

SE204 - Measurements and Instrumentations

P. Pages : 2

Time : Three Hours



GUG/W/24/13859

Max. Marks : 80

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- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.
 5. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.
 6. Non programmable calculator is permitted.

1. a) Explain Electrodynamometer type instruments in detail. 8
b) Explain with neat sketch the construction of PMMC type instruments and states its merits and demerits. 8

OR

2. a) Explain moving iron instrument (MI) with neat diagram. 8
b) Discuss the types of torque required in measuring instrument. 8
3. a) State static and dynamic characteristic of transducer. 8
b) Explain piezoelectric transducer and discuss its applications. 8

OR

4. a) Explain generalized block diagram of instrumentation system in detail. 8
b) Explain the different static and dynamic characteristics of instrument. 8
5. a) State the errors in power measurements. 8
b) Derive the equation for active power measurement in three phase circuit using two wattmeter method. 8

OR

6. a) A 230V, single phase energy meter has a constant load of 4 A passing through it for 6 hours at unit power factor. If the meter disc makes 2208 revolutions during this period what is the meter constant in revolutions per kWh? Calculate the power factor of the load if the number of revolutions made by the meter are 1480 when operating at 230V and 5A for 4 hours. 8
b) What is Power factor? And explain the different loads effecting the power factor. 8

7. a) Write a short note on **any two** terms: 8
- i) Megger,
 - ii) Earth tester
 - iii) Loss of charge method
- b) Explain the working of Wheatstone's Bridge in detail. 8

OR

8. a) Explain the Maxwell Bridge with brief. 8
- b) Explain Wein bridge with detailed derivation. 8
9. a) What is Thermistor? Explain its construction, resistance temperature characteristics and application. 8
- b) Explain Bourdon tube with its various applications with neat suitable diagram. 8

OR

10. a) Explain single phase power measurement in high voltage system using instrument transformer with suitable circuit diagram. 8
- b) Explain the working principle of thermocouple in detail. 8
