Note:-
    1. All Questions are compulsory.
    2. Numbers on the right indicate full marks.

Section A

Q.1 Select and Write the correct answer. **(4)**

1. As per recent understanding light consists of

   A) Rays   B) Waves

   C) Corpuscles   D) Photons obeying the rules of waves

2. A student uses spectacles of number –2 for seeing distant objects. Commonly used lenses for her/his spectacles are

   A) Bi-concave   B) Double concave

   C) Concavo-convex   D) Convexo-concave

3. A concave mirror of curvature 40 cm, used for shaving purposed produces image of double size as that of the object. Object distance must be

   A) 10 cm only   B) 20 cm only

   C) 30 cm only   D) 10 cm or 30 cm

4. Two plane mirrors are inclined at angle 40° between them. Number of images seen of a tiny object kept between them is

   A) Only 8   B) Only 9

   C) 8 or 9   D) 9 or 10

Q.2 Answer the following. **(3)**

1. Define absolute refractive index and relative refractive index. Explain in brief with an illustration for each.

2. As per recent development, what is the nature of light? Wave optics and particle nature of light are used to explain which phenomena of light respectively?

3. State mirror formula.

Section B
Attempt any Four

Q.3   What is a terrestrial telescope and an astronomical telescope? **(2)**

Q.4   What are the limitations in increasing the magnifying powers 1. Simple microscope 2. Compound microscope 3. Astronomical telescope? **(2)**

Q.5   State speed of light considering light as EM wave. **(2)**

Q.6   Explain and define dispersive power of a transparent material. Obtain its expressions in terms of angles of deviation and refractive indices. **(2)**

Q.7   What is focal length of a lens biconcave, biconvex and plano-convex lens? **(2)**

Q.8   A car uses a convex mirror of curvature 1.2 m as its rear-view mirror. A minibus of cross section **(2)**
2.2 m × 2.2 m is 6.6 m away from the mirror. Estimate the image size.

Section C
Attempt any Two

Q.9   Obtain the expressions for magnifying power and the length of an astronomical telescope   **(3)**
under normal adjustments.

Q.10   Why is a prism binoculars preferred over traditional binoculars? Describe its working in brief.   **(3)**

Q.11   From the given data set, determine angular dispersion by the prism and dispersive power of its   **(3)**
material for extreme colours n_R = 1.62, n_V = 1.62= 1.66, $\delta R = 3.1^{O/}$

Section D
Attempt any One

Q.12   Give position and magnification for concave mirror.   **(4)**

A glass slab thickness 2.5 cm having refractive index 5/3 is kept on an ink spot. A transparent
beaker of very thin bottom, containing water of refreactive index 4/3 up to 8 cm, is kept on the
glass block. Calculate apparent depth of the ink spot when seen from the outside air.

Q.13   Derive Prism formula.   **(4)**