22325

11920

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) State the meaning of 'Absolute standard' and 'Secondary Standard'.

b) State the working principle of PMMC Analog instrument.

c) Calculate the resistance of shunt required to make a milliammeter which gives maximum deflection for a current of 15 mA and which has a resistance of 5Ω ; read upto 10 Amp.

d) State the purpose of four quadrant meter.

e) A single phase wattmeter rated for 500V; 5A is having full scale deflection of 1000 watt, What is multiplying factor of the wattmeter?

f) List the errors occurring in single phase electronic energy meter.

g) State the advantages of electronic energy meter.

Marks

2. Attempt any THREE of the following: **12**

a) Compare analog instrument to digital instrument on the basis of accuracy; resolution, power required and portability.

b) List the types of systematic errors and state the reasons due to which these errors occur.

c) State the purpose of calibration of measuring instruments. Explain the procedure of calibration of D.C.Voltmeter by using D.C. Potentiometer.

d) A permanent magnet moving coil instrument of full scale deflection of 25 mA when P.D. across its terminal is 75 mV Calculate.

(i) Resistance of shunt required for full scale deflection of 150 A

(ii) Series Resistance for full scale reading 500 volts.

3. Attempt any THREE of the following: **12**

a) Explain with neat sketch: the working of full-wave rectifier voltmeter.

b) Draw the circuit diagram for:-

(i) Measurement of active power in 3-phase load circuit using two wattmeter.

(ii) Measurement of reactive power in 3-phase load circuit using one wattmeter.

c) Explain the error occurred due to pressure coil inductance of electrodynamometer type wattmeter How this error is compensated?

d) Describe with block diagram; the construction of single phase Electronic Energy meter.

Marks

4. Attempt any THREE of the following: **12**

a) Draw a neat labeled block diagram of 3-phase Electronic Energy meter.

b) Describe with block diagram; the principle of operation of digital storage oscilloscope.

c) Describe with block diagram; the working of digital frequency meter.

d) Describe with suitable example; frequency measurement by Lissajous patterns on CRO.

e) Draw the block diagram of trivector meter. State the various measurements possible from trivector meter.

5. Attempt any TWO of the following: **12**

a) Explain with neat sketch; the construction and working principle of Repulsion type moving Iron instrument.

b) Explain the effect of power factor on wattmeter readings in two wattmeter method of power measurement.

c) Draw a block diagram of function generator and state the function of each block.

6. Attempt any TWO of the following: **12**

a) Explain the calibration of single phase electronic energymeter using direct loading.

b) Describe the procedure for the measurement of Earth resistance by using Earth tester.

c) Explain with neat sketch; the construction and working principle of Megger.