Code No: 155BC

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

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

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication Engineering)

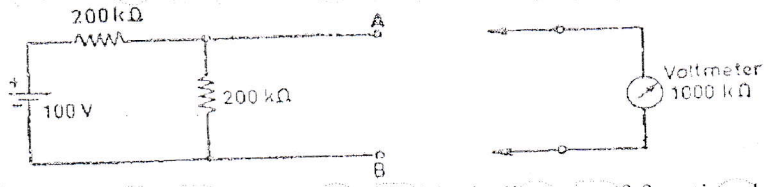
Time: 3 Hours **Max. Marks: 75**

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 kΩ.



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 x 10^6 kN/m^2 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 Ω.

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 Ω, *Q*= 100 Ω, *R*= 2.005 Ω and *S*= 200 Ω. The battery bas an emf of 5 V and negligible internal resistance. The galvanometer bas a current sensitivity of 10 mm/μA 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]

---ooOoo---