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TALLENTEX
ALLEN'S Talent Encouragement Exam

SAMPLE TEST PAPER
for
CLASS IX

"TALLENTEX COORDINATION CELL"

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A Specially Designed Initiative at National Level to Encourage Young Talent
by

INSTRUCTIONS

Time duration: 2:00 hours.

Maximum Marks: 320

This Question Paper contains 80 MCQs with 4 choices (Subjects: Physics: 15, Chemistry: 15, Biology: 15 & Maths: 15, Mental ability: 20).
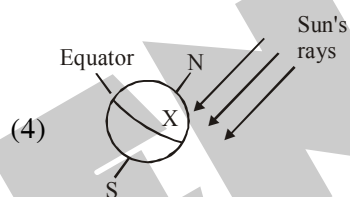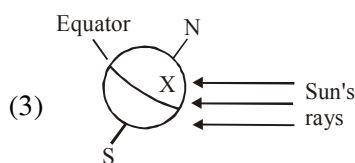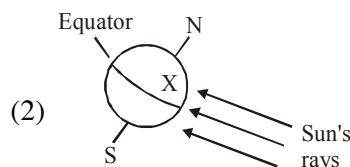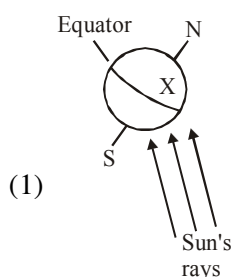
Marking Scheme: For each correct answer **4 marks** are awarded and for each wrong answer **–1 mark** is awarded. In case of no response zero mark will be awarded.
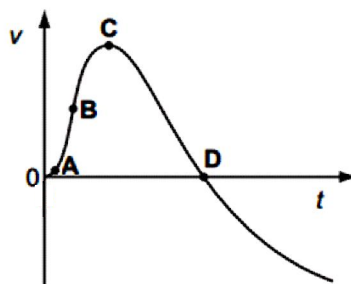
SECTION - A : PHYSICS

This section contains **15 Multiple Choice Questions**. Each question has four choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

1. Which of the following diagrams best represents the angle at which the Sun's rays strike location X at noon on June 21?

(1)

Equator N
X
S
Sun's rays

(2)

Equator N
X
S
Sun's rays

(3)
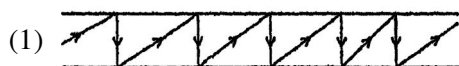
Equator N
X
S
Sun's rays

(4)

Sun's rays
Equator N
X
S

2. The graph shows how the velocity 'v' of a firework rocket changes with time t. At which point on the graph does the rocket have the greatest acceleration?
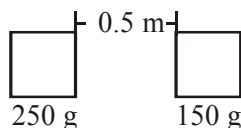
(1) A   (2) B   (3) C   (4) D

3. Which diagram correctly represents reflection of light along an optical fibre?

(1)   (2)

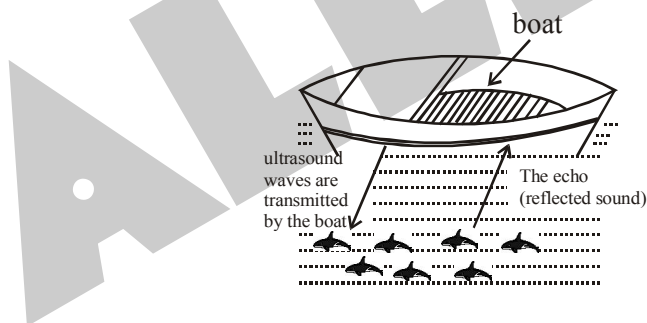(3)   (4)

4. A bomb at rest explodes into two pieces of equal mass. Then the pieces will fly off

(1) in the same direction with equal speeds   (2) in the same direction with unequal speeds

(3) in opposite direction with equal speeds   (4) in opposite directions with unequal speeds

5. If the velocity of car is increased by 20% then the minimum distance in which it can be stopped increases by

(1) 44%   (2) 55%   (3) 66%   (4) 88%

6. A sound tone is produced in water, when it enters air

(1) λ decreases, and f does not change

(2) both λ and f increase

(3) both λ and f decrease

(4) λ increases and f does not change

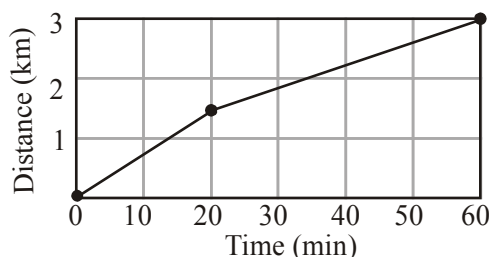**7.** What event will produce the greatest increase in the gravitational force between the two masses ?

