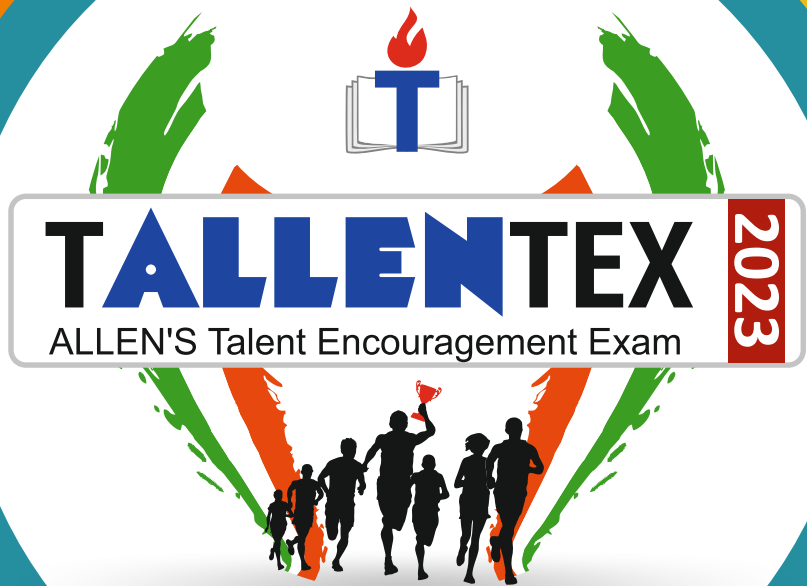


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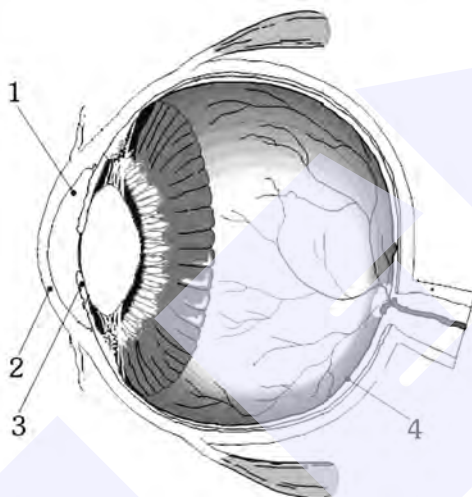
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SECTION-A : PHYSICS

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

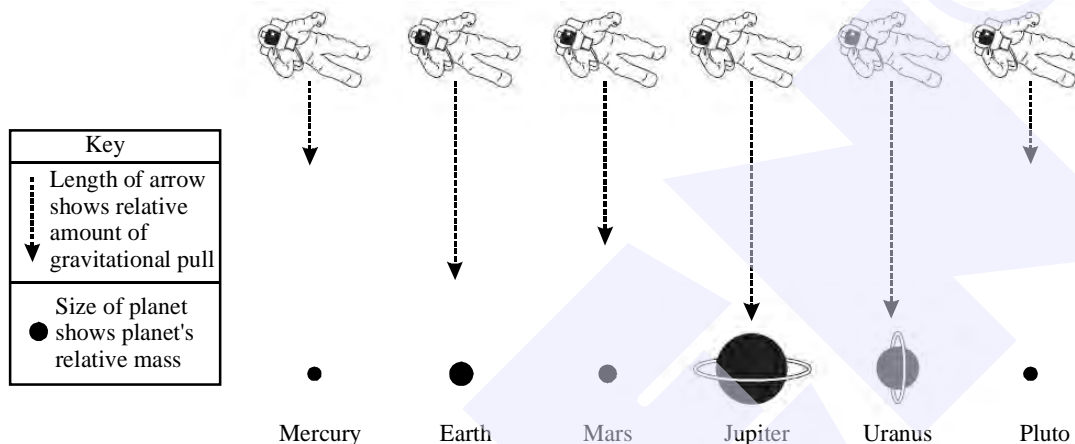
1. In the figure of human eye shown below, which of the labelled part give it its distinctive colour?



