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

Seat No.	

[5668]-154

S.E. (Electrical) (I Sem.) EXAMINATION, 2019

ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(2015 PATTERN)

Time : Two Hours　　　　　　　　**Maximum Marks : 50**

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

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

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

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

1. (*a*) With suitable diagram explain construction and working of PMMC instrument. Write down the equation of deflection. [6]

(*b*) A 300 pF capacitor is charged to potential difference of 100 volt when capacitor is disconnected from supply, the reading of electrostatic voltmeter in parallel with capacitor is observed to fall to 80 volt in 20 seconds. Find the insulation resistance. [6]

Or

2. (*a*) With suitable diagram explain range extension of ammeter, voltmeter using shunt and multiplier. Also write the expression for shunt resistance and multiplier resistance. [6]

P.T.O.

(b) With suitable circuit diagram and phasor diagram explain Anderson's bridge for measurement of inductance. Write the expression for unknown inductance in terms of bridge parameters. [6]

3. (a) The readings of two wattmeters connected for measurement of power in 3-phase circuit are 5000 watt and 500 watt. The second wattmeter reading is obtained after reversing the connections. Find the total active power and power factor of load. [6]

(b) With suitable block diagram explain working of electronic energy meter. [7]

Or

4. (a) An energy meter makes 100 revolutions of the disc for one unit of energy. Calculate the desired number of revolutions made by it when connected to a load carrying 20 Amp at 230 volt, 0.8 power factor lag for one hour. If it makes 360 revolutions during this one hour, find percentage error. [6]

(b) Explain one wattmeter method for measuring active power in a 3-phase balanced R&L load. Draw respective circuit diagram. [7]

5. (a) State detailed classification of transducer. [6]

(b) With suitable diagrams explain phase angle and frequency measurement using Lissajous pattern in CRO. [6]

6. (*a*) With suitable diagram explain construction and working of McLeod gauge. [6]

(*b*) With suitable diagram explain any *two* types of resistive transducers. [6]

7. (*a*) With suitable diagram explain ultrasonic method of level measurement. [6]

(*b*) Explain construction and working of foil type strain gauge. [7]

Or

8. (*a*) With suitable diagram explain any *one* method of level measurement using hydraulic principles. [6]

(*b*) Draw and explain characteristics of LVDT. State advantages and disadvantages of LVDT. [7]