BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Optometry

Course Name – Visual Optics –I

Course Code - BOPTO302

Semester / Year - Semester III

Time allotted : 75 Minutes Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 60=60

1. *(Answer any Sixty)*

(i) With regard to optical radiation:

a) The wavelengths of visible light lies

b) Ultraviolet A has a shorter wavelength than ultraviolet C

c) Ultraviolet A has a shorter wavelength than ultraviolet C

d) the crystalline lens is better at absorbing shorter than longer wavelengths

(ii) The aberration that occurs due to dispersion of light are called _____ aberration

a) Monochromatic

b) Coma

c) Distorsion

d) Chromatic

(iii) Regarding diffraction:

a) it is best explained with the wave theory of light

b) it occurs when there is an obstruction to the light

c) both constructive and destructive interference occurs

d) it increases with longer wavelength

(iv) The following are true about reflection on a mirror:

a) the focal length of a concave mirror is half the length of its radius of curvature

b) the focal length of a convex mirror is half the length of the its radius of curvature

c) the image formed by a concave mirror is

d) the image formed by a convex mirror is

always magnified

always magnified

(v) For an object situated between the centre of curvature and the principal focus of a concave mirror, the image has the following characteristics:

a) it is erect

b) it is virtual

c) it is real

d) it is magnified

(vi) The following are true about accommodation:

a) it increases with age

b) in order to focus an object at a distance of 25cm, an emmetropic eye needs to use 4D of accommodation

c) in order to focus an object at a distance of 25cm, an eye with -3.00D needs 6D of accommodation

d) none of these

(vii) The crystalline lens:

a) has an in-situ effective power of +15.00D

b) contributes more power than the cornea towards the refraction of the eye

c) if extracted without implant can correct myopia who needs spectacle correction of -15.00D

d) has a longer radius of curvature anteriorly than posteriorly

(viii) Anisometropia:

a) occurs when the two eyes have different refractive errors

b) of more than 1D in hypermetropic patients can usually be controlled through accommodation of the more hypermetropic eye

c) is a common cause of amblyopia in patients with uncorrected low myopia

d) of recent onset may be caused by the development of posterior sub capsular cataract

(ix) True statement is about the correcting lens include:

a) when a correcting lens is moved forward

b) when a correcting lens is moved forward

in a hypermetrope the image is moved backward

in a myope the image is moved backward

c) the effectivity of the lens is increased in a myope if the correcting lens is moved backward

d) a hypermetrope with early presbyopia may be able to read clearly by pushing his glasses closer to his eyes

(x) The following is true about myopia:

a) the second principal focus lies behind the retina

b) nucleosclerosis is not a cause of index myopia

c) the presence of posterior staphyloma suggests axial myopia

d) axial myopia may be caused by the cornea having too strong a refractive power

(xi) With regard to astigmatism, which statement is false

a) regular astigmatism has the principal meridians at 90 degree to each other

b) oblique astigmatism occurs when the principal meridians do not lie at 90 degree to each other

c) irregular astigmatism is seen in patients with keratoconus

d) astigmatic eye produces an image known as a Sturm's conoid

(xii) The following is true about hypermetropia:

a) absolute hypermetropia can be overcome by accommodation

b) latent hypermetropia is the residual hypermetropia masked by ciliary tone and involuntary accommodation

c) manifest hypermetropia is the strongest plus lens the eye can accept for clear distant vision

d) latent hypermetropia can be unmasked by cycloplegic refraction

(xiii) In the schematic eye of Gullstrand,which statement is not true?

a) the human model eye is based on the principal of thick lenses

b) the eye is about 24.0 mm in axial length

c) the nodal points lie on either side of the posterior surface of the lens

d) the nodal points coincide with the principal points

(xiv) The catoptric images :

a) are formed at the refracting interfaces of the eye
b) can be used to measure the ocular accommodation
c) are all virtual images
d) all are real images

(xv) Best form lenses is used to reduce:

a) chromatic aberration
b) glare
c) spherical aberration
d) coma

(xvi) The following is true about image distortion through strong lenses:

a) it is mainly the result of chromatic aberration
b) it is mainly the result of spherical aberration
c) pin-cushion distortion occurs with high minus lens
d) barrel distortion occurs with high plus lens

(xvii) Compared with glasses, the contact lenses:

a) increase the amount of convergence needed in myopes
b) increase the amount of accommodation needed in myopes
c) decrease the amount of convergence needed in hypermetropes
d) All of these

