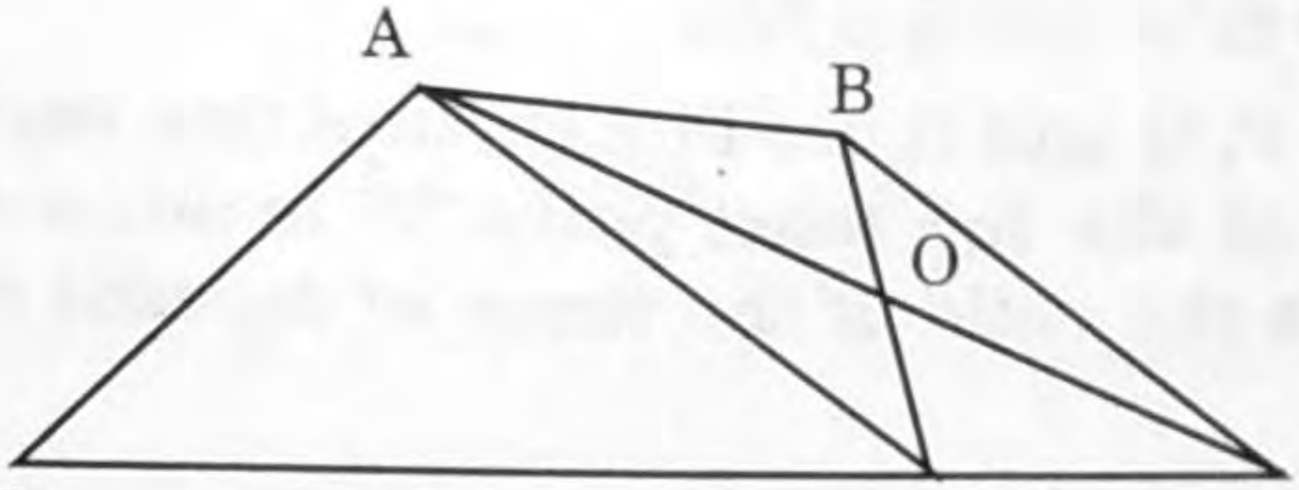
(D) 10 cm^2



23. If the polynomial f(x) is such that f(–43)=0, then a factor of f(x) is:

(A) x – 43 (B) x (C) x – 7 (D) x + 43

24.



ABCD is a quadrilateral. BE||AC. BE meets DC (produce(D) at E. AE and BC intersect at O. Which one is the correct answer from the following?

(A) ABEC is a parallelogram (B) ar(△AO(C) = ar(△BOE)

(C) ar(△OA(B) = ar(△OCE) (D) ar(△ABE) = ar(△ACE)

25. The ratio of the areas of two squares is 4 : 9. The ratio of their perimetres in the same order is:

(A) 3 : 2 (B) 2 : 3 (C) 9 : 4 (D) 4 : 9

CLASS: IX PHYSICS

26. A particle is pushed along a horizontal surface in such a way that it starts with a velocity of 12 m/s, decreasing at the rate of 0.5 m/s^2. The time it will take to come to rest is:

(A) 6 s (B) 12 s (C) 24 s (D) 48 s

27. The heart of a man pumps 4 litres of blood per minute at a pressure of 130 mm of mercury. If the density of mercury is 13.6 g/cm^{-3}, then calculate the power of the heart. *(Assume g = 10 m/s^2)*

(A) 0.02 W (B) 0.2 W (C) 1.2 W (D) 3.2 W

28. Study the given statements P & Q and select the correct answer.

P. Gas must be cooled considerably irrespective of pressure on it so that it can be liquefied.

Q. Gas can be liquefied under a temperature less than its critical temperature and under pressure more than its critical pressure.

(A) Both P and Q are true and Q explains P

(B) Both P and Q are true but Q does not explain P

(C) Only P is true

(D) P is false but Q is true

29. Points P, Q and R are in a vertical line such that PQ = QR. A ball at the top most point 'P' is allowed to fall freely. What is the ratio of the times of descent through PQ and QR?

(A) $\frac{3}{2}$ (B) $\frac{3}{\sqrt{2}+1}$ (C) $\frac{1}{\sqrt{2}-1}$ (D) $\frac{5}{2}$

30. By what factor does the kinetic energy of a particle gets multiplied, if the velocity is tripled?

(A) 6 (B) 7 (C) 8 (D) 9

31. If it is safe to jump from a height of 3 m on the earth, then what would be the safe height of drop on a planet where the value of 'g' is 1.96 ms^{-2}?

(A) 2 m (B) 4 m (C) 6 m (D) 15 m

32. A lorry and a car with the same kinetic energy are brought to rest by the application of brakes which provide equal retarding forces. Which of them will come to rest in a shorter distance?

(A) Lorry (B) Car

(C) Both will stop at the same distance (D) Cannot be determined

33. A wooden block of mass 10 g is dropped from the top of a cliff 100 m high. Simultaneously, a bullet of mass 10 g is fired from the foot of the cliff upward with a velocity of 100 ms^{-1}. At what time will the bullet and the block meet?

(A) 4 s (B) 3 s (C) 2 s (D) 1 s

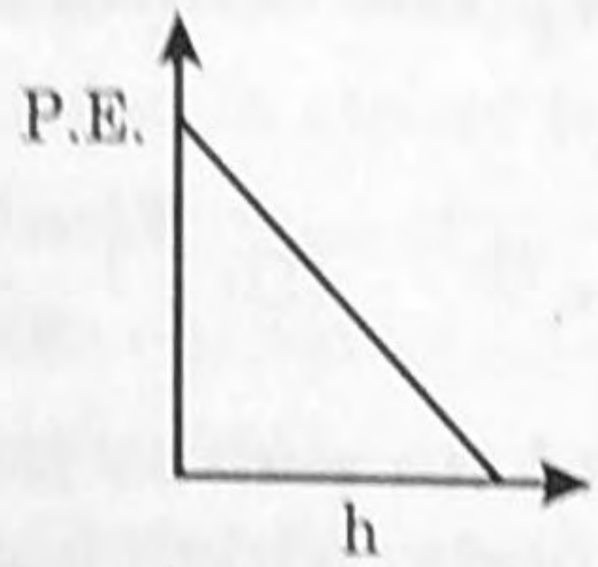
34. Two masses, one is 'n' times as heavy as the other, have equal kinetic energy. What is the ratio of their momenta?

