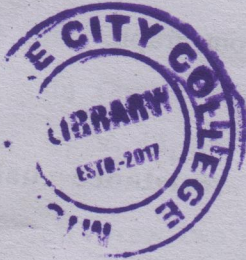


Acc No.

UGQP15

Total Pages—6

C/18/B.Sc./2nd Sem/PHSH/C3P



2018

2nd Semester

PHYSICS

(Honours)

PAPER—C3P

(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.*

Answer one questions.

1. Determine the capacitance of a given capacitor using an ac source of low frequency ( $\sim 50$  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  $V_C \sim I$  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 ( $\rho$ ) for at least four sets. 4
- (d) Table for determining unknown resistance ( $R$ ) for at least four sets. 4
- (e) Calculation 1
- (f) Accuracy 1

4. Verify the Thvenin 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  $V_L \sim I_L$  or  $V_L \sim R_L$  at least for 10 different loads. 5
- (d) Draw of  $P_L \sim R_L$  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 ending points and two mid points. 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
- (c) Data for variation of 'r' with at least five different capacitors. 5
- (d) Drawing graph  $\frac{1}{C} \sim r$
- (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 ( $I \sim f$ ) 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, Viba-Voce—03**

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