JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, July - 2021
ELECTRONIC MEASURING INSTRUMENTS
(Common to CE, ME, EIE, MIE)

Time: 3 hours

Max. Marks: 75

Answer any Five Questions
All Questions Carry Equal Marks

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1.a) The expected value of current through a resistor is 1330mA, but the measurement yields a current value of 1286mA. Calculate the percentage of accuracy and percentage of error.

b) List out the characteristics of instruments that are used to measure an unvarying process condition. [6+9]

2.a) An engineer wants to generate a sawtooth wave that varies in frequency from a fraction of Hertz to several hundred KiloHertz. With a neat block diagram design the device and explain its working.

b) Draw the block diagram that provides a sinusoidal output voltage whose frequency varies continuously over audio frequency band. [8+7]

3.a) Explain how an unknown resistance can be measured when it is connected in series to the D'Arsonval moment.

b) A CRO is set to a time base of 0.1 ms/cm with a 10cm amplitude. Sketch the display of the pulse signal waveform with a pulse repetition rate of 3000Hz and duty cycle of 30%. [9+6]

4.a) An engineer wants to plot the instantaneous relation between two variables G = F(s). Explain how plotting of one variable against another variable is done.

b) Explain the working of Servo transducer and what are the applications of it? [7+8]

5.a) Briefly explain the working principles and measurement of force by any two nonelectric techniques?

b) Describe the method of measuring flow rate with a neat diagram. [8+7]

6.a) The accuracy of five digital voltmeters are checked by using each of them to measure a standard 2.0000V from a calibration instrument. The voltmeter readings are as follows: V1=2.001v, V2=2.002v, V3=1.999v, V4=1.998v and V5=2.0000v. Calculate the average measured voltage and the average deviation

b) What is the difference between pulse generator and square wave generator? Also discuss requirements of Pulse. [8+7]

7.a) Design a multirange ammeter with ranges of 0-100 mA, 0-300 mA, 0-600 mA, 0-2 A employing individual shunts for each range. A D' Arsonval movement with an internal resistance of 600 Ω and a full scale current of 200 μA is available.

b) Draw the basic block diagram of an oscilloscope and explain the function of each block. [6+9]

8.a) Sketch the DC signal conditioning circuit for pressure measurement using strain gauge. Justify it.

b) An ac LVDT has the following data: Input = 8.2 V, Output = 4.3 V, range ± 0.3 in. Determine (i) Calculate the output voltage Vs Core position for a core moment going from +0.45 in, to − 0.30 in. (ii) The output voltage when the core is -0.25 in. from the centre. [8+7]

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