

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

**CLASS: IMSC.
BRANCH: PHYSICS**

**SEMESTER : V
SESSION : MO/2024**

SUBJECT: PH307 EXPERIMENTAL TECHNIQUES

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.
-

		CO	BL
Q.1(a)	Briefly outline how the Chi-squared test for a distribution is carried out.	[5]	1 2
Q.1(b)	Consider a measured value (x) which depends on variables a, b and c: $x = f(a,b,c)$. What will be the total error in x based on the concept of propagation of error. A wire has a mass $m = 0.300 \pm 0.003$ g, radius $r = 0.500 \pm 0.005$ mm and length $l = 6.00 \pm 0.06$ cm. What will be the maximum percentage error in the measurement of its density?	[5]	1 1,3
Q.2(a)	List any three types of signals. With schematic, discuss the periodic and aperiodic signals.	[5]	2 1,2
Q.2(b)	What is shielding? Discuss electric field shielding and magnetic field shielding.	[5]	2 1,2
Q.3(a)	What do you understand by transducer? Describe any electrical transducer.	[5]	3 1,2
Q.3(b)	What is piezo electric effect? Describe a piezo electrical transducer.	[5]	3 1,2
Q.4(a)	Distinguish between analog and digital instruments. Draw the block diagram of a digital multimeter and describe each part.	[5]	4 1,2,3
Q.4(b)	Describe the principle and working of LCR bridge with help of block diagram.	[5]	4 1,2
Q.5(a)	What do you understand by radiation sensor? Describe the principle and working of gas filled detector.	[5]	5 1,2,3
Q.5(b)	Define vacuum. What are its units and dimension? Describe any mechanical pump to generate vacuum.	[5]	5 1,2

:::22/11/2024:::M