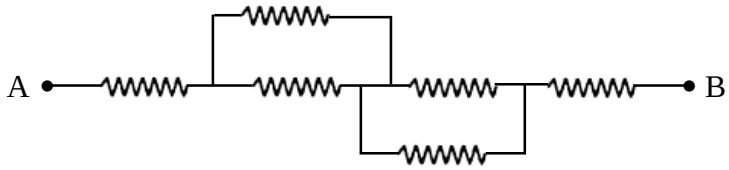
SECTION – I : PHYSICS

1. A convex lens forms a real and inverted image of a needle at a distance of 50 cm from it, if size of image is equal to the size of object, find the power of the lens.
(A) –4D (B) 2D (C) +4D (D) –2D

2. The far point of a myopic person is 80 cm in front of the eye. What is the power of the lens required to correct the problem?
(A) –1D (B) +1D (C) –1.25D (D) +1.25D

3. Choose the correct option.
The magnetic field **inside** a long straight solenoid carrying current
(A) is zero.
(B) is same at all points.
(C) increases as we move towards its end.
(D) decreases as we move towards its end.

4. How much work is done by an external agent in moving a charge of 2.5C across two points having a potential difference 10 V?
(A) 24 J (B) 25 J (C) 2.5 J (D) 0.25 J

5. 

If all the resistors shown have the value $3\,\Omega$ each, the equivalent resistance across points A and B is
(A) $3\,\Omega$ (B) $9\,\Omega$ (C) $18\,\Omega$ (D) $\frac{27}{4}\Omega$

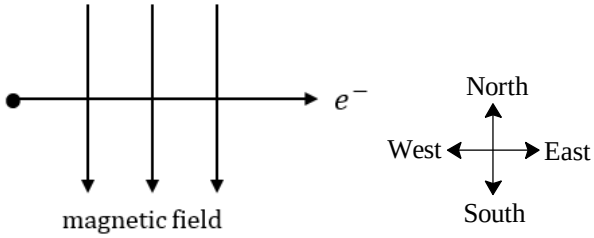
6. A car moving with 90 km/hr requires 2 meter distance to completely come to rest. If it were moving with 54 km/hr distance required for completely coming to rest will be?
[Assuming same and constant retardation for both cases.]
(A) 1 meter (B) 5.5 meter (C) 0.36 meter (D) 0.72 meter

SPACE FOR ROUGH WORK

7. The potential difference between the terminals of an electric bulb is 60 volt, when it draws a current of 4A from the source. What current (in Ampere) will the bulb draw if the potential difference is increased to 180 volt.

(A) 8 A (B) 12 A (C) 6 A (D) 10 A

8. An electron enters a magnetic field at right angles to it, as shown in figure. The direction of force acting on the electron will be

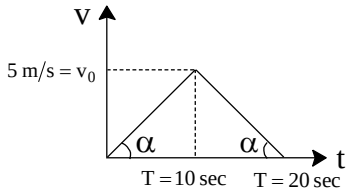


(A) into the page (B) out of the page (C) North (D) South

9. Force between two identical masses due to gravitation is found be equal to 'F' Newton. If both the masses are doubled and separation between then is reduced to half. Now, force between masses will be

(A) 4F (B) 8F (C) 16F (D) F

10. Speed-time graph for a particle moving on a straight line between two points A & B is shown total distance between A and B is ?



(A) 100 meter (B) 50 meter (C) 25 meter (D) none of these

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SECTION – II : CHEMISTRY

11. The number of valence electrons in Cl^- ion is:
(A) 16 (B) 8 (C) 17 (D) 18

12. Some fruits like mango, lemon, raw grapes, orange, etc., have a sour taste due to the presence of:
(A) Acetic acid (B) Citric acid (C) Lactic acid (D) Oxalic acid

13. The solution of a substance which conducts electricity is called _____
(A) an electrolyte (B) an insulator (C) a conductor (D) None of these

14. Which orbit is nearest to the nucleus of an atom?
(A) K (B) L (C) M (D) N

15. The weight of sugar present in 4 litres of 0.123 M solution is (Sugar : $C_{12}H_{22}O_{11}$)
(A) 85 g (B) 684 g (C) 168 g (D) 342 g

16. Identify 'A' in the following reaction:
$CH_3COOH + Na_2CO_3 \rightarrow A + CO_2 + H_2O$
(A) CH_3COONa (B) $CH_2(Na)COOH$ (C) NaOH (D) $NaHCO_3$

17. Addition reactions are undergone by
(A) saturated hydrocarbons (alkanes) (B) only alkenes
(C) only alkynes (D) both alkenes and alkynes

18. In CO_2, C and O_2 are present in the ratio _____ by mass
(A) 1 : 8 (B) 8 : 1 (C) 8 : 2 (D) 3 : 8

19. Co-ordination bond is formed
(A) By exchange of electrons. (B) By equal sharing of electrons.
(C) By one way sharing of electrons. (D) None of these.

