

PART-I

IQ (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.

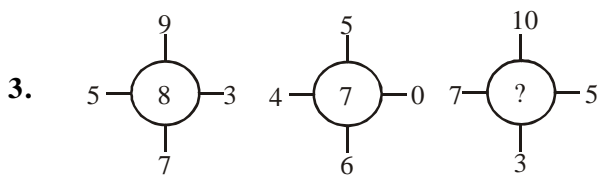
Direction (Q. 1 & Q. 2) : Find the missing term.

1. 2, 3, 6, 18, ?, 1944

- (1) 154 (2) 180 (3) 108 (4) 452

2. 7, 19, 55, 163, ?

- (1) 387 (2) 329 (3) 527 (4) 487



- (1) 12 (2) 9 (3) 14 (4) 1

4. Find the missing letters from left to right.

Z	-	V
R	K	-
-	C	F

- (1) JSN (2) JNS (3) JRS (4) KRS

5. If ADARSHI is coded as 53, SCHOOL is coded as 66 then the word STUDENT will be coded as :

- (1) 90 (2) 97 (3) 89 (4) 96

6. If in any code language CLERK is coded as AHYJA how is JOB coded in that language.

- (1) HKW (2) HKV (3) HKU (4) None



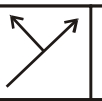
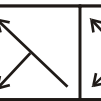

7. At 3.40, the hour hand and the minute hand of a clock form an angle of:

- (1) 120° (2) 125° (3) 130° (4) 135°

8. What was the day of the week on, 26th August, 1886?

- (1) Sunday (2) Monday
(3) Thursday (4) Friday




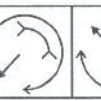

Direction (Q. 9 & Q. 10) : In each of the following questions, choose the correct mirror-image of the fig. (X) from amongst the four alternatives (1), (2), (3) and (4) given along with it.

9.     

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

(1) 1 (2) 2

(3) 3 (4) 4

10.     

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

(1) 1 (2) 2

(3) 3 (4) 4

11. A does 80% of a work in 20 days. He then calls B and they together finish the remaining work in 3 days. How long B alone would take to do the whole work?

(1) 23 days (2) 37 days

(3) $37\frac{1}{2}$ (4) 40 days

Direction (Q. 12 & Q. 13) : Read the following information carefully and answer the questions that follow:

A + B means A is the son of B ; A – B means A is the wife of B ; A × B means A is the brother of B ;
 A ÷ B means A is the mother of B and A = B means A is the sister of B.

12. What does P = R + Q mean ?

(1) P is the aunt of Q (2) P is the daughter of Q

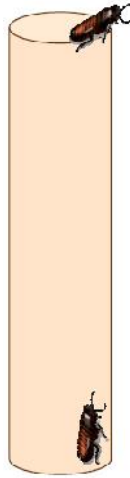
(3) P is the niece of Q (4) P is the sister of Q

13. What does P = R ÷ Q means ?

(1) P is the aunt of Q (2) P is the sister of Q

(3) Q is the niece of P (4) Q is the daughter of P

14. Starting at the bottom of a 15-foot hole, a bug crawls up 3 feet each day but slips down 2 feet each night. When will it emerge from the hole?



- (1) 14th day (2) 15th day (3) 12th day (4) 13th day
15. Four friends Manoj, Happy, Pradeep & Raju want to cross a bridge. Manoj takes 1 minute to cross the bridge, whereas Happy takes 3 minutes, Pradeep takes 7 minutes and Raju takes 10 minutes to cross the bridge. However it's late at night and they can't cross the bridge without a flashlight. They only have one flashlight and the bridge is strong enough to support the weight of only two persons at once. When two friends cross the bridge they walk at the slower person's rate. How quickly the four can cross the bridge?
- (1) 20 minutes (2) 22 minutes (3) 24 minutes (4) 28 minutes

Direction (Q. 16 to Q. 20) : Study the following information carefully and answer the given questions.

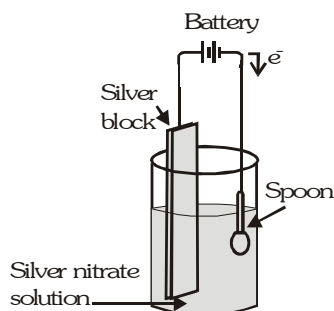
- (i) B and E are good in Dramatics and Computer Science.
 (ii) A and B are good in Computer Science and Physics
 (iii) A, D and C are good in Physics and History
 (iv) C and A are good in Physics and Mathematics
 (v) D and E are good in History and Dramatics
16. Who is good in Physics, History and Dramatics?
 (1) A (2) B (3) D (4) E
17. Who is good in Physics, History and Mathematics, but not in Computer Science?
 (1) A (2) B (3) C (4) E
18. Who is good in Computer Science, History and Dramatics?
 (1) A (2) B (3) D (4) E
19. Who is good in Physics, History, Computer Science and Mathematics?
 (1) A (2) B (3) D (4) E
20. Who is good in Physics, Dramatics and Computer Science?
 (1) A (2) B (3) D (4) E

