

2019

B.Sc.

4th Semester Examination

**PHYSICS (Honours)**

**Paper - C9P**

**[Practical]**

Full Marks : 20

Time : 3 Hours

*The figures in the margin indicate full marks.  
Candidates are required to give their answers  
in their own words as far as practicable.*

**Marks Distribution**

[Experiment - 15; LNB - 2; Viva-voce - 3]

*Students are advised to record the data  
in a proper tabulated manner*

**Answer any one question**

*[ Turn Over ]*

1. Study the photoelectric effect

(a) Working Formula

(b) Data recording

(i) Photocurrent vs intensity

(ii) Photocurrent vs wavelength of light  
(minimum four colours)

(c) Plot the graphs from the data of (i) and (ii)

(d) Calculation of stopping potential for four different  
colours. 3+6+4+2

2. Determine Planck's constant using black body radiation and photo-detector.

(a) Working Formula

(b) Circuit diagram and circuit implementation

(c) Record the experimental data for LEDS of at least four different colours.

(d) Calculation

3. Determine ionization potential of Mercury

(a) Working Formula

(b) Circuit diagram and circuit implementation

(c) Record the experimental data and plot I-V graph.

(d) Calculation

3+3+7+2

4. Determine the wavelength of H-alpha emission line of Hydrogen atom. (Rulings of the grating to be supplied)

(a) Working Formula

[ Turn Over ]

(b) Leveling the spectrometer and performance of Schuster's method

(c) Set the unruled surface of the grating for normal incidence (data for one vernier only)

(d) Determine of angle of diffraction for two different colours in first order on both sides.

(e) Determine of the unknown wavelength.

3+2+2+6+2

5. Set up Millikan's oil drop apparatus and determine the charge of an electron.

(a) Working Formula

(b) Record of experimental data

(c) Calculation

3+10+2

6. Determine the wavelength of LASER source using diffraction by single slit.

(a) Working Formula

(b) Determine of band widths of at least four diffraction bands on either side of the central band.

(c) Determine of slit width using travelling microscope

(d) Calculation

3+8+2+2

7. Determine the wavelength of LASER source using diffraction through double slit

(a) Working Formula

(b) Determine of band widths of at least four diffraction bands on either side of the central band.

[ Turn Over ]

(c) Determine of slit widths and slit separation using travelling microscope

(d) Calculation 3+8+2+2

8. Determine the wavelength of LASER source using diffraction grating (No. of Ruling per unit length of the grating to be supplied)

(a) Working Formula

(b) Determine of diffraction angles of five different order on either side of the central band

(c) Calculation

For part (b) take only first order diffraction on either side if the experiment is done using spectrometer and detector. 3+10+2

9. Study the characteristics of a tunnel diode.

(a) Working Formula

(b) Circuit diagram and circuit implementation.

(c) Data for I-V characteristics.

(d) Plotting I-V graph and determine the valley  
voltage 3+2+6+4

10. Determine the value of  $e/m$  using bar magnet.

(a) Working Formula

(b) Study of the deflection using bar magnet at five different points on either side of the magnetic needle and tabulate the associated deflecting voltage.

(c) Calculation.

3+10+2

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