Total No. of Questions—8]　　　　　[Total No. of Printed Pages—3

Seat
No.

[5352]-545

S.E. (Electrical) (First Semester) EXAMINATION, 2018
ELECTRICAL MEASUREMENTS AND INSTRUMENTATION
(2015 PATTERN)

Time : Two Hours　　　　　　　　　　　　Maximum Marks : 50

N.B. :— (*i*) Neat diagrams must be drawn wherever necessary.

(*ii*) Figures to the right indicate full marks.

(*iii*) Use of logarithmic table, slide rule, Mollier chart, electronic pocket calculator and steam table is allowed.

(*iv*) Assume suitable data, if necessary.

1. (*a*) Draw a neat schematic diagram of attraction type moving iron instrument and explain deflecting, controlling, and damping system used in it. [6]

(*b*) With a circuit diagram derive the equation for an unknown self inductance by Anderson's bridge. [6]

Or

2. (*a*) Design a multi range d.c. milli-ammeter using a basic movement with an internal resistance $R_m = 50\ \Omega$ and a full scale deflection current $I_m = 1$ mA. The ranges required are 0–10 mA; 0–50 mA; 0–100 mA; and 0–500 mA. [6]

(*b*) Draw circuit diagram of Kelvin's double bridge. Derive expression for unknown resistance with usual notations. [6]

P.T.O.

3. (*a*) Draw the possible method of connecting the pressure coil of a wattmeter and compare the errors. Explain the use of "compensation winding" in a wattmeter. [6]

(*b*) A 230 V single phase energy meter has constant load of 5 A passing through it for 8 hours at a power factor of 0.9. If the meter LED makes 26500 impulses during this period, find the meter constant in imp/kwh. calculate the power factor of the load if the no. of impulses are 11230 when operating at 230 V and 6 A for 5 hours. [7]

Or

4. (*a*) While performing a load test on a 3 phase wound rotor induction motor by two wattmeter method, the readings obtained on two wattmeters were + 14.2 kW and –6.1 kW and line voltage was 440 V. [6]

Calculate :

(*i*) True power drawn by the motor

(*ii*) Power factor

(*iii*) Line current.

(*b*) With a neat schematic diagram, explain construction of two element energy meter. [7]

5. (*a*) Explain the following terms associated with CRO : [6]

(*i*) Volts/division

(*ii*) Invert

(*iii*) dual ch

(*iv*) x-position

(*v*) xy-mode

(*vi*) y-position.

(*b*) Explain capacitive transducers for pressure measurement with a neat diagram. [6]

Or

6. (*a*) Draw and explain block diagram of Digital Storage Oscilloscope. [6]

(*b*) Explain Mcleod gauge for measurement of pressure. [6]

7. (*a*) Explain level measurement by mechanical method. [6]

(*b*) Define strain. What are the types of strain gauge ? Explain wire strain gauge. [7]

Or

8. (*a*) Explain Electrical method for measurement of level. [6]

(*b*) What are the advantages and disadvantages of a Linear Variable Differential Transformer (LVDT). Explain how the magnitude and direction of displacement of core of an LVDT detected ? [7]