PART-II

SECTION-A : PHYSICS

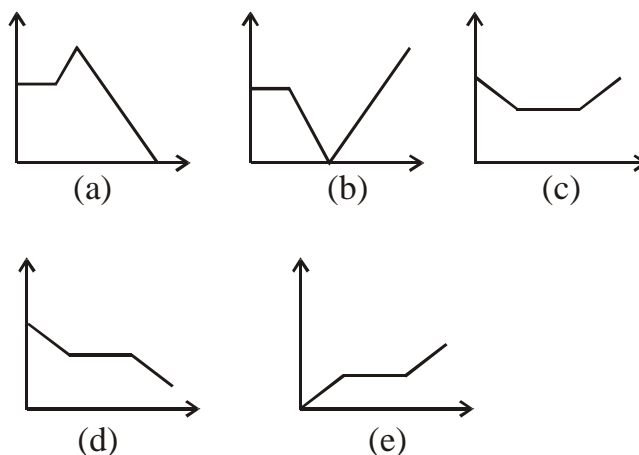
This section contains **15 multiple choice questions**. Each question has four choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

21. Two pieces of metal when immersed in liquid have equal upthrust on them, then
- (1) Both pieces must have equal weight
 - (2) Both pieces must have equal densities
 - (3) Both pieces must have equal volume
 - (4) Both are floating to the same depth.
22. When an object is placed in front of a mirror, the image formed is inverted. The mirror must be
- (1) Plane
 - (2) Concave
 - (3) Convex
 - (4) Either plane or convex
23. An inverted image can be seen in a convex mirror,
- (1) under no circumstances.
 - (2) when the object is very far from the mirror.
 - (3) when the object is at a distance equal to the radius of curvature of the mirror.
 - (4) when the distance of the object from the mirror is equal to the focal length of the mirror.
24. The value of g is maximum
- (1) at poles of earth
 - (2) at equator of earth
 - (3) in a mine
 - (4) at a high hill
25. In the setup shown here, the spoon is being electroplated with silver. Which of these BEST describes how the electroplating takes place ?



- (1) Silver particles float from the silver block to the silver spoon.
- (2) Electrical energy is converted to matter and deposited on the spoon.
- (3) Silver nitrate loses silver to the spoon but gains it again from the silver block.
- (4) The spoon loses particles and in return, receives silver particles from the silver block.

26. On Electrolysis of copper sulphate solution
- (1) Thickness of cathode terminal increases
 - (2) Thickness of cathode terminal decreases
 - (3) Thickness of anode terminal increases
 - (4) None of these
27. Mark incorrect option
- (1) A force is applied to an object in the direction of its motion, the speed of object will increase.
 - (2) A force is applied to an object in the opposite direction of its motion, the speed of object will decrease.
 - (3) A force can change shape and size of a body.
 - (4) Direction of motion of any body may change when net force acting on the body is zero.
28. A block of mass 5 kg with dimension $2 \times 3 \times 4$ (m) respectively. The ratio of minimum to maximum pressure it exerts on the change in orientation is :
- (1) 1 : 4
 - (2) 4 : 1
 - (3) 1 : 2
 - (4) 2 : 1
29. A train accelerates from 20km/h to 80 km/h in 4 minutes . How much distance does it cover in this period? Assume that the tracks are straight.
- (1) 5 km
 - (2) 10 km
 - (3) 5/3 km
 - (4) 10/3 km
30. Which velocity-time graph represents the motion of a body initially moving with uniform deceleration (retardation) then a constant speed followed by uniform acceleration?