(A) $1:\sqrt{n}$ (B) $\sqrt{n}:1$ (C) $1:n$ (D) $n:1$

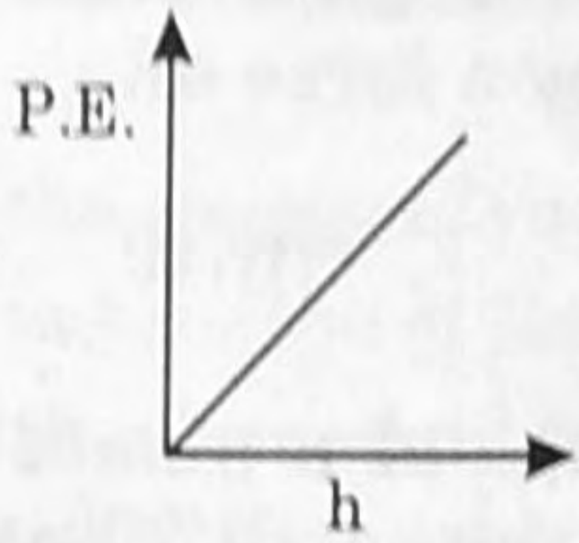
35. If a graph between P.E. of the body in relation to the height through which it falls freely is plotted. Which of the following graphs shows this relation correctly?

(It may be noted that the total energy remains the same)

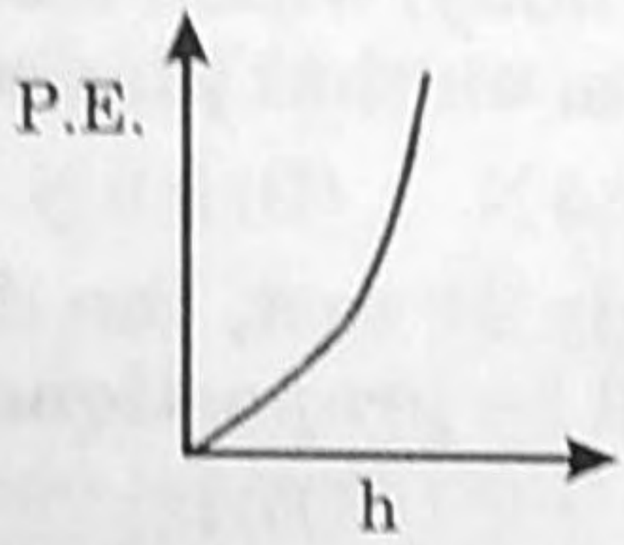
(A)



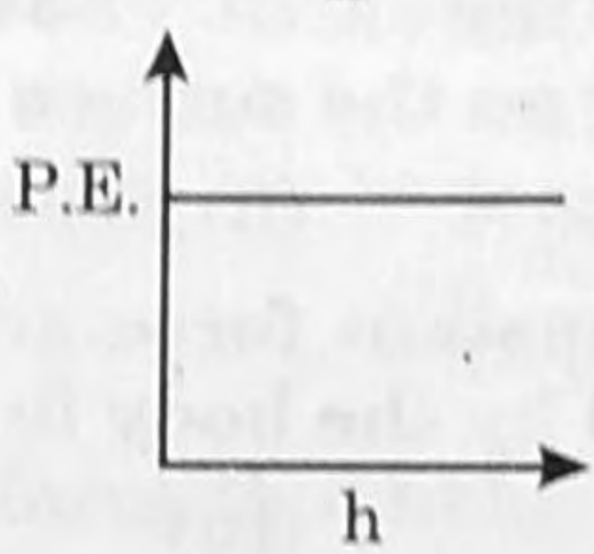
(B)



(C)



(D)



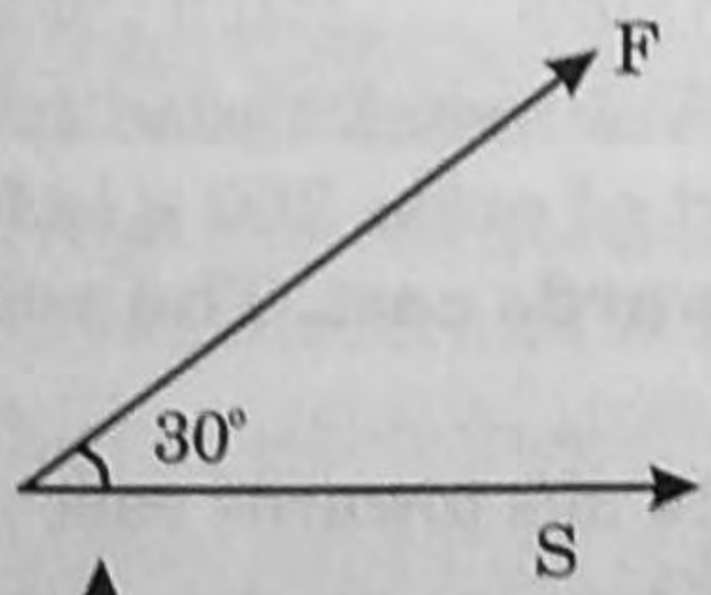
36. Calculate the velocity of the bob of a simple pendulum at its mean position if it is able to rise to a vertical height of 10 cm.

