# RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

#### SECOND YEAR B.A./B.SC. FOURTH SEMESTER (January – June) 2014 Mid-Semester Examination, March 2014

: 25/03/2014 Date

### **PHYSICS** (General)

Time : 11 am – 12 noon Paper : IV

Full Marks: 25

[3]

(Answer *five questions* taking at least **one** from each group)

## Group – A

- What do you understand by Polarization of light ? Explain the reason of double refraction in some 1. materials. [2+3]
- 2. Derive an expression for determination of wave length of a monochromatic light by Newton's ring method. [5]
- Deduce the expression of intensity distribution of light in case of Young's double slit experiment. 3. [5]

### <u>Group – B</u>

- What is photo-electric effect? How has it been explained on the basis of quantum nature of light ? 4. a) [2] b) Photo electrons are emitted with maximum energy  $7 \times 10^5$  ms<sup>-1</sup> from a metal surface on incident of light of frequency  $8 \times 10^{14}$  Hz. Find the threshold frequency of the metal.
- What is Compton effect ? Derive the expression for wavelength difference  $\Delta\lambda$  between the incident and 5. scattered X-rays from the scatterer. [1+4]

## Group - C

- Explain the forward and reverse characteristics of a pn junction. [5] 6.
- 7. A 10 volt Zener diode along with a resistance is connected across a 40 volt supply. Calculate the minimum value of the resistance required, if the maximum Zener current is 50 mA. [5]
- Explain with suitable circuit diagram the operation of a full-wave bridge rectifier. [5] 8.

#### **約**樂 Q3