

Electronics Measurements & Instrumentations

P. Pages : 2

Time : Three Hours



NKT/KS/17/7214/7219

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.
 11. Use of non programmable calculator is permitted.

1. a) Explain the block diagram of electronic measurement system. **6**
- b) The following 10 observations were recorded when measuring a voltage 51.7, 52, 51.8, 51.2, 52.3, 51.9, 52.4, 52.6, 50.9 & 50.7 **7**
Find :
i) The Arithmetic mean
ii) Deviation from mean
iii) Average deviation
iv) Standard deviation
v) Variance
vi) Probable error

OR

2. a) Give the classification of error in measurement system with the help of example & corrective measures to reduce these errors. **7**
- b) The value of a resistance is $5.7\text{K}\Omega$ while measurement. It was measured as $5.64\text{K}\Omega$. **6**
Calculate :
i) Absolute error
ii) % error
iii) Relative accuracy
iv) % accuracy.
3. a) Explain construction and operating principle of PMMC galvanometer, also derive torque equation. **6**
- b) How PMMC instrument can be used as ammeter & voltmeter? **7**

OR

4. a) Explain the working of True RMS responding voltmeter with construction and diagram. 7
 b) Explain the working of electro-dynamometer. 6
5. a) Explain the sources and detectors used in AC bridge. 3
 b) Discuss in detail generalised condition of balance for AC Bridge. 4
 c) Draw and explain Schering bridge & derive expression for balance condition alongwith phasor diagram. 7
- OR**
6. a) Explain Maxwell's induction capacitance bridge and draw the phasor diagram. 7
 b) The four arms of Hay's alternating current bridge are arranged as follows : 7
 AB is of unknown impedance.
 BC is a non - reactive resistor of 1000Ω .
 CD is a non - reactive resistor of 8.33Ω in series with a standard capacitance of $0.38 \mu\text{f}$.
 DA is a non - reactive resistor of 16.800Ω , if the supply frequency is 50 Hz determine the inductance & resistance at the balance condition.
7. a) Explain the working principle of linear variable differential transformer (LVDT). 6
 b) Show that for a piezoelectric transducer $E_O = gtP$. 7
- OR**
8. a) Write short note on RTD. 6
 b) Derive the expression for gauge factor of strain gauge. 7
9. a) Draw the block diagram of dual beam & dual trace CRO, explain it. 7
 b) Explain the block diagram of function generator in detail. 6
- OR**
10. a) Explain block diagram of standard signal generator. 7
 b) Write short note on : 6
 Different types of sweeps used in CRO.
11. a) Explain the heterodyne wave analyzer with block diagram. 7
 b) Draw and explain single - channel data acquisition system & multichannel data acquisition system. 7
- OR**
12. a) Explain the term 'Total harmonic distortion' Describe the functioning of a total harmonic distortion analyser. 7
 b) What is signal conditioning explain AC signal conditioning system. 7
