GREENLAWNS SCHOOL, WORLI

Terminal Examination 2018

PHYSICS

STD: X Marks: 80

Date: /09/2018 Time: 2hrs

Question 1

a. Arrange the following in ascending order of frequency, X-rays, Radio waves, Infrared radiation, Gamma rays and Ultraviolet rays. **[2]**

b. State four ways in which machines are useful to us. **[2]**

c. An electrical heater is rated 4 kW, 220 V. Find the cost of using this heater for 12 hours if one kW h of electrical energy costs Rs. 3.25. **[2]**

d. The refractive index of air with respect to glass is expressed as ${}_g\mu^a$ = sin i / sin r

i) Write down a similar expression for ${}_a\mu^g$ in terms of angles i and r .

ii) If angle r = 90˚, what is the corresponding angle i called? **[2]**

e. The stone of hand flour grinder is provided with a handle near its rim. Give a reason.

Question 2

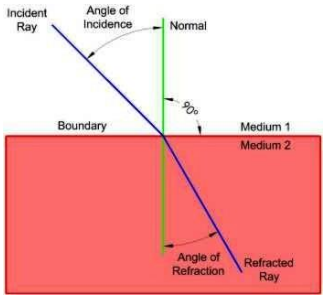
a. Of the three connecting wires in a house-hold circuit:

(i) Which two of the three wires are at the same potential?

(ii) In which of the three wires should the switch be connected? **[2]**

b. Define absolute refractive index of a medium? **[2]**

c. A ray of light follows the path as shown, when it passes from medium1 to medium 2, state with the reason whether ${}_1\mu^2 > {}_2\mu^1$ OR ${}_2\mu^1 > {}_1\mu^2$? **[2]**



d. State the energy change which takes place when a magnet is moved inside a coil having a galvanometer at its ends. Name this phenomenon. **[2]**

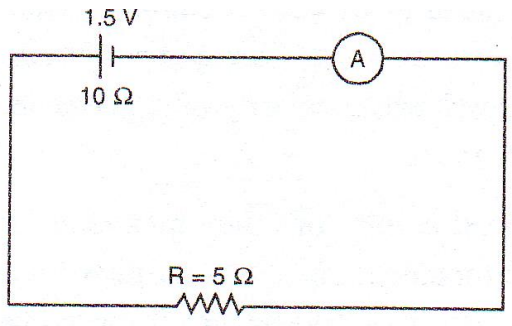
e. State the condition for no change in the direction of light ray on refraction. **[2]**

Question 3

a. Can a glass slab disperse light? If not, why? **[2]**

b. Rock salt prism is used instead of glass prism to obtain infra-red spectrum. Explain why. **[2]**

c. A cell of emf 1.5 V and internal resistance 10 ohms is connected to a resistor of 5 ohms, with an ammeter in series (see Fig.). What is the reading of the ammeter? **[2]**



d. State two dissimilarities between a d.c. motor and an a.c. generator. **[2]**

e. Define Principal focus and focal length of a diverging lens. **[2]**

Question 4

a. How does earthing prevent electrical shock? **[2]**

b. Name the material used for making a fuse wire. State two properties of the material of fuse wire which make it suitable for use. **[2]**

c. Give reasons for the following:

i) In a single fixed pulley, the velocity ratio is always more than the mechanical advantage.

ii) The efficiency of a pulley is always less than 100 %. **[2]**

d. Derive the relationship between mechanical advantage, velocity ratio and efficiency. **[2]**

e. Give one useful and harmful effect of ultraviolet radiation on the human body. **[2]**

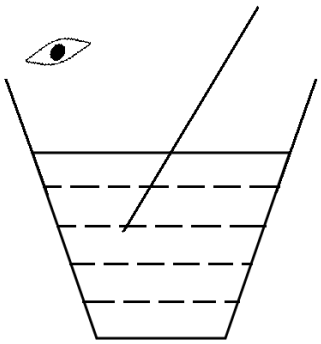
Section II

(Attempt any 4 question from this section.

Question 5

a. Neha puts a stick inside a beaker filled with water as shown in figure. Complete the diagram showing how Neha's eye sees the stick through water.

[3]



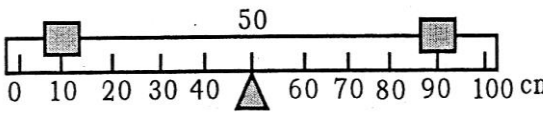
b. i) For which spectral color of light is the speed maximum and minimum in glass

ii) What is the relation between the critical angle and the refractive index for a given pair of media? **[3]**

c. Fig. below shows a uniform metre rule placed on a fulcrum at its midpoint 0 and having a weight 40 gf at the 10 cm mark and a weight of 20 gf at the 90 cm mark.