(Given: $g = 980\ cms^{-2}$)

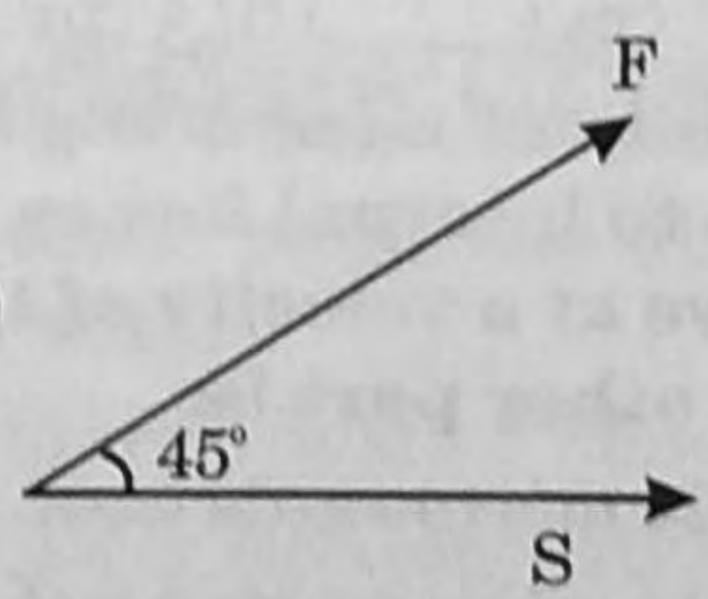
(A) 1.40 ms^{-1} (B) 2.54 ms^{-1} (C) 3.43 ms^{-1} (D) 5.35 ms^{-1}

37. In which of the following cases, is the work done maximum?

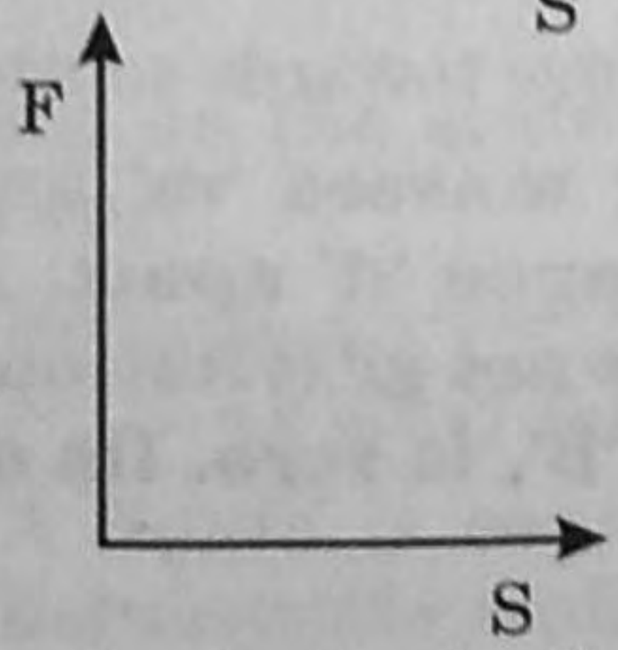
(A)



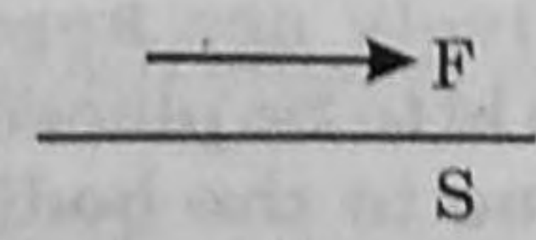
(B)



(C)



(D)



38. A man shot a bullet with a speed of 10 ms^{-1} which just penetrates a plank of wood. With what speed should he shoot a bullet to pass through 10 similar planks?

(A) 100 ms^{-1} (B) 10 4 ms^{-1}

(C) $10\sqrt{10}$ ms^{-1} (D) $5\sqrt{10}$ ms^{-1}

39. A body of weight W_1 is suspended from the ceiling of a room through a chain of weight W_2. The ceiling pulls the chain by a force of:

(A) W_1 (B) W_2 (C) $W_1 + W_2$ (D) $\frac{W_1 - W_2}{2}$

40. The mass of a planet is twice and its radius is 3 times that of the earth. The weight of a body, which has a mass of 5 kg on the surface of the earth, on that planet is:

(A) 11.95 N (B) 20.9 N (C) 10.85 N (D) 9.9 N

41. If a constant force acts on a body at rest, the distance moved by the body in time 't' will be proportional to:

(A) t (B) t^2 (C) t^3 (D) t^4

42. Which of the following is not matched correctly?

(A) Force – kg m s^{-1} (B) Pressure – Nm^{-2}

(C) Buoyancy – N (D) Density – kg-m^{-3}

43. A force of 1.0 N acts on a body of mass 10 kg. The body covers 100 cm in 4 seconds moving along a straight line. The initial velocity is:

(A) 2 cm/s (B) 4 cm/s (C) 6 cm/s (D) 5 cm/s

44. A body of mass 300 g kept at rest breaks into two parts due to internal forces. One part of mass 200 g is found to move at a velocity of 12 m/s towards east. The velocity of the other part is:

(A) 24 m/s towards west (B) 14 m/s towards east

(C) 24 m/s towards north (D) 54 m/s towards south

45. Two bodies 'A' and 'B' having masses 'm' and '2 m' respectively are kept at a distance 'd' apart. A small particle is to be placed so that the net gravitational force on it, due to the bodies 'A' and 'B', is zero. Its distance from the mass 'A' should be:

(A) $x = \frac{d}{1+\sqrt{2}}$ (B) $x = \frac{d}{1+\sqrt{4}}$ (C) $x = \frac{d}{1+\sqrt{3}}$ (D) $\frac{d}{1+\sqrt{6}}$

46. When a bus starts, the passengers are pushed back. This is an example of:

(A) Newton's first law (B) Newton's second law
(C) Newton's third law (D) None of Newton's laws

47. Impulse is equal to:

(A) the change of momentum (B) the change of velocity
(C) the change of force (D) the change of position

48. A stone is thrown upwards with a speed 'u' from the top of a tower. It reaches the ground with a velocity '3u'. The height of the tower is:

