MT

2018 ___ ___ 1100 **Seat No.** | | | | | | | |

MT - SCIENCE & TECHNOLOGY -I (72) - SEMI PRELIM - I : PAPER - 1

Time : 2 Hours **(Pages 5)** **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) The device which converts electrical energy into mechanical energy is called ..... .

(2) ..... is a tin ore.

(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:**

$CH_3 - CH_2 - \overset{\overset{O}{\|}}{C} - OH$ is propanone.

(5) Name the apparatus used in the experiment to prove anamolous behaviour of water.

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

(1) Substance used to decrease the melting point of alumina in Hall - Haroult process ..... .

(a) $CuSO_4$ (b) Cryolite

(c) Gypsum (d) Limonite

(2) 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 (b) $\frac{1}{4}$ W

(3) Ice is a substance which ..... .

(a) expands on heating (b) contracts on heating

(c) contracts on cooling (d) remains unchanged

(4) Monomer of polythene is ..... .

(a) CH = CH (b) $CH_2 = CH_2$

(c) $CH_3 - CH_3$ (d) CH = CH

(5) ..... is a High Earth Orbit (HEO) satellite.

(a) Navigational satellite (b) Geostationary satellite

(c) International Space Station (d) SPUTNIK

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

(1) **Give Scientific Reason :**
Hydrogen gas is not evolved when metals like copper, zinc, iron etc react with dilute nitric acid.

(2) **Give Scientific Reason :**
Tungsten metal is used to make a solenoid type coil in an electric bulb.

(3) **Write structural formula for the following IUPAC name.**
Ethanamine: Molecular formula $C_2H_5NH_2$

(4) While defining the unit for heat, which temperature interval is chosen? Why?

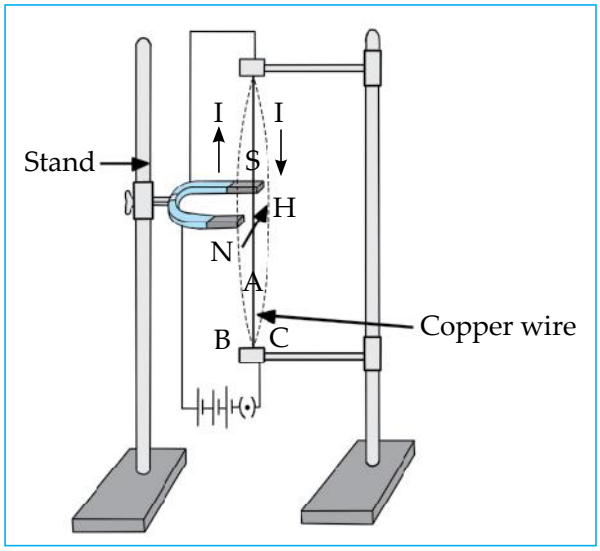
(5) **Write chemical equation for the following reaction:**
Copper reacts with concentrated nitric acid.

(6) **Differentiate between** : Ethanol and Ethanoic acid (Chemical Properties)

(7) Define specific heat capacity and state its unit.

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

(1) Answer the following based on the diagram given below.



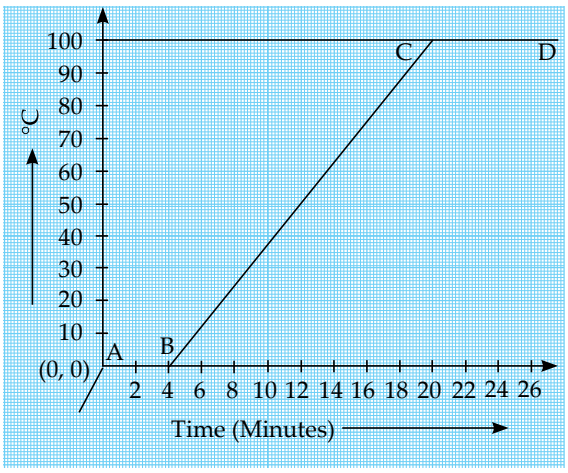
(i) What is the direction of the force experienced by the conductor when the direction of current is downwards?

(ii) If the conductor experiences a force inwards, then what would be the direction of current?

(iii) Which rule helps us to find the force experienced by a current carrying conductor in the above diagram?

(2) How much time, a satellite in an orbit at a height 35780 km above earth's surface would take, if the mass of the earth would have been four times its original mass? (consider tangential velocity (V) = 3.08 km/s)

(3) Answer the following based on graph:



Temperature vs Time Graph

(a) Which part of the graph shows a change from ice to water at constant temperature.
(b) Which part of the graph shows a change in the temperature without change in the state.
(c) Define : Latent heat of Vapourization.

(4) (a) Identify the type of the following reaction of carbon compounds.
$CH_3COOC_2H_5 + NaOH \rightarrow CH_3COONa + C_2H_5OH$

(b) Explain Esterification reaction.

(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 a neat and labelled diagram of Froth floatation method.

(b) Define Patination of Copper.

(7) Give names of three functional groups containing three different heteroatoms, write name and structural formula and one example each.

Functional group				
Hetero atom	**Name**	**Structural formula**	**Condensed Structural formula**	**Example**
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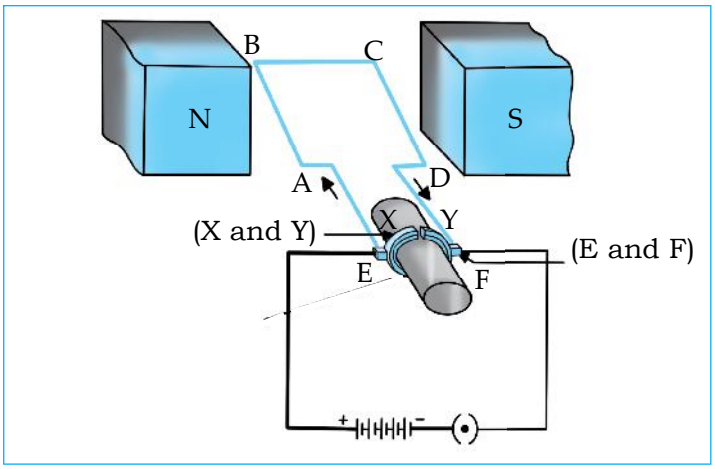
Q.4. Solve the following questions : (Any 1) **[5]**

(1) Describe Hall's Process with neat labelled diagram.

(2) From diagram below answer the following questions :



(a) Define Motor.
(b) State the principle on which an electric motor works.
(c) Name 4 components of an Electric motor
(d) Describe the working of Electric motor.

Best Of Luck