Section : 1 - Aptitude and Logical Reasoning

1. How many 5s are there in the following number sequence which are immediately preceded by 7 and immediately followed by 6?
7 5 5 9 4 5 7 6 4 5 9 8 7 5 6 7 6 4 3 2 5 6 7 8
(a) One (b) Two (c) Three (d) Four

2. In a family, a couple has a son and a daughter. The age of the father is three times that of his daughter and the age of the son is half of that of his mother. The wife is 9 years younger to her husband and the brother is seven years older than his sister. What is the age of the mother ?
(a) 60 years (b) 50 years (c) 45 years (d) 40 years

3. Two men and two boys wish to cross a river. Their small boat will carry the weight of only one man or two boys. The minimum number of times the boat must cross the river to get all the four people on the opposite shore is ?
(a) 9 (b) 7 (c) 10 (d) 8

4. One night, three naughty boys stole a basketful of apples from the garden, hid the loot and went to sleep. Before retiring they did some quick counting and found that the fruits were less than a hundred in number. During the night one boy woke awoke, counted the apples and found that he could divide the apples into three equal parts if he first took one for himself. He then took one apple, ate it up and took 1/3 of the rest, hid them separately and went back to sleep. Shortly thereafter, another boy awoke, counted the apples and he again found that if he took one for himself the loot could be divided into three equal parts. He ate up one apple, bagged 1/3 of the remainder, hid them separately and went back to sleep. The third boy also awoke after sometime, did the same and went back to sleep. In the morning, when all of them woke up and counted the apples, they found that the remaining apples again totaled one more than could be divided into three equal parts. How many apples did the boys steal ?
(a) 67 (b) 79 (c) 85 (d) 87

5. A man placed three sheets with two carbons to get two extra copies of the original. Then he decided to get more copies and folded the sheets in such a way that the upper half of the sheets were on top of the lower half. Then he typed. How many carbon copies did he get ?
(a) 4 (b) 2 (c) 8 (d) 1

ROUGH SPACE

Section : 2 – Mathematics

6. For what value of m is $(x^3 - 2mx^2 + 16)$ divisible by $(x-2)$?
(a) 4 (b) 1 (c) –1 (d) 3

7. $3x^3 + 2x^2 - 3x - 2 = ?$
(a) $(3x-2)(x^2+1)$ (b) $(3x+2)(x^2-1)$ (c) $(3x-2)(x^2-1)$ (d) $(3x+2)(x^2+1)$

8. If $x = 3k + 2$ and $y = 2k + 1$ is a solution of the equation $4x - 3y + 1 = 0$, find the value of k.
(a) –1 (b) 1 (c) –2 (d) 2

9. The point of the form (a, a), lies on
(a) The x-axis (b) The y-axis (c) The line y = x (d) The line $x + y = 0$

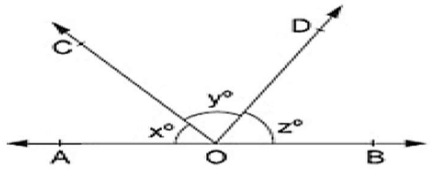
10. If (3, 0) is a solution of the linear equation $2x + 3y = k$ then the value of k is
(a) 5 (b) 2 (c) 4 (d) 6

11. Find the remainder when the polynomial $p(x) = 12x^3 + 13x^2 - 5x + 7$ is divided by $g(x) = (2 + x)$
(a) –33 (b) –27 (c) –22 (d) 20

12. If $x = (7 + 4\sqrt{3})$ then $(x - 1/x) = ?$
(a) 48 (b) 14 (c) $8\sqrt[2]{3}$ (d) 49

13. If $x = (2\sqrt{7})/5$ and $\frac{5}{x} = p\sqrt{7}$ then the value of p is
(a) 15/7 (b) 25/14 (c) 7/15 (d) 7/25

14. In the adjoining figure, AOB is a straight line. If x : y : z = 2 : 3 : 4, then y in deg = ?



(a) 60 (b) 80 (c) 48 (d) 72

ROUGH SPACE

15. If O(0, 0), A(3, 0), B(3, 3), C(0, 3) are four given points then the figure OABC is a
(a) Trapezium (b) Square (c) Rhombus (d) Rectangle

Section : 3 – Science

16. When force of 1 N acts on mass of 1 kg, which is able to move freely, the object moves with a/an-
(a) Speed of 1 ms^{-1} (b) Speed of 1 kms^{-1}
(c) Acceleration of 10 ms^{-2} (d) Acceleration of 1 ms^{-2}

17. The net force acting on a body of mass of 1 kg moving with a uniform velocity of 5 ms^{-1} is-
(a) 5 N (b) 0.2 N (c) 0 N (d) None of these

18. A body of mass 20 kg moves with an acceleration of $2ms^{-2}$. The rate of change of momentum in S.I. unit is-
(a) 40 (b) 10 (c) 4 (d) 1