(xviii) During clinical refraction:

a) accommodation results in a more myopic prescription
b) the visual acuity is measured binocularly for distance and near
c) occlusion is recommended for patient with nystagmus to reduce the ocular movement
d) a high minus lens over the non-examining eye of a patient with bilateral congenital nystagmus can reduce the nystagmus

(xix) Refractive power of eye depends upon mainly following mentioned factors- 1.Lens 2.Cornea 3.Vitreous Hemorrhage 4.Aqeous Humour 5.Axial length of eye

a) 1,2,3
b) 2,3,4
c) 1,2,5
d) 3,4,5

(xx) The Airy's disc:

a) is formed by diffraction
b) contains a central bright disc that receives 90% of the luminance flux
c) is surrounded by concentric light and dark rings
d) is proportional to the wavelength of the light

(xxi) Regarding reflection:

a) it always occurs when light travels from one medium into another
b) the incident ray and the reflected lie in the same plane
c) the angle of incidence is always equals to the angle of reflection
d) all of these

(xxii) For an object situated outside the centre of curvature of a concave mirror, the image has the following characteristics

a) it is erect
b) it is virtual
c) it is real
d) it is magnified

(xxiii) The vergence power of a lens is dependent on:

a) its dispersive power
b) vergence power of each surface
c) thickness of the lens
d) the wavelength of the light

(xxiv) Duochrome test:

a) uses letters or numbers of different colours against the same background
b) uses blue and red colours c d. is useful in myopic patients to avoid under correction
c) is sensitive to changes in refraction of 0.25D or less
d) cannot be used in colour blind patients

(xxv) The refractive state of the eye may be altered by:

a) removing the vitreous
b) changing the depth of the anterior

chamber

c) changing the axial length of the eye

d) All of these

(xxvi) Fresnel's biprism is based on splitting of

a) Amplitude

b) Wave front

c) Inclination

d) Thickness

(xxvii) Spherical aberration can also be made minimum by using two___ lens

a) Convex

b) Concave

c) Plano Convex

d) Plano-Concave

(xxviii) Most important factor determining convergence of light rays on the retina is

a) Length of the eyeball

b) Refractive power of the lens

c) The curvature of the Cornea

d) The physical state of the vitreous

(xxix) Which component of the eye has a maximum refractive index?

a) The anterior surface of lens

b) Center of the lens

c) The posterior surface of lens

d) All are wrong

(xxx) Monovision:

a) refers to the use of one eye for distant vision and the other for near

b) is mainly reserved for presbyopic patients

c) reduces stereopsis

d) All of these

(xxxi) Night vision depends primarily on

a) Fovea

b) Rods

c) A full moon

d) Cones

(xxxii) The fovea is the part of the retina that contains photoreceptors called

a) Ganglion cell

b) Rods

c) Cones
d) Amacrine cells

(xxxiii) The aperture controlling the amount of light entering the eye is called

a) The pupil
b) The cornea
c) The lens
d) Cillary muscle

(xxxiv) The rods and cones synapse directly on to

a) Horizontal cell
b) Ganglion cell
c) Amacrine cell
d) Bipolar cell

(xxxv) Who developed Trichromatic Theory of Colour?

a) Thomas Young & Helmholtz
b) Stephen Kuffler
c) Ewald Hering
d) David Hubel &Torsten Wiesel

(xxxvi) The image formed by retina of human eye is

a) Virtual and erect
b) Virtual and inverted
c) Real and erect
d) Real and inverted

(xxxvii) Human eye act acts like a

a) Endoscope
b) Telescope
c) Microscope
d) Camera

(xxxviii) For an object situated within the principal focus of a concave mirror, the image has the following characteristics:

a) it is erect
b) it is laterally inverted
c) it is real
d) it is magnified

(xxxix) The following are true about prism:

a) its orientation is defined by its apex
b) light is deviated towards the apex
c) the angle of the prism apex is c Called the refracting angle
d) light with shorter wavelength is deviated more than light with longer wavelength

(xl) The following are true about the prismatic effect of lenses:

a) if the optical centre of a myope lens is moved nasally, a base out prism will be induced

b) if the optic centre of a myope lens is moved inferiorly, a base down prism will be induced

c) if the optic centre of a hyperope lens is moved temporally, a base in prism will be induced

d) if the optic centre of a hyperope lens is moved superiorly, a base up prism will be induced