(1) doubling the large mass

(2) doubling the distance between the masses

(3) reducing the small mass by half

(4) reducing the distance between the masses by half.

8. The diameter of Saturn is almost ten times that of the Earth, yet its density is much less. This can best be explained by the fact that Saturn

(1) is farther from the Sun

(2) is a gaseous planet

(3) has a shorter period of rotation

(4) has a ring around its center

9. A fish finder sends ultrasonic waves down the water to determine the location of the fish.
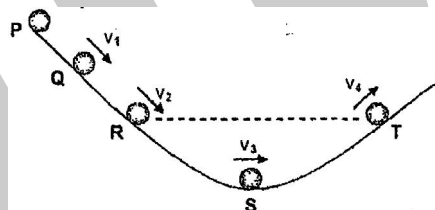

The same principle of reflection of sound is used in

(1) Sonic boom

(2) Sonar

(3) Echocardiography

(4) Ultrasonography

10. If the density of earth increases by 20% and radius decreases by 20% then the new value of "g" on the surface of earth will be :

(1) 0.8 g

(2) 0.90 g

(3) 0.96 g

(4) g

11. A plane mirror forms a virtual image. The distance between Mahima and her image in a plane mirror is 10 m. How much distance should she move in order to get the distance of 5 m between herself and her image ?

(1) 2.5 m away form the mirror

(2) 2.5 m towards the mirror

(3) 5 m away form the mirror

(4) 5 m towards form the mirror

12. The graph below shows distance over time.

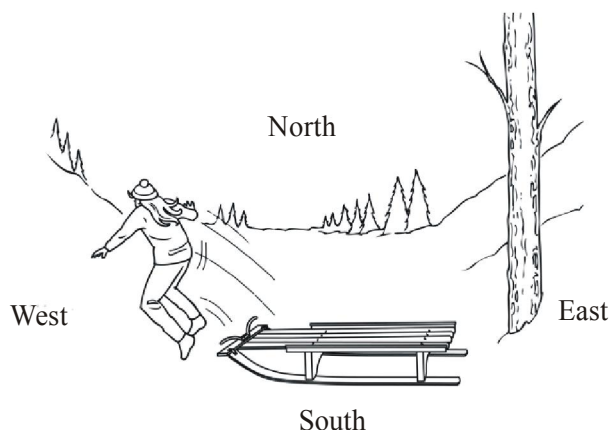

Which of these situations could be represented by this graph?

(1) A student walks 1.5 km to a friend's house in 40 minutes. The two students then walk another 1.5 km to school in 20 minutes.

(2) A student walks 1.5 km to a friend's house in 20 minutes. The two students then walk another 1.5 km to school in 40 minutes.

(3) A student walks 1.5 km to a friend's house in 30 minutes. The two students then walk another 1.5 km to school in 30 minutes.

(4) A student walks 1.5 km to a friend's house in 20 minutes. The two students then walk another 1.5 km to school in 60 minutes.

13. P,Q,R,S and T are five points on a smooth curved rail. Point R is directed along point T as shown in the diagram.

A marble released from rest at point P slides along the rail. The speeds of the marble at points Q, R, S and T are v_1, v_2, v_3 and v_4 respectively. Then which of the following relation is correct?

(1) $v_4>v_3>v_2>v_1$ (2) $v_1>v_2>v_3>v_4$ (3) $v_4=v_2>v_3>v_1$ (4) $v_3>v_4=v_2>v_1$

14. A student jumps off a sled toward the west after it stops at the bottom of an icy hill.

In what direction will the sled most likely move as the student jumps off?

(1) North   (2) South   (3) East   (4) West

15. The minute hand of a clock is 4 cm long. The average velocity of the tip of the minute hand between 11:00 am to 11:30 am is

