

SEAT No. _____

[101]

SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar - 388120

B. Sc. (3rd Semester) Examination - Dec-2020

US03CINS21 (Electronic Instrumentation)

Day and Date: Thursday, 31/12/2020

Time: 02:00 pm to 04:00 pm

Maximum Marks: 70

[10]

Que 1 Multiple Choice Type Questions.

- 1 The _____ type of instrument can be used for DC measurements only.
a) PMMC
b) Electrostatic
c) Moving iron
d) Thermocouple
- 2 The unit of torque is _____.
a) Newton/meter
b) Newton-meter
c) Meter/Newton
d) Newton-meter²
- 3 LVD stands for _____.
a) Light Vapour Display
b) Liquid Viscous Display
c) Liquid Vapour Display
d) Liquid Vapour Digital
- 4 To select range, the Aryton shunt uses a _____.
a) Resistor
b) Diode
c) Capacitor
d) Simple switch
- 5 The sensitivity of voltmeter is defined as _____.
a) Ω/V
b) V/Ω
c) $V-\Omega$
d) V/Ω^2
- 6 The process of _____ involves the comparison of a given instrument with a standard instrument, to determine its accuracy.
a) Amplification
b) Calibration
c) Attenuation
d) Oscillation
- 7 _____ measures the speed of a rotating shaft.
a) Pyrometer
b) Venturi meter
c) Digital tachometer
d) Rotameter
- 8 The time base consists of a fixed frequency _____, called clock oscillator, which must be very accurate.
a) Amplifier
b) Calibrator
c) Stroboscope
d) crystal oscillator
- 9 The _____ is used to measure radiation intensity.
a) Field strength meter
b) Thermometer
c) Galvanometer
d) Rectifier
- 10 A _____ is used to measure inductance.
a) Wheatstone bridge
b) Q-meter
c) Kelvin bridge
d) Crystal oscillator

[08]

Que 2 Fill in the blanks and True - False.

- 1 EPID stands for _____.
- 2 The _____ galvanometer constitutes the basic movement of a dc ammeter.
- 3 The purpose of _____ bus is to provide digital interfacing between programmable instruments.
- 4 The stroboscope is used to measure _____.
- 5 LED is based on the principle of illumination (TRUE/FALSE).

[1]

[P.T.O.]

- 6 Rectifier type instruments generally use a PMMC movement along with a rectifier arrangement (TRUE/FALSE).
- 7 The automation in digital instruments includes automatic polarity indication, automatic ranging and automatic zeroing (TRUE/FALSE).
- 8 The stroboscopic principle uses a flashing light (TRUE/FALSE)

Que 3 Short Answer Questions (Attempt any 10 out of 12).

[20]

- 1 A moving coil instrument has number of turns 100, width of coil 20 mm, depth of coil 30 mm and flux density in the gap 0.1 Wb/m^2 . Calculate the deflecting torque when carrying a current of 10 mA. Also calculate the deflection, if the control spring constant is $2 \times 10^{-6} \text{ Nm/degree}$.
- 2 A moving coil instrument has number of turns 100, width of coil 20 mm, depth of coil 30 mm, flux density in the gap 0.1 Wb/m^2 and deflection torque $30 \times 10^{-6} \text{ Nm}$. Calculate the current through the moving coil.
- 3 Give an account of bar graph displays.
- 4 A 1 mA meter movement with an internal resistance of 100Ω is to be converted into a 0-100 mA. Calculate the value of shunt resistance required.
- 5 Briefly explain multirange ammeter.
- 6 Write on Ayrton shunt with necessary diagram.
- 7 Discuss briefly IEEE 488 bus.
- 8 Explain digital phase meter.
- 9 Write on digital capacitance meter.
- 10 Briefly explain automatic bridge.
- 11 Explain what megger is.
- 12 What is telemetry? Draw diagram of general telemetry system.

Que 4 Long Answer Questions (Attempt any 04 out of 08).

[32]

- 1 Give complete classification of displays. Discuss light emitting diode (LED).
- 2 Explain liquid crystal display (LCD). Give important features of LCD.
- 3 Write a detailed note on solid state voltmeter with necessary diagram.
- 4 Explain differential voltmeter with necessary diagram.
- 5 Discuss digital pH meter.
- 6 Explain digital measurement of time.
- 7 Discuss RX meter with necessary diagram.
- 8 Explain stroboscope in detail.

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[2]