22325

21819

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) Define the term 'calibration' and state its need for measuring instruments.

b) What is the difference between conventional ammeter and clip-on ammeter?

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 5 Ω, read upto 10 Amp.

d) State the difference between unity P.F wattmeter and low P.F wattmeter.

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

f) State the various errors in single phase electronic energy meter.

g) State any two advantages of electronic energy meter?

Marks

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

a) State the types of errors in measuring instruments and reasons of occurrence of errors.

b) Define the following terms.

(i) Precision

(ii) Drift

(iii) Resolution

(iv) Back lash

c) Distinguish between:

(i) Absolute and secondary instruments

(ii) Analog and digital instruments.

d) Which meter has a greater sensitivity and why? Meter A having a range of 0-10 V and a multiplier resistance of 18 kΩ and meter B with a range of 0-300 V and multiplier resistance of 298 kΩ? Both meter movements have a resistance of 2 kΩ.

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

a) Describe with circuit diagram, the working of full wave rectifier type A.C Voltmeter.

b) A 3-phase, 500 volt motor load has a power factor of 0.4. Two wattmeter connected to measure the input. They show the input to be 30 KW. Find the reading of each wattmeter?

c) List the various errors occurred in dynamometer type wattmeter and describe the way of compensating any one type of error.

d) Describe with circuit diagram, the calibration of single phase electronic energy meter using direct loading?

Marks

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

a) Describe with block diagram working of single phase electronic energy meter.

b) Describe with block diagram; working of signal generator and state atleast two applications of signal generator.

c) What is Trivector meter? Describe the constructional details of Trivector meter?

d) Describe how the following measurements can be made with the use of CRO:

(i) Voltage measurement

(ii) Time period measurement

e) Describe with block diagram, the working of function generator.

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

a) Explain with sketch, the construction and working principle of repulsion type moving iron instrument? Compare repulsion type MI instrument with attraction type MI instrument?

b) Explain with suitable diagram, the constructional detail and working of Dynometer type wattmeter.

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

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

a) Explain with block diagram the construction and working principle of three phases electronic energy meter?

b) What is the necessity of synchroscope in power system? Explain with neat sketch the working of synchroscope.

c) Explain with neat sketch:

(i) Earth resistance measurement using earth tester

(ii) High resistance measurement using megger.