(1) 1.5×10^{-5} m/s   (2) 4.5×10^{-5} m/s   (3) 1.8×10^{-6} m/s   (4) 3.5×10^{-6} m/s
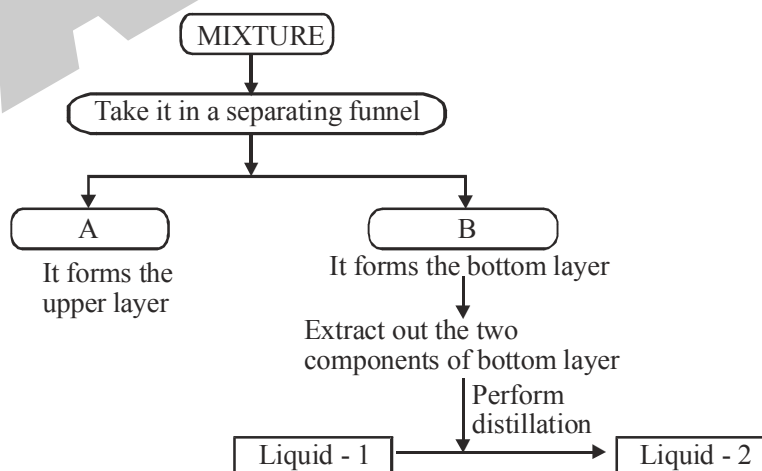
SECTION-B : CHEMISTRY

This section contains **15 Multiple Choice Questions.** Each question has four choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

16. Arrange the different types of coal in the increasing order of their quality.

(a) Lignite   (b) Peat   (c) Anthracite   (d) Bituminous

(1) acdb   (2) dbca   (3) badc   (4) bcda

17. German silver is an alloy of

(1) Cu, Ni and Sn   (2) P, Cu and Ag   (3) Cu, Zn and Sn   (4) P, Cu and As

18. Element used for making solar cells, transistors and computer chips is

(1) Phosphorus   (2) Silicon   (3) Iron   (4) Sulphur

19. Total amount of heat produced by a fuel having calorific value of 30 kJ/kg was found to be 60,000 Joules. How much fuel was burnt ?

(1) 2000 kg   (2) 200 kg   (3) 20 kg   (4) 2 kg

20. Forest fire is an example of

(1) slow combustion   (2) rapid combustion

(3) spontaneous combustion   (4) explosion

21. The liquid and its vapours at boiling point are at equilibrium. The molecules of the two phases have equal

(1) potential energy   (2) forces   (3) total energy   (4) kinetic energy

22. The boiling points of diethyl ether, acetone and n-butyl alcohol are 35°C, 56°C and 118°C respectively. Which one of the following correctly represents their boiling points in kelvin scale?

(1) 306 K, 329 K, 391 K   (2) 308 K, 329 K, 392 K

(3) 308 K, 329 K, 391 K   (4) 329 K, 392 K, 308 K

23. The solubility of potassium chloride in water at 20ºC is 34.7 g in 100 g of water. The density of solution is 1.3 g/ml. Calculate the % of mass/volume concentration of potassium chloride.

(1) 25.76%   (2) 33.49%   (3) 24.7%   (4) 1.3%

24. Which one of the following processes results in the formation of a new chemical compound ?

(1) Dissolving common salt in water   (2) Heating water

(3) Heating platinum rod   (4) Heating calcium carbonate

25. Water is used to extinguish fire because water

(1) raise the ignition temperature of the burning substance.

(2) lowers the ignition temperature of the burning substance.

(3) cools the burning substance to a temperature below its ignition temperaure.

(4) conducts the heat.

26. The table shows the melting and boiling points of four pure substances.

Which substance is a liquid at room temperature and rapidly evaporates if left exposed to air?

Substance	Melting point/°C	Boiling point/°C
A	-100	-35
B	-7	58
C	-6	225
D	44	280

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

27. Goldsmith uses ____ zone of the flame for melting gold.

(1) Outermost zone   (2) Middle zone   (3) Innermost zone   (4) Both (2) & (3)

28. Arrange the given combustible substances in decreasing order of calorific value.

(a) Hydrogen   (b) Charcoal   (c) Petrol

(d) L.P.G   (e) Wood

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

29. Which of the following statements is true about the evaporation of water from an open container?

(1) Evaporation is slower when there is a breeze.

(2) Evaporation takes place faster on a humid day.

(3) The process of evaporation gives off energy.

(4) Some water particles leave the surface and become part of the air.