- (1) 1 (2) 2 (3) 3 (4) 4
2. Velocity of a car at $t = 0$ is u , moves with a constant acceleration α and then decelerates at a constant rate β for some time and gain its initial velocity. If the total time taken is T , the maximum velocity of car is given by
- (1) $u - \frac{\alpha\beta T}{\alpha + \beta}$ (2) $u + \frac{\alpha\beta T}{\alpha + \beta}$
- (3) $u - \frac{\alpha\beta T}{\alpha - \beta}$ (4) $u + \frac{\alpha\beta T}{\alpha - \beta}$
3. India has built and launched several satellites, the first Indian satellite built by ISRO was :
- (1) INSAT-IA (2) Aryabhata (3) Apple (4) Bhaskara-I
4. A horse pulls a cart along a flat road. Consider the following four forces that arise in this situation.
- (I) the pulling force of the horse on the cart
(II) the pushing force of the horse on the road
(III) the pulling force of the cart on the horse
(IV) the pushing force of the road on the horse
- Suppose that the horse and the cart have started from rest; and as time goes on, their speed increases in the same direction. Which one of the following conclusions is correct concerning the magnitudes of the forces mentioned above?
- (1) Force (I) exceeds force (III) (2) Force (II) exceeds force (IV)
(3) Force (III) is less than force (II) (4) Force (III) exceeds force (IV)
5. Mars orbits the sun at a distance of 2.3×10^{11} meter. The mass of the sun is 2×10^{30} kg and mass of mars is 3.4×10^{23} kg. Approximately what is the gravitational force that the sun exerts on mars ($G = 6.7 \times 10^{-11}$ N)
- (1) 1.6×10^{20} N (2) 1.6×10^{21} N (3) 3.7×10^{21} N (4) 3.7×10^{32} N

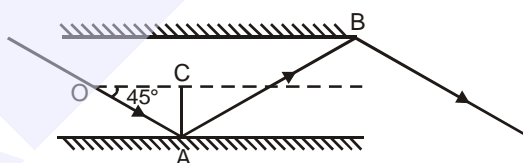
6. The diagram shows the relative strengths of the gravitational force for planets of different masses. The size of each planet represents the planet's relative mass. The arrow length indicates the relative amount of gravitational pull that each planet would exert on an astronaut in space.

Relative strengths of gravitational force for planets of different mass



The relationship between the mass of the planets (M) and the relative strength of their gravitational pull is (F)

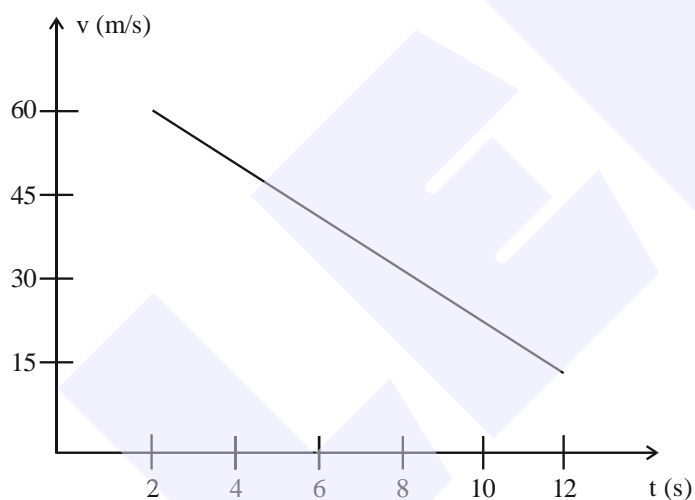
- (1) $F \propto M$ (2) $F \propto \frac{1}{M}$ (3) $F \propto M^2$ (4) $F \propto \frac{1}{(M)^2}$
7. 10 N force acts on 2 kg body at rest. Neglecting all other forces on the body, we can say that the body
- (1) has an acceleration of 5 m/s^2 .
 (2) has momentum of 30 N-s after 3 seconds of force application.
 (3) has a speed of 10 m/s after 2 seconds of force application.
 (4) all of above options are true.
8. Two plane parallel mirrors A and B, reflect a ray of light as shown below.



