

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2125)

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B. Tech 4th Semester Examination
Electrical and Electronic Measurements (OS)

EEE-4001

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one question from each of the sections A, B, C & D. Section E is compulsory.

SECTION - A

1. Describe the construction details of attraction type moving iron instrument with the help of a neat diagram. Derive the equation for deflection if spring control is used and comment upon the shape of scale. (20)
2. (a) Describe the construction and working of PMMC instrument. (10)
(b) A moving coil voltmeter with a resistance of 20Ω . gives a full scale deflection of 120° when a potential difference of 100mV is applied across it. The moving coil has dimensions of $30\text{ mm} \times 25\text{ mm}$ and is wound with 100 turns. The control spring constant is $0.375 \times 10^{-6}\text{ Nm/deg}$. Find the flux density in the air gap. Find also the diameter of copper wire of coil winding if 30 percent of instrument resistance is due to coil winding. The specific resistance for copper = $1.7 \times 10^{-8}\ \Omega\text{m}$. (10)

SECTION - B

3. (a) Describe the sources of error in single phase induction type energy meter. (10)

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- (b) Explain in detail creep, overload and temperature compensations. (10)
4. (a) What is a synchroscope? Explain the working of weston synchroscope. (10)
(b) List different methods of measurement of frequency in power frequency range, Explain working of resonance type frequency meter. (10)

SECTION - C

5. (a) Derive the expression for ratio and phase angle errors for potential transformer. Explain the design and constructional features used for the reduction of ratio and phase angle errors. (10)
(b) Discuss any two methods of testing a current transformer. (10)
6. (a) Explain the construction and principle of working of light dependent resistors. (10)
(b) Discuss the principle of working of strain gauge. Explain semiconductor type strain gauge. (10)

SECTION - D

7. (a) With the help of suitable diagram, describe the working of cathode ray tube. (10)
(b) Discuss the working of LCR meter. (10)
8. (a) Explain the difference between VTVM and digital voltmeter. (10)
(b) What are the different types of telemetry systems? Discuss the land-line telemetering system and describe its advantages. (10)

SECTION - E

9. (i) Give limitations of PMMC instruments.
- (ii) Define burden in instrument transformers.
- (iii) Compare landline and RF telemetry.
- (iv) What is gauge factor? State the gauge of any two materials.
- (v) Write the importance of range extension.
- (vi) Discuss piezoelectric materials.
- (vii) Why piezoelectric transducer cannot be used for static displacement measurements?
- (viii) What are the applications of V.T.V.M.?
- (ix) What is the purpose of triggering circuit in CRO?
- (x) List various types of RF meters. (2×10=20)