

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

CLASS: MTECH  
BRANCH: ECE

SEMESTER : I  
SESSION : MO/2024

SUBJECT: EC507 SENSING AND 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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		CO	BL
Q.1(a)	Explain the working of LVDT. Explain how it can be used as a secondary transducer in pressure measurement.	[5] 1	2
Q.1(b)	Draw the basic block diagram of smart sensor. Write down its characteristics.	[5] 1	2
Q.2(a)	Draw the block diagram of the vector network analyzer and explain its operation.	[5] 2	3
Q.2(b)	A sensor outputs a voltage ranging from to -2.4 V to -1.1V. For interface to an analog-todigital converter, this needs to be 0 to 2.5 V. Develop the required signal conditioning. What will be the signal conditioner output when the sensor input is -1.5V. .	[5] 2	4
Q.3(a)	Explain the construction and working of FMCW radar sensor. Explain how it is used for proximity sensing?	[5] 3	3
Q.3(b)	Write down the application of RF-ID sensor. Compare between passive and active RF-ID.	[5] 3	2
Q.4(a)	Explain Thick film sensor fabrication process. Compare it with Thin film fabrication process.	[5] 4	2
Q.4(b)	With suitable diagram explain the working of bio-sensor. Write down the applications of bio sensors.	[5] 1	2
Q.5(a)	Draw the architecture of a wireless sensor node and explain the individual block. Write down the challenges involved in design of wireless sensor node.	[5] 5	2
Q.5(b)	Compare between FSK and PSK. What is dynamic modulation scaling in WSN.	[5] 5	2

:::22/11/2024:::E