

SCIENCE AND TECHNOLOGY

(212)

Time : 2 ½ Hours]

Maximum marks : 85

Note :- 1 . All questions are compulsory .

2 . Marks for each question are indicated against it .

- 1 . Which of the following is not a transition element ? 1
(A) Platinum (B) Silver
(C) Copper (D) Lead

- 2 . Which one of the following compounds has the shortest C – C Bond length ? 1
(A) H₃C-CH₃ (B) H₂C=CH₂
(C) HC=CH (D) H₃C-CH₂-CH₃

- 3 . Momentum of a body of given mass is proportional to its : 1
(A) Volume (B) Shape
(C) Acceleration (D) Velocity

- 4 . the relationship between focal length (f) and radius of curvature (r) of a convex mirror is : 1
(A) $f = r$ (B) $f = 2r$
(C) $f = r/2$ (D) $f = r^2$

- 5 . The function of the moderator in a nuclear reactor is : 1
(A) to cool the reactor
(B) to absorb neutrons so as to stop the chain reaction
(C) to control the energy released in the reactor
(D) to reduce the kinetic energy of the neutrons produced in the chain reaction

- 6 . Soil erosion can be prevented by : 1

- (A) excessive use of prevented by :
- (B) excessive use of fertilizers
- (C)deforestation
- (D) afforestation

7 . The cell-organelle, which co-ordinates the activities of the entire cell is : 1

- (A) Lysosome (B) Nucleus
- (C) Mitochondria (D) Golgi body

8 . which one of the following statement is true for conducting tissues in plants ? 1

- (A) Only tracheids are dead cells
- (B)Only vessels are dead cells
- (C)Both tracheids and vessels are dead cells
- (D) Both tracheids and vessels are living cells

9 . Which one of the following is not an endocrine gland ? 1

- (A) Pituitary (B) Pancreas
- (C) Testes (D) Liver

10 how many molecules of O_2 are in 8.00 g of oxygen ? If the oxygen molecules were completely split in oxygen atoms, how many moles of atoms of oxygen would be obtained ?

[O = 16u] 2

11 . In the reaction



Calculate the mass of sodium hydroxide that would be produced when 2.3 g of sodium reacts with excess water .

[Na = 23u, O = 16u, H = 1u] 2

12 . A person jumping out of a stationary boat noticed that the boat moved in the backward direction .

Why does this happen ? Explain 2

13 . A bus starts from rest and moves with a uniform acceleration of 3 ms^{-2} . Calculate the velocity of the bus after moving a distance of 54 m .

14 . Why is mercury used as a thermometric substance ? Mention any two points . 2

- 15 . With the help of two diagrams shows how does every square metre of land receive more energy from the Sun on a mid-summer noon than on a mid-winter noon . 2
- 16 . Describe how are TV programmes transmitted to remote areas through INSAT satellite ? 2
- 17 . (a) What is meant by the term 'volume of a body' ? Give the S.I. unit of volume . Write the relation between litre and S.I. unit of volume .
(b) Describe how would you measure the volume of a large irregular piece of salt ?
(C) Which liquid will you select for the above experiment ? 4
- 18 . What is meant by the terms 'renewable' and 'non-reneable' sources of energy ? What is meant by 'energy crisis' ? Which potential sources of energy do you recommend to be developed for our country for future ? 4
- 19 . List four activities of man which are disturbing balance of the life support systems of earth . 4
- 20 . An element belonging to Group 15 of the Periodic Table is available in nature in two forms A and B . The ignition temperatures of A and B are 260°C
- 21 . (a) Name the allotropic form of carbon which has been recently discovered .
(b) Name the products formed when :
(i) Wood is strongly heated in the absence of air .
(ii) Coal is strongly heated in the absence of air .
(iv) Hydrocarbons are heated in limited supply of oxygen .
- 22 . List the raw materials used in the manufacture of washing soda . Write the steps and chemical equations involved in the process of its manufacture by Solvay process . 4
- 23 (a) Draw a diagram of the internal structure of heart . Label on it :
(i) Right ventricle; and
(ii)Left auricle .
(b) Name the kind of muscle fibres that make the heart . 4

- 24 . What is meant by the term 'binomical nomenclature' ? Taking any two examples of living organisms justify the need for using binomical nomenclature . 4
- 25 . People in a certain village have been drinking water from a pond and eating unwashed vegetables plucked from the fields . After a few weeks they started complaining of symptoms such as abdominal pain, five to six mucous and blood containing stools/motions per day . Identify the disease and the category of the causative organism . How can this condition be prevented ? Name any one other disease caused by the same group of organism that caused the disease you identified . 4
- 26 . (a) What are weeds ? How do they affect the crops ? How can they be removed ?
(b) List any two methods for proper storage of agricultural products . 4
- 27 . Draw the block-diagram for broadcasting radio programmes . Give the functions of the following :
(i) Microphone;
(ii) Modulator;
(iii) Demodulator; and
(iv) Loudspeaker .
- 28 . (a) Define the term 'nutrition'.
(b) List five steps involved in the process of nutrition .
(c) Where does the digestion of proteins and fats take place and what is the role played by the associated glands ? 6
- 29 . (a) What is the commercial unit of electricity ? How is it related to S.I. unit of energy ?
(b) Describe the three types of large scale electricity generating plants in India .
(c) A potential difference of 220 V is applied across a resistance of 1000 Ω . Calculate the heat energy produced in the resistor in 20 s .
- 30 . A metallic element combines with a non-metallic element by transference of electrons to form a compound 'X' .
(a) Identify the type of chemical bond present in 'X' .

(b) State the properties of this identified bonding with respect to its :

(I) melting and boiling points;

(ii) electrical conductivity; and

(iii) solubility .

(c) By taking a suitable example show the formation of such a compound .

6