(i) Is the metre rule in equilibrium? If not, how will the rule turn?

(ii) How can the rule be brought in equilibrium by using an additional weight of 40 gf? **[4]**



Question 6

a. (a) What is the name given to a cylindrical coil whose diameter is less in comparison to its length?

(b) If a piece of soft iron is placed inside the current carrying coil, what is the name given to the device?

(c. Give one use of the device named by you in (b.above.

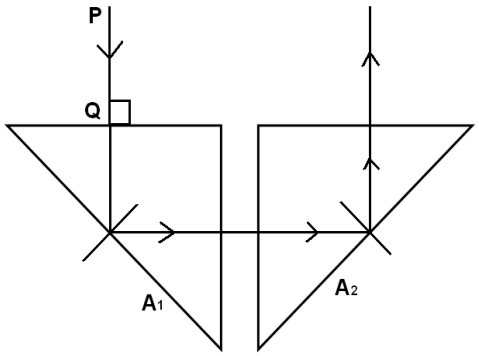
Ans. (a) Solenoid

(b) Electromagnet

(c. Electromagnet is used in electric bell.

b. a) The figure given below represent two isosceles right angled prism A_1 and A_2. Copy the diagram and trace the course of the ray PQ.

b.Name the phenomenon responsible for the path of the ray PQ **[3]**



c. **i.** What quantity of heat will be produced in coil of resistance 80 ohm if current of 3 A is passed through it for 4 second? **[2]**

ii. What are high tension wires? Give two characteristics of these wires. **[2]**

Question 7

a. Study the diagram given below and answer the following questions. **[2]**

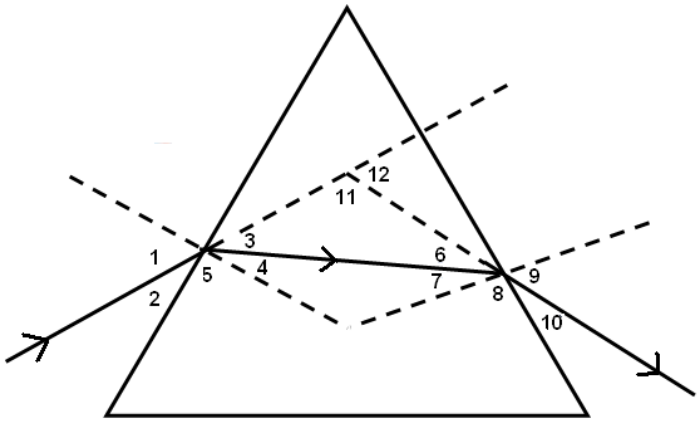
Identify:

i) Angle of incidence.

ii) Angle of refraction.

iii) Angle of emergence.

iv) Angle of deviation.



b. (I) (i) State the purpose of a fuse in an electric circuit. Name the material used for making a fuse wire.

(ii) Mention two factors on which the internal resistance of a cell depends.

(II) (i) Draw a labeled diagram to show the various components of a step-down transformer.

(ii) State the main difference between a step-up and step-down transformer. **[4]**

c. An object of 10 cm high forms an inverted image of 20 cm high, when the distance between the object and image is 40 cm. By drawing ray diagram on graph using scale 10 cm =1unit. i) Find the focal length and power of the lens. **[4]**

Question 8

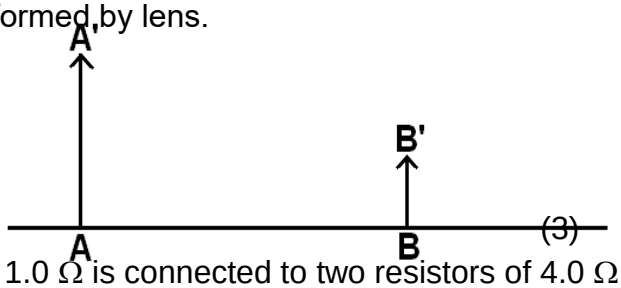
a. State the factors that alter the resistance of conductor. **[2]**

b. In the figure AA' is object and BB' is image formed by lens.

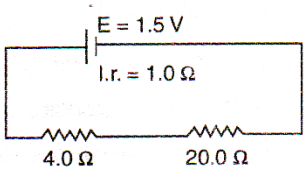
i) Complete the diagram.

ii) Locate the lens and mark the focus of the lens by letter F.

iii) What type of lens is this? Give reason for your answer. (3)



c. A cell of e.m.f. 1.5 V and internal resistance 1.0 Ω is connected to two resistors of 4.0 Ω and 20.0 Ω in series as shown in the figure:



Calculate the:

(i) current in the circuit.

(ii) potential difference across the 4.0 ohm resistor.

(iii) voltage drop when the current is flowing.

(iv) potential difference across the cell. **[4]**

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