(A) $\frac{u^2}{g}$ (B) $\frac{2u^2}{g}$ (C) $\frac{3u^2}{g}$ (D) $\frac{4u^2}{g}$

49. When a horse pulls a cart, the force that helps the cart to move forward is the force by:

(A) the cart on the horse (B) the ground on the horse
(C) the ground on the cart (D) all of these

50. What does the area of an 'acceleration-displacement' graph represent?

(A) s (B) v (C) $\frac{v^3 - u^3}{2}$ (D) st^2

CLASS: IX CHEMISTRY

51. During the formation of an ionic bond the atom that receives electrons is the atom with:

(A) higher electronegativity (B) lower oxidation number
(C) higher ionisation energy (D) lower electronegativity

52. Based on the statements given here choose the correct answer.

P. Some sugar can be added to a full glass of water without causing overflow.

Q. A liquid is continuous even-though space is present between the molecules.

(A) P and Q are true and Q explains P
(B) P and Q are true but Q does not explain P
(C) Only P is true
(D) Only Q is true

53. Size of Ca^{+2} is smaller than K^{+}. This is due to:

(A) low effective nuclear charge

(B) high effective nuclear charge

(C) more number of electrons in Ca^{+2}

(D) high IP value

54. According to Kinetic theory of gases, molecules are:

(A) perfectly inelastic particles in random motion

(B) perfectly elastic particles in random motion

(C) perfectly inelastic particles at rest

(D) perfectly elastic particles at rest

55. Which set has the strongest tendency to form anions?

(A) Ga, In and Te

(B) Na, Mg and Al

(C) N, O and F

(D) V, Cr and Mn

56. Based on the statements given here choose the correct answer.

P. In polar regions aquatic life is safe in water under frozen ice

Q. Water has a high latent heat of fusion and the upper portion of ice does not allow the heat of the water to escape to the surroundings.

A) Both P and Q are correct and Q is the satisfactory explanation of P

B) Both P and Q are correct but Q is not the satisfactory explanation of P

C) Only P is correct

D) Only Q is correct

57. The covalent compound HCl has the polar character because:

A) the electronegativity of hydrogen is greater than that of chlorine

B) the electronegativity of chlorine is greater than that of hydrogen

C) the electronegativity of hydrogen is equal to that of chlorine

D) hydrogen and chlorine are gases

58. Butter is an example of:

(A) true solution

(B) gel

(C) aerosol

(D) suspension

59. How many molecules of glucose are present in 5.23 g of glucose (molecular weight of glucose is 180)?

(A) 1.75×10^{22} molecules (B) 17.5×10^{-22} molecules

(C) 17.5×10^{22} molecules (D) 1.75×10^{-22} molecules

60. Which of the following is the formula of the compound nickel bisulphate?

(A) $NiHSO_4$ (B) Ni_2HSO_4 (C) Ni_2SO_4 (D) $Ni(HSO_4)_2$

61. Electrophoresis is due to:

(A) the neutralization of charges (B) the presence of charges

(C) the scattering of light (D) all of the above

62. How much of quick lime can be obtained by burning 400 g of lime stone?

(A) 224 g (B) 220 g (C) 400 g (D) 320 g

63. Amalgam is a mixture of:

(A) solid in solid (B) solid in liquid

(C) liquid in solid (D) liquid in liquid

64. 16 grams of oxygen is equal to:

(A) 1 gram atom (B) 0.5 gram mole

(C) 6.023×10^{23} atoms (D) all of these

65. Which of the following statements is correct?

A) Compounds can be separated into constituents by physical processes

B) The boiling points and melting points of compounds are not fixed

C) The composition of compounds are not fixed

D) The properties of compounds are entirely different from those of its constituents

66. A hydrocarbon contains 90% of carbon and 10% hydrogen. The empirical formula of the compound is:

(A) C_2H_5 (B) C_3H_2 (C) C_3H_4 (D) CH_3

67. The percentage of oxygen in NaOH is:

(A) 40 (B) 16 (C) 20 (D) 32

68. 180 grams of water contains _____ moles.

(A) 100 (B) 10 (C) 180 (D) 0.01

69. **Carbon disulphide is used to separate the components of:**

(A) brine (B) gunpowder

(C) petroleum (D) all of these

70. **Covalent compounds:**

(A) have higher boiling points than ionic compounds

(B) have lower boiling points than ionic compounds

(C) are good conductors of electricity

(D) are generally solids

71. **The following information describes the characteristics of an animal.**

i. It is a vertebrate

ii. It is warm blooded with strong and light skeleton

iii. It lays eggs

The animal described belongs to which of the following groups?

(A) Amphibia (B) Reptilia (C) Aves (D) Mammalia

72. **Which of the following options correctly lists the organs with the animals which use them?**

(A) Gills (insects), tracheal system (spiders) lungs centipedes

(B) Gills (scorpions), book lungs (prawns), tracheal system (spiders)

(C) Gills (crustaceans), tracheal system (insects), book lungs (spiders)

D) Gills (crustaceans), tracheal system (millipedes), book lungs (prawns)

73. **Which of the characteristics show that humans are complex organisms?**

i. The systems are not dependent on one another

ii. The organisation of cells from the simplest to the complex

iii. The division of labour among the cells, ensures that all functions are carried out efficiently and effectively

(A) i and ii only (B) i and iii only

(C) ii and iii only (D) i, ii and iii

74. Which of the following statements describes monocotyledons?

i. They have fibrous roots

ii. Their leaves have parallel venation

iii. Their seeds have only one cotyledon

(A) i and ii only (B) i and iii only

(C) ii and iii only (D) i, ii and iii

75. Study the statements X and Y given below.

X : Higher plants have meristematic regions for indefinite growth

Y : Higher plants have root and shoot apices

(A) If both X and Y are true and the reason Y is the correct explanation of the X.

