BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Bachelor of Optometry
Course Name – Geometrical Optics
Course Code - BOPTO205
(Semester II)

Time allotted : 1 Hrs.15 Min. **Full Marks : 60**

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question) 1 x 60=60

Choose the correct alternative from the following :

(1) Focal length of plane mirror is
a) at infinity b) zero
c) negative d) none of these

(2) Image formed by plane mirror is
a) real and erect b) real and inverted
c) virtual and erect d) virtual and inverted

(3) A concave mirror gives real, inverted and same size image if the object is placed
a) at F b) at infinity
c) at C d) beyond C

(4) Power of the lens is -40, its focal length is
a) 4m b) -40m
c) -25m d) -20m

(5) In optics an object which has higher refractive index is called
a) optically rarer b) optical denser
c) optical density d) refractive index

(6) The optical phenomena, twinkling of stars, is due to
a) atmospheric reflection b) total reflection
c) atmospheric refraction d) total refraction

(7) The radius of curvature of a mirror is 20cm the focal length is
a) 20 cm b) 10 cm
c) 40 cm d) 5 cm

(8) Which one of the following materials cannot he used to make a lens?
a) Glass b) Plastic
c) Clay d) water

(9) The Image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should be the position of the object?

a) between the principal focus and the centre of curvature
b) at the centre of curvature
c) beyond the centre of curvature
d) between the pole of the mirror and its principal focus

(10) A spherical mirror and a thin spherical lens have each a focal length of 15 cm. The mirror and the lens are likely to be

a) both concave
b) both convex
c) the mirror is concave and the lens in convex
d) the mirror is convex but the lens is concave.

(11) No matter how far stand from a mirror, your image appears erect. The mirror is likely to be

a) plane
b) concave
c) convex
d) either plane or convex

(12) The laws of reflection hold good

a) plane mirror
b) concave mirror
c) conves mirror
d) all of these

(13) The speed of light in vacuum is

a) 3×10^5 m/s
b) 3×10^8 m/s
c) 3×10^8 km/s
d) 3×10^6 m/s

(14) We can see objects because of

a) reflection
b) refraction
c) transmission
d) diffraction

(15) As you move an object away from a convex mirror, its image becomes_____ and moves towards _____

a) smaller, infinity
b) smaller, focus
c) enlarged, infinity
d) enlarged, focus

(16) For a spherical mirror, _____ is true.

a) f = 2R
b) R = 2f
c) fR = 2
d) fR = ½

(17) The mirror formula is

a) 1/u - 1/v = 1/f
b) 1/f + 1/u = 1/v
c) f = uv/(u+v)
d) f = (u+v)/uv

(18) For a plane mirror, magnification (m) is

a) 0
b) 1
c) ±1
d) less than equal to zero

(19) The image formed by a concave lens is

a) always real and enlarged
b) always real and diminished
c) always virtual and enlarged
d) always virtual and diminished

(20) If the focal length of a spherical mirror is 40 cm, then its radius of curvature is

a) 80
b) 20
c) 10
d) 5

(21) If the angle of incidence, $\theta i = 0°$, the angle of reflection, θr is

a) 0^0
b) 90^0
c) 180^0
d) 45^0

(22) Absolute refractive index of any medium is always

a) 1
b) > 1
c) < 1
d) 0

(23) If magnification is +1.5, the image is

a) erect
b) diminished

c) real
d) inverted

(24) A short pulse of white light is incident from air to a glass slab at normal incidence. After travelli ng through the slab, the first colour to emerge is

a) blue
b) green
c) violet
d) red

(25) A converging lens is used to form an image on a screen. When the upper half of the lens is cover ed by an opaque screen

a) half of the image will disappear
b) image will not form on the screen
c) intensity of image will increase
d) intensity of image will decrease

(26) To increase the magnifying power of a telescope, the focal length of

a) objective lens should be increased
b) objective lens should be decreased
c) eye-piece lens should be increased
d) eye-piece lens should be decreased

(27) A mirage occurs because of

a) reflection by hot ground
b) total internal reflection by layers of air
c) interference of light
d) diffraction of light

(28) A rear-view mirror for driving is

a) plain
b) concave
c) convex
d) inverted

(29) Which of the following is used to split white light into different colours?

a) glass slab
b) convex lens
c) concave lens
d) prism

(30) Hypermetropia or longsight can be corrected by using

a) bifocal lenses
b) cylindrical lenses
c) concave lenses
d) convex lenses

(31) In mirrors, the back surface is coated with a thin layer of

a) mercury
b) silver
c) red oxide
d) silver nitrate

(32) Which colour of light shows maximum deviation when passed through a prism?

a) red
b) green
c) violet
d) yellow

(33) Red light is used for signals because it has

a) long wavelength
b) high intensity
c) high frequency
d) low refraction in the medium

(34) Which of the following is not an electromagnetic wave?