19. A body is said to be in motion if
(a) Its position with respect to surrounding objects remains same
(b) Its position with respect to surrounding objects keeps on changing
(c) Both (a) and (b)
(d) Neither (a) nor (b)

20. A distance is always-
(a) Shortest length between two points
(b) Path covered by an object between two points
(c) Product of length and time
(d) None of the above

21. A displacement-
(a) is always positive (b) is always negative
(c) may be positive as well as negative (d) is neither positive nor negative

22. During summer, an echo is heard-
(a) Sooner than during winter (b) Later than during winter
(c) After same time as in winter (d) Rarely

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23. The velocity of sound in air at 30°C is approximately-
(a) 332 ms^{-1} (b) 350 ms^{-1} (c) 530 ms^{-1} (d) 332 kms^{-1}

24. A concrete pillar has a cross-section 9 m^2, if a force of 9×10^6 N acts on its surface, the pressure developed will be
(a) 10 bar (b) $10^5\,Nm^{-2}$ (c) $10^4\,Nm^{-2}$ (d) 10^2 bar

25. The drawing pin is pushed against a board with a force of 16 N, if its tip has an area of cross section 0.4 mm^2, the pressure developed will be
(a) 40×10^7 pascal (b) 4×10^7 pa (c) 4×10^6 pa (d) 4×10^5 pa

26. Which of the following is/are applications of high compressibility of glass?
(a) L.P.G. is used as fuel in homes for cooking food.
(b) Oxygen cylinders are supplied to hospitals.
(c) C. N. G is used as fuel in vehicles.
(d) All of these

27. On changing which of the following, the states of matter will change?
(a) Temperature (b) Pressure (c) a & b both (d) None of these

28. If the volume of a given mass of a gas at constant temperature becomes 3 times, the pressure will be-
(a) 3 P (b) P / 3 (c) 9 P (d) P

29. Which of the following is an example of gel?
(a) Coloured gem (b) Jelly (c) Smoke (d) Shaving cream

30. A mixture of sand, iodine and iron filing can be separated by
(a) Magnetic separation & sublimation (b) Magnetic separation & distillation
(c) Sublimation & distillation (d) Distillation & sedimentation

31. What is atomicity of $Al_2(CO_3)_3$?
(a) 5 (b) 14 (c) 10 (d) 12

32. Molecular mass of H_2SO_4 is
(a) 89 u (b) 98 u (c) 49 u (d) 198 u

ROUGH SPACE

33. The number of carbon atoms in 1 g of $CaCO_3$ is-
(a) 6.023×10^{23} (b) 6.023×10^{21} (c) 3.0125×10^{22} (d) 1.204×10^{23}

34. $AgNO_3(aq)+NaCl(aq)\rightarrow AgCl(s)+NaNO_3(aq)$ above reaction is a-
(a) Precipitation reaction (b) Double displacement reaction
(c) Combination reaction (d) (a) and (b) both

35. Solubility of gases in water
(a) Increases with increase in temperature (b) Decreases with decrease in temperature
(c) Decreases with increase in temperature (d) None of these

36. Cellular respiration is carried out in the
(a) Cells (b) Organs (c) Tissues (d) Muscles

37. Yeast are used to make
(a) Curd (b) Wine and beer (c) Bakery items (d) Both (b) and (c)

38. Which of these reactions occur in photosynthesis?
(a) Carbon dioxide is reduced and water is oxidised (Carbon dioxide + water + energy from light produces glucose and oxygen)
(b) Water is reduced and carbon dioxide is oxidised
(c) Carbon dioxide and water are oxidised
(d) Carbon dioxide and water are reduced

39. The filtration units of the kidney are called _____.
(a) Urethra (b) Ureter (c) Neuron (d) Nephron

40. The correct path of urine is _____.
(a) Kidney→ ureter → urethra→ urinary bladder
(b) Kidney → urinary bladder → urethra → ureter
(c) Kidney→ ureter → urinary bladder→ urethra
(d) Urinary bladder → kidney → ureter →urethra

41. Which is the first enzyme that mixes with food?
(a) Salivary amylase (b) Trypsin (c) Erepsin (d) Gastric juice

ROUGH SPACE

42. Which of the statements is correct regarding bile?
(a) Secreted by duct and stored in liver (b) Secreted by liver and stored in bile duct
(c) Secreted by liver and stored in gall bladder (d) Secreted by gall bladder and stored in liver

43. What is the function of pituitary gland?
(a) To develop sex organs in males (b) To stimulate growth in all organs
(c) To regulate sugar and salt level in the body (d) To initiate metabolism in the body

44. Which of these is not a vestigial organ in human beings?
(a) Appendix (b) Wisdom tooth
(c) Nictitating membrane (d) Gall bladder

45. _____ is a form of cell division which results in the creation of gametes or sex cells.
(a) Mitosis (b) Meiosis (c) Miosis (d) None of the above

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