

## SARDAR PATEL UNIVERSITY

B.Sc. INSTRUMENTATION (Voc.) - I Semester

22<sup>th</sup>, October-2018 EXAMINATION

Sub: INSTRUMENTATION SYSTEM- I (US01CINV21)

TIME:-02:00 pm to 5:00 pm

MARKS-70

Q-1 Choose correct answer.

[10]

1. The CRO provides a \_\_\_\_\_ dimensional visual display of the signal wave shape on its screen.  
(A) one (C) three  
(B) two (D) none of above
2. Working Standards has Accuracy of \_\_\_\_\_ ppm.  
(A) 9.144 (C) 0.9144  
(B) 91.44 (D) none of above
3. A Multimeter is used to measure \_\_\_\_\_.  
(A) Voltage (C) Resistance  
(B) Current (D) all of above
4. Limitation of the Ayrton shunt is as the range increases the meter resistance \_\_\_\_\_.  
(A) Increases (C) Constant  
(B) Decreases (D) none of above
5. Capacitance of a capacitor depend on \_\_\_\_\_.  
(A) Area of plates (C) Free space permittivity  
(B) Difference between two plates (D) all of above
6. \_\_\_\_\_ Damping is considered as best damping.  
(A) Critical (C) Over  
(B) Under (D) none of above
7. \_\_\_\_\_ converts one form of energy to another form of energy.  
(A) Transducer (C) Transformer  
(B) Wheatstone bridge (D) none of above
8. \_\_\_\_\_ is the unit of candela.  
(A) Pressure (C) Temperature  
(B) Luminous intensity (D) none of above
9. \_\_\_\_\_ is referring to the deviation from true value of measured quantity.  
(A) Error (C) Significant figure  
(B) Random (D) none of above
10. \_\_\_\_\_ is the resistance of the resistor having grey, blue, brown and gold colour bands printed on it.  
(A)  $860 \Omega \pm 5\%$  (C)  $86 \Omega \pm 5\%$   
(B)  $8.6 K\Omega \pm 5\%$  (D) none of above

Q-2 Short answer type question. (any Ten)

[20]

1. Briefly explain active and passive component.
2. Define inductive reactance ( $X_L$ ).
3. Briefly explain LDR.
4. List the advantage of DVM (Digital Voltmeter) over other type of voltmeter.
5. List the factors that determine the motion of coil in the magnetic field.
6. List applications of CRO.
7. A set of independent voltage measurements taken by four observers was recorded

as 117.02 V, 117.11 V, 117.08 V and 117.03 V. Calculate (i) the average voltage  
(ii) The range of error.

8. What is instrumentation error?
9. Define Sensitivity and Resolution.
10. Define : (i) accuracy (ii) precision
11. State Different standard of Measurement.
12. List different typical applications of instrumentation system.

Q.3 List different type of fixed type resistor and explain in detail. [10]

OR

Q.3 (a) List different type of capacitor and explain fixed type capacitor any three in detail. [07]

Q.3(b) Write a short note on series and parallel connected capacitor. [03]

Q.4(a) Write a note on DVM (digital voltmeter). [05]

Q.4(b) Determine resistance value of multiplier resistance  $R_a, R_b, R_c, R_d$ ; A PMMC movement with  $100 \Omega$  coil resistance ( $R_m$ ) and 1 mA full scale deflection current ( $I_{fsd}$ ) is to be converted in to a multi-range voltmeter with voltage ranges of 0-10 V, 0-50 V, 0-250 V and 0-500 V. [05]

OR

Q.4(a) Explain cathode ray tube in detail with necessary diagram. [07]

Q.4(b) Draw a block diagram of cathode ray oscilloscope and explain it [03]

Q.5(a) Explain Gross and Random error in detail. [07]

Q.5(b) Explain systemic error. [03]

OR

Q.5 Explain functional elements of measurement system in detail with necessary diagram. [10]

Q.6(a) Write a note on classification of standards. [07]

Q.6(b) The speed limit on a highway is 60 km/hr. Calculate the limit in ; [03]  
(i) mi/hr (ii) ft/s.

OR

Q.6 Write a note on an electrical standards. [10]

→ X ←

(2)