

Time : 2hrs

Answer all questions

[4x10=40]

- Q1. (a) Write two uses of convex mirror.  
 (b) Draw velocity time graph for a boy going to school with uniform velocity.  
 (c) A car is accelerated from  $30 \text{ km}^{-1}$  to  $33.6 \text{ km}^{-1}$  in 2 sec find acceleration in  $\text{ms}^{-2}$ .  
 (d) With the help of diagram show "convex mirrors are better rear view mirror".  
 (e) Draw displacement time graph for a freely falling body.
- Q2. (a). Draw a density graph of water with temp. in the range from  $0^{\circ}\text{C}$  to  $10^{\circ}\text{C}$ .  
 (b) State the temperature of ice point and steam point on the Fahrenheit scale.  
 (c) How are g and G are related ?  
 (d) A mirror forms a real image of an object placed in front of it. Draw a ray diagram.  
 (e) A body moves from rest with a uniform acceleration and travel 270 m in 3 sec. Find the velocity of the body 10 sec. after the start.
- Q3. (a) Draw a graph for change of atmospheric pressure with height.  
 (b) Draw ray diagram to show the formation of image using convex mirror .  
 (c) An object is placed between two plane mirrors at angle of  $60^{\circ}$  . Find the number of images formed.  
 (d) Prove that  $1 \text{ N} = 10^5 \text{ dyne}$  .  
 (e) Define absolute zero.
- Q4. (a) Differentiate between a real and a virtual image.  
 (b) A stone is dropped freely from the top of a tower and it reaches the ground in 4s. CALCULATE THE HEIGHT OF TOWER.  $g = 10\text{ms}^{-2}$ .  
 (c) An object is placed symmetrically between two plane mirrors at an angle of  $50^{\circ}$  .Find the number of images formed.  
 (d) Find nature & position of image formed in a concave mirror when object is placed between centre of curvature C & focus F.  
 (e) Draw a diagram of Nuclear Reactor.

[ Section B ]

Answer four questions only

[4x15=60]

- Q6. (a) Describe an experiment to verify Laws of reflection.  
 (b) For a concave mirror prove that  $f = R/2$  .  
 (c) At what distance in front of a concave mirror of focal length 10 cm, an object is placed so that its real image of size five times of the object is obtained. [ 5+5+5=15]
- Q7. (a) An object 5 cm height is placed at a distance 20 cm in front of a concave mirror of focal length 10 cm . Find position of image .  
 (b) Name the mirror which always produces an erect and virtual image. How is the size of image related to the size of object ? Draw ray diagram.  
 (c) A convex mirror forms the image of an object placed at a distance 40 cm in front of mirror, at a distance 10 cm Find focal length of mirror. [ 5+5+5=15]
- Q8. (a) Draw a labeled diagram of SOLAR CELL .  
 (b) Derive  $F = m \cdot a$  .  
 (c) The image formed by a convex mirror is of size one – third of the size of object.  
 How are U & V are related ? . [ 5+5+5=15]
- Q9. (a) Distinguish between mass and weight.  
 (b) Calculate the gravitational force of attraction between the two bodies of masses 40 kg and 80 kg separated by a distance 6.7 m.  
 (c) Write disadvantages of wind energy. [ 5+5+5=15]
- Q10. (a) Write observations of HOPE'S EXPERIMENT.  
 (b) A body is dropped freely under gravity from the top of a tower of height 78.4 m. Calculate  
 (i) the time to reach the ground, and  
 (ii) the velocity with which it strikes the ground ?  $g = 9.8 \text{ ms}^{-2}$  .  
 (c) State five characteristics of the image formed by a PLANE mirror. [ 5+5+5=15]

- Q1 b) Draw a graph showing variation of volume of water with temperature
- c) Why the fruit falls down when the branch is shaken
- e) Define <sup>mirror</sup> " formulae

Q3 a) Differentiate between Plane, Concave, Convex mirror

Q4 e) A boy is standing ~~at~~ in front of plane mirror at a distance of 3 m from it

- (i) What is the distance between image and boy
- (ii) If boy moves 1 m backward find the distance between boy and image

### Section - B

Q5 b) State the law of gravitation

Q6 d) State three newtons law.