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

2019

B.Sc.

2nd Semester Examination

PHYSICS (Honours)

Paper - GE2P

[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 'Stefan's constant'.

[Data for plotting  $R/R_0$  Vs. T graph to be supplied.]

(a) Working formula. 2

(b) Circuit diagram and implementation of the circuit.  
1+1

[ Turn Over ]

- (c) Data for first glowing (dapper point) resistance ( $R_g$ ) 2
- (d) Graph for  $R_f/R_o$  Vs. T. 2
- (e) Data for  $\text{Log}_{10}T$  vs  $\text{Log}_{10}P$  curve. 4
- (f) Drawing of  $\text{Log}_{10}P$  vs.  $\text{Log}_{10}T$  curve. 2
- (g) Calculation of Stefan's constant. 1
2. Determine the coefficient of thermal conductivity of Cu by Searle's apparatus.
- (a) Working formula. 2
- (b) Radius (r) of the rod by the slide caliper. 2
- (c) Distance between holes. (d). 1
- (d) Table for determination of the value of thermal conductivity (k). 6
- (e) Result. 2
- (f) Discussion. 2
3. Determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method. 4

[Mass (m), specific heat (s) of Lee's disc, thickness  
(d) radius (r) of cardboard supplied]

- (a) Working formula. 2
  - (b) Recording of steady temperature  $\theta_1$  and  $\theta_2$ . 1
  - (c) Measurement of radius ( $r_1$ ) and thickness (t) of  
Lee's disc by slide caliper. 3
  - (d) Data for cooling Temperature ( $\theta$ ) with time (t). 4
  - (e) Graph for  $\theta$  vs. t. 3
  - (f) Result. 2
4. Determine the temperature co-efficient of resistance  
of platinum coil by using Carey-Foster bridge.

[Resistance per unit length (p) to be supplied]

- (a) Working formula. 2
- (b) Circuit diagram. 2
- (c) Data for  $R_1$  (at room temperature) and  $R_2$  (at  
steam temperature) 8

[ Turn Over ]

- (d) Result. 2
- (e) Discussion. 1
5. Study the variation of the thermo-emf with temperature of the two junctions of a thermocouple at five different temperatures.
- [Resistance of the potentiometer to be supplied]
- (a) Working formula and circuit diagram. 2+2
- (b) Determination of 'e' at five different temperatures  
(t). 8
- (c) Drawing of e-t curve. 3
6. Record and analyze the cooling temperature of an hot object as a function of time using a thermocouple and suitable data acquisition system —
- (a) Theory. 2
- (b) Circuit diagram. 2
- (c) Determination of temperature of the hot body for five different times by measuring thermo-emf and thermo emf temperature calibration table. 8

- (d) Drawing of the cooling curve ( $\theta$  vs.  $t$ ) 3
7. Calibrate the Resistance temperature Device (RTD) using null method/off-Balance Bridge.
- (a) Theory. 2
- (b) Circuit diagram. 2
- (c) Measurement of  $R_{RTO}$  and  $R_T$  (thermistor resistance) at five different temperatures. 8
- (d) Plotting of the variation of  $R_{T0}/R_0$  with  $(T-T_0)$  ( $R_0$  is the resistance at  $T_0=0K$ ). 3

Experiment : 15 marks.

Laboratory Note Book : 02 marks.

Viva-Voce : 03 marks.

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