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

B.OPTOMETRY DEGREE EXAMINATION – February 2020
First Year

PHYSICAL OPTICS

Time: Three hours   Maximum: 80 marks

I. Choose the best answer   (10 x 1 = 10)

1. Which of the electromagnetic wave has longest wavelength
   a) X rays   b) Ultraviolet
   c) Infra red   d) Non of these
2. Visible has wave length of
   a) 3×10^8m   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) none of these
4. Diffraction is more with
   a) small pupil   b) normal pupil
   c) dilated pupil   d) None
5. All light particles vibrate in same plane is called
   a) polarised light   b) un polarised light
   c) natural light   d) none of the above
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 we compare illumination of two light
    a) spectrometer   b) gyrometer
    c) photometer   d) none of these.

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

1. Sky looks blue because of _____
2. Longitudinal waves do not exibit_____
3. Object like sun that give out or emit light of their own are called _____ object.
4. Light travels in_____ line.
5. Types of waves used in night vision apparatus are _____
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 refraction and refraction.
9. The focal length of the plane mirror is at _____
10. Spectrum has _____ types.

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

1. Light waves not travel in vacuum.
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 are 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.

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

1. Write short note on Young's experiment.
2. Derive and explain Lambert's cosine law.
3. Explain the colours of thin films.
4. Explain in brief construction and working of circular aperture.
5. Describe in detail Raman's scattering.
6. Write a short note on Nicol prism act as polariser.
7. Explain how to find refractive index of 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 circular and elliptical polarization.
3. Explain in detail with neat diagram electromagnetic spectrum.

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