1. The acceleration of a moving body can be found from
   (a) slope of velocity-time graph   (b) area under velocity-time graph
   (a) slope of distance-time graph   (b) area under displacement-time graph

2. A ball is dropped from the top of a building 19.6 m high. Find the time taken by the ball to reach the ground (Acceleration due to gravity = 9.8 m/s²)
   (a) 8s       (b) 4s       (c) 2s       (d) 1s

3. Which of the following represents an example of derived quantity?
   (a) Mass   (b) Area   (c) Length   (d) Temperature

4. Rest and motion both are:
   (a) Relative terms   (b) Absolute terms   (c) Can’t say   (d) None of these

5. A truck has a uniform acceleration of 2 m/s². The distance covered by the car in 10 seconds after the start is:
   (a) 200m   (b) 100m   (c) 300m   (d) 400m

6. A car moving with a speed of 50 km/hr can be stopped by brakes after at least 6 m. If the same car is moving at a speed of 100 km/hr, the minimum stopping distance is:
   (a) 6m   (b) 12m   (c) 18m   (d) 24m

7. A bike moving along a straight road with uniform acceleration covers 35 m in the 4th second and 40 m in the 5th second. What is its acceleration?
   (a) 2 m/s²   (b) 1.2 m/s²   (c) 5 m/s²   (d) 8 m/s²

8. An ant moves from one corner of a hall to the diagonally opposite corner. If the dimensions of the hall are 8 m x 6 m, then the displacement of the ant is
   (a) 14m   (b) 10 m   (c) 28 m   (d) 2 m

9. The velocity-time graph of a particle is not a straight line. Its acceleration is
   (a) Zero   (b) constant   (c) negative   (d) variable
10. If a body is projected vertically upwards then on reaching maximum height its
   (a) velocity is zero and the acceleration is not zero
   (b) velocity is not zero and the acceleration is zero
   (c) both velocity and acceleration are not zero
   (d) both velocity and acceleration are zero

11. A boy travels 50 km with 5 km/hr and then for next 4 hr travels with a uniform speed of 20 km/hr. What is the average speed for the whole journey?
   (a) 62/7 km/hr                          (b) 65/7 km/hr                          (c) 60/7 km/hr                          (d) 9 km/hr

12. In case of a moving body
   (a) Displacement = Distance            (b) Displacement < Distance
   (c) Displacement > Distance            (d) Displacement = or < Distance

13. What is the acceleration required to change the velocity of an object from 20 m/s to 40 m/s across displacement of 20 m.
   (a) 10 m/s²                           (b) 30 m/s²                           (c) 15 m/s²                           (d) 24 m/s²

14. Area under velocity versus time graph gives
(a) Speed                                (b) Change in Displacement
(a) Change in velocity                   (d) NOT

15. A stone tied to a string is whirled by a circle. As it is revolving, the rope suddenly breaks. Then
   (a) The stone flies tangentially
   (b) The stone moves radially inward
   (c) The stone moves radially outward
   (d) The motion of the stone depends upon its velocity

16. If acceleration of a car is −4 m/s², than its retardation is
   (a) −2 m/s²                           (b) 2 m/s²                           (c) 4 m/s²                           (d) NOT

17. The speed-time graph of a car is given below. The car weighs 1000 kg. What is the magnitude of braking force applied at the end of 5 seconds to bring the car to stop within 1 second.
   (Use F = mass x acceleration)

![Speed-time graph]

(a) 15,000 N                          (b) 7500 N                          (c) 10000 N                          (d) 12,000 N

18. A car covers the first half of the distance between two places at a speed of 40 km/h and the second half with 60 km/h. What is the average speed of the car?
   (a) 20 km/h                          (b) 48 km/h                          (c) 65 km/h                          (d) 72 km/h
19. If both observer and moving body are moving with the same velocity of 5 m/s in the same direction then distance between them would
(a) Increase (b) Decrease (c) Won’t change (D) May or may not change

20. A stone is allowed to fall from the top of a tower of height 100m and at the same time another stone is projected vertically upwards from the ground with a velocity 25m/s. Find where the two stones will meet?
(a) 4m (b) 15.8m (c) 21.6m (d) 42.5m

21. Camphor and salt mixture is separated using
(a) Gravity Separation (b) Solvent Extraction
(c) Sublimation (d) Fractional Crystallization

22. What type of substance is always made up of a single type of atom?
(a) Mixture (b) Element (c) Molecule (d) Compound

23. What type of substance is always made up of a two or more atom?
(a) Both (B) and (C) (b) Compound
(c) Molecule (d) Can’t say

24. Particles of a liquid
(a) Are tightly packed together and stay in a fixed position
(b) Have no viscosity
(c) Decrease in volume with increasing temperature
(d) Are free to move in a container but remain in close contact with one another.