a) x-rays
b) cosmic rays
c) Microwave
d) all of these

(35) The refractive index of glass is 1.5. The velocity of light in glass is

a) 3×10^8 m/s
b) 4.5×10^8 m/s
c) 2×10^8 m/s
d) 6×10^8 m/s

(36) If absolute refractive index of water and glass are 4/3 and 3/2 respectively, the refractive index of glass with respect to water is

a) 2/3
b) 8/9
c) 9/8
d) 3/4

(37) A candle is placed in front of a concave mirror. The image produced by the mirror is

a) real, inverted and magnified
b) real, inverted and demagnified
c) virtual, upright and magnified
d) virtual, upright and demagnified

(38)

Which of the lens or lenses is the converging lens?

a) I and V
b) II, III and IV
c) II and III
d) III and IV

(39) To increase the magnifying power of a telescope, the focal length of

a) objective lens should be increased
b) objective lens should be decreased
c) eye-piece lens should be increased
d) eye-piece lens should be decreased

(40) Why the colour of the ocean appears blue?

a) because the sunlight falling on it is reflected
b) because the sunlight falling on it is refracted
c) because the sunlight falling on it is absorbed
d) because the sunlight falling on it is scattered

(41) In projectors which lenses are used?

a) convex lens
b) concave lens
c) bipolar lens
d) both (a) and (b)

(42) Due to which phenomena the stick if immersed in water appears to be bent?

a) reflection
b) dispersion
c) refraction
d) scattering

(43) Suppose you are standing 1 m in front of a plane mirror. What should be the minimum vertical si ze of the mirror so that you can see your full image in it?

a) 0.50 m
b) 2 m
c) half of your height
d) twice your height

(44) A spherical air bubble is embedded in a piece of glass. For a ray of light passing through the bub ble, it behaves like

a) converging lens
b) diverging lens
c) plano-converging lens
d) plano-diverging lens

(45) The mirror used for the head light of a car is

a) spherical concave
b) plane
c) cylindrical
d) parabolic concave

(46) The human eye is like a camera and hence it contains a system of lens. The eye lens forms

a) a straight or upright, real image of the object on th e retina
b) an inverted, virtual image of the object on the reti na
c) an inverted, real image of the object on the retina
d) a straight or upright, real image of the object on t he iris

(47) An object is placed at the focus of a concave mirror. The image will be

a) real, inverted, same size at the focus
b) real, upright, same size at the focus
c) virtual, inverted, highly enlarged at infinity
d) real, inverted, highly enlarged at infinity

(48) How far must an object be from a concave mirror if the image formed is to be inverted?

a) less than its focal length
b) exactly at its focal length
c) more than its focal length
d) none of the above

(49) The head mirror used by E.N.T doctors is

a) concave
b) convex
c) plane
d) plano-convex

(50) What would be the number of images formed of an object in two mirrors placed at right angles to each other?

a) 2
b) 3
c) 4
d) 6

(51) An object is placed at a distance of 12 cm from a convex lens on its principal axis and a virtual image of certain size is formed. If the object is moved further 8 cm away from the lens, a real image of the same size as that of the virtual image is formed . Which one of the following is the focal length of the lens?

a) 15 cm
b) 16 cm
c) 18 cm
d) 20 cm

(52) The visible light has a wavelength range from about 380 nm (violet) to 780 nm (red). If an excited object emits light with wavelength of 15 nm, to which one of the following ranges does it belong?

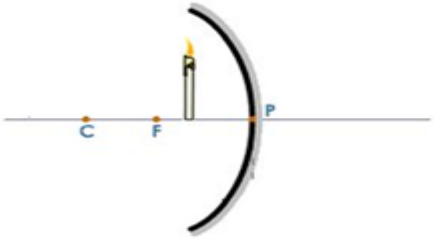
a) X-ray
b) gamma ray
c) infrared
d) ultraviolet

(53) In vacuum, the speed of light

a) depends on its wavelength
b) depends on its frequency
c) depends on its intensity
d) neither depends on its wavelength, frequency nor intensity

(54)

A candle is placed in front of a concave mirror. The image produced by the mirror is



a) real, inverted and magnified
b) real, inverted and demagnified
c) virtual, upright and magnified
d) virtual, upright and demagnified

(55) By which optical phenomenon does the splitting of white light into seven constituent colours occur?

a) refraction
b) reflection
c) dispersion
d) interference

(56) Which is the complimentary colour of blue?

a) red
b) yellow
c) green
d) magenta

(57) Which phenomenon does not play role in the formation of rainbow?

a) reflection
b) refraction
c) dispersion
d) absorption

(58) For which of the following cases will the total internal reflection of light be possible?

a) angle of incidence is less than the critical angle
b) angle of incidence is equal to the critical angle
c) angle of incidence is greater than the critical angle
d) angle of incidence is equal to the angle of refraction

(59) To an astronaut in space, the sky will appear to be

a) violet
b) blue
c) red
d) black

(60) Rainbow formation is due to

a) absorption of sunlight by water droplets
b) diffusion of sunlight through water droplets
c) ionisation of water droplets
d) refraction and reflection of sunlight by water droplets