(B) If both X and Y are true and Y is not the correct explanation of X

(C) If X is true but Y is false

(D) If both X and Y are false

76. Which of the following diseases can be spread when the patient coughs?

(A) AIDS, TB and hepatitis

(B) TB, influenza and cholera

(C) TB and influenza

(D) TB and hepatitis

77. Which of the following is not the symptom of tuberculosis?

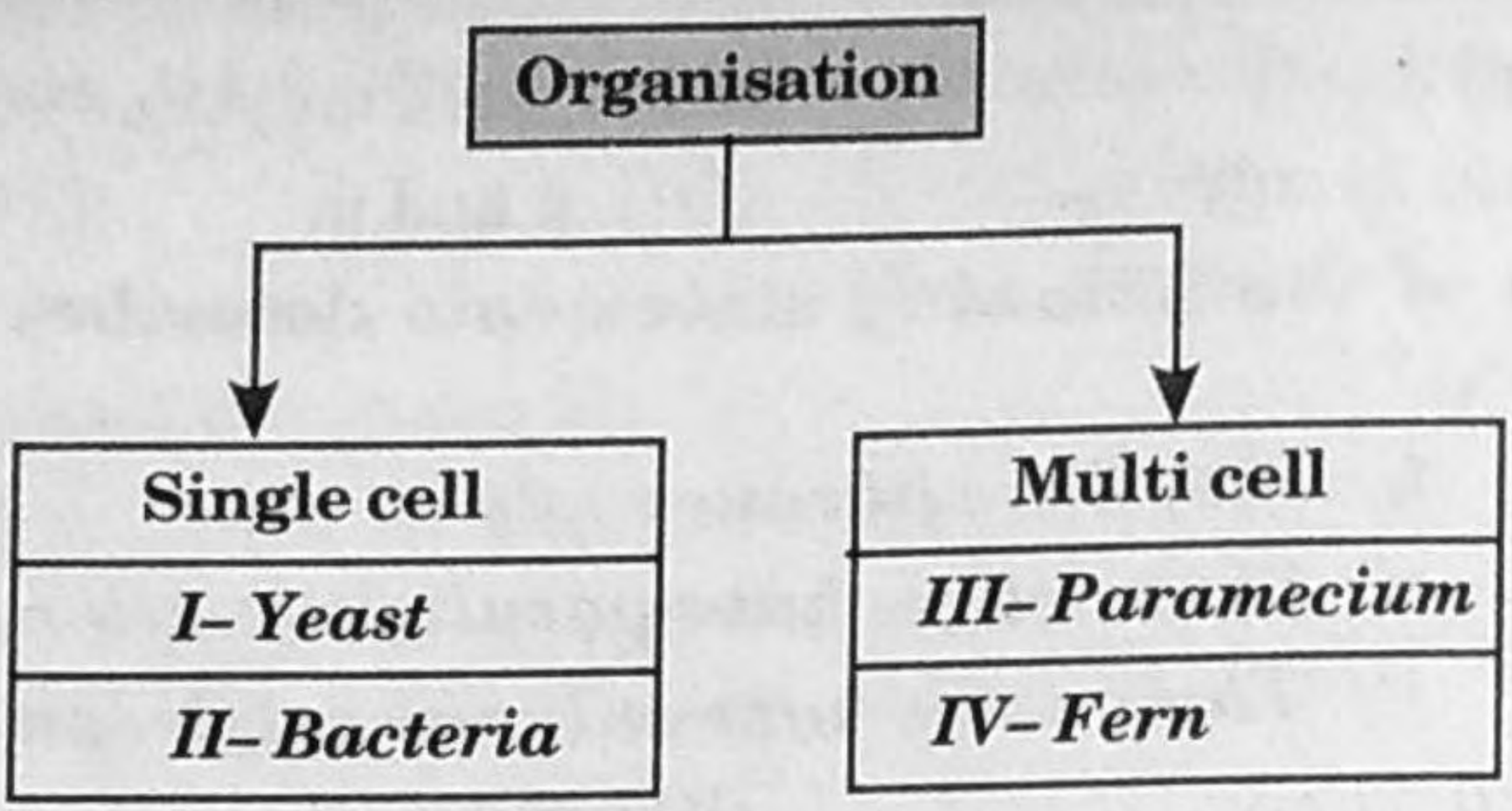
(A) Increase in body weight and tiredness

(B) More than two weeks of coughing bouts

(C) Thick yellowish green sputum produced

(D) An X-ray shows dark spots in the lungs

78. Which organism is wrongly grouped in the chart given below?



(A) I (B) II (C) III (D) IV

79. A plant cell and an animal cell is similar as they both have:

i. A nucleus
ii. A cell wall
iii. A cell membrane
iv. Cytoplasm
v. Chloroplasts

(A) ii and v only (B) i, ii and iii only
(C) i, iii and iv only (D) ii, iii and iv only

