Section : 1 – Mathematics

1. If $\sqrt{x}+\sqrt{y}=\sqrt{18+6\sqrt{5}}$, find the value of x.
(a) 12 (b) 15 (c) 6 (d) 8

2. If the area of the three adjacent faces of a cubiod are x, y and z then the volume of the cuboid is
(a) xyz (b) 2xyz (c) $\sqrt{xyz}$ (d) $3\sqrt{xyz}$

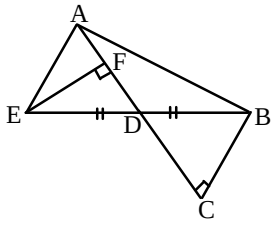
3. If sum of radii of two circles is greater than the distance between their centres, then total number of common tangents that can be drawn
(a) 2 (b) 3 (c) 4 (d) infinite

4. What would be the remainder when $x^3 + 3x^2 + 3x + 1$ is divided by x where $x > 1$?
(a) 0 (b) 1 (c) 8 (d) $1/8$

5. Factors of $x^3 - 23x^2 + 142x - 120$ is/ are
(a) (x – 1) (b) (x – 10) (c) (x – 12) (d) All

6. Distance between points (–5, 2) and (15, 2) is
(a) 20 (b) 10 (c) 15 (d) none of these

7. In the given figure ED = DB and EF and BC are perpendicular drawn from E and B respectively, then $\otimes EDF \cong \otimes BDC$ by which test ?



(a) SSS (b) RHS (c) AAS (d) SAS

8. If $\frac{x}{2}+3y=17$ and $3x+\frac{y}{5}=13$ then find the value of y – x = ?
(a) 3 (b) 2 (c) 1 (d) 5

ROUGH SPACE

9. Square root of $12+2\sqrt{35}$ is

(a) $\sqrt{35}$ (b) $\sqrt{5}+\sqrt{3}$ (c) $\sqrt{7}+\sqrt{5}$ (d) $\sqrt{5}+\sqrt{2}$

10. A women is now 30yrs older than her son. Fifteen years ago she was twice as old as her son. What is the sum of their ages at present?

(a) 100 years (b) 120 years (c) 90 years (d) 110 years

Section : 2 – Science

11. A body is thrown vertically upwards and rises to a height of 10m. The velocity with which the body thrown upwards is ($g = 9.8\ m/s^2$)

(a) 10 m/s (b) 20 m/s (c) 14 m/s (d) none of these

12. A body whose speed in particular direction is constant

(a) must be accelerating (b) must be retarding
(c) has a constant velocity (d) all the above

13. The velocity-time graph for a body with non-uniform acceleration is a

(a) straight line (b) straight line parallel to x-axis
(c) straight line parallel to y-axis (d) curved line

14. A driver accelerates his car first at the rate of $1.8\ m/s^2$ and then at the rate of $1.2\ m/s^2$. The ratio of the forces exerted by the engines will be respectively equal to

(a) 2 : 3 (b) 1 : 2 (c) 2 : 1 (d) 3 : 2

15. If the momentum of the body is doubled, the kinetic energy is

(a) halved (b) unchanged (c) doubled (d) becomes 4 times

16. A stationary ball weighing 0.25 kg acquires a speed at 10 m/s when hit by a hockey stick. The impulse imparted to the ball is

(a) 2.5 Ns (b) 2 Ns (c) 1.5 Ns (d) 0.5 Ns

17. Momentum has the same units as that of

(a) impulse (b) torque (c) force (d) kinetic energy

ROUGH SPACE

18. The maximum weight of a body is
(a) at the centre of the earth (b) inside the earth
(c) on the surface of the earth (d) above the surface of the earth

19. A force of 20 N acts on a body and the body moves through 1 m at an angle of 45^o to the direction of the force. The work done by the force is
(a) $10\sqrt{2}$J (b) $10/\sqrt{2}$J (c) $-10\sqrt{2}$J (d) $\frac{-10}{\sqrt{2}}$J

20. Calculate the amount of work required to stop a car of mass 1000 kg moving with a speed of 72km/hr
(a) -2×10^5J (b) -10^5J (c) -10^6J (d) -10^7J

21. Under which of the following conditions we can boil water at room temperature?
(a) At low pressure (b) At high pressure
(c) At very high pressure (d) At atmospheric pressure

22. Kinetic energy of molecules is directly proportional to
(a) Temperature (b) Pressure (c) Both (a) and (b) (d) Atmospheric pressure

23. The atomicity of $K_2Cr_2O_7$ is
(a) 9 (b) 11 (c) 10 (c) 12

24. Number of moles present in 28g of nitrogen atoms are
(a) 1 mol (b) 2.3 mol (c) 0.5 mol (d) 2 mol

25. The maximum number of electrons that can be accommodated in third shell (n = 3) is:
(a) 2 (b) 8 (c) 18 (d) 10

26. Which of the following statements is incorrect for cathode rays?
(a) They move in straight line
(b) Their nature depends upon the nature of gas present in the discharge tube.
(c) They cost shadow of solid objects placed in their path
(d) They get deflected towards positive charge.

ROUGH SPACE

27. Which of the following is a heterogeneous mixture?
(a) Air (b) Brass
(c) Sugar dissolved in water (d) lime water

28. The particles of a suspension will be size_____.
(a) less than 1nm(nm = nanometre) (b) between 1nm and 100nm
(c) greater than 100nm (d) less than 0.1nm

29. The process of separation of insoluble solids from a liquid is called:
(a) Filtration (b) Decantation (c) Crystallisation (d) Evaporation

30. Which of the following will have maximum mass?
(a) 0.1 mol of NH_3 (b) 10^{22} atoms of carbon
(c) 10^{22} molecules of CO_2 (d) 1g of Fe

31. Which of these units contain 70s Ribosome?
(a) Mitochondria (b) Chloroplast (c) Eukaryotic cell (d) All of above

32. Striking difference between a plant cell and an animal cell is due to the presence of
(a) Mitochondria (b) Plasma membrane (c) Cell wall (d) Ribosome

33. Which of the following is agranulocyte?
(a) Lymphocyte (b) Eosinophil (c) Basophil (d) Neutrophil

34. Schwann cells and Node of Ranvier are found in
(a) Nervous tissue (b) Osteoblast (c) Chondrioblast (d) Liver cells

35. Complex tissue consist of
(a) Different types of cells carrying out the same function
(b) Different types of cells carrying out different function
(c) Same type of cells having same origin and carry some function
(d) Different type of cells having same origin and carry same function

36. Which of the following tissues is composed of mainly dead cells?
(a) Phloem (b) Epidermis (c) Xylem (d) Endodermis

37. Several genera resembling one another in their major anatomical and reproductive characters are placed together in
(a) Species (b) Genus (c) Family (d) Order

ROUGH SPACE

38. Basic unit or smallest taxon of taxonomy is
(a) Species (b) Kingdom (c) Family (d) Variety

39. Which is an exclusive chordate character ?
(a) True coelom (b) Pharyngeal gill slit (c) Bilateral symmetry (d) Triploblastic

40. Manures are used in sandy soils mainly to
(a) Provide all essential nutrients to crops (b) Increase water holding capacity
(c) Avoid water logging (d) Reduce soil pollution

ROUGH SPACE