

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

CLASS: BTECH
BRANCH: ECE

SEMESTER : III/ADD
SESSION : MO/2024

SUBJECT: EC207 ELECTRONIC MEASUREMENTS

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Illustrate and explain with block diagram the elements of generalized measurement system with the example of voltmeter or Bourdon Tube pressure gauge.	[5] 1	3
Q.1(b)	Distinguish between <u>any two</u> (i) Scale range and scale span (ii) Repeatability and reproducibility (iii) Noise factor and Noise figure	[5] 1	4
Q.2(a)	The inductance of a moving iron ammeter with a full scale deflection of 90° at 1.5A is given by expression $L = (200 + 40\theta - 4\theta^2 - \theta^3)\mu\text{H}$ where θ is the deflection in radian from the zero position. Estimate the angular deflection of the pointer for a current of 1.0 A.	[5] 2	5
Q.2(b)	Explain the working of DC Voltmeter with a chopper type DC Amplifier with help of a neat and labelled diagram	[5] 2	2
Q.3(a)	With help of circuit diagram, illustrate the steps of quality factor calculation of the Hay's bridge. Discuss the phasor diagram of the bridge.	[5] 3	3
Q.3(b)	Compare and contrast between dual trace and dual beam Cathode ray oscilloscope with block diagrams.	[5] 4	4
Q.4(a)	Design and implement a 3 bit R-2R ladder type digital to analog converter.	[5] 4	6
Q.4(b)	Describe <u>any one</u> with help of block diagram (i) Successive approximation type analog to digital converter (ii) Digital Frequency Meter	[5] 4	2
Q.5(a)	Explain the principle and working of a strain gauge. Derive the expression for gauge factor of strain gauge.	[5] 5	2
Q.5(b)	Choose any industry of your choice employing various transducers in the assembly line. Recommend appropriate transducers used in that industry. Discuss various transducer parameters like sensing principle, transmission method and output for <u>3</u> of these transducers.	[5] 5	5

:::21/11/2024:::E