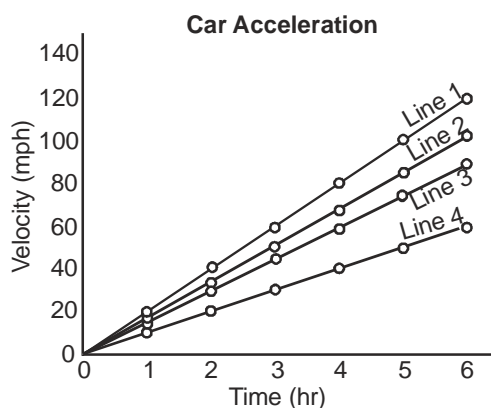
What is the angle of reflection at the point of incidence A?

- (1) 90° (2) 45° (3) 30° (4) 60°
9. On a $60 \text{ cm} \times 60 \text{ cm}$ carrom board, a carrom-coin placed at the centre is hit by the striker. The coin moves to the front edge, rebounds and strikes to the mid point of the right side limb and stops. The displacement of the coin is
- (1) $30\sqrt{2} \text{ cm}$ (2) $30 + 30\sqrt{2} \text{ cm}$ (3) 30 cm (4) 60 cm
10. Objects on the surface of Earth experience a large downward force although the universal gravitational constant is very small. Which of the following best explains this phenomenon?
- (1) Objects on Earth's surface exert a gravitational pull as strong as Earth's, regardless of the gravitational constant.
 (2) The universal gravitational constant only describes relationships between small objects in outer space.
 (3) Earth's mass is large enough that its gravity remains strong even when multiplied by a small constant.
 (4) The universal gravitational constant increases in proportion with the mass of an object.

11. How many types of tectonic plate boundaries are classified on the basis of geologic characteristics and process associated with it
(1) 2 (2) 3 (3) 4 (4) 5
12. What is the rate of change of velocity of the body having uniformly accelerated motion if its velocity increases by 10 m/s in 5 seconds.
(1) 5 m/s^2 (2) 2 m/s^2 (3) 0 m/s^2 (4) 10 m/s^2
13. A toy car of 400 g has the given graph for its motion. The magnitude of force acting on it would be:-



- (1) 1.8 N (2) 2 N (3) 6 N (4) 3.6 N
14. Which of the following planets has the lowest average density?
(1) Mercury (2) Earth (3) Venus (4) Jupiter
15. The graph below represents the change in velocity of four cars over a period of 6 seconds. Which line represents the car with the greatest acceleration?

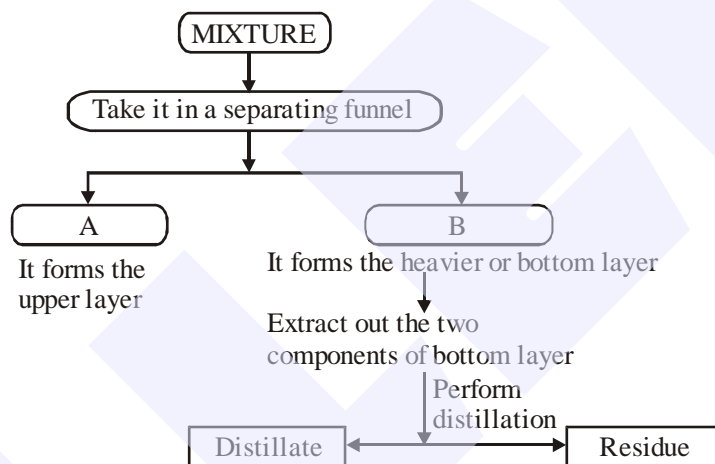


- (1) Line 1 (2) Line 2 (3) Line 3 (4) Line 4

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. An element M has an atomic number 9 and atomic mass 19. It's ion will be represented by:
 (1) M (2) M^{2+}
 (3) M^{-} (4) M^{2-}
17. Identify A and B.



