

MT

2018 ___ ___ 1100

Seat No.

--	--	--	--	--	--	--

MT - SCIENCE & TECHNOLOGY -I (72) - SEMI PRELIM - I : PAPER - 4

Time : 2 Hours

(Pages 4)

Max. Marks : 40

Note :

- (i) All questions are compulsory.
- (ii) Draw neat and labelled diagrams wherever necessary.

Q.1. (A) Solve the following questions : 5

- (1) **Fill in the blanks:**
If height of orbit of a satellite from earth's surface is increased, the tangential velocity of the satellite will
- (2) **Select the odd man out:**
Brass, Bronze, Steel, Antimony
- (3) **State whether the following statements are 'True' or 'False', and explain:**
If a spacecraft has to be sent away from the influence of earth's gravitational field, its velocity must be less than the escape velocity.
- (4) **State whether the following statements are true or false. If false, rewrite the correct statements:**
Covalent compounds have high melting and boiling points.
- (5) Which principle is used to measure the specific heat capacity of a substance?

Q.1. (B) Choose the correct alternative and rewrite the sentences : 5

- (1) react with dil.HNO_3 to evolve hydrogen gas.
 - (a) Iron and Copper
 - (b) Manganese and Magnesium
 - (c) Zinc and Manganese
 - (d) Aluminium and Magnesium

- (2) Which of the following statement correctly describes the magnetic field near a long, straight current carrying conductor?
- (a) The magnetic lines of force are in a plane, perpendicular to the conductor in the form of straight lines.
 - (b) The magnetic lines of force are parallel to the conductor on the sides of the conductor.
 - (c) The magnetic lines of force are perpendicular to the conductor going radially outward.
 - (d) The magnetic lines of force are in concentric circles with the wire as the centre, in a plane perpendicular to the conductor.
- (3) If the potential difference across a wire is 2 V and the current through the wire is 1 A, the electric power is
- (a) 4 W
 - (b) $\frac{1}{2}$ W
 - (c) 2 W
 - (d) $\frac{1}{4}$ W
- (4) Gas evolved during fermentation
- (a) O₂
 - (b) CO
 - (c) H₂
 - (d) CO₂
- (5) Ice is a substance which
- (a) expands on heating
 - (b) contracts on heating
 - (c) contracts on cooling
 - (d) remains unchanged

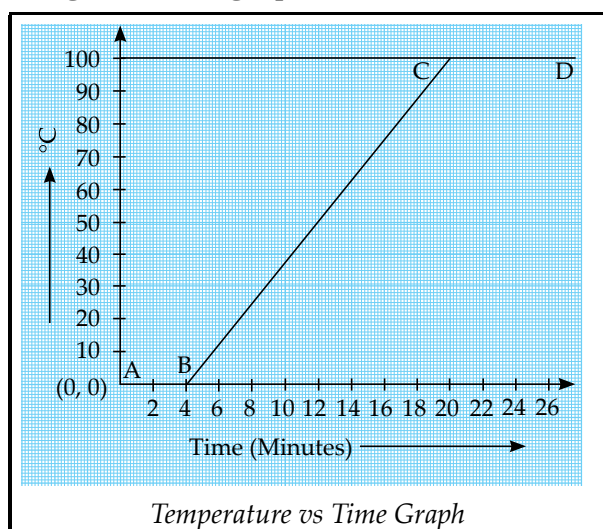
Q.2. Solve the following questions : (Any 5)**[10]**

- (1) **Give Scientific Reason:**
Sodium is always kept in kerosene.
- (2) How will you increase the strength of magnetic field in an electromagnet?
- (3) **Write structural formula for the following IUPAC name:**
2 - Chlorobutane : Molecular formula C₄H₉Cl
- (4) Explain the Role of Latent heat in the change of state of a substance.
- (5) **Write chemical equation for the following reaction:**
Extraction of copper from its sulphide ore.

- (6) **Differentiate between** : Covalent compounds and Ionic compounds.
- (7) State Fleming's Right Hand Rule.

Q.3. Solve the following questions : (Any 5)**[15]**

- (1) (a) What is a Solenoid ? Compare the magnetic field produced by a solenoid with the magnetic field of a bar magnet.
 (b) Draw a neat labelled diagram of solenoid and name various components of it.
- (2) How much time a satellite in an orbit at height 35780 km above earth's surface would take, if the mass of the earth would have been four times its original mass? (consider the tangential velocity (v) = 3.08 km/s)
- (3) Answer the following based on graph:



- (a) Which part of the graph shows a change from ice to water at constant temperature?
 (b) Which part of the graph shows change in temperature without change in state?
 (c) Define : Latent heat of Vapourization.
- (4) (a) Identify the type of the following reaction of carbon compounds.
 $\text{CH}_3\text{-CH}_2\text{-COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COONa} + \text{H}_2\text{O}$
 (b) Explain reaction of ethanol with Sodium metal.

- (5) Liquid ammonia is used in ice factory for making ice from water. If water at 20 °C is to be converted into 2 kg ice at 0 °C, how many grams of ammonia are to be evaporated? (Given: The latent heat of vaporization of ammonia= 341 cal/g)
- (6) (a) Draw neat labelled diagram of Wilfley table method.
(b) Define Gangue.
- (7) Give names of three natural polymers. Write the place of their occurrence and name of monomers from which they are formed.

Q.4. Solve the following questions : (Any 1)**[5]**

- (1) Describe the process of electrolytic reduction of Alumina with the help of a neat labelled diagram.
- (2) (a) Draw a neat labelled diagram of AC generator.
(b) State the principle on which AC generator works.
(c) Explain the working of an AC generator.

Best Of Luck 