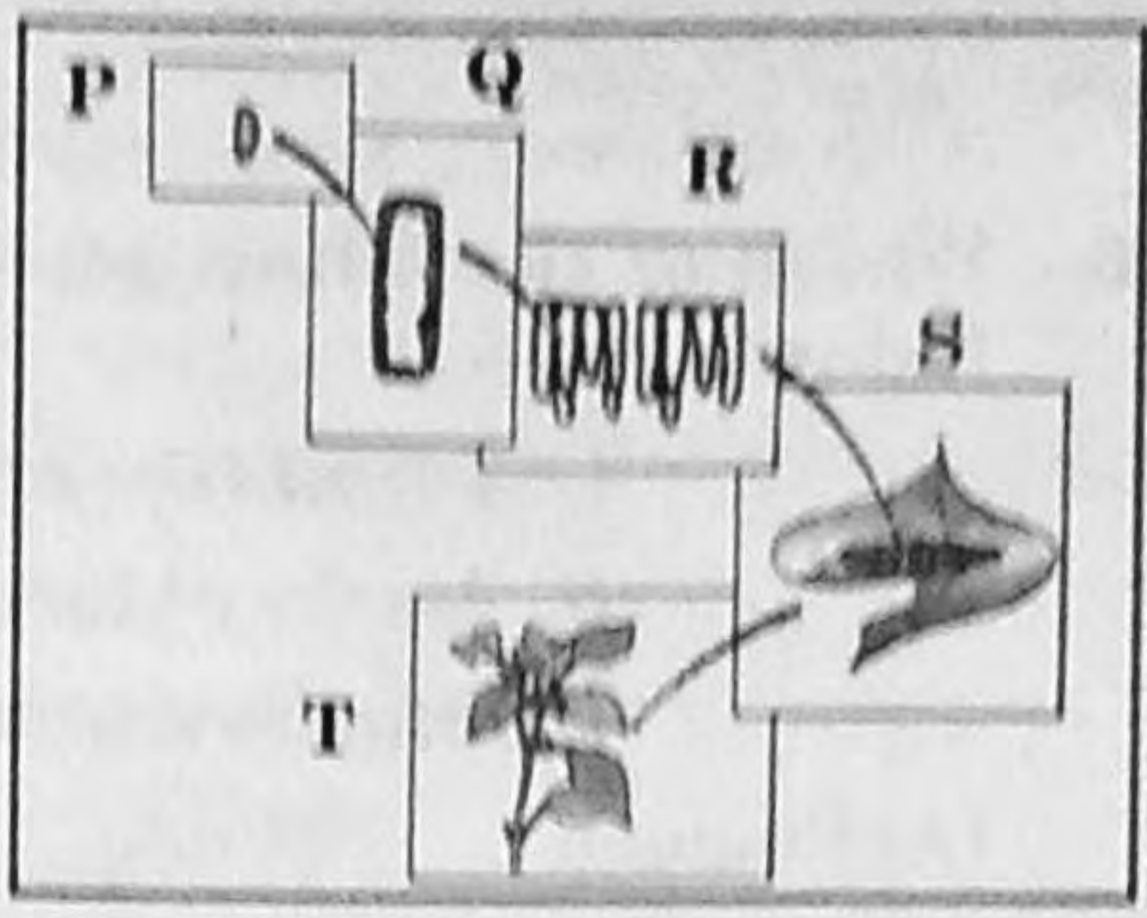
80. Figure given below shows the structure of a cell. Which of the following organisms have this type of cell?

i. A rabbit
ii. A cockroach
iii. A mushroom

(A) Rabbit and Cockroach
(B) Rabbit and Mushroom
(C) Cockroach and Mushroom
(D) Rabbit, Cockroach and Mushroom

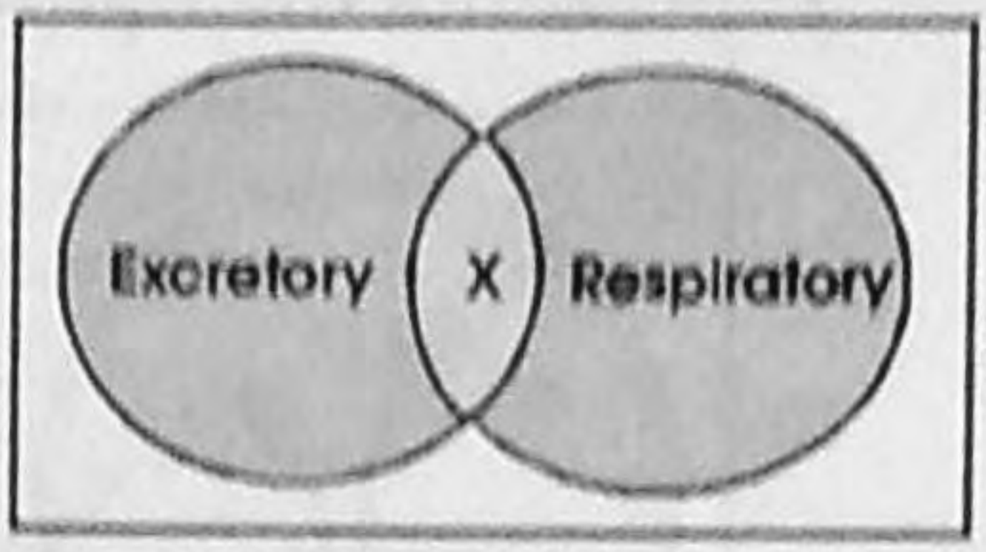
81. Observe the given diagram and answer the question. Name the organelle shown in 'P'?

(A) Mitochondria
(B) Lysosome
(C) Chloroplast
(D) Vacuole



82. Which of the following organs is represented by 'X' in the human body?

(A) The liver
(B) The heart
(C) The lungs
(D) The kidneys



83. The information below shows the different stages of cellular organisation in the human body.

Cell → Tissue → Pancreas → X → Organism

Which of the following systems represents X?

