Total No. of Questions : 8]

SEAT No. :

P9094

[Total No. of Pages : 3

[6179]-219
S.E. Electrical
Electrical Measurements & Instrumentation
(2019 Pattern) (Semester - III)(203144)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 Q.7 or Q.8***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Assume suitable additional data, if necessary.***
5) ***Use of non-programmable calculator is allowed.***

Q1) a) What are the different methods to measure power in three phase circuits? Explain any one method in detail. **[6]**

b) State and explain errors in dynamometer type wattmeter. **[6]**

c) A wattmeter reads 4.5 kW when its current coil is connected in the 'R' phase and its voltage coil is connected between 'R' phase and neutral of a symmetrical 3 phase system supplying a balance load of 20 A at 415V. What will be the reading of the wattmeter if the current coil remains unchanged and voltage coil is connected between 'B' and 'Y' phases? The phase sequence is RYB. **[6]**

OR

Q2) a) With neat diagram, explain construction and working of a dynamometer type wattmeter. **[6]**

b) When two wattmeter method is used for measurement of power in a three phase balanced circuit, comment upon the readings of the two wattmeter under following conditions. **[6]**

i) when the power factor is unity

ii) when the power factor is zero

c) Two wattmeter's connected to measure the power supplied to a 3 phase, 500 V circuit indicate the total input to be 10 kW. The power factor is 0.3 lagging. Find the reading on each wattmeter. **[6]**

P.T.O.

Q3) a) Draw neat diagram of induction type energy meter, label all the parts and explain its construction and working. **[9]**

b) A single phase energy meter is supplying power to a resistive load at 240 V, 4.4 A for a period of 5 hours. **[8]**

i) If disc makes 2400 revolutions, calculate the meter constant.

ii) Calculate the power factor of the load if the load is operated for 4 hours at 240
V, 5A and meter making 1500 revolutions.

OR

Q4) a) Explain with neat diagram and necessary phasor diagrams, how single-phase energy meter can be calibrated at different power factors. **[6]**

b) With a block diagram explain working of single phase static energy meter. **[6]**

c) An energy meter is designed to make 100 revolutions of disc for one unit of energy. Calculate the number of revolutions made by it when connected to load carrying 40A at 230V and 0.4 power factor for an hour. If it actually makes 360 revolutions, find the percentage error and also state that whether meter is fast or slow. **[5]**

Q5) a) Give detailed classification of transducers along with examples of each type. **[6]**

b) With neat diagram, explain Pirani gauge for measurement of low pressure. **[6]**

c) Draw a block diagram of DSO. Explain functions of each block. **[6]**

OR

Q6) a) Define pressure? What is the classification of pressure? State the various methods of measurement for each type. **[6]**

b) With a suitable diagram explain working of inductive transducres. **[6]**