- (1) (A) Sand and Water, (B) Common salt
 (2) (A) Oil and Water, (B) Common salt
 (3) (A) Oil, (B) Common salt and Water
 (4) (A) Water, (B) Common salt and Oil
18. **Statement - 1** : Petroleum is a dark oily liquid and a mixture of various constituents.
Statement - 2 : The process of separating various constituents of petroleum is known as Refining.
 (1) Both statements 1 and 2 are correct and statement 2 is the correct explanation of the statement 1.
 (2) Both statements 1 and 2 are correct and statement 2 is not the correct explanation of the statement 1.
 (3) Statement 1 is correct, but statement 2 is incorrect.
 (4) Statement 1 is incorrect, but statement 2 is correct.
19. Two liquids A and B have same boiling point. Liquid A is kept at sea level and B is kept at mountain top. Which of the following is correct observation on heating?
 (1) Liquid A boils at lower temperature than B
 (2) Liquid B boils at lower temperature than A.
 (3) Both A and B boils at same temperature.
 (4) Can not be determined

20. Match the Column

Column-I		Column- II	
(A)	Chlorine	(p)	Thermometer
(B)	Copper	(q)	Fertilizers
(C)	Nitrogen	(r)	Water purification
(D)	Mercury	(s)	Electric wires

(1) A-q, B-s, C-r, D-p

(2) A-r, B-q, C-s, D-p

(3) A-r, B-s, C-q, D-p

(4) A-p, B-s, C-r, D-q

21. A family consumes 12 kg of L.P.G. in 30 days. Calculate the average energy consumed per day, if the calorific value of L.P.G. is 50 KJ/Kg.

(1) 10,000 J/day

(2) 15000 J/day

(3) 20,000 J/day

(4) 25000 J/day

22. Among the following, the substance which does not have fixed set of properties is

(1) Water

(2) Sodium chloride

(3) Iron

(4) Lemonade

23. Choose the correct statement :

(1) The value of latent heat of vapourization is less than the value of latent heat of fusion for H_2O .

(2) The substance having high specific heat takes more time to increase its temperature by $1^\circ C$.

(3) Water is used in radiators of cars because it has low specific heat.

(4) Latent heat of fusion for water is 540 calories/gm

24. Which of the following is true about combustion?

(1) Combustion occurs in the presence of oxygen.

(2) The substances react with hydrogen in combustion.

(3) It produces light and heat.

(4) Both (1) and (3)

25. Which of the following is non-renewable source of energy?

(1) Solar Energy

(2) Biogas

(3) Geothermal energy

(4) Coal

26. Which one among the following do not show sublimation ?

(1) $I_2(s)$

(2) $CO_2(s)$

(3) $CCl_4(l)$

(4) $NH_4Cl(s)$

27. The substances which have very low ignition temperature will _____.

(1) catch fire easily

(2) not catch fire

(3) catch fire after sometime

(4) none of these

28. Which of the following solutions can be separated by simple distillation?

(i) Salt solution

(ii) Ethanol (B.pt = $78^\circ C$) and water

(iii) Alloys

(iv) Acetone (B.pt = $56^\circ C$) and water

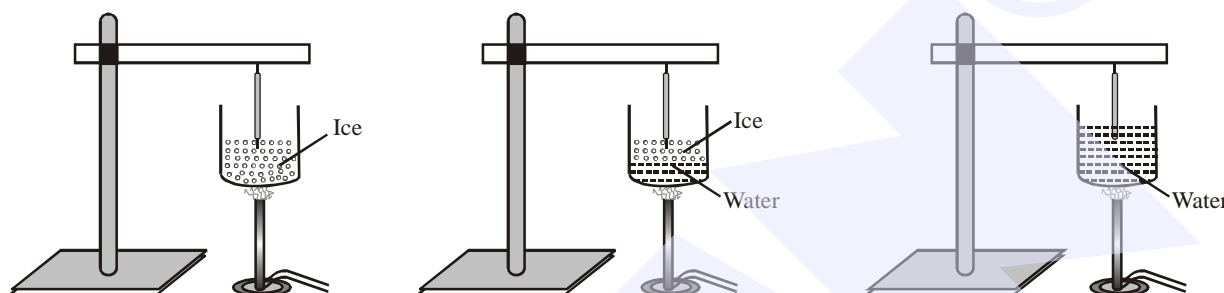
(1) (i), (ii) and (iv)

(2) (i) and (iv)

(3) (i) and (ii)

