

**SCIENCE AND TECHNOLOGY**  
**(212)**

Time : 2½ Hours

Maximum Marks : 85

Note :- (i) All questions are compulsory.  
(ii) Marks are given against each question.

1. a- particles are : 1
- (a) negatively charged
  - (b) positively charged having no mass
  - (c) positively charged having mass
  - (d) neutral particles
2. Which of the following characteristics are associated with gaseous state ? 1
- (a) Definite shape, compressible and fixed volume.
  - (b) Incompressible, fixed shape and size.
  - (c) No fixed shape and size, highly compressible.
  - (d) Fixed shape, incompressible having strong intermolecular force.
3. The force required to accelerate a body of 50 kg at  $2.0 \text{ ms}^{-2}$  is : 1
- (a) 100 N
  - (b) 25 N
  - (c) 200 N
  - (d) 50 N
4. If two resistances of 4 ohm each are connected in parallel, the equivalent resistance is : 1
- (a) 1 ohm
  - (b) 2 ohms
  - (c) 4 ohms
  - (d) 8 ohms
5. Which of the following is responsible for depletion of ozone layer in the atmosphere ? 1
- (a) Carbon monoxide
  - (b) Carbon dioxide
  - (c) Sulphur dioxide
  - (d) Chlorofluorocarbons
6. During the photosynthesis in plants the light reaction takes place in : 1
- (a) Mitochondria
  - (b) Golgi bodies
  - (c) Lysosomes
  - (d) Chlorophyll
7. The cell organelle which should be removed from a cell to stop the use of oxygen and production of A.T.P. is : 1
- (a) Nucleus
  - (b) Golgi bodies
  - (c) Mitochondria
  - (d) Ribosome
8. The blood coming from lungs passes into : 1
- (a) Left auricle
  - (b) Right auricle
  - (c) Left ventricle
  - (d) Right ventricle

9. Fire caused due to electricity can be extinguished by : 1  
 (a) Foam type extinguisher  
 (b) Soda-acid extinguisher  
 (c) Pouring water  
 (d) Carbon tetrachloride extinguisher
10. "A person gets hurt more when he falls on a concrete floor than on a foam mattress." Explain. 2
11. The driver of a train moving at  $40 \text{ ms}^{-1}$  applies the brakes as the train enters the station. Calculate the distance traveled by the train to stop if it slows down at a rate of  $2 \text{ ms}^{-2}$ . 2
12. "Sun is the ultimate source of energy". Justify this statement by citing four examples. 2
13. 'We always see the same phase of the moon.' Explain. 2
14. Classify the following molecules as polar or non-polar : 2  
 (i)  $\text{N}_2$  (ii)  $\text{HCl}$   
 (iii)  $\text{CH}_4$  (iv)  $\text{NH}_3$
15. Sodium metal reacts with excess of water according to the equation : 2  

$$2 \text{ Na (s) + 2H}_2\text{O (l)} \rightarrow 2\text{NaOH(aq)} + \text{H}_2\text{(g)}$$
- Calculate the volume of  $\text{H}_2$  evolved at S.T.P., when 506 g of sodium metal reacts with excess water. [ $\text{Na} = 23 \text{ u}$ ].
16. What are (i) transverse and (ii) longitudinal waves ? Give one examples of each of them. 2
17. (a) Define the terms : 4  
 (i) base and  
 (ii) derived units.
- (b) Derive the units of force and pressure.
- (c) Write the S.I. units of  
 (i) Amount of substance;  
 (ii) Density.
18. You are given two convex lenses, one of focal length 10 cm and another of focal length 100 cm. If you are asked to make a refracting telescope, which lens would you use as an : 4  
 (d) eye piece;  
 (ii) objective.

With the help of a labelled ray diagram, show the formation of image of a distant object by a refracting telescope.

Why is it also called an astronomical telescope ?

- 19.** (a) List any four physical conditions necessary for existence of life on a planet.  
(b) Name the two planets of the solar system which have a protective layers like ozone in their atmosphere.  
(c) "There is no life on Mars." Give two reasons. 4
- 20.** (a) Differentiate between ecosystem and biosphere.  
(b) "The energy flow in the biosphere is unidirectional." Justify giving one example. 4
- 21.** Describe Frasch process for extraction of sulphur with the help of a labelled diagram. 4
- 22.** How would you categorize the waste generated at home for ecological balance ? Write the differences between these categories. Giving one example from each category, describe how would you manage this waste so that it causes least pollution. 4
- 23.** Write three differences between the class Amphibia and Reptilia giving one example of each. 4
- 24.** Draw a diagram of human-excretory system. Label :  
(i) kidney,  
(ii) ureter,  
(iii) bladder and  
(iv) urethra, 4
- on it. Name the structural and functional unit of kidney.
- 25.** (a) A person is suffering from fever. He experiences loss of appetite, nausea, vomiting and weakness. His urine, eyes and nails have become yellowish. Name the disease he is likely to be suffering from. Mention the causative organism of the disease. Mention two precautions he should have take to prevent this disease ? 4
- (b) Classify the following diseases as communicable and non-communicable disease :  
(i) Influenza  
(ii) Diabetes  
(iii) Rickets  
(iv) Ringorm
- 26.** What is :  
(i) a geostationary orbit; and  
(ii) a sun-synchronous orbit ? 4
- Draw diagrams to show a satellite in :  
(i) geostationary orbit;  
(ii) polar orbit

State briefly the principle involved in launching of satellites.

**27.** What is crop rotation ? List four advantages of crop rotation. Why is it advisable to rotate the crop with leguminous crops only ?

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**28.** Give four points of differences between 'mixtures' and 'compounds'. Write two examples of each.

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**29.** What is the commercial unit of electrical energy ? How is it related to SI unit of energy ?

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Name two places in our country where thermal power plants are located. Calculate the time, a 2 kW immersion rod would take to raise the temperature of 1 kg of water from 20°C to 50°C.

[Specific heat of water = 4.2 kJ/kg°C]

**30.** Write the full form of AIDS. Name the causative organism of AIDS. How much is its incubation period ? Describe any three ways by which it is transmitted. List any three precautionary measures to prevent spread of AIDS.

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