

VINAYAKA MISSION'S RESEARCH FOUNDATIONS, SALEM
(Deemed to be University)

B.OPTOMETRY DEGREE EXAMINATION – September 2021

First Year

PHYSICAL OPTICS

Time: Three hours

Maximum: 80 marks

I Choose the best answer

(10 x 1 = 10)

1. The wave front due to a source situated at infinity
 - a) spherical
 - b) plannar
 - c) circular
 - d) cylindrical
2. Visible light has wave length of
 - a) 3×10^8 m
 - b) 5×10^{-8} m
 - c) both
 - d) none
3. Color depends on what characteristic of light?
 - a) its frequency
 - b) its wavelength
 - c) both of these
 - d) non of these
4. Diffraction is more with
 - a) small pupil
 - b) normal pupil
 - c) dilated pupil
 - d) none
5. Which of the electromagnetic wave has longest wavelength
 - a) X rays
 - b) Ultraviolet
 - c) Infra red
 - d) Non of these
6. In Fraunhoffer diffraction the wave front will be
 - a) Spherical
 - b) plane
 - c) cylindrical
 - d) hexagonal
7. The color of an object is the same as the light that is
 - a) transmitted
 - b) absorbed
 - c) reflected
 - d) all of these
8. Compared to ultraviolet waves, the wavelength of infrared waves is
 - a) shorter
 - b) longer
 - c) faster
 - d) slower
9. Constructive interference happens when two waves are
 - a) Zero
 - b) in front
 - c) out of phase
 - d) In phase
10. Through which device the compare illumination of two light
 - a) spectrometer
 - b) gyrometer
 - c) photometer
 - d) none of these

(p.t.o)

II State whether the following statements are **TRUE** or **FALSE** (10 x 1 = 10)

1. The phenomenon of interference is based on conservation of energy.
2. The fact two angles must be the same is an example of law of reflection.
3. In reflected light the central fringes of Newton's ring is dark.
4. In a simple microscope concave lens is used.
5. Compton effect supports the wave nature of light.
6. Convex lens can produce real and inverted image.
7. Colours in thin film because of interference.
8. A ray of light passing through the centre of curvature retraces its path.
9. A band of colours formed due to polarization is called image.
10. The least distance of distinct vision is 25 cm.

III Fill in the blanks: (10 x 1 = 10)

1. Sky looks blue because of _____ scattering.
2. Transverse waves exhibit _____
3. Object like sun that give out or emit light of their own are called _____ object.
4. Light travels in _____ line.
5. Which types of waves are used _____ in night vision apparatus.
6. Snell's law relates _____
7. Super position of light waves will give _____ property.
8. In double refraction _____ ray does not obey the law of reflection and refraction.
9. The focal length of the plane mirror is at _____
10. Spectrum has _____ types.

IV Write any **FIVE** answers of the following: (5 x 6 = 30)

1. Write a brief note on Hygens theory for the law of reflection.
2. Derive and explain Lambert's cosine law.
3. Explain the colours of thin films.
4. Write short note on Young's double slit experiment.
5. Describe in detail Raman's scattering.
6. Write a short note about Nicol prism.
7. Explain how to find refractive index of transparent liquid by Newton's rings.

V Write any **TWO** essays of the following: (2 x 10 = 20)

1. Derive and explain mathematical representation of a simple harmonic wave.
2. Explain in detail the detection method of plane and elliptical polarization.
3. Explain in detail with neat diagram multiple slit grating.

(Sl.No. M21101)