- (1) Graph (a and b)
 - (2) Graph (c)
 - (3) Graph (d)
 - (4) Graph (e)
31. A bus travels the first one-third distance at a speed of 10 km h^{-1} , the next one-third distance at a speed of 20 km h^{-1} and the next one-third distance at a speed of 30 km h^{-1} . The average speed of the bus is
- (1) 20 m s^{-1}
 - (2) $\frac{50}{11} \text{ m s}^{-1}$
 - (3) $\frac{180}{11} \text{ m s}^{-1}$
 - (4) 30 m s^{-1}

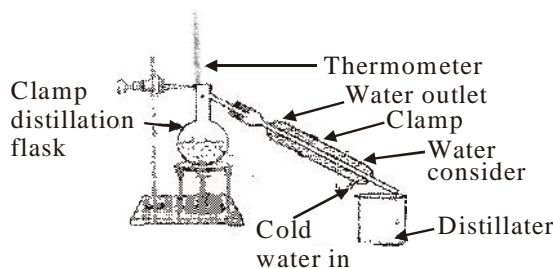
32. A person is standing in an elevator. He finds his weight less than actual, when :-
- (1) The elevator moves upward with constant acceleration.
 - (2) The elevator moves downward with constant acceleration.
 - (3) The elevator moves upward with uniform velocity
 - (4) The elevator moves downward with uniform velocity.
33. A cannon ball of 2 kg leaves the barrel of the cannon, with a velocity 100 m/s. If the cannon weighs half a ton and moves through 0.5 m, what is the resistance offered by the ground to the Motion of the cannon ?
- (1) $F = 80 \text{ N}$ (2) $F = 60 \text{ N}$ (3) $F = 40 \text{ N}$ (4) $F = 100 \text{ N}$
34. When a sailor jumps from a boat to the river bank ?
- (1) boat is pushed away from the bank (2) boat is pushed towards the bank
(3) either (1) or (2) (4) neither (1) nor (2)
35. Two masses of 1 gm and 4 gm. are moving with equal kinetic energies. The ratio of the magnitudes of their linear momenta is -
- (1) 4 : 1 (2) $\sqrt{2} : 1$ (3) 1 : 2 (4) 1 : 16

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.

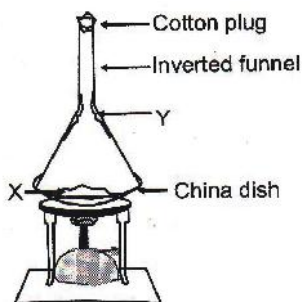
36. Which of the following is a non metal?
- (1) Tungsten (2) Mercury (3) Graphite (4) Platinum
37. Jute fibre is obtained from the _____ of the jute plant.
- (1) stem (2) root (3) fruit (4) leaves
38. Water is a universal
- (1) solution (2) solvent (3) solute (4) both (1) & (2)
39. The density of water is maximum at
- (1) 40° C (2) 4° C (3) 14° C (4) 24° C
40. Which of the following has more heat content ?
- (1) 10 g of ice at 0° C (2) 10 g of water at 0° C
(3) both have same heat content (4) their heat content cannot be compared
41. Latent heat of vaporisation is used to
- (1) overcome the forces of attraction between molecules in solid state.
(2) increase the kinetic energy of molecules in liquid state.
(3) overcome the forces of attraction between molecules in liquid state.
(4) increase the kinetic energy of molecules in vapour state.

42. Amorphous solids
- (1) are more flexible at higher temperature (2) include glasses
(3) do not have specific melting point (4) all of the above
43. Rate of diffusion of a gas is
- (1) directly proportional to its density
(2) directly proportional to its molecular mass
(3) directly proportional to the square root of its molecular mass
(4) inversely proportional to the square root of its molecular mass
44. Dry ice on heating produces
- (1) liquid CO₂ (2) liquid water
(3) gaseous CO₂ (4) water vapour
45. Water was taken in four beakers labelled as I to IV. To these beakers, the following substances were added.
- Beaker (I) Common salt
Beaker (II) Alum
Beaker (III) Potassium nitrate
Beaker (IV) A few drops of barium chloride and a few drops of dilute H₂SO₄.
- After sometime, the contents of the beakers were filtered. The contents of which beaker will leave residue on the filter paper.
- (1) Beaker (2) Beaker (II) (3) Beaker (III) (4) Beaker (IV)
46. While using the given apparatus, what must be kept in mind?



- (1) The mixture in the distillation flask must contain a solid.
(2) The temperature difference between the boiling point of components of the mixture must be less than 25° C
(3) The temperature difference between the boiling points of components of the mixture must be more than 25° C
(4) All of these
47. A mixture contains four solid compounds A, B, C, D. On heating C changes to vapour state. C can be separated from rest of the solids by
- (1) crystallisation (2) sublimation
(3) distillation (4) filtration

48. Identify X and Y in the given figure.



- (1) X = Mixture of naphthalene and anthracene; Y = Solid naphthalene.
- (2) X = Mixture of NaCl and water; Y = Solid NaCl.
- (3) X = Mixture of NaCl and water; Y = Solid anthracene.
- (4) X = Mixture of sugar and NaCl; Y = Solid sugar.

