

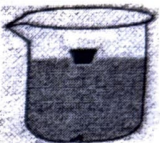


General Instructions:

- (i) This question paper consists of 39 questions in 3 sections. Section A is Physics, Section B is Chemistry and Section C is Biology.
- (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- (iii) All Multiple choice questions will be of 1 Mark each.

**SECTION A [PHYSICS]**

1. The speed of sound in air depends on:
  - (a) Air pressure only
  - (b) Air density only
  - (c) Temperature only
  - (d) Temperature and pressure
2. Ultrasound is preferred for medical imaging because:
  - (a) It travels faster than sound in air
  - (b) Its wavelength is smaller, giving better resolution
  - (c) It is audible
  - (d) It does not reflect
3. Two vehicles move toward each other with speeds 20 m/s and 30 m/s. How long will they take to meet if initially 250 m apart?
  - (a) 2 s
  - (b) 3 s
  - (c) 4 s
  - (d) 5 s
4. Weight of a body is maximum at:
  - (a) Equator
  - (b) Poles
  - (c) Sea level
  - (d) Center of Earth
5. Observe the diagram carefully and choose the correct option.
 



  - (a) The downward force acting on the nail is greater than the upthrust of water on the nail
  - (b) The upward force acting on the nail is greater than the downward force acting on the nail.
  - (c) There is no net force acting on the nail and the cork.
  - (d) The net force on the iron nail and the cork is in the same direction.
6. If two bodies of masses  $m_1$  and  $m_2$  are acted upon by equal forces, their accelerations  $a_1$  and  $a_2$  are:
  - (a)  $a_1 = a_2$
  - (b)  $a_1/a_2 = m_2/m_1$
  - (c)  $a_1/a_2 = m_1/m_2$
  - (d) None
7. A source emitting sound moves away from a stationary observer. The observed sound has:
  - (a) Greater frequency
  - (b) Smaller wavelength
  - (c) Lower pitch
  - (d) Greater speed
8. Assertion: When a person jumps from a boat, the boat moves backward.  
Reason: The total momentum of the system remains conserved.
  - (a) Both A and R is true and R is the correct explanation of A.
  - (b) Both A and R is true and R is not the correct explanation of A.
  - (c) A is true but R is false.
  - (d) A is false but R is true.
9. Assertion: Uniform circular motion is an example of accelerated motion.  
Reason: The direction of velocity changes continuously in circular motion.
  - (a) Both A and R is true and R is the correct explanation of A.
  - (b) Both A and R is true and R is not the correct explanation of A.
  - (c) A is true but R is false.
  - (d) A is false but R is true.
10. Why does a camel walk easily on sand but it is difficult for a man to walk on sand though a camel is much heavier than a man? 2

OR

A piece of ice is placed gently on the surface of water in a glass so that when the ice floats, the water comes up to the brim of the glass. What will happen to the level of water when the ice melts? Will it overflow? Why? 2
11. What is stethoscope? Name the principle on which a stethoscope works. 2
12. A light and a heavy object have the same momentum, find out the ratio of their kinetic energies. Which one has a larger kinetic energy? 2
13. Calculate the force of gravitation between the earth and sun, given that the mass of the earth =  $6 \times 10^{24}$  kg and of the sun =  $2 \times 10^{30}$  kg. The average distance between the two is  $1.5 \times 10^{11}$  m. 3

OR

$$f = \frac{m}{a} \text{ or } \frac{m_1}{a_1} = \frac{m_2}{a_2}$$

$$\Rightarrow f = m_2 \cdot a_1$$

HISTOLOGY

$a = 10 \text{ m/s}^2$

- A stone is thrown in a vertically upward direction with a velocity of 5 m/s. If the acceleration of the stone during its motion is  $10 \text{ m/s}^2$  in the downward direction, what will be the height attained by the stone and how much time will it take to reach there?
14. (a) Why does an athlete put some sand or cushion on the ground while high jumping. 3  
(b) State first law of motion.
15. A car starts from rest and moves along a straight road. For the first 10 s, it accelerates uniformly and reaches a speed of 20 m/s. It then moves with constant speed for the next 20 s. Finally, it comes to rest uniformly in the next 5 s. 4
- a) Find the acceleration during the first 10 s  
b) Calculate the distance covered during uniform acceleration.  
c) Find the retardation during the last 5 s.
16. Attempt either A or B: 5
- A. (i) Differentiate between G and g. (any two points)  
(ii) A motorcyclist drives from A to B with a uniform speed of 30 km/h and returns back with a speed of 20 km/h. Find the average speed.  
(iii) Earthquake produces which kind of sound before the main shock begins.
- OR
- B. (i) What is the audible range of hearing of children till 5 years of age?  
(ii) State Archimedes Principle.  
(iii) State third law of motion.  
(iv) Flying aircraft will possess which form of energy?

