UG/2nd Sem/Phys/H/19 (Pr.)

2019

B.Sc.

2nd Semester Examination

PHYSICS (Honours)

Paper - C3P

[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.

Answer *one* question.

1. Determine the capacitance of a given capacitor using an ac source of low frequency (~ 50 Hz)

   (a) Theory 3

   (b) Circuit diagram and its implementation. 2

   (c) Table for V_R, V_C data for fixed R and a fixed frequency (at least five voltages) 5

[Turn Over]

(d) Drawing of V_C~I curve. 3

(e) Determination of capacitance from graph. 1

(f) Accuracy. 1

2. Determine an unknown low resistance using potentiometer.

(a) Theory 3

(b) Circuit diagram and its implementation. 2

(c) Table for null points for at least three different wires. 2×3

(d) Calculation of r 2

(e) Accuracy 1

(f) Discussion 1

3. Determine unknown low resistance using Carey Foster's Bridge.

(a) Theory 3

(b) Circuit diagram and its implementation. 2

(c) Table for determining resistance per unit length for at least four sets. 4

(d) Table for determining unknown resistance (R) for at least four sets. 4

(e) Calculation. 1

(f) Accuracy 11

4. Verify the Thevenin and Norton theorems

(a) Statement of the theorems. 2

(b) Circuit diagram and its implementation 2

(c) $V_L \sim I_L$ (load voltage and load current) data for at least six loads. 6

(d) Draw two separate graphs for two theorems 2+2

(e) Verification summary table. 1

5. Verify the Superposition theorem

(a) Theory 3

(b) Circuit diagram and its implementation 2

(c) Data for voltage (v) and current (I) when one source is switched on alternatively and both sources are switched on (Two times each) 2×3

(d) Calculation 2

(e) Verification table and accuracy 2

6. Verify Maximum power transfer theorem

(a) Theory 3

(b) Circuit diagram and its implementation 2

(c) Data for V_L~I_L or V_L~R_L at least for 10 different loads. 5

(d) Draw of P_L ~ R_L graph 3

(e) Conclusion and accuracy 2

7. Determine the resistance of a given galvanometer following Thomson's method.

(a) Theory 3

(b) Circuit diagram and its implementation 2

(c) Table for the value of the P, Q and R resistance variation and null point detection. 8

(d) Calculation and accuracy 2

8. Study the variation of magnetic field strength (B) along the axis of a solenoid.

(a) Theory 3

(b) Circuit diagram and its implementation 2

(c) Measure B along the axis of the given solenoid for a fixed current (at least 10 positions) 5

(d) Plot variation of B along the axis. 3

(e) Determine $\frac{dB}{dx}$ at two end points and the mid point 2

9. Determine self-inductance of a coil by Anderson's bridge (DC balance to be made by the examiner)

(a) Theory 3

(b) Circuit diagram and its implementation 2

[Turn Over]

(c) Data for variation of 'r' with at least five different capacitors. 5

(d) Drawing graph $\frac{1}{c} \sim r$ 2

(e) Calculation of 'L' from graph. 3

10. Study the response curve of a series LCR circuit.

(a) Theory 3

(b) Circuit diagram and its implementation 2

(c) Data for current Vs. frequency graph (at least 10 frequencies) 5

(d) Draw graph (1 ~ f) to show resonance point and band width 2

(e) Determination of impedance at resonance, quality factor and Band width. 3

11. Study the response curve of a parallel LCR circuit and determine its antiresonance frequency

(a) Theory 3

(b) Circuit diagram and its implementation 2

(c) Data for frequency Vs. impedance graph (at least 10 frequencies) 5

(d) Drawing of frequency Vs. impedance graph 3

(e) Determine antiresonance frequency and quality factor 2

[LNB : 02, Viva-voce : 03]