49. Purity of a solid substance can be checked by its characteristic

- (1) boiling point
- (2) melting point
- (3) solubility in water
- (4) solubility in a alcohol

50. The solution which has two components is known as

- (1) binary solution
- (2) true solution
- (3) quaternary solution
- (4) aqueous solution

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.

51. Basement membrane is made up of

- (1) Epidermal cells only
- (2) Endodermal cells only
- (3) both epidermal and endodermal cells
- (4) No cells at all, but is a product of epithelial cells

52. The characteristic features of cork is / are

- (1) Its light weight
- (2) Its high compressibility
- (3) Its resistance to catch fire easily
- (4) All of the above

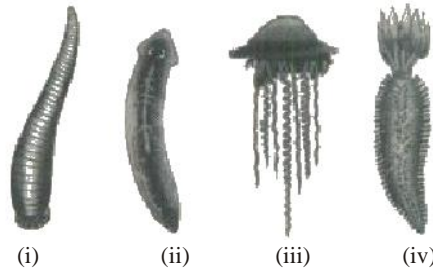
53. In which of the following groups would you place a plant which produces spores and embryos but lacks seeds and vascular tissue?

- (1) fungi
- (2) Pteridophytes
- (3) Bryophytes
- (4) tissues

54. Dodo is a/an

- (1) Critically endangered species
- (2) Extinct species
- (3) Endangered species
- (4) Vulnerable species.

55. Which phylum do the given animals (i), (ii), (iii) and (iv) belong to ?



- (1) Annelida Platyhelminthes Coelenterata Echinodermata
 (2) Annelida Platyhelminthes Echinodermata Coelenterata
 (3) Platyhelminthes Annelida Coelenterata Echinodermata
 (4) Platyhelminthes Annelida Echinodermata Coelenterata

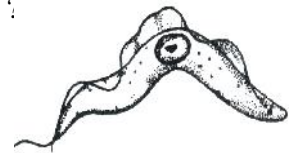
56. Match the following and select the correct answer.

i. Measles	a. Protozoa
ii. Cholera	b. Virus
iii. Kala azar	c. Bacteria

- (1) i - a, ii - c, iii - b (2) i - a, ii - b, iii - c (3) i - b, ii - a, iii - c (4) i - b, ii - c, iii - a

57. The given pathogenic organism causes which of the following diseases ?

- (1) Kala-azar (2) Syphilis
 (3) Dengue (4) Sleeping sickness



58. Water harvesting is :

- (1) collection of river water
 (2) collection of rainwater in storage tanks or in the soil to recharge ground water
 (3) harvesting of water from tube wells (4) all of the above

59. All of earth's water, land and atmosphere, within which life exists is known as :

- (1) a population (2) a community (3) a biome (4) the biosphere

60. Which of the following indications of the health of a water body is the most widely accepted means of measuring how polluting an effluent is ?

- (1) COD (chemical oxygen demand) (2) BOD (biological oxygen demand)
 (3) Chloroform content (4) None of the above

61. Match the column I with column II and select the correct option from the codes given below.

Column-I

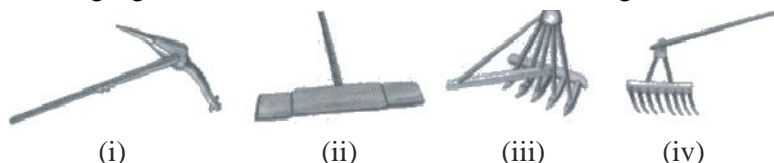
- (a) Particulate matter
 (b) Oil spills
 (c) Detergents
 (d) Plastics
 (e) Domestic wastes

Column-II

- (i) Chemical water pollutants
 (ii) Nondegradable soil pollutants
 (iii) Degradable soil pollutants
 (iv) Air pollutants
 (v) Physical water pollutants

- (1) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii), (e) - (v)
 (2) (a) - (iv), (b) - (v), (c) - (i), (d) - (ii), (e) - (iii)
 (3) (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv), (e) - (v)
 (4) (a) - (i), (b) - (ii), (c) - (iii), (d) - (v), (e) - (iv)

62. Which of the following agricultural tools is/are used in weeding ?



- (1) (iv) & (iii) (2) (iv) only (3) (i), (iii) & (iv) (4) (i) only

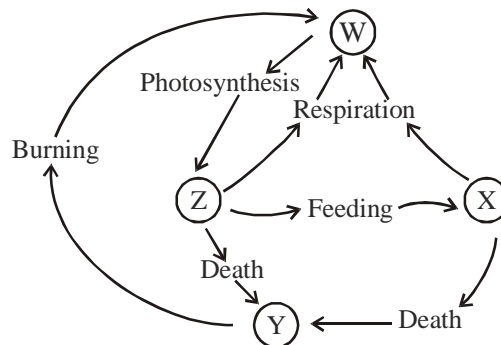
63. Read the given statements.

