

Enrollment No: \_\_\_\_\_

Exam Seat No: \_\_\_\_\_

# C.U.SHAH UNIVERSITY

## Summer Examination-2022

**Subject Name: Basic Instrumentation Skills**

**Subject Code: 4SC06BIS1**

**Branch: B.Sc. (Physics)**

**Semester: 6**

**Date: 09/05/2022**

**Time: 02:30 To 05:30**

**Marks: 70**

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  - (2) Instructions written on main answer book are strictly to be obeyed.
  - (3) Draw neat diagrams and figures (if necessary) at right places.
  - (4) Assume suitable data if needed.
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- Q-1**      **Attempt the following questions:**      **(14)**
- a) If the length of a metal piece is measured to be 4.75 cm with an error of 0.001; How would you represent the final result?      1
  - b) Define the term 'precision'. What is its significance?      1
  - c) What is the function of a rectifier?      1
  - d) Write applications of distortion meter.      1
  - e) Which quantity corresponds to the x-axis (base) of the CRO?      1
  - f) What is the function of universal counters?      1
  - g) Mention the difference between a digital and an analog signal.      1
  - h) Give the full form of CRT.      1
  - i) What is the role of a function generator?      1
  - j) Mention any one significance of a digital voltmeter.      1
  - k) Which material is used in the screen of a CRO to visualize the wave forms?      1
  - l) What do you mean by digital storage oscilloscope?      1
  - m) Mention the formula for total harmonic distortion.      1
  - n) Can a multimeter serve the purpose of an ammeter? If so, how?      1

**Attempt any four questions from Q-2 to Q-8**

- Q-2**      **Attempt all questions**      **(14)**
- a) Explain in detail the working of amplifier-rectifier millivoltmeter.      7
  - b) Write a short note on delay line.      7
- Q-3**      **Attempt all questions**      **(14)**
- a) Elaborate on the principle of measurement of ac current using a multimeter.      7
  - b) Explain in detail digital to analog converter with necessary diagram.      7
- Q-4**      **Attempt all questions**      **(14)**
- a) Write a note on the functioning of a digital storage oscilloscope.      7
  - b) Explain the working of a CRO with necessary diagram.      7
- Q-5**      **Attempt all questions**      **(14)**
- a) With necessary block diagrams, explain the working of pulse generators.      7



	b)	Explain the working principle of the Q-meter.	7
<b>Q-6</b>		<b>Attempt all questions</b>	<b>(14)</b>
	a)	A 3 ½ digit voltmeter is used for measuring voltage	7
		(i) Find resolution of the instrument.	
		(ii) How would a voltage of 14.53 V be displayed on a 10 V scale?	
		(iii) How would a reading of 14.53 be displayed on a 100 V scale?	
	b)	Explain the uses of CRO in measuring various quantities of a wave pattern.	7
<b>Q-7</b>		<b>Attempt all questions</b>	<b>(14)</b>
	a)	Write short notes on (1) function generator, (2) RF and microwave generator	7
	b)	What is the significance of LCR meter?	4
	c)	Differentiate between analog and digital instruments.	3
<b>Q-8</b>		<b>Attempt all questions</b>	<b>(14)</b>
	a)	What is a time base generator? Explain its basic principle in detail.	6
	b)	Write a short note on the working of a digital multimeter as a digital voltmeter.	8