(A) Nervous (B) Excretory (C) Digestive (D) Respiratory

84. Which of the following statements are true about erythrocytes?

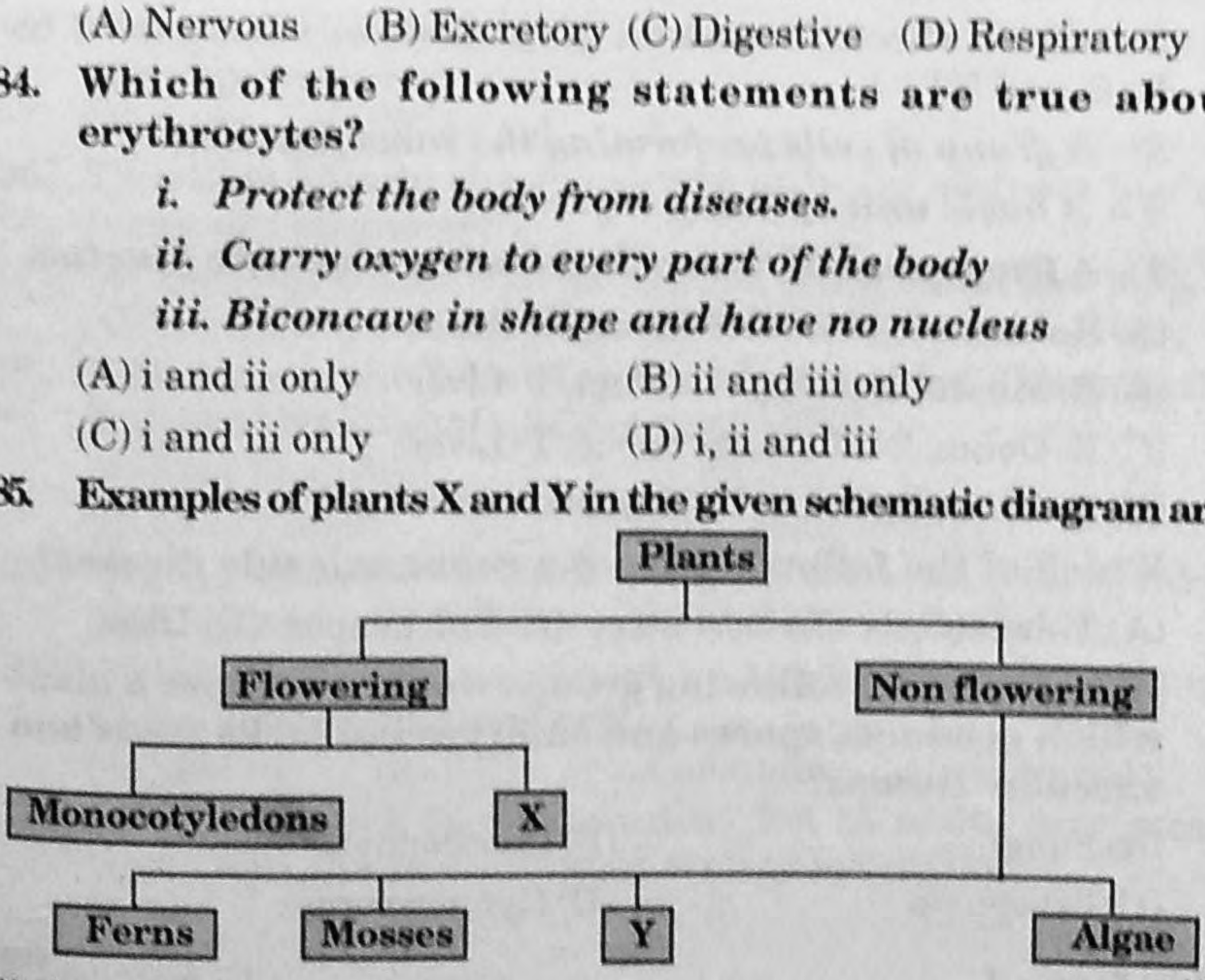
i. Protect the body from diseases.

ii. Carry oxygen to every part of the body

iii. Biconcave in shape and have no nucleus

(A) i and ii only
(B) ii and iii only
(C) i and iii only
(D) i, ii and iii

85. Examples of plants X and Y in the given schematic diagram are:



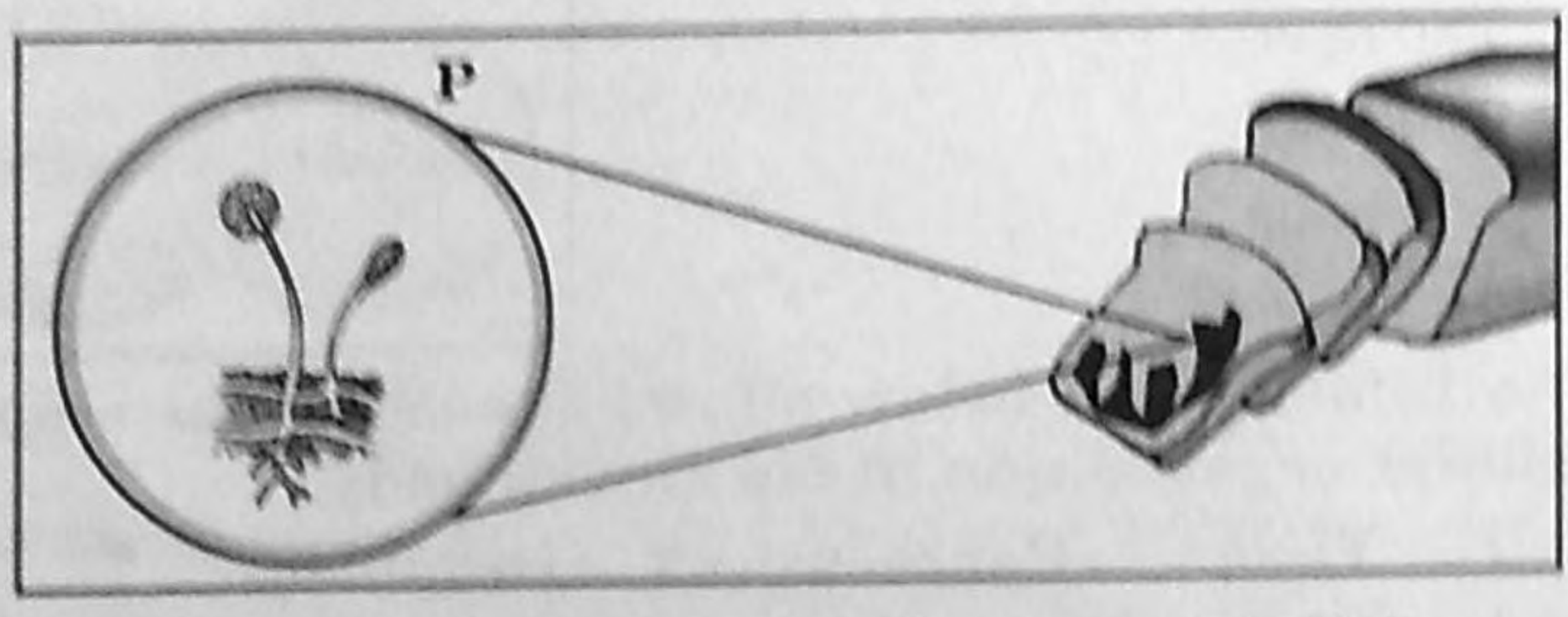
(A) X–coconut, Y–yeast (B) X–maize, Y–mushroom
(C) X-balsam, Y–spirogyra (D) X–long bean, Y– mushroom