30. Identify A and B in the given flow-chart.

(1) (A)-Kerosene and Water, (B)-Common salt

(2) (A)-Oil and Water, (B)-Common salt

(3) (A)-Oil, (B)-Alcohol and Water
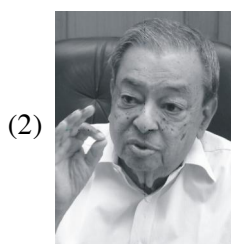
(4) (A)-Water, (B)-Common salt and Oil

SECTION-C : BIOLOGY

This section contains **15 Multiple Choice Questions.** Each question has four choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

31. Who is/are "Father of Green Revolution" ?
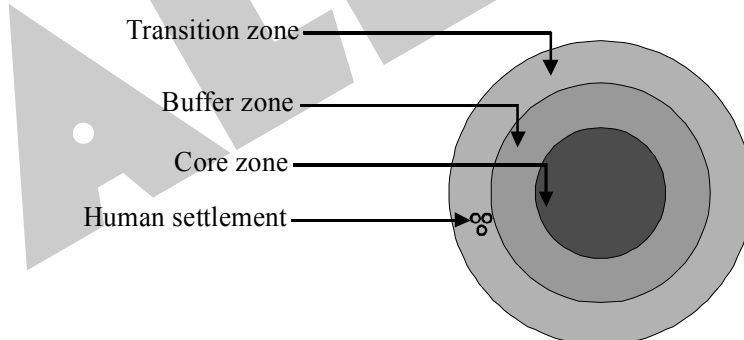
(1)

Norman borlaug

(2)

Dr. V. Kurein

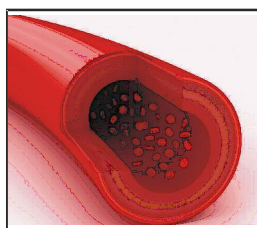(3) Norman borlaug and Dr. V. Kurein both are the Father of Green Revolution.

(4) None of these

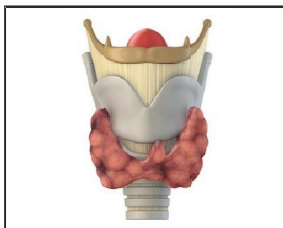**32.** Select the zone from the below image where no human activity is allowed.

Transition zone
Buffer zone
Core zone
Human settlement

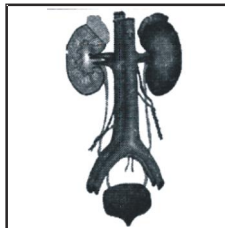(1) Transition zone   (2) Core zone   (3) Buffer area   (4) None of the above

33. Shown here are some drawings of structures that are found in our bodies. They are all at different magnifications.
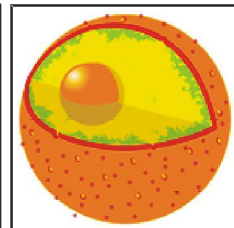
Blood vessel   Thyroid gland   Organs   Nucleus of a cell

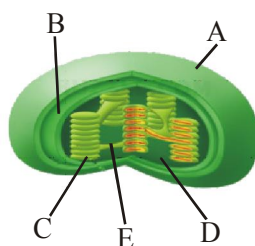Which one of them is drawn at the highest magnification?

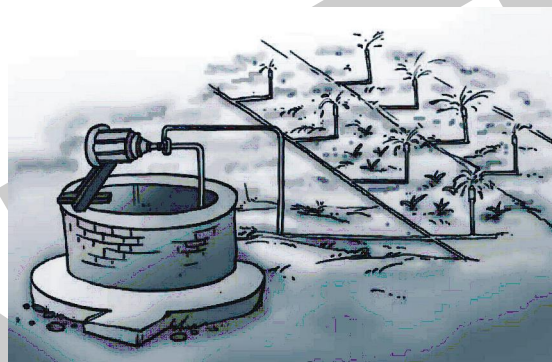(1) Blood vessel   (2) Thyroid gland   (3) Organs   (4) Nucleus of a cell

34. Identify A to E in the sectional view of a chloroplast given below.

(1) A-Inner membrane, B-Granum, C-Outer membrane, D-Stromal lamellae E-Stroma

(2) A-Outer membrane, B-Inner membrane, C-Thylakoid D-Stroma, E-Stromal lamellae

(3) A-Thylakoid, B-Outer membrane, C-Stroma, D-Stromal lamellae, E-Granum

(4) A-Outer membrane, B-Stroma, C-Inner membrane, D-Granum, E-Thylakoid

35. Which of the following option is correct regarding the diagram given below?

Sprinkler system of irrigation

(1) It is useful for sandy soil and even land.

(2) It is useful for loamy soil and even land.

(3) It is useful for loamy soil and uneven land.

