

Code No: 155BC

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2021

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

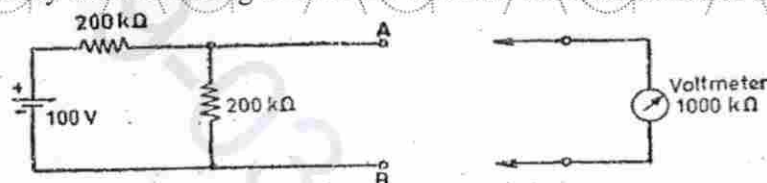
(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) A 50 V range voltmeter is connected across terminals *A* and *B* of the circuit shown in figure. Find the reading of the voltmeter under open circuit and loaded conditions. Find the accuracy and the loading error. If the voltmeter has a resistance of 1000 k Ω .



- b) With help of a neat diagram, explain the block diagram of functional elements of the measurement system. [8+7]
- 2.a) Enumerate and explain the different types of dynamic characteristics of instruments.
b) With help of a neat diagram explain the construction and working of the True RMS responding voltmeter. [7+8]
- 3.a) With relevant block diagram explain the working of a standard signal generator.
b) With neat diagram explain the working of heterodyne wave analyzer. [7+8]
- 4.a) Briefly explain the working of the basic function generator with a neat diagram.
b) Explain the working of the AF wave analyzer with help of a neat diagram. [8+7]
- 5.a) With neat diagram, enumerate the main components of CRT.
b) Explain the working of a vertical amplifier with a relevant circuit diagram. [8+7]
- 6.a) With help of a neat diagram, explain the working of a sampling oscilloscope.
b) Explain the working of dual-beam CRO with relevant diagram. [8+7]
- 7.a) A resistive strain gauge $G = 2.2$ is cemented on a rectangular steel bar with the elastic modulus $E = 205 \times 10^6$ kN/m² width 3.5 cm and thickness 0.55 cm. An axial force of 12kN is applied. Determine the change of the resistance of the strain gauge, ΔR , if the normal resistance of the gauge is $R = 100 \Omega$.
b) Briefly discuss the working of LVDT with neat block diagram. [7+8]
- 8.a) In the Wheatstone bridge, the values of resistances of various arms are $P = 1000 \Omega$, $Q = 100 \Omega$, $R = 2,005 \Omega$ and $S = 200 \Omega$. The battery has an emf of 5 V and negligible internal resistance. The galvanometer has a current sensitivity of 10 mm/ μ A and an internal resistance of 100 Ω . Calculate the deflection of the galvanometer and the sensitivity of the bridge in terms of deflection per unit change in resistance.
b) With help of a neat diagram, explain the working of turbine type flow meter. [8+7]