25. The freezing point of a substance is _____ the melting point of the same substance.
(a) Greater than (b) less than (c) equal to (d) unrelated to

26. The diagram shows the changes in state of water (H₂O). What is the process W called?

(a) Boiling (b) Melting (c) Freezing (d) Condensation

27. Which one of the following statements is correct?
(a) Gases are easier to compress than solids.
(b) Liquids cannot be compressed or expanded
(c) Solids are easily compressed
(d) Liquids are easily compressed

28. Which change of state occurs when particles in a solid begin to move slowly past each other?
   (a) Condensing    (b) boiling    (c) sublimation    (d) melting

29. A solid is a state of matter that has a(n)
   (a) Indefinite volume and an indefinite shape.
   (b) Definite volume and a definite shape.
   (c) Definite volume and an indefinite shape.
   (d) Indefinite volume and a definite shape.

30. In which state of matter do the particles spread apart and fill all the space available to them?
   (a) Crystal    (b) Liquid    (c) Gas    (d) Solid

31. During the process of sublimation,
   (a) A solid turns directly into a gas.
   (b) A solid turns into a liquid
   (c) A gas turns directly into a solid
   (d) A liquid turns into a gas.

32. The change from liquid to solid, or the reverse of melting, is called
   (a) Condensation    (b) Boiling
   (c) Sublimation    (d) Freezing

33. The freezing point of water is the same as its
   (a) Melting point    (b) Boiling point
   (c) Sublimation point    (d) Evaporation point

34. What is vaporization?
   (a) A gas becoming a liquid    (b) A liquid becoming a solid
   (c) A gas becoming a solid    (d) A liquid becoming a gas
35. An uncovered pot of soup is simmering on a stove, and there are water droplets on the wall above the back of the stove. What sequence can you infer has occurred?
   (a) Melting, then boiling  (b) Freezing, then thawing
   (c) Vaporization, then condensation  (d) Condensation, then vaporization

36. What is the weight of water is formed by 2g of hydrogen? (Assuming oxygen to be in excess and H: 1 O: 16)
   (a) 16  (b) 2  (c) 18  (d) 36

37. What is the weight of water is formed by 4g of hydrogen if efficiency of reaction is 25%? (Assuming oxygen to be in excess)
   (a) 16  (b) 8  (c) 18  (d) 36

38. What is the mass of calcium carbonate reduced, if strongly heated, to obtain 14g of calcium oxide?
   (Ca: 40, C: 12, O: 16)
   (a) 5.5  (b) 11  (c) 22  (d) 44

39. The boiling point of water is observed to be 400K. The process is carried out on
   (a) mountain  (b) Sea  (c) Mean sea level  (d) Boiling point is fixed i.e. 100°C.

40. Latent heat of fusion is used to
   (a) Increase the temperature  (b) Increase the rigidity
   (c) Increase the random motion  (d) Increase the molecular force of attraction

41. Which of the following is not rational number?
   (a) \( \sqrt{24} \)  (b) \( \sqrt{25} \)  (c) \( \sqrt{81} \)  (d) \( \sqrt{16} \)

42. The number \( \frac{3-\sqrt{3}}{3+\sqrt{3}} \) is
   (a) Rational  (b) irrational  (c) both  (d) Can’t say

43. The exponential form of \( \sqrt[4]{2\sqrt{3}} \) is
   (a) \( 6^{1/2} \)  (b) \( 6^{1/3} \)  (c) \( 6^{1/4} \)  (d) 6

44. The value of \( \sqrt[3]{27} - \frac{2}{3} - 4 \sqrt[3]{1} + 4^{1/3} \) will be:
   (a) \( \sqrt{3} \)  (b) \( 2\sqrt{3} \)  (c) 0  (d) \( 3\sqrt{3} \)
45. If \((4)^3 \times (6)^4 \times (10)^5 = 2^x \times 3^y \times 5^z\) then the value of \(x+y+z\) is:
   (a) 12     (b) 15     (c) 20     (d) 24

46. If \(b=a+c\), then
   \(\left(\frac{x}{y}\right)^a \left(\frac{x}{y}\right)^b \left(\frac{x}{y}\right)^{-c} = \)
   (a) 0     (b) 1     (c) 2     (d) -1

47. The value of \(a\) in the following equation:
   \[
   \left[\frac{9}{5}\right]^{-3} \times \left[\frac{2}{3}\right]^{-6} = \left[\frac{3}{5}\right]^{2a-1} \left[\frac{2}{3}\right]^0
   \]
   (a) 1     (b) -2     (c) -1     (d) 2

48. The value of \(\sqrt[3]{(32)^{-3}}\) is
   (a) \(\frac{1}{8}\)     (b) \(\frac{1}{16}\)     (c) \(\frac{1}{32}\)     (d) none

49. Simplify: \(\frac{2}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{2}} + \frac{3}{\sqrt{5}+\sqrt{2}}\)
   (a) 1     (b) 0     (c) 10     (d) 2\sqrt{5} - 2\sqrt{2}

50. \((2\sqrt{2}-7)(2\sqrt{2}+7) = \)
   (a) 0     (b) -41     (c) 2     (d) 1

51. \(\sqrt[3]{x^2} = \)
   (a) \(x\)     (b) \(x^{1/2}\)     (c) \(x^{1/3}\)     (d) \(x^{1/6}\)

