

GuessPaper – 2010
Class – X
Subject – Physics

Time allotted :- 1 ½ Hrs

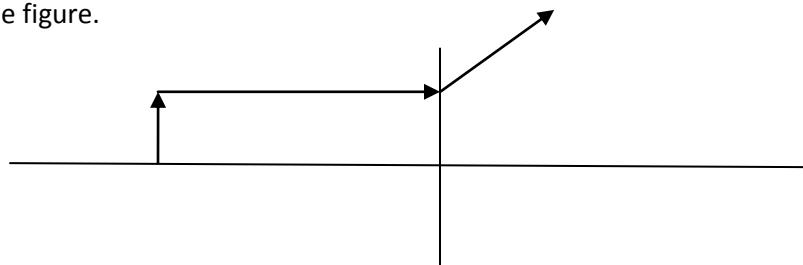
Max. Marks:- 80 General

Instructions :- This question paper is divided into two sections

- (1) Section – I is compulsory.
(2) Attempt any four questions in Section-II
(3) The intended marks for questions or parts of questions are given in brackets []
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SECTION – I (ATTEMPT ALL QUESTIONS) – 40 MARKS

- Q.1 (a) How is the work done by a force measured when
(i) force is in the direction of displacement
(ii) force is at an angle to the direction of displacement [2]
(b) State the principle of lever [2]
(c) What is the SI unit of power ? How is it related to horse power ? [2]
(d) What is the energy associated with a parrot flying in the air [2]
(e) How fast should a man of mass 60 kg run so that his kinetic energy is 750 J ? [2]
- Q.2 (a) Why does the surface of an empty test tube (kept in a beaker filled with water) shines like a mirror . [2]
(b) Infrared radiation are used for photography in fog. Why ? [2]
(c) Copy the figure below and complete it to show the formation of the image of the object. Name the lens used in the figure.

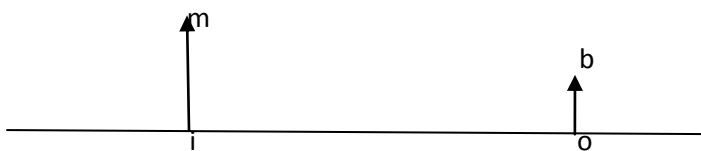


- [2]
(d) Define refractive index of a medium with respect to air. [2]
(e) (i) How does the power of a lens change if its focal length is doubled? [2]
(ii) The power of a lens is +2.0D. Find the focal length and state what kind of lens it is .
- Q.3 (a) Write the necessary conditions for hearing an echo. [2]
(b) How do the frequency and amplitude affect a musical sound. [2]
(c) Why is tungsten filament used in bulb ? [2]
(d) An electric heater has a rating 220 V -1000 Watt. What does it mean ? [2]
(e) A cell of emf 1.5 Volt and internal resistance 10.0 ohm is connected to a resistance of 5 ohms with an ammeter in series . What is the reading of the ammeter ? [2]
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- Q.4. (a) If current is flowing in a straight wire from south to north, what will be the direction of magnetic field lines?
 (i) State the rule that helped you to find the direction of magnetic field. [2]
 (b) Why do we feel cool after hot water bath ? [2]
 (c) Some hot water was added to three times its mass of cold water at 10°C and the resulting temperature was found to be 20°C . What was the temperature at hot water? [2]
 (d) What do you mean by tracers ? Give two applications of tracers. [2]
 (e) Why the materials of low work function preferred as electron emitters? [2]

SECTION-II (Attempt any four) - 40 Marks

- Q.5 (a) State the energy changes which takes place while using the following
 (i) Nuclear reactor (ii) Filament lamp (iii) Electric motor. [3]
 (b) A pulley has a velocity ratio of 4 and an efficiency of 90 % . Calculate
 (i) the mechanical advantage of the system.
 (ii) the effort required to raise a load off 300 N by the system [3]
 (c) A block and tackle pulley system has a velocity ratio 3.
 (i) Draw a labeled diagram of the system. In your diagram clearly indicate the point of application and direction of the load and effort.
 (ii) Why should the lower block of the pulley system be of negligible weight ? [4]
- Q.6 (a) A prism deviates a monochromatic ray of light through an angle ' δ ' , when the angle of incidence at the surface of the prism is ' i '
 (i) Draw a graph showing the variation of ' δ ' with ' i ' . On your graph show the angle of minimum deviation.
 (ii) What is the relation between the angle of emergence when the ray suffers minimum deviation [3]
 (b) The angle of incidence is 40° and angle of refraction is 30° for an optical rectangular slab. When the ray travels from air to the optical medium. Calculate
 (i) Refractive index of the optical medium.
 (ii) What is the magnitude of angle of emergence? [3]
 (c) The diagram given below shows an object O and its image I . Copy the the diagram and draw suitable rays to locate the type of lens in this case. [4]



- Q.7 (a) When a tuning fork, struck by a rubber pad , is held over a length of air column in a tube , it produces a loud sound for a fixed length of the air column.
 (i) Name the above phenomenon
 (ii) How does the frequency of the loud sound compare with that of the tuning fork ?
 (iii) State the unit for measuring loudness [3]

- (b) An observer sitting in between two vertical walls claps 10 times per second. He adjusts his distance 17 m from one wall in such a way that the sound at his clapping coincide with the echo. Calculate the velocity of sound.[3]
- (c) (i) Differentiate between free vibration and damped vibration .
- (ii) The wave length of waves produced on the surface of water is 20 cm . If the wave velocity is 24 m/s , calculate
- The no. of waves produced in one second.
 - The time required to produce one wave

[4]

Q.8 (a) Find the current flowing in the current shown in the figure.[3]

(b) An electrical appliance is rated 1500 W , 250 Volt . This appliance is connected to 250 V mains. Calculate

- the current drawn.
 - the electrical energy consumed in 60 hours.
 - the cost of electrical energy consumed at Rs. 2.50 per kWh.
- (c) (i) State two ways to increase the speed of a d.c motor .
- (ii) What is the use of split rings and carbon brushes in a dc motor.

[3]

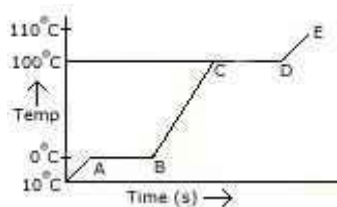
[4]

Q.9. (a) Define the specific latent heat of fusion of ice. Give its SI unit.

[3]

(b) A piece of metal at 10°C has a mass of 50 gm. When it is immersed in a current of steam at 100°C , 0.7 gm of steam is condensed on it. Calculate the specific heat of the metal. Latent heat of steam = 540 Cal / gm. [3]

(c) A piece of ice is heated at constant rate . The variation of temperature with heat input is shown in the graph



(i)What are represented by AB and CD ?

(ii)What conclusion can you draw regarding the nature of ice from the above graph. ?

(iii)Why the length of AB is less than CD ?

[4]

Q.10 (a)(i) A nuclear ${}_n\text{X}^m$ emits one α particle and one β particle. What are the mass number and atomic number of the product nucleus.

(ii) What are the harmful effects of radiation exposure ?

[3]

(b) (i) Define the term work function of a metal.

(ii) Mention two common properties of gamma radiation and visible light.

[3]

(c) (i)Draw a labeled diagram of a hot cathode ray tube.

(ii)What is the function of deflecting systems in a cathode tube?

[4]