(4) (iv) only

29. In an experiment to note the temperature of ice, as heat is supplied to it till it is completely converted into water, the temperature as noted by a student at the instant when complete ice just melted will be



- (1) 0°C
 (2) 0°C gradually rising to 100°C
 (3) 0°C suddenly rising to 100°C
 (4) none of these
30. When candle burns in air, what are the products formed?
- (1) $\text{CO}_2 + \text{H}_2\text{O} + \text{Heat}$
 (2) $\text{CO}_2 + \text{H}_2$
 (3) $\text{CO} + \text{H}_2$
 (4) $\text{CO} + \text{O}_2$

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. Which of the tissue of plant have following characteristics?
- Responsible for growth in plant
 - Having large and prominent nucleus
 - Thin cell wall
 - No or very small vacuole
 - Intercellular space absent
- (1) Meristematic tissue
 (2) Parenchyma
 (3) Collenchyma
 (4) Sclerenchyma
32. Which of the following is/are cause of loss of biodiversity ?
- (A) Increase in human population
 (B) Pollution of air, water and land
 (C) Increase in vegetation
 (D) Natural phenomenon like rain fall
- (1) A and B only
 (2) A, B, C and D
 (3) C and D only
 (4) B and D only
33. The plasma membrane of an animal cell consist of
- (1) Proteins, lipids and cellulose
 (2) Lipids, proteins and carbohydrates
 (3) Proteins, pectin and cellulose
 (4) Hemicellulose, proteins and lipids

34. Find out the correct statements.

- (A) Hybridization is crossing between genetically dissimilar plants
(B) Cross between two varieties is called as interspecific hybridization
(C) Introducing gene of desired character into a plant gives genetically modified crops
(D) Cross between plants of two species is called intervarietal hybridization

- (1) A, B, C only (2) B, C only
(3) A and C only (4) B, C and D only

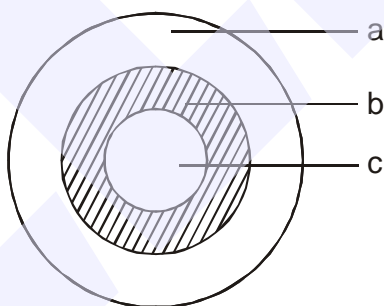
35. The time and frequency of irrigation varies from

- (1) Crop to crop (2) Soil to soil
(3) Season to season (4) All of these

36. Artificial method of vegetative propagation is

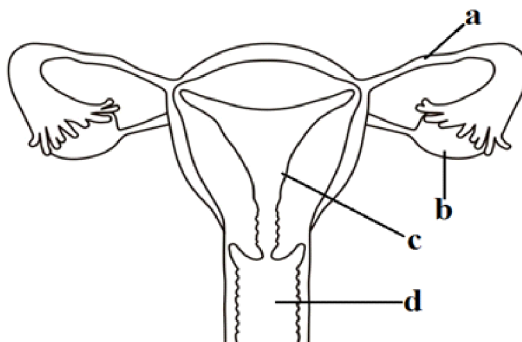
- (1) Cutting (2) Layering (3) Grafting (4) All of these

37. Labelled zone of biosphere reserve where human activity and settlement is not allowed?



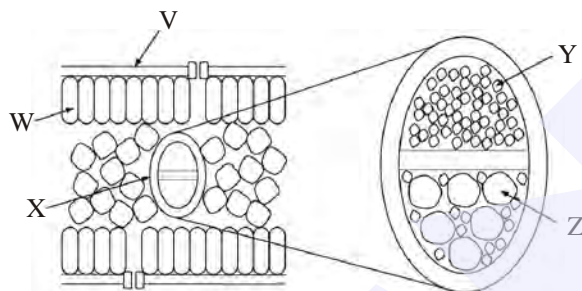
- (1) a-core zone (2) c-transitional zone
(3) c- core zone (4) b-buffer zone

38. Labelled part which provides the support for development of baby?



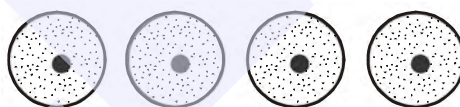
- (1) a (2) b (3) c (4) d

39. Given question refers to the following diagram of a leaf cross section. The cell type W is likely to contain an abundance of which organelle?