52. If \(x=\sqrt{5}+\sqrt{2}\) and \(y=\sqrt{5}-\sqrt{2}\), find the value of \(3x+4xy+3y\)
   \(\frac{12+56\sqrt{10}}{3}\)
   (a) \(\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-\sqrt{4}}\)
   (b) 0     (c) 14     (d) None

53. Simplify \(\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-\sqrt{4}}\)
   (a) 1     (b) 0     (c) 5     (d) -1

54. If \(x=3 + \sqrt{8}\) and \(y=3 - \sqrt{8}\) then, \(\frac{1}{x^2} + \frac{1}{y^2} = \)
   (a) -34     (b) 34     (c) 12\sqrt{8}     (d) -12\sqrt{8}
55. If \(\frac{3+\sqrt{7}}{3-\sqrt{7}} = a + b\sqrt{7}\) then (a,b)=
   (a) (8,-3)  (b)(-8,-3)  (c)(-8,3)  (d)(8,3)

56. If \(2^{x+y}=32\) and \(2^{y+z}=16\) then \(x^2+y^2\) is equal to:
   (a) 9  (b) 10  (c) 11  (d) 13

57. The value of \(\frac{x^{2}+b^{2}+c^{2}}{x^{2}+y^{2}+z^{2}}\) is
   (a) \(x^2\)  (b) \(x^{a+b+c}\)  (c) \(\frac{x^{abc}}{x^2}\)  (d) \(x^0\)

58. The value of \(\left(\frac{x}{a^2}\right)^{a+b} \times \left(\frac{y}{b^2}\right)^{b+c} \times \left(\frac{z}{c^2}\right)^{c+a}\) is equal to
   (a) 0  (b) 1  (c) \(x\)  (d) \(x^{a+b+c}\)

59. The value of \(\frac{(4.7)^{3}-(2.7)^{3}}{(4.7)^{2}+4.7\times 2.7+(2.7)^{2}}\) is
   (a) 2  (b) 7.4  (c) 5  (d) 84.14

60. If \(x = \sqrt{2+\sqrt{3}}\), then \(x^4 + \frac{1}{x^4}\) is:
   (a) \(2(3-\sqrt{2})\)  (b) \(6\sqrt{2} - 2\)  (c) \(6 - \sqrt{2}\)  (d) 14

61. The bi-layer of the cell membrane is made up of?
   (a) Lipids  (b) Proteins  (c) Carbohydrates  (d) Cellulose

62. The structure of mitochondria was discovered by?
   (a) Robert Brown  (b) Nicolson  (c) Richard Altman  (d) Robert Virchow

63. The organelle which is the site for photosynthesis?
   (a) Mitochondria  (b) Nucleus  (c) Chloroplast  (d) Golgi Body

64. The nucleus of the cell was discovered by?
   (a) Robert Brown  (b) Robert Virchow  (c) Robert Hooke  (d) Johannson

65. Ribosomes are the site of?
   (a) Lipid Synthesis  (b) Protein Synthesis  (c) Steroid synthesis  (d) None of the above

66. Phosphorylation is the process in which there is formation of?
   (a) ADP  (b) AMP  (c) ATP  (d) Energy
67. Oxysomes are found in?
   (a) Mitochondria   (b) Endoplasmic reticulum   (c) Chloroplast   (d) Nucleus

68. The smaller subunit of prokaryotic cell ribosomes is of type?
   (a) 40 S   (b) 50S   (c) 30S   (d) 60S

69. The entire cell function is governed by?
   (a) ER   (b) Golgi body   (c) Nucleus   (d) Ribosomes

70. An organelle which has its own DNA & RNA are?
   (a) Chloroplast   (b) Mitochondria   (c) Both a & b   (d) All of the above

71. Who proposed the cell theory?
   (a) Schleiden and Schwann   (b) Watson and Crick
   (c) Darwin and Wallace   (d) Mendel and Morgan

72. A plant cell differs from an animal cell in the absence of?
   (a) Endoplasmic Reticulum   (b) Mitochondria   (c) Ribosome   (d) Centriole

73. Centrosome is found in
   (a) Cytoplasm   (b) Nucleus   (c) Chromosomes   (d) Nucleolus

74. The powerhouse of a cell is?
   (a) Chloroplast   (b) Mitochondrion   (c) Golgi apparatus   (d) Nucleolus

75. Organisms lacking nucleus and membrane bound organelle are -
   (a) Diploids   (b) Prokaryotes   (c) Haploids   (d) Eukaryotes

76. Cell secretion is done by?
   (a) Plastids   (b) ER   (c) Golgi apparatus   (d) Nucleolus

77. Which of the following organelle does not have membrane?
   (a) Ribosome   (b) Nucleus   (c) Chloroplast   (d) Mitochondria

78. Cell organelle that acts as supporting skeletal framework of the cell is -
   (a) Golgi apparatus   (b) Nucleus   (c) Mitochondria   (d) ER

79. Plastids are present in?
   (a) Animal cell only   (b) Plant cells only
   (c) Both animal and plant cells   (d) Neither animal nor plant cell

80. Genes are located on the?
   (a) Chromosomes   (b) Nucleolus   (c) Nuclear membrane   (d) Plasma membrane