(4) It is useful for sandy soil and uneven land
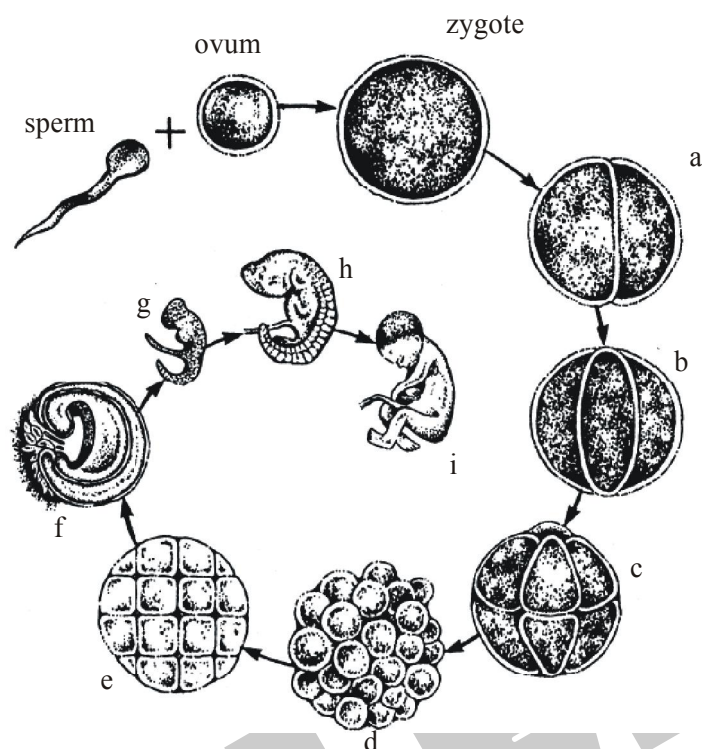
36. Find out the correct sentences about manure.

(i) Manure reduces soil erosion.

(ii) Manure improves the texture of soil by adding organic matter.

(iii) Manure decreases water holding capacity.

(iv) Manure decreases the number of friendly microbes.

(1) (i) and (iii)   (2) (i) and (ii)

(3) (ii) and (iii)   (4) (iii) and (iv)

37. The Black Rhino is killed for its

(1) Ivory   (2) Fur   (3) Horn   (4) Meat

38. The new baby's genetic / inherited material is carried in the

(1) sperm cell　　　　　　　　　　　　(2) ovum
(3) sperm cell and ovum　　　　　　　　(4) sperm and body cell

39. Which of the following blood cells are phagocytic in nature?
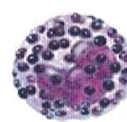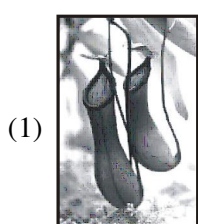
Blood Cells

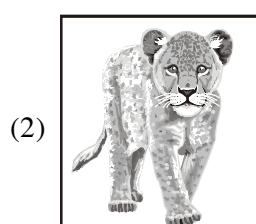(1) Eosinophil and Basophil　　　　　　(2) Erythrocyte and Monocyte
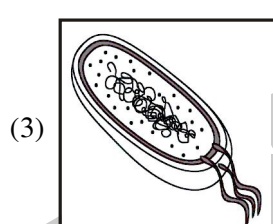(3) Lymphocyte and Platelet　　　　　　(4) Neutrophil and Monocyte

40. Which of the following practices involve in organic farming ?

(1) Use of biofertilizers

(2) Crop rotation

(3) Both (1) and (2)

(4) Use of chemical pesticides

41. Use of contraceptive pills by female inhibits which step of reproductive cycle

(1) Ovulation

(2) Ejaculation

(3) Insemination

(4) Fertilization

42. There are some microorganisms which decompose the waste products and remain of dead plant and animals. This helps in keeping the environment clean. Which of the following can do this ?
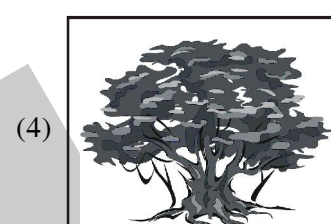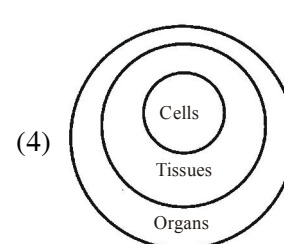
(1)
Pitcher plant