- (1) Chloroplasts
(2) Mitochondria
(3) Ribosomes
(4) Smooth endoplasmic reticulum
40. Roughage includes
(1) Food rich in fibres
(2) Food rich in proteins
(3) Food rich in vitamins
(4) Food rich in fats
41. Identical animal cells were placed in solutions with different concentrations. The diagram shows the volume of the cells at the start and the end of the experiment. Identify from the following options that which cell was placed in hypertonic solution?

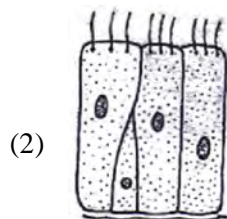
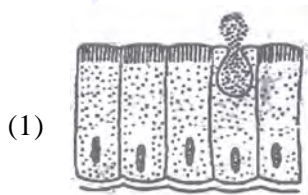
Volume at start



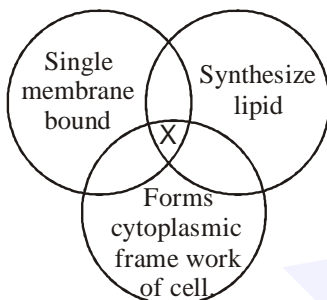
End result



42. If same crop is grown in a piece of land year after year, it
(1) reduces the fertility of the soil
(2) increases the fertility of the soil
(3) does not affect the fertility of the soil
(4) helps in increasing production
43. Which of these epithelia is chiefly involved in function like diffusion and thereby is found in the wall of blood vessel and air sacs of the lungs?



44. Identify X in the given venn diagram.



- (1) Golgi body (2) Mitochondria
(3) Endoplasmic reticulum (4) Nucleus

45. Spirogyra differs from a Paramecium in the presence of

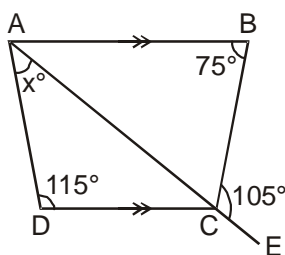
- (1) Plastid (2) Mitochondria (3) Nucleus (4) Golgi body

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. If $(x + a)(x + b)(x + c) = x^3 - 10x^2 + 45x - 15$, then $a^2 + b^2 + c^2$ is equal to
(1) 100 (2) 10 (3) 20 (4) 50
47. How many positive integers between 10 and 2016 are divisible by 3 and have all of their digits the same?
(1) 9 (2) 12 (3) 6 (4) 18
48. The cube root of 140608 is
(1) 42 (2) 152 (3) 72 (4) 52
49. The value of $\frac{\sqrt{63} - \sqrt{45}}{\sqrt{7} - \sqrt{5}}$ is
(1) $\sqrt{7} + \sqrt{5}$ (2) $\sqrt{9}$ (3) $\sqrt{3}$ (4) 9
50. $(3^5 \div 3^8)^5 \times 3^{-5} =$ _____
(1) 3^{-19} (2) 3^{20} (3) 3^{-20} (4) $\frac{1}{3}$
51. If $x^2 + y^2 + z^2 - xy - yz - xz = 0$, then which of the following is true?
(1) $x \neq y \neq z$ (2) $x = y = z$
(3) $x \neq y = z$ (4) $x = y \neq z$
52. The area of a square is $100\frac{601}{900}\text{cm}^2$, then the length of the side of the square is
(1) $10\frac{1}{30}\text{cm}$ (2) $10\frac{7}{30}\text{cm}$ (3) $10\frac{3}{5}\text{cm}$ (4) $10\frac{9}{30}\text{cm}$