- (i) Bee wax obtained from beehive is deposition of excretory products of honeybee.
- (ii) Fish culture is sometimes done in combination with rice crop so that fish are grown in the water accumulated in the paddy field.
- (iii) Fish feed in different zones of pond to make most efficient use of available food.
- (iv) Sahiwal and Murrah are exotic breeds used extensively in cattle farming.
- (v) Inter-cropping is growing two or more crops simultaneously on the same field in a definite pattern.

Which of the given statements are incorrect?

- (1) (i), (ii) and (iii) (2) (ii), (iii) and (iv) (3) (i) and (iv) (4) (i), (iv) and (v)

64. The given diagram shows some stages in the carbon cycle. W, X, Y and Z are carbon compounds. What is W ?



- (1) Carbon compounds in animals (2) Carbon compounds in plants
(3) Carbon dioxide in the air (4) Coal and oil

65. Which of the following is a hermaphrodite animal.

- (1) Frog (2) Cow (3) Dog (4) Earthworm

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.

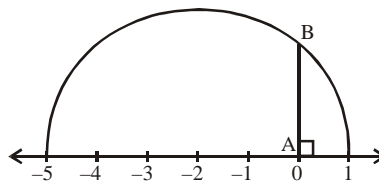
66. If both $x-3$ & $x-\frac{1}{3}$ are factor of x^2+qx+r , then

- (1) $r = 1$ (2) $r = \frac{-1}{3}$ (3) $r = -1$ (4) $r = \frac{1}{3}$

67. If $a+b = 10$ & $ab = 6$, then $a^2 - ab + b^2 =$

- (1) 106 (2) 82 (3) 18 (4) 6

68. The length of AB is



- (1) $\sqrt{5}$ (2) $\sqrt{3}$ (3) $\sqrt{2}$ (4) None of these

69. Which of the following is rational
- (1) $(7+\sqrt{2})(7-\sqrt{2})$ (2) $(7+\sqrt{2})(7+\sqrt{2})$
(3) $(7-\sqrt{2})(7-\sqrt{2})$ (4) None of these
70. A postman riding a bicycle at 15 km/h can reach a village in 4 hours. If he is delayed by 1 hour at the start, then in order to reach his destination in time, he should ride with a speed of :
- (1) 20 km/h (2) 16 km/h (3) 14 km/h (4) 12 km/h
71. The ratios of height of two cylinders is 3:2 and the ratio of their radius is 6:7. What is the ratio of their curved surface area ?
- (1) 9:7 (2) 1:1 (3) 7:9 (4) 7:4
72. If $4A = 5B$ & $3A = 2C$, the ratio of B:C is
- (1) 4:3 (2) 5:8 (3) 8:15 (4) 10:15
73. If m men can do a work in r days, then the number of days taken by (m+n) men to do it is:
- (1) $\frac{m+n}{mn}$ (2) $\frac{m+n}{mr}$ (3) $\frac{mr}{m+n}$ (4) $\frac{(m+n)r}{mn}$
74. The lengths of the sides of a triangle are in the ratio 3:4:5 and its perimeter is 288 cm. The height corresponding to the longest side is
- (1) 14.4 cm (2) 57.6 cm (3) 28.8 cm (4) None of these
75. If the cost price of an article is Rs. 300 and the percent makeup is 20%. What is the marked price ?
- (1) Rs. 360 (2) Rs. 370 (3) Rs. 380 (4) Rs. 390
76. The altitude of a right angle triangle is $\frac{4}{3}$ rd of its base. If the area is 24 then perimeter of this triangle is :-
- (1) 20 (2) 30 (3) 25 (4) 24
77. The remainder is 8 when $x^3 - ax^2 + 2x - 4$ is divided by $a-x$, then a is
- (1) 5 (2) 6 (3) 7 (4) 8
78. The area of the triangle formed by the points P(4, 5), Q(4, 9) & R(7, 8) is
- (1) 36 sq. units (2) 63 sq. units (3) 12 sq. units (4) 6 sq. units
79. If $a+b+c = 3$, $a^2 + b^2 + c^2 = 6$ and $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 1$ where a,b,c are all non-zero, then abc is :
- (1) $\frac{1}{3}$ (2) $\frac{2}{3}$ (3) $\frac{3}{2}$ (4) 1
80. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, Then the value of x is.
- (1) 15 (2) 18 (3) 16 (4) 25

SPACE FOR ROUGH WORK