(2)
Tiger

(3)
Bacteria

(4)
Tree

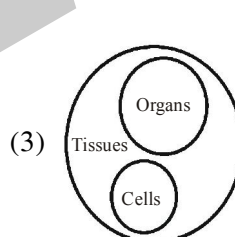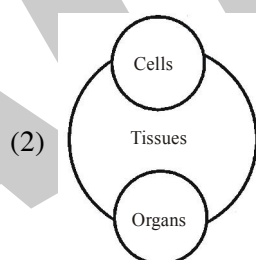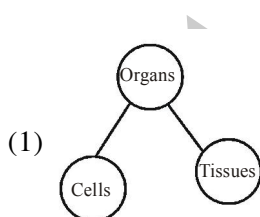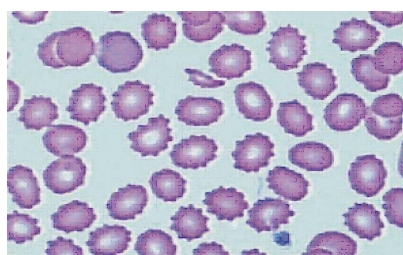**43.** Which diagram best illustrates the relationship among the number of cells, tissues, and organs in a complex multicellular organism?

(1)
Organs
Cells
Tissues

(2)
Cells
Tissues
Organs

(3)
Tissues
Organs
Cells

(4)
Cells
Tissues
Organs

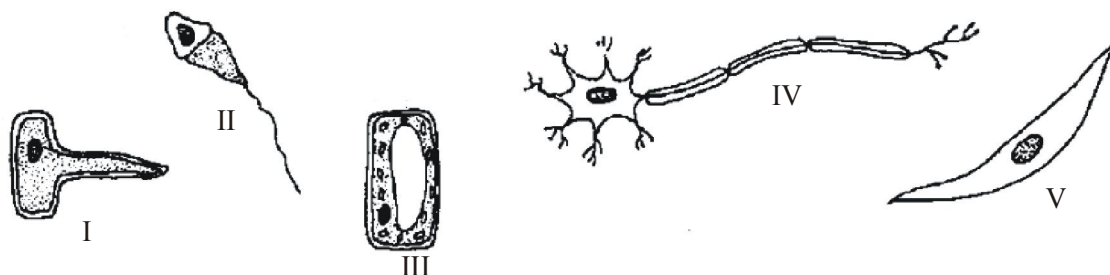**44.** Study the diagram given below. In this diagram RBC's show crenation then this solution will be

(1) Hypotonic

(2) Isotonic

(3) Hypertonic

(4) None of these

45. Living organisms are madeup of building blocks called cells. They may differ in size, in the way they look and in what they are used for. Look at the pictures of different cells.

Which diagrams represent plant cells?

(1) III and IV   (2) II and V   (3) I and III   (4) I and IV

SECTION-D : MATHEMATICS

This section contains **15 Multiple Choice Questions.** Each question has four choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

46. The unit's digit in the product of first 50 odd natural numbers is

(1) 0   (2) 5   (3) 7   (4) None of these

47. Find the quotient if we divide $x^7 y - xy^7$ by $(x+y)(x^2 - xy + y^2)$

(1) $xy(x^3 + y^3)$ (2) $(x^3 + y^3)$ (3) $xy(x^3 - y^3)$ (4) $(x^3 - y^3)$

48. If $3^{x+3} \cdot 9^{2x-5} = 3^{3x+7}$, then the value of x is

(1) 3   (2) 4   (3) 6   (4) 7

49. Factorize : $p^2 + q^2 - a^2 - b^2 + 2pq + 2ab + p + q - a + b$

(1) (p + q − a + b)(p + q + a − b + 1)   (2) (p − q − a + b)(p − q + a − b + 1)

(3) (p + q + a + b)(p + q + a − b + 1)   (4) (p + q − a − b)(p + q + a − b + 1)

50. If $r^3 = 1728$ and $s = (6859)^{1/3}$, then $s^2 - r^2$ is

(1) 217   (2) 341   (3) 534   (4) 231

51. The number $107^{90} - 76^{90}$ is divisible by

(1) 61   (2) 62   (3) 64   (4) None of these

52. What is the value of $x^3 - 3b^{\frac{2}{3}}x + 9a$, if $x = \left(2a + \sqrt{4a^2 - b^2}\right)^{1/3} + \left(2a - \sqrt{4a^2 - b^2}\right)^{1/3}$?

