

Class : X]

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02/08Name of the Student : Cancelled Roll No. :

(Physical Science - 10 Marks)

SECTION - I

2 x 1 = 2

Note : 1) Answer all the questions.

2) Each question carries 1 mark.

1. State the principle of method of mixtures.

2. The refractive index of glass respect to air is 2. Then the critical angle of glass-air interface is []

a) 0° b) 45° c) 30° d) 60° SECTION - II

2 x 2 = 4

Note : 1) Answer all the questions.

2) Each question carries 2 marks.

3.A) How do you appreciate the role of the higher specific heat of water in stabilizing atmospheric temperature during winter and summer seasons?

B) Plaster of Paris should be stored in moisture – proof container. Explain why?

SECTION - III

1 x 4 = 4

Note : 1) Answer any ONE question.

2) Each question carries 4 marks.

4.A) Explain the formation of mirages.

(Or)

B) Compounds such as alcohols and glucose contain hydrogen but are not categorized as acids. Describe an activity to prove it.

[Turn Over

KEY PAPER:

(1) The heat lost by the hot body is equal to the heat gained by cold body.

Net heat lost = Net heat gain

(2) C

3 (A) The sun delivers a large amount of energy to the Earth daily. The water sources on earth, particularly the oceans, absorb this energy for maintaining a relatively constant temperature. The oceans behave like heat “store houses” for the earth. They can absorb large amounts of heat at the equator without appreciable rise in temperature due to high specific heat of water.

3. (B) Plaster of Paris is a white powder and on mixing with water or presence of moisture, it sets into hard solid mass due to the formation of gypsum. So, Plaster of Paris should be stored in a moisture - proof container.

4. (A)

i) During a hot summer day, air just above the road surface is very hot and the air at higher altitudes is cool.

ii) It means that the temperature decreases with height.

iii) As a result, the density of air increases with height.

iv) We know that the refractive index of air increases with density.

v) Thus, the refractive index of air increases with height. So, the cooler air at the top has greater refractive index than hotter air just above the road. Light travels faster through the thinner hot air than through the denser cool air.

vi) When the light from a tall object such as a tree or from the sky passes through a medium just above the road, whose refractive index decreases towards ground, it suffers refraction and takes a curved path because of total internal reflection.

vii) This refracted light reaches the observer in a direction shown in Figure.

viii) Hence, we feel the illusion of water being present on the road which is the

virtual image of the sky (mirage) and an inverted image of a tree on the road.
(OR)

4. (B)

i) Prepare solutions of glucose, alcohol, hydrochloric acid and sulphuric acid etc.,

ii) Connect two different coloured electrical wires to graphite rods separately in a 100 ml beaker as shown in figure.

iii) Connect free ends of the wire to 230 volts AC plug and complete the circuit as shown in the fig by connecting a bulb to one of the wires.

iv) Now pour some dilute HCl in the beaker and switch on the current.

v) We observe that the bulb glows.

vi) Repeat activity with dilute sulphuric acid and glucose and alcohol solutions separately.

vii) You will notice that the bulb glows only in acid solutions but not in glucose and alcohol solutions.

viii) Glowing of the bulb indicates that there is flow of electric current through the solution. Acid solutions have ions and the movement of these ions in solution helps for flow of electric current through the Solution.

ix) The positive ion (cation) present in HCl solution is H^+ . This suggests that acids produce hydrogen ions H^+ in solution, which are responsible for their acidic properties.

x) In the glucose and alcohol solution the bulb did not glow indicating the absence of H^+ ions in these solutions. The acidity of acids is attributed to the H^+ ions produced by them in solutions.