

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2064)

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B. Tech 4th Semester Examination

Electronic Measurement & Measuring Instruments (O.S.)

EC(ID)-4002

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 each from section A, B, C & D. Section-E is compulsory.

SECTION - A

1. (a) Why is an electronic voltmeter more accurate than an ordinary voltmeter? Draw its block diagram and explain its principle of operation. (10)
- (b) Explain the working of Q-meter. (10)
2. (a) Draw block diagram of a CRO and explain the function of each block. (12)
- (b) Explain measurement of phase difference and frequency of sinusoidal voltage signals using cathode ray oscilloscope. (8)

SECTION - B

3. Differentiate between a current transformer and potential transformer. Discuss the theory of a potential transformer with phasor diagrams. Derive expressions for actual transformation ratio, ratio error and phase angle error of a PT. (20)

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4. (a) How does a wave analyzer differ from an harmonic distortion analyzer? Describe an Heterodyne wave analyzer with the help of its block diagram. (10)
- (b) With the help of block diagram, explain the working of a spectrum analyzer. (10)

SECTION - C

5. (a) What is an X-Y recorder? How is it different from X-t or Y-t recorders? Describe its functioning giving suitable circuit diagram. Give its merits and demerits. (12)
- (b) Describe the operation of an LVDT. (8)
6. (a) Explain the operating principle, construction and applications of photoelectric transducers. (10)
- (b) Describe the working principle and construction of thermocouples. Describe the various types of compensations employed. Also give the merits, demerits and applications of thermocouples. (10)

SECTION - D

7. (a) Explain frequency division multiplexing and time division multiplexing. Compare their performance.
- (b) Explain operation of Nixie tube. (12+8=20)
8. (a) Explain various methods of data transmission. (12)
- (b) What are the various display devices? Explain operation of seven segment displays. (8)

SECTION - E (Compulsory)

9. Explain the following:
- (1) What is the difference between recording and integrating instruments?

- (2) Why there are two conditions of balance in a.c. bridges, whereas there is only one in d.c. bridges?
- (3) What are electrical transducers?
- (4) Why are TVMs preferred over VTVMs?
- (5) What is meant by harmonic distortion?
- (6) What happens if the secondary of a current transformer is open circuited, while the primary carries the rated current?
- (7) Why is quartz crystal commonly used in crystal oscillators?
- (8) What is an electronic galvanometer and how is it superior to ordinary galvanometer?
- (9) Why phototransistor is much sensitive than a photodiode?
- (10) Why is it necessary to make strain gauges of high resistance? (10×2=20)