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

B.OPTOMETRY DEGREE EXAMINATION – August 2018
First Year

PHYSICAL OPTICS

Time: Three hours   Maximum: 80 marks

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

1. When light passes through air into glass, its angle of refraction is
   a) less than its angle of incidence.   b) the same as its angle of incidence.
   c) more than its angle of incidence.
   d) can be more or less than its angle of incidence.

2. When the object is at the focal point of cancave mirror the image is formed at
   a) Infinity and virtual   b) Infinity and real
   c) both   d) None

3. Color depends on what characteristic of light?
   a) its frequency   b) its wave length
   c)   both of these   d) neither 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) polarized light   b) un polarized light
   c) natural light   d) none of the above

6. The color of an object is the same as the light that is
   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 wave length of infrared waves is
   a) shorter   b) longer
   c) faster   d) slower

9. Who proposed corpuscular theory?
   a) Newton   b) Maxwell
   c) Einstein   d) Clark

10. All of the waves listed below are a part of the electromagnetic
    spectrum except
    a) sound waves   b) X rays
    c) gamma rays   d) light waves

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

1. Velocity of light is maximum in _____
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. Which types of waves are used _____ in night vision apparatus?
6. Shadows are of two kind named _____
7. Super position of light waves will give _____ property.
8. In double refraction _____ ray obey the law of reflection and refraction.
9. The focal length of the plane mirror is at _____
10. Which lens produce a virtual image smaller in size of the object _____

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

1. Dual nature of light is a form of electromagnetic wave.
2. The fact two angles must be the same is an example of law of reflection.
3. A monochromatic electromagnetic wave has one and same frequency.
4. In a simple microscope concave lens is used.
5. Convex mirror can produce real images.
6. Convex lens can produce real and inverted image.
7. SI unit of power of lens is dioptre.
8. A ray of light passing through the centre of curvature retraces its path.
9. A band of colours formed due to dispersion is called image.
10. The least distance of distinct vision is 25 cm.

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

1. Write short note on Wave nature of light.
2. Derive and explain Lambert's cosine law.
3. Explain the colours of thin films.
4. Explain in brief construction and the importance of young's double slit experiment.
5. Describe in detail Rayleigh's scattering.
6. Write a short note on Nicol prism act as polarizer.
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 production method circular and elliptical polarization.
3. Explain the optical activity using freshnel's half shade polarimeter.

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