

AU – 2525

Third Semester B. E. (Elect. Engg./Elect. and Power) (CGS) Examination

ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

Paper – 3 EP 05/3 EX 05/3 EL 05/3 EE 05

(USC – 10481)

P. Pages : 3

Time : Three Hours]

[Max. Marks : 80

- Note :** (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.
- (2) Answer **Three** questions from Section A and **Three** questions from Section B.
- (3) Assume suitable data wherever necessary.
- (4) Illustrate your answer wherever necessary with the help of neat sketches.
- (5) Use pen of Blue/Black ink/refill only for writing the answer book.

SECTION A

1. (A) The law of deflection of a moving iron ammeter is given by $I = 4\theta^n$ ampere where θ is the deflection in radian and n is a constant, the self inductance when the meter current is zero is 10 mH. The spring constant is 0.16 N – m/rad
- (i) Determine an expression for self inductance of the meter as a function of θ and n .
With $n = 0.75$, calculate the meter current and the deflection that corresponds to a self inductance of 60 mH. 7
- (b) Differentiate between PMMC, MI, Electrostatic and Electrodynamic type instruments. 7

OR

2. (a) Derive the torque equation of a PMMC instrument. Also state its advantages and disadvantages. 8
- (b) Define the terms “indicating instruments”, “Recording instruments” and “Integrating instruments.” Give examples of each case. 6

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3. (a) State and explain Blondels theorem. 7
(b) Explain electronic energy meter in detail. 6

OR

4. (a) Describe construction and working principle of induction type energy meter. 7
(b) Explain briefly measurement of three phase power in a star connected load by using two wattmeter method. Draw the circuit diagram and phasor diagram for the same. 6
5. (a) Explain the construction and working principle of a C. T. 6
(b) State importance of phase sequence and explain phase sequence indicator. 7

OR

6. (a) Define and explain following terms as used for instrument transformers.
(i) Transformation ratio.
(ii) Nominal ratio.
(iii) Turns ratio
(iv) Ratio correction factor. 6
(b) Explain the maximum demand indicator in detail. 7

SECTION B

7. (a) Classify resistances and explain Kelvin's double bridge method. 7
(b) Compare AC and DC bridges. 7

OR

8. (a) Draw and explain Megger. 7

- (b) Draw and explain Desauty's bridge with phasor diagram. 7
9. (a) Explain the construction and working principle of LVPT. State advantages, disadvantages and areas of application. 7
- (b) Explain characteristics of transducers in detail. 6

OR

10. (a) Enlist the advantages of electrical transducers and classify it in detail. 7
- (b) Explain strain gauge and its applications. 6
11. (a) Explain resistance temperature detector. 7
- (b) Differentiate between thermistor and thermocouple. 6

OR

12. (a) Draw and explain manometer. 6
- (b) Write down the working principle of –
- (i) Bellows.
- (ii) Bourdon tube.
- (iii) Diaphragm. 7



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