(xli) The following are true about an emmetropic patient has an amplitude of accommodation of 6D:

a) the near point is 33 cm

b) in order to achieve comfortable reading he will need to keep 2D of his accommodation in reserve

c) if the patient is emmetropic, he will require glasses for comfortable reading at 25cm

d) if the patient is myopic, he will require glasses for comfortable reading at 25cm

(xlii) The distance between two nodal points is always _____ to the distance between two principal points

a) equal

b) unequal

c) higher

d) lower

(xliii) There are _____ points known as cardinal points of an optical system

a) two

b) four

c) six

d) eight

(xliv) Twinkling of stars is due to atmospheric

a) Dispersion of light by water droplets

b) Refraction of light by different layers of varying refractive indices

c) Scattering of light by dust particle

d) Internal reflection of light by clouds

(xlv) The angle of deviation of a prism is determined by:

a) the refracting angle
b) the angle of incidence of the ray
c) the refractive index of the prism material
d) the width of the base

(xlvi) A patient has a 8? right esotropia. The following prisms can be used to correct the deviation

a) 8? base in over the right eye
b) 8 ?base out over the right eye
c) 8 ? base in over the left eye
d) 8? base out over the left eye

(xlvii) Which of the following is not a cyclopegic

a) Phenylephrine
b) Atropine
c) Homatropine
d) Tropicamide

(xlviii) The light sensitive cell present on retina and is sensitive to the intensity of light is

a) cones
b) both Rods and Cones
c) Rods
d) All are wrong

(xlix) The change in the focal length of human eye is caused due to

a) Ciliary muscle
b) Pupil
c) Cornea
d) Iris

(l) Regarding accommodative convergence / accommodation ratio (AC/A):

a) the eye could not accommodate in the absence of convergence
b) the normal range of AC/A is 3:1 to 5:1
c) the interpupillary distance needs to be known if the ratio is to be calculated using the gradient method
d) the heterophoria method of calculation gives a lower value than the gradient method

(li) The following definitions which is not true for accommodation:

a) the far point of distinct vision of an emmetropic eye is at infinity
b) dynamic refraction refers to the dioptric power of the accommodated eye
c) range of accommodation is the difference
d) static refraction refers to the dioptric

in dioptric power between the eye at rest and the fully accommodated eye

power of a resting eye

(lii) With regard to bifocal glasses, which is not true?

a) it used for children with accommodative esotropia

b) Franklin design involves attaching a supplementary lens to the surface of a distance lens of the same refractive power

c) fused bifocals involves the use of lenses with different refractive indexes

d) the problem of prismatic jump is related to the power of the lenses

(liii) Spasm of accommodation mimics

a) Myopia

b) Hypermetropia

c) Presbyopia

d) Amblyopia

(liv) Aniseikonia means

a) The difference in axial length in the two eyes

b) The differences in the curvature of the cornea in the two eyes

c) The differences in the size of the pupil in the two eyes

d) The differences in the size of the image formed by the two eyes

(lv) Variation of focal length to form a sharp image on retina is called

a) Accommodation

b) Retinal control

c) aperture

d) sutter

(lvi) A patient has a 4 ?deviation of right over left strabismus. The following prisms may be used to correct the vertical diplopia that this patient is experiencing:

a) 4 ? base down over the right eye

b) 4 ? base up over the left eye

c) 2 ? base down over the right eye and 2 ? base up over the left eye

d) 2 ? base down over the right eye and 2 ? base down over the left eye

(lvii) The polarization is possible in _____ wave

a) transverse
b) longitudinal
c) water
d) mechanical

(lviii) A person cannot see distinctly objects kept beyond 2 meter. This defect can be corrected by using a lens power of

a) +0.5D
b) -0.50D
c) -0.2D
d) +0.2D

(lix) Using minus cylinder during refraction :

a) is a major cause of spectacle intolerance
b) may undercorrect myope patients
c) avoids stimulation of accommodation in young myopic patients
d) may overcorrect hypermetrope in cyclopegic refraction

(lx) Regarding refraction in children:

a) myopia is more common than Hypermetropia
b) myopia tends to progress as the child grows older
c) increased accommodation is used by children to overcome uncorrected astigmatism
d) correction of Hypermetropia can reduce exophoria