2018

CBCS

1st Semester

PHYSICS

PAPER—GE1P

(Honours)

(Practical)

Full Marks : 20

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Elements of Modern Physics Lab.

1. To Determine the value of Boltzmann constant using *V-I* characteristics of *p-n* diode [value of n is to be supplied]

(a) Working formula. 2

(b) Circuit diagram. 2

(c) Implementation of the circuit. 2

(d) Data for ln *I* vs *V* curve. 5

(e) Drawing in ln I vs V curve. 2

(f) Calculation of K from graph. 2

2. To determine work function of the material filament of directly heated vacuum diode. [Temperature coefficient of resistance of filament material is to be supplied].

(a) Working formula. 2

(b) Circuit diagram. 2

(c) Implementation of the circuit. 2

(d) Data for ln $\frac{1}{T^2}$ vs $\frac{1}{T}$ graph. 5

(e) Drawing ln $\frac{1}{T^2}$ vs $\frac{1}{T}$ graph. 2

(f) Calculation of work function from graph. 2

3. To determine the wavelength of H_α emission line of Hydrogen atom using grating method. [Number of rulings per mm is to be supplied]

(a) Working formula. 2

(b) Vernier constant of the spectrometer. 1

(c) Setting the grating for normal incidence. 2

(d) Reading for deviation of H_α line for any order on either side of the central maximum. (Reading for both vernier are to be taken.) 8

(e) Calculation of the wavelength of H_α emission line. 2

4. To determine the wavelengths of absorption lines in the rotational spectrum of Iodine vapour.

(a) Working formula. 2

(b) Vernier constant of the spectrometer. 1

(c) Setting the grating for normal incidence. 2

(d) Reading for deviation of H_α line for any two absorption lines specified by the examiner. (Readings on Either side of the central maximum and for one vernier is to be taken) 8

(e) Calculation of the wavelength of H_α emission line. 2

5. To study the diffraction patterns of a single slit using laser and measure its intensity variation using LDR.

(a) Theory. 2

(b) Date of LDR current versus angle of diffraction (only main scale reading with one vernier) on each sides of the central maximum. 8

(c) Drawing intensity (in arbitrary unit) versus angle of diffraction graph. 3

(d) Calculation of slit width from position of 1st order minima. 2

6. Determine of Planck's constant by photo electric effect.

(a) Working formula. 2

(b) Figure with circuit diagram. 3

(c) Data for stopping potential of photo diode for lights of five wavelengths. 5

(d) Drawing stopping potential versus wavelength graph. 3

(e) Calculation of Planck's constant from graph. 2

7. To determine the value of e/m by magnetic focusing (Thomson's method).

(a) Working formula. 2

(b) Calculation of magnetic field of the Helmholtz coil from magnetizing current. [Radius and number of turns of the Helmholtz coil are to be supplied] 2

(c) Data for D^2 versus V graph (for at least for accelerating voltages). 7

(d) Drawing D^2 versus V graph. 2

(e) Calculation of e/m . 2

Experiment : 15 Marks

Laboratory Note Book : 2 Marks

Viva-Voce : 3 Marks.