53. The area of parallelogram is 91 cm^2 and one of its altitude is 13 cm. The length of its corresponding side is
(1) 13 cm (2) 5 cm (3) 6 cm (4) 7 cm
54. If $(2x - 3)$ is a factor of $2x^4 - x^3 - 3x^2 - 2x + a$, then the value of 'a' is
(1) -3 (2) 2 (3) -2 (4) 3
55. The sides of a hexagon are produced in order, which of the following is the sum of its exterior angles?
(1) 540° (2) 270° (3) 360° (4) 720°
56. A grey squirrel has 65 nuts gathered in its nest, and a red squirrel has 114 nuts gathered in its nest. A wily woodpecker steals nuts from both squirrels nests. It steals $\frac{2}{3}$ as many nuts from the nest of the grey squirrel as it steals from the nest of the red squirrel. After the woodpecker takes the nuts from both nests, the red squirrel has twice as many nuts left as the grey squirrel has. How many nuts does the grey squirrel is left with?
(1) 33 (2) 36 (3) 48 (4) 30
57. The Monday after Thanksgiving is now called "Cyber Monday" and is the busiest online shopping day of the year. On Cyber Monday 2004, credit card users for one company spent $\frac{4}{5}$ of the amount of money they spent on Cyber Monday in 2005. What percent more money was spent in 2005?
(1) 30% (2) 25% (3) 20% (4) 35%
58. In the diagram, AB is parallel to DC and ACE is a straight line. The value of x° is



- (1) 35° (2) 30° (3) 40° (4) 45°
59. If the perimeter of a semi-circular protractor is 72 m, find the radius of protractor. $\left(\pi = \frac{22}{7}\right)$
(1) 15 m (2) 14 m (3) 16 m (4) None of these
60. Seema types 270 words in half an hour. How many words would she type in 5 minutes?
(1) 36 (2) 45 (3) 40 (4) 50

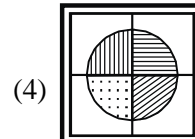
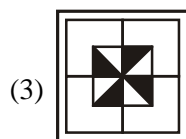
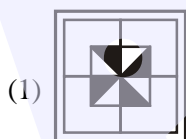
SECTION-E : MENTAL ABILITY

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. A man starts from his house and walks 10 km in South direction, then he turns right and goes 6 km, again he turns right and goes 10 km and finally turns right and goes 6 km. At what distance is he from the starting point and in which direction ?
 (1) 2 km, North (2) 3 km, South
 (3) At the starting point (4) 4 km, East
62. If 'YAASPYAW' stands for 'ACCURACY', how will you write 'QSAACQQ' ?
 (1) TOMORROW (2) REASONS (3) SUCCESS (4) IAGRAM
63. In the following number series how many 8's are there which are exactly divisible by the numbers which are preceded and followed by it ?
8 2 4 5 1 7 2 8 4 8 4 2 2 8 2 6 9 8 4 5 4 8 3 2 8 4 3 1 8 3
 (1) 1 (2) 2 (3) 3 (4) 4
64. A dice is numbered from 1 to 6 in different ways. If 1 is opposite to 5 and 2 is opposite to 3, then
 (1) 4 is adjacent to 3 and 6 (2) 2 is adjacent to 4 and 6
 (3) 4 is adjacent to 5 and 6 (4) 6 is adjacent to 3 and 4
65. If 'BARS' = 10 and 'BEERT' = 10, 'DEEZ' will be ?
 (1) 15 (2) 12 (3) 14 (4) 10
66. Find out the alternative figure which contains figure (X) as its part.



(X)



67. In the give question, three sequences of letters/ numbers are given which correspond to each other in some way. In each question, you have to find out the letters/numbers that come in the vacant places marked by (?). These are given as one of the four alternatives under the question. Mark your answer as instructed.

_	A	C	_	B	D	_	C	D	C	D
2	_	4	1	_	1	4	_	_	_	_
c	d	_	b	c	_	a	?	?	?	?

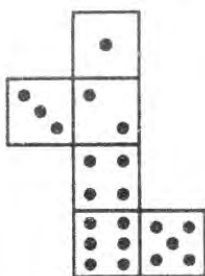
(1) a, b, a, b

(2) a, c, a, c,

(3) c, b, c, b

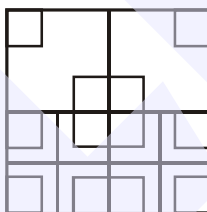
(4) c, d, c, d

68. When the following figure is folded to form a cube, how many dots would lie opposite to the face bearing five dots ?

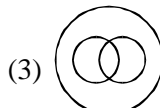


- (1) 1 (2) 2 (3) 3 (4) 4
69. Saurav starts from a definite point and moves towards East travelling a distance of 2 m. Then he turns to right and travels 5 m. From here he turns to right and travels 8 m. Finally he turns to right and moves 13 m. How far is he now from his starting point?