20. Which of the following gives the correct increasing order of the atomic radii of O, F and N?
(A) O, F, N (B) N, F, O (C) O, N, F (D) F, O, N

SPACE FOR ROUGH WORK

SECTION – III : BIOLOGY

21. Which of the following is a dominant trait of Pea plant ?
(A) Dwarfness (B) Yellow seed (C) Wrinkled seed (D) Yellow pod

22. The category '_____' lies between 'family' and 'class' in the hierarchy of classification.
(A) order (B) genus (C) species (D) kingdom

23. Bees are important to agriculture as they
(A) Produce wax (B) Perform pollination
(C) Prevent pollination (D) Produce honey

24. The phrase "Windows for the brain" is used to describe
(A) sense organs (B) spinal organs (C) brain (D) nerve impulse

25. In cardiac cycle, diastole mean
(A) the number of heart beats per minute.
(B) the relaxation period after contraction of the heart
(C) the forceful pumping action of the heart.
(D) the contraction period after relaxation of the heart.

26. Rough endoplasmic reticulum is involved in
(A) Lipid synthesis (B) Starch synthesis
(C) Protein synthesis (D) Carbohydrate synthesis

27. According to Lamarck, a giraffe has a long neck because-
(A) a Creator designed it that way.
(B) catastrophe eliminated short-necked forms.
(C) its ancestors stretched their necks to get food.
(D) ancestral giraffes with slightly longer necks than others got more food and left more surviving offspring.

28. How many molecules of ATP are produced by one molecule of glucose during respiration?
(A) 30 (B) 38 (C) 20 (D) 2

SPACE FOR ROUGH WORK

29. In which phase of cell division can we study structure of chromosome?
(A) Anaphase (B) Prophase (C) Telophase (D) Metaphase

30. Which of the following is a sugar observed in DNA?
(A) Ribose (B) Deoxyribose (C) Mannose (D) Galactose

31. Which of the following helps in formation of Lysosomes?
(A) Mitochondria and Endoplasmic reticulum
(B) Golgi complex and Chloroplast
(C) Endoplasmic reticulum and Golgi complex
(D) Mitochondria and Golgi complex

32. If a large number of people are enclosed in a room, then
(A) oxygen decreases and carbon dioxide increases
(B) oxygen increases and carbon dioxide decreases
(C) both oxygen and carbon dioxide decreases
(D) both oxygen and carbon dioxide increases

33. Homologous organ have
(A) Same structure, same function (B) Different structure, different function
(C) Same structure, different function (D) Different structure, same function

34. What is the role of bile during digestion?
(A) Emulsification of fat (B) Digestion of fat
(C) Absorption of fat (D) Assimilation of fat

35. Light sensitive cells in the eyes are present in which of the following regions?
(A) Choroid (B) Retina (C) Sclera (D) Lens

36. An unknown organism was discovered with the following characteristics
I. Multicellular organization
II. Definite cell wall made of chitin
III. Heterotrophic and saprophytic
IV. Reserve food material in the form of glycogen
This organism is most likely to be classified under kingdom
(A) Monera (B) Protista (C) Fungi (D) Animalia

SPACE FOR ROUGH WORK

37. The epithelium lining oviduct and trachea is
(A) Brush border epithelium (B) Cuboidal epithelium
(C) Glandular epithelium (D) Ciliated epithelium

38. Identify the CORRECT statements related to Chromosomes
i. contain genes
ii. are rod like structures
iii. contain information for inheritance
iv. composed of DNA and protein
(A) All are correct (B) i, iii & iv (C) i, ii & iii (D) i & ii

39. Which of the following diseases is caused due to vitamin deficiency?
(A) Addison's disease (B) Scurvy
(C) Dengue (D) Dysentery

40. The brain is responsible for all EXCEPT
(A) Thinking (B) Regulating the heart
(C) Balancing the body (D) Initiate heart beat

SPACE FOR ROUGH WORK