



<http://www.makaut.com/>

DO NOT WRITE ON THIS PAGE



ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009
VISUAL OPTICS (OPTICS – IV)
SEMESTER – 4



Time : 3 Hours]

] Full Marks : 70

GROUP – A**(Multiple Choice Type Questions)**

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10
- i) Slight under-correction is required in
- | | | |
|------------------------|------------------|--------------------------|
| a) high myopia | b) hypermetropia | |
| c) oblique astigmatism | d) aphakia. | <input type="checkbox"/> |
- ii) The colour of pupil in Aphakia is
- | | | |
|--------------|----------|--------------------------|
| a) jet black | b) black | |
| c) white | d) grey. | <input type="checkbox"/> |
- iii) The position of Nodal Point from the retina in a Myopic eye is
- | | | |
|--------------------------------|-------------------|--------------------------|
| a) further away | b) more nearer | |
| c) remain at the same position | d) none of these. | <input type="checkbox"/> |
- iv) The cause of Index Hypermetropia is
- | | | |
|-----------------|------------------|--------------------------|
| a) pathological | b) physiological | |
| c) congenital | d) old age. | <input type="checkbox"/> |
- v) In refractive ametropia the R.S.M. is equal to
- | | | |
|---------------------------|------------------------|--------------------------|
| a) S.M. | b) corrected eye image | |
| c) un-corrected eye image | d) none of these. | <input type="checkbox"/> |

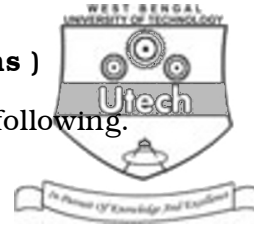
4431 (04/06)



- vi) Airy disc develops due to
 - a) chromatic aberration
 - b) spherical aberration
 - c) distortion
 - d) diffraction.
- vii) Circle of least confusion is on retina in case of
 - a) uncorrected compound myopic astigmatism
 - b) uncorrected simple astigmatism
 - c) uncorrected mixed astigmatism
 - d) irregular astigmatism.
- viii) Spherical equivalent for + 3.50 DSph / - 3.00 DCyl @ 90 is
 - a) - 2.00 DSph
 - b) + 1.00 DSph
 - c) +2.00 DSph
 - d) none of these.
- ix) In case of hypermetropia, Punctum Remotum is at
 - a) infinity
 - b) in front of eye
 - c) behind eye
 - d) none of these.
- x) Far point of a patient is at 20 cm in front of his eyes. His refractive error is
 - a) - 5.00 D
 - b) + 5.00 D
 - c) + 10.00 D
 - d) none of these.
- xi) Blur circle with pupil size.
 - a) increases
 - b) decreases.
- xii) A patient requires cylindrical lens at 30 degree in one eye & at 150 degree in the other eye. What can be the type of astigmatism ?
 - a) WTR
 - b) ATR
 - c) Oblique
 - d) Bi-oblique.

**GROUP – B****(Short Answer Type Questions)**

Write short notes on any *three* of the following.



3 × 5 = 15

2. Circle of least diffusion.
3. Advantages/disadvantages of 10 L, over spectacles in aphakia.
4. Irregular astigmatism.
5. Congenital myopia.

GROUP – C**(Long Answer Type Questions)**

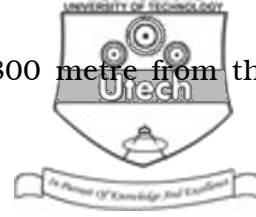
Answer any *three* of the following questions.

3 × 15 = 45

6. What is blur disc ? How is retinal image size determined using reduced eye model ?
Find the size of retinal image formed by an emmetropic eye of an object of height 15 m situated at a distance of 750 m from eye if axial length is 24 mm. 2 + 7 + 6
7. Define astigmatism. Draw & describe refractive types of regular astigmatism. A patient has a far point at 20 cm behind his cornea in uncorrected state. Find out the power of spectacle lens required to his refractive error (assume vertex distance of 12 mm). 2 + 7 + 6
8. What do you mean by spectacle refraction (F) and ocular refraction (K). Give their relation. The far point of a hypermetropic eye is 12.5 cm behind the eye. Find the ocular refraction and spectacle refraction of this eye, when correcting lens to be worn 12 mm in front of cornea. $7\frac{1}{2} + 7\frac{1}{2}$



9. What do you mean by visual acuity ? How will you detect it ? Find the size of image of an object whose height is 10 metre and situated at 800 metre from the eye with an axial length of 21 mm and R.I. is $4/3$.



5 + 10

10. With the help of proper diagrams, illustrate the different refractive types of regular astigmatism in the following cases :

3 × 5

- a) Simple myopia
- b) Simple hypermetropia
- c) Compound myopic astigmatism
- d) Mixed astigmatism

(Only labelled diagrams, no explanation needed).

END