- (1) 8 m (2) 26 m (3) 14 m (4) 10 m
70. How many squares are there in the given figure?



- (1) 24 (2) 20 (3) 27 (4) 34
71. If $a * b = a + b^2$ and $a \# b = a^2 + b$, then what is the value of $(4 * 3) - (4 \# 3)$?
- (1) 6 (2) 8 (3) -6 (4) -4
72. Choose the Venn diagram which best illustrates the three given classes in the question.
Atmosphere, Hydrogen, Oxygen



73. Find the missing term.

B	H	J
K	F	Q

T	A	U
G	H	O

L	N	Z
R	C	?

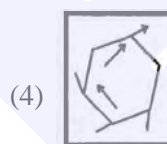
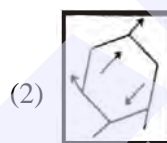
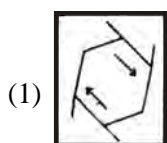
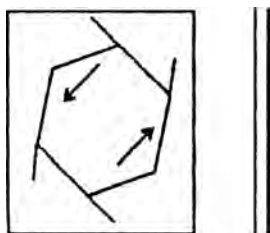
- (1) U (2) T (3) W (4) None of these
74. According to the given information answer the following question.

- (i) Ankit and Bobby are brothers
 (ii) Chandni is sister of Ankit
 (iii) Deepak is brother of Esha
 (iv) Esha is daughter of Bobby

Who is the uncle of Deepak?

- (1) Ankit (2) Bobby (3) Esha (4) None of these

75. There is a figure to the left of the vertical parallel lines. Examine the figures given in the alternatives and find the one which is the exact mirror image of the figure given to the left the vertical lines.



76. Find the next number in the given series.

4, 10, 23, 50, 105, ?

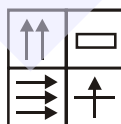
(1) 215

(2) 210

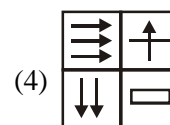
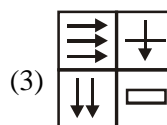
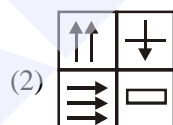
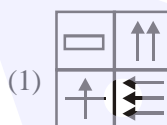
(3) 216

(4) 439

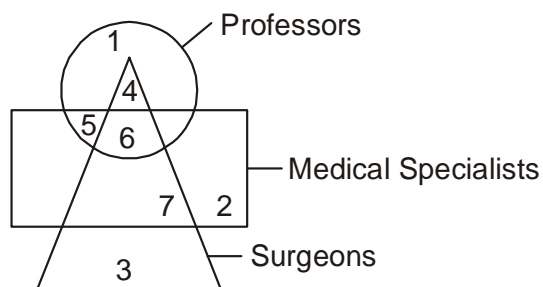
77. Choose the correct water image of the question figure, from the given answer figures.



(X)



78. Study the following diagram and then answer the given question. Write only the number.



Which number indicates Professors who are Medical Specialists ?

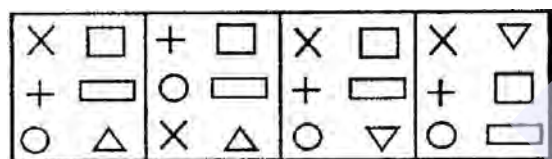
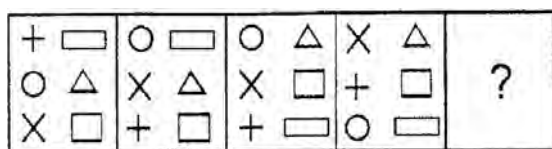
(1) 12

(2) 9

(3) 10

(4) 11

79. Sarita is the wife of the grandson of Somesh's mother. How is Somesh related to Sarita?
- (1) Grandmother (2) Father
(3) Father-in-law (4) Husband
80. The figures in the following question follow a series. Select the figure from the given alternatives which would continue the series.



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