(1) 12a   (2) 13a   (3) 14a   (4) None of these

53. Find x : $[3+\{2+(1+x^2)^2\}^2]^2 = 144$
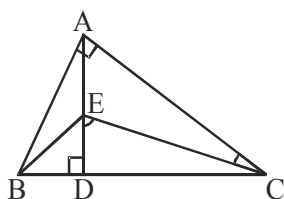
(1) 1   (2) 0   (3) 5   (4) 6

54. If a wire is bent into the shape of a square, then the area of the square is 81 sq. cm. When the wire is bent into a semi-circular shape, the area of the semi-circle will be: (take $\pi = \dfrac{22}{7}$)

(1) 22 cm^2 (2) 44 cm^2 (3) 77 cm^2 (4) 154 cm^2

55. In ΔABC, if $\angle ABD = 64°$, what is the measure of $\angle DEC - \angle ACE$?

(1) 66°

(2) 64°

(3) 60°

(4) 54°

56. ABCD is a parallelogram in which $\angle DAO = 40°$, $\angle BAO = 35°$ and $\angle COD = 65°$ where point O is intersection point of diagonals then $\angle ODC = $ ....
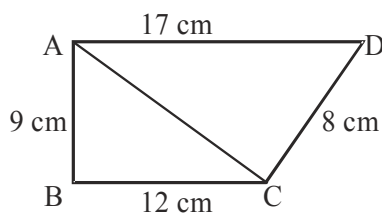
(1) 80°   (2) 105°   (3) 25°   (4) None of these

57. If two lines intersect X axis at (–1, 0) and (10, 0) and Y axis at (0, 1) and (0, 10) and intersect each other at (4, 5) then find the difference between area of triangle formed by the lines along with X axis and area of triangle formed by lines along with Y axis.

(1) $\dfrac{19}{2}$ sq units   (2) 7 sq units   (3) 14 sq units   (4) None of these

58. Three pumps working 8 hours a day can empty a tank in 2 days. How many hours a day must 4 pumps work to empty the tank in 1 day ?

(1) 13 hours   (2) 12 hours   (3) 10 hours   (4) 9 hours

59. If the area of the quadrilateral ABCD ($\angle B = 90°$) is $(a + 20\sqrt{b})$ cm^2 (where a is area of ΔABC), then the value of a + b is

(1) 54   (2) 63   (3) 85   (4) none of these

60. Factorize $(x + y + z)^2 - (x + y - z)^2$

(1) $2(x + y + z)(x + y - z)$

(2) $(x + y + z)(x + y - z)$

(3) $4z(x + y)$

(4) $(x + y + z)(x - y - z)$

SECTION-E : MENTAL ABILITY

This section contains **20 Multiple Choice Questions.** Each question has four choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

61. Kunal travels 10 m from his shop and turns to his left. After that he turns to right from the crossing. After moving certain yards, he turns to left and again turns to left after moving some distance. Finally, he turns to right. If at final position he is facing North direction, then which direction he was facing while coming out of his shop ?

(1) South   (2) West   (3) East   (4) North

62. Two ladies and two men are playing a bridge game (cards) and are seated around a square table. No lady is facing towards East. Persons sitting opposite to each other are not of the same sex. One man is facing towards South. Which directions are the ladies facing ?

(1) East and West

(2) South and East

(3) North and East

(4) North and West

63. In a certain code language, QUEUE is written as Q22, and CHURCH is written as 1UR1. Which of the following would be most appropriate code for BANANA in that language ?

(1) B5A5   (2) 5N5A   (3) B55A   (4) BA5A5A

64. Kritik ranked 16th from the top and 29th from the bottom among those who has passed an examination. Six children do not participate in the examination and five failed in it. How many children are there in the class ?

(1) 40   (2) 44   (3) 50   (4) 55

65. Two equi dimensional cubes are joined face to face and are coloured red on all of their available open faces. One cube is then cut into eight equal smaller cubes and the other cube is cut into 27 smaller cubes. How many smaller cubes have two of their faces coloured ?
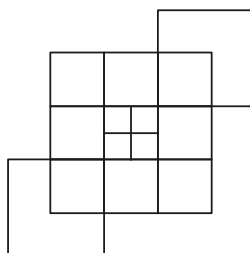
(1) 10   (2) 12   (3) 16   (4) 18

66. Find the number of squares in the given figure.

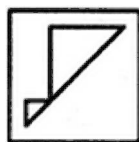(1) 19   (2) 20   (3) 18   (4) 16

67. In a certain code KETTLE is coded as 252235, ROUGH is coded as 96378. What is the code of TALENT ?

(1) 213562   (2) 251362   (3) 213552   (4) 251335

68. Find the alternative figure which contains figure (X) as its part.
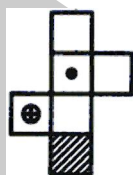

(X)

(1)   (2)   (3)   (4)

69. A series of small letters is given which follow a certain pattern. However some letters are missing from the series. You have to find out the right set of letters from alternative that can be inserted into the blanks of the series.