**SECTION-B [CHEMISTRY]**

17. The English name of an element is tungsten, its latin name will be:  
(a) plumbum (b) wolfram (c) hydragyrum (d) argentum
18. The atomic number of an element X is 13. What will be the number of electrons in its ion  $X^{3+}$   
(a) 11 (b) 15 (c) 16 (d) 10
19. The formula of the sulphate of an element X is  $X_2(\text{SO}_4)_3$ . The formula of nitride of an element X will be:  
(a)  $X_2N$  (b)  $XN_2$  (c)  $XN$  (d)  $X_2N_3$
20. Which fabric is comfortable for summers?  
(a) Nylon (b) Acrylic (c) Polyester (d) Cotton
21. When water at  $0^\circ\text{C}$  freezes to form ice at the same temperature of  $0^\circ\text{C}$ , then it:  
(a) absorbs some heat (b) releases some heat  
(c) neither absorbs nor releases heat (d) absorbs exactly  $3.34 \times 10^5 \text{ J/kg}$  of heat
22. Which of the following are chemical changes?  
(i) decaying of wood (ii) burning of wood  
(iii) sawing of wood (iv) hammering of nail into wood  
(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)
23. One of the following elements has an atomicity of one. This element is:  
(a) helium (b) hydrogen (c) sulphur (d) ozone
24. Assertion (A): A mixture is made up of two or more elements or two or more compounds.  
Reason (R): Ammonium chloride on heating changes directly to vapours.  
(a) Both A and R is true and R is the correct explanation of A.  
(b) Both A and R is true and R is not the correct explanation of A.  
(c) A is true but R is false.  
(d) A is false but R is true.
25. (a) Why does steam causes more severe burns than boiling water? 2  
(b) Give an example of sublimating compound.
- OR
- (a) Why does our palm feel cold when we put some acetone on it?  
(b) Define latent heat of fusion.
26. (a) Many indigestion mixtures are suspensions. What do the instructions written on the bottle of an indigestion mixture tell us before taking the mixture, and why? 3  
(b) Name the process of conversion of solid state into gaseous state without coming to liquid state. 3
27. (a) Name a non metal which is liquid at room temperature.  
(b) Name a non-metal necessary for combustion.  
(c) What is the full form of IUPAC?

25 + 125  
150

28. A student heated 5 g of calcium carbonate ( $\text{CaCO}_3$ ) in a closed container. After heating, it decomposed into calcium oxide ( $\text{CaO}$ ) and carbon dioxide ( $\text{CO}_2$ ). The total mass of the products was found to be 5 g. 4
- (a) Name the law illustrated in this experiment.  
 (b) Why must the container be closed during the experiment?  
 (c) State one real-life example where this law is applicable.
29. Attempt either A or B 5
- A. (i) Calculate the molecular formula and molecular mass of the following:  
 (a) Quicklime  
 (b) Aluminium oxide  
 (c) Ammonium chloride  
 (ii) Write the postulates of Dalton atomic theory.
- OR
- B. (i) Write the electronic configuration of sodium and potassium atom.  
 (ii) Explain the conclusion given by Rutherford in his atomic theory.

### SECTION-C|BIOLOGY|

30. Parenchyma which contains chlorophyll is called:  
 (a) collenchyma (b) sclerenchyma (c) chlorenchyma (d) none of these
31. 'Organic farming' does not include  
 (a) green manures (b) chemical fertilizers (c) crop rotation (d) compost and farmyard manures
32. Assertion (A): Ribosomes are factories of cells for protein synthesis  
 Reason (R): Building material of ribosomes are manufactured in nucleolus (RNA) and cytoplasm (proteins).  
 (a) Both A and R is true and R is the correct explanation of A.  
 (b) Both A and R is true and R is not the correct explanation of A.  
 (c) A is true but R is false.  
 (d) A is false but R is true.
33. Why are lysosomes known as suicide bags? 2
34. Give two features of cardiac muscle. 2
35. (a) Which organelle is known as the powerhouse of the cell? Why? 3  
 (b) Who discovered the dead cell for the first time? 3
36. Differentiate between parenchyma, collenchyma and sclerenchyma.  
 OR  
 Write a note on meristematic tissue. Also draw a well-labelled diagram. 3
37. (a) Give any one advantage of Intercropping. 3  
 (b) Give any two points of differences between manures and fertilisers.
38. Sita owns a dairy farm but the milk production of her cattle is low. A veterinary doctor advised her to provide proper feed, maintain cleanliness and select improved breeds for better productivity. 4
- (a) What is animal husbandry?  
 (b) Name two components of good animal husbandry practices.  
 (c) Why is proper feed important for animals?  
 (d) How does selecting improved breeds help farmers?
39. Attempt either A or B 5
- A. (a) Tissue that forms inner lining of our mouth.  
 (b) Tissue that connects muscle to bone in humans.  
 (c) Tissue that transports food in plants.  
 (d) Why there waxy coating of cutin present on bark of tree. (State three reasons)
- OR
- B. (a) What is green revolution.  
 (b) What are plastids?  
 (c) Draw a well labelled diagram of a nerve cell. Also state the function of a nerve cell in human body?