86. Which of the following exhibit the characteristics given below?

i. Plant like organisms
ii. Lacks chlorophyll
iii. Mostly saprophytes and parasites

(A) Euglena (B) Fungi (C) Algae (D) Bryophytes

87. Observe the figure given below. Which of the following represents the figure 'P'?



(A) Moss (B) Mucor (C) Yeast (D) Volvox

88. Based on the information given below, what could be R, S and T?

R – A group of cells performing the same function
S – A basic unit of living organism
T – A few groups of tissues involved in a specific function

(A) R–Liver, S–Muscular tissue, T–Ovum
(B) R–Muscular tissue, S–Ovum, T–Liver
(C) R–Ovum, S–Muscular tissue, T–Liver
(D) R–Liver, S–Ovum, T–Muscular tissue

89. Which of the following is not a communicable disease?

(A) Tuberculosis (B) Dysentery (C) Chickenpox (D) Ulcer

90. In which of the following groups would you place a plant which produces spores and embryos but lacks seeds and vascular tissues?

(A) Fungi
(B) Pteridophyta
(C) Bryophyta
(D) Gymnosperms

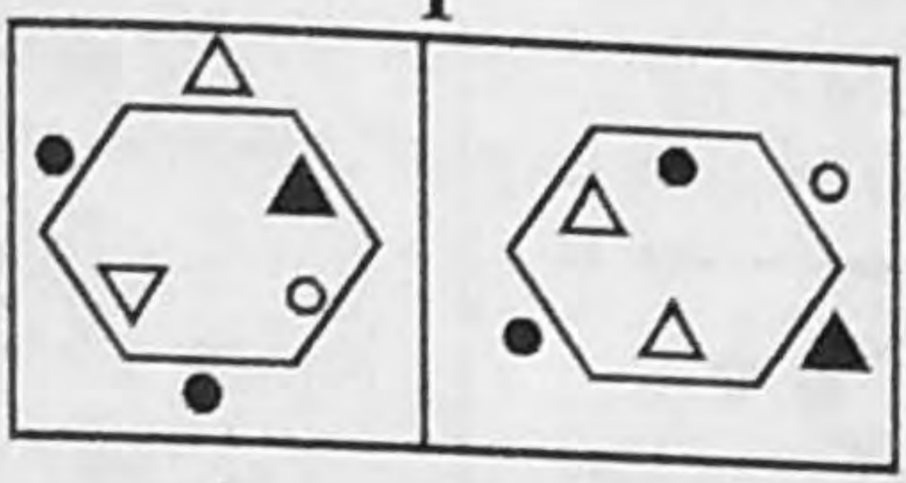
91. What is the meaning of the word 'plenary'?

(A) Easy to bend (B) Acceptable

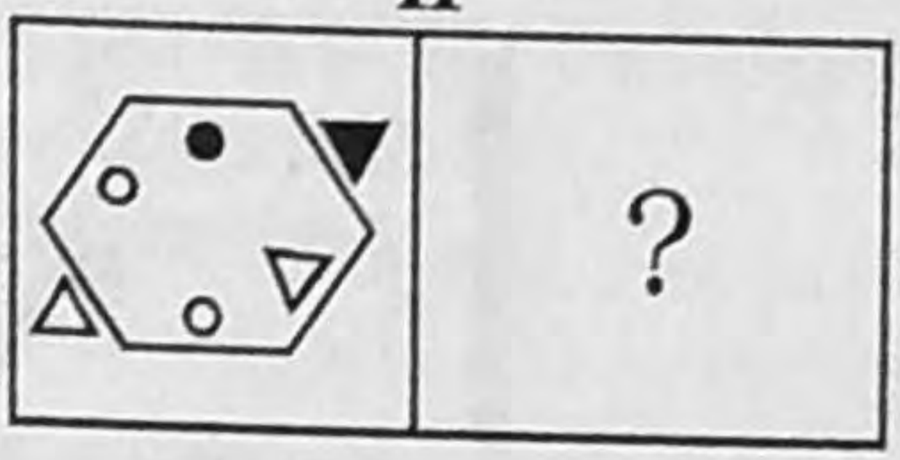
(C) Open to all (D) Able to absorb

92. Study the relation between the figures in set I and find the missing figure in set II?

I



II



(A) 

(B) 

(C) 

(D) 

93. Oriya is to Orissa, as Dogri is to:

(A) Maharastra (B) Kerala (C) Andhra Pradesh (D) Kashmir

94. Which letter should come next in the series given below?

Y, W, U, S, Q, ?

(A) O (B) L (C) M (D) P

95. Which of the following waves cannot be transmitted through vacuum?

(A) Light (B) Sound (C) Heat (D) Electromagnetic

96. To whom should the President of India address his/her letter of resignation?

(A) The Chief Justice of India (B) The Prime Minister of India

(C) The Speaker of Lok Sabha (D) The Vice President of India

97. Who among the following was defeated by Akbar in the Battle of Haldighati, in the year 1576?

(A) Sher Shah Suri (B) Shivaji

(C) Rana Pratap (D) Krishnadevaraya

98. Which Indian state is bordered by Bangladesh on three sides?

(A) Nagaland (B) Tripura (C) Manipur (D) Sikkim

99. Which game can be played on three different mounts- horse, cycle and elephant?

(A) Skating (B) Polo (C) Javelin (D) Billiards

100. From 1 O'clock in the morning till 12 noon, how many times will the pendulum of wall clock strike?

(A) 70 (B) 75 (C) 78 (D) 12