_a_b_abaa_bab_abba

(1) aaabb   (2) ababb   (3) babab   (4) babba

70. Choose the box that is similar to the box formed from the given sheet of paper (X) :

(X)   (1)   (2)   (3)   (4)

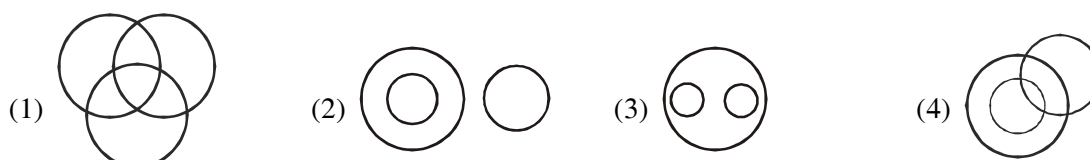(1) 1 only   (2) 1 and 3 only   (3) 1, 3 and 4 only   (4) 1, 2, 3 and 4

71. If a means +, b means − , c means × and d means ÷ , then

16 c 12 b 6 d 2 a 17 = ?

(1) 172   (2) 192   (3) 206   (4) None of these

72. Out of the four figures that follow, you are to indicate which figure will best represent the relationship amongst the three classes.
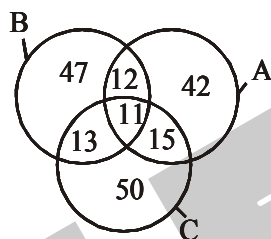
"Boys, Students, Athletes"

(1)   (2)   (3)   (4)

73. Find the missing character in the given figure.

6	7	17
8	8	20
2	3	?

(1) 7   (2) 16   (3) 10   (4) 45

74. There are three circles A, B and C in the figure, which represents the number of students who got distinction in Physics, Chemistry and Mathematics respectively. The total number of candidates passed is 500. Observe the diagram given below and find out the total percentage of students who got distinction in all the three subjects ?

(1) 7.2   (2) 5.2   (3) 3.2   (4) 2.2

75. Pointing to a woman, a girl said, 'She is the only daughter-in-law of the grandmother of my father's son'. How is the woman related to the girl ?
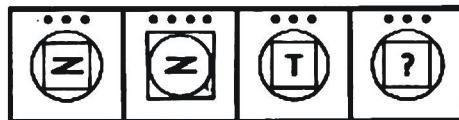
(1) Sister   (2) Cousin

(3) Mother   (4) Aunt

76. Pick up from the answer figures, one which will continue the series to the problem figures.

Problem figures   Answer figures

77. If A + B means 'A is the daughter of B'

A × B means 'A is the son of B'.

A − B means 'A is the wife of B'.
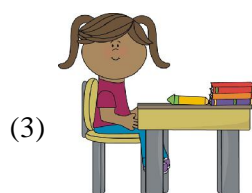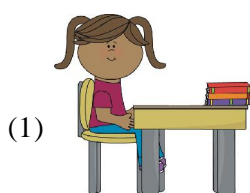
Given T − S × B − M, which of the following is not true ?

(1) B is the mother of S.   (2) M is the husband of B.

(3) S is the daughter of B.   (4) T is the wife of S.

78. Choose the Mirror Image of the given figure (X).

(X)

(1)   (2)   (3)   (4)

79. Find the missing number in the series.
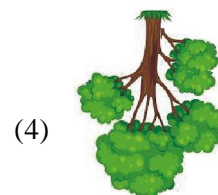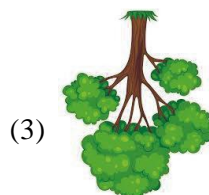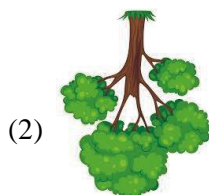
13, 16, 22, 26, 38, 62, ?, 102

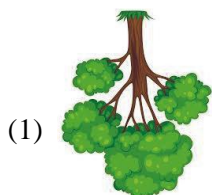(1) 74   (2) 89   (3) 70   (4) 90

80. Choose the Water Image of the given figure (X).

(X)

(1)   (2)   (3)   (4)

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	3	2	2	3	1	1	4	2	2	3	2	2	4	3	2
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	3	1	2	4	3	4	3	2	4	3	2	1	2	4	3
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	1	2	4	2	4	2	3	3	4	3	1	3	4	3	3
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	2	3	4	1	1	1	2	2	3	2	1	1	2	2	3
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	3	4	3	4	3	2	3	4	4	1	3	1	1	4	3
Que.	76	77	78	79	80										
Ans.	1	3	3	1	3										