B.Sc.-CBCS/IS/PHS/GE1P/17
(Pr.)

2017

PHYSICS

[Gen. Elective]

(CBCS)

(Practical)

PAPER – GE1P

Full Marks **: 20**

Time **: 2 hours**

Answer any one question

The figures in the right hand margin indicate marks

Experiment : 15, Laboratory Note Book : 2, Viva-voce : 3

1. To determine value of Boltzmann constant using V-I characteristics of *PN* diode [value of η is to be supplied].

   (*a*) Working formula. 2

   (*b*) Circuit diagram. 2

(*c*) Implementation of the circuit. 2

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

(*e*) Drawing the ln *I*-*V* curve. 2

(*f*) Calculation of *k* from graph. 2

2. To determine work function of 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 value of Planck's constant using LEDs of *4 different colours*.

   (*a*) Working formula and circuit diagram. 3

   (*b*) Implementation of the circuit. 2

   (*c*) Data for required voltage for just glowing of the LEDs of four different colours. 8

   (*d*) Calculation of Planck's constant. 2

4. To determine the wavelength of H_α emission line of Hydrogen atom [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 one 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

5. 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

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

(*a*) Theory. 2

(*b*) Data 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

7. Determination of Plank'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 Plank's constant from graph. 2

8. To determine the value of e/m 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.] 2

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

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

(*e*) Calculation of e/m. 2
