PARUL UNIVERSITY
FACULTY OF APPLIED SCIENCE
B.Sc./IMSC, Summer 2017-18 Examination

Semester: 4	**Date: 10/05/2018**
Subject Code: 11104252	**Time: 10:30 am to 1:00 pm**
Subject Name: Optics	**Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1. A) Essay type.   **(08)**
    (a) Derive Newton's formula for Convex lens.
    (b) Explain refraction on the basis of Fermat's Principle.

Q.1. B) Answer the following questions. (Any two)
    (a) Short note   **(04)**
        1. Write a short note on Cardinal Points of Lens.
        2. Draw the image construction by considering Cardinal Points.
    (b) Derive $\frac{\omega_1}{f_1} + \frac{\omega_2}{f_2} = 0$ **(04)**
    (c) Explain Rayleigh's criteria for image formation of two nearby objects due to optical   **(04)**
        instrument.

Q.2. A) Answer the following questions.
    (a) Short note   **(04)**
        1. Define 1) aberration 2) chromatic aberration.
        2. Explain longitudinal aberration
    (b) Write the conditions for Sustained Interference.   **(04)**

Q.2. B) Answer the following questions. (Any two)
    (a) Short note   **(03)**
        1. State Fermat's Principle
        2. Write the equation of net focal length due to combination of convex lenses separated by
          distance x.
        3. What do you mean by interference?
    (b) Explain reflection on the basis of Fermat's Principle.   **(03)**
    (c) Write a short note on resolving power of telescope.   **(03)**

Q.3. A) Essay type.   **(08)**
    (a) Explain Michelson Interferometer.
    (b) Explain Fabry- Parrot Interferometer.

Q.3. B) Answer the following questions. (Any two)
    (a) Short note   **(04)**
        1. Write at least two application of Interferometer.
        2. Explain Young's Double slit experiment
    (b) Explain Interference due to reflected light.   **(04)**
    (c) Write a short note on resolving power of microscope.   **(04)**

Q.4. A) Answer the following questions.
    (a) Short note   **(04)**
        1. Explain Fraunhoffer diffraction.
        2. Explain Amplitude division method for interference.
    (b) Explain interference due to refracted light.   **(04)**

Q.4. B) Answer the following questions. (Any two)
    (a) Short note   **(03)**
        1. Define Destructive Interference.
        2. Write condition of Constructive interference in terms of path difference.
        3. Write the equation of fringe width.
    (b) Write a Short note on Nichol Prism   **(03)**
    (c) Explain Chromatic aberration.   **(03)**