14115

17322

3 Hours/100 Marks

Seat No. | | | | | | | | |

Instructions *: (1)* ***All*** *questions are* ***compulsory****.*

(2) Answer ***each*** *next main question on a* ***new*** *page.*

(3) ***Illustrate*** *your answers with neat sketches* ***wherever*** *necessary.*

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

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

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

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

(8) ***Use*** *of Steam tables, logarithmic, Mollier's chart is* ***permitted****.*

MARKS

1. Attempt **any ten** : **20**

a) Define reproducibility and accuracy.

b) Define error and drift.

c) Explain why ammeter is low resistive and voltmeter is high resistive instrument.

d) Explain why extension of range of meters is needed.

e) Define multiplying factor of wattmeter.

MARKS

f) Write any two difference between current coil and pressure coil of wattmeter.

g) Define energy and one kilowatt hour.

h) Energy meter is integrating type measuring instrument. Explain.

i) Explain maximum demand in energy meter.

j) Explain how Megger can be used for checking whether insulation of a wire.

k) State any two applications of multimeter.

l) Explain what is function generator.

m) What is the necessicity of synchroscope in power system ?

2. Attempt **any two** : **16**

a) Write difference between each of following :

i) Absolute and secondary instruments

ii) Deflection and null type measuring instruments

iii) Analog and digital type instruments

iv) Recording and indicating type instrument.

b) Describe three types of torques required in analog type measuring instruments.

c) With neat diagram describe construction and working of PMMC type measuring instrument.

3. Attempt **any two** : **16**

a) Explain with neat diagram construction and working of attraction type moving iron instrument.

MARKS

b) A moving coil instrument gives a full scale deflection of 5 milliamp when the potential difference across its terminal is 50 millivolt. Calculate

i) The shunt resistance for a full scale deflection corresponding to 50 A.

ii) The series resistance for full scale reading with 500 V.

iii) Calculate power dissipated in i) and ii) above.

c) i) Explain with neat diagram how voltmeters are calibrated.

ii) Explain with neat diagram how ammeters are calibrated.

4. Attempt **any two** : **16**

a) Explain with neat diagram construction and working of electrodynamometer type wattmeter.

b) i) Draw circuit diagrams for measurement of 3 phase active power and 3 phase reactive power using one wattmeter.

ii) Explain effect of power factor on reading of wattmeter.

c) Describe any four errors in electrodynamometer type wattmeter.

5. Attempt **any two** : **16**

a) Two wattmeters connected to measure 3 phase power gives reading of 3000 W and 1000 W respectively. Find power factor of circuit.

i) When both readings positive ?

ii) When reading of 1000 W is obtained after reversing current coil of second wattmeter ?

MARKS

b) Explain with diagram construction and working of induction type energy meter.

c) i) Compare analog and digital multimeter. (any four points)

ii) Explain how earth resistance can be measured using earth tester.

6. Attempt **any two** : **16**

a) Explain with diagram construction and working of single phase dynamometer type power factor meter.

b) Explain with diagram construction and working of each of following :

i) Ferrodynamic type frequency meter.

ii) Clip on meter.

c) Draw and explain internal structure of a cathode ray tube.
