

SARDAR PATEL UNIVERSITY  
F.Y.B.Sc. (Semester – I)(CBCS) Examination.

2010

Monday, 22<sup>nd</sup> November.

US01CINS01 Instrumentation (Vocational)

Basic Electronics Instrumentation.

Time: - 11:30 To 1:30 PM

Marks: - 70

Answer of all the questions (Including multiple choice questions) should be written in the answer book only.

Q.1 Multiple choice questions (Attempt all)

(10)

- 1 The capacitance of the capacitor depends on
  - (a) Length of connecting leads.
  - (b) Resistivity of the material.
  - (c) Area of the plates.
  - (d) All of above.
- 2 Self inductance of the coil depends on the
  - (a) No of turns in the coil.
  - (b) Permeability of the core.
  - (c) Area of the core.
  - (d) All of above.
- 3 As the light intensity increases the resistance of the LDR
  - (a) Increases.
  - (b) Remains constant.
  - (c) Decreases.
  - (d) None of above.
- 4 \_\_\_\_\_ have higher power rating.
  - (a) Carbon compound resistors.
  - (b) Metal film resistors.
  - (c) Wire wound resistors.
  - (d) None of above.
- 5 Which transformer is normally used at high frequencies?
  - (a) Air core.
  - (b) Ferrite core.
  - (c) Iron core.
  - (d) Dust core.
- 6 Find the resistance of the resistor having Brown, Brown and Brown color band printed on it.
  - (a) 10  $\Omega$
  - (b) 0.1  $\Omega$
  - (c) 100  $\Omega$
  - (d) 1000 $\Omega$
- 7 The resistance of the resistor depends on
  - (a) Length of conductor.
  - (b) Resistivity of the material.
  - (c) Area of the conductor.
  - (d) All of above.
- 8 The temperature coefficient of the Thermister is
  - (a) Positive.
  - (b) Zero.
  - (c) Negative.
  - (d) None of above.
- 9 The dynamic behavior of the PMMC depends on
  - (a) Moment of inertia of the coil.
  - (b) Resistance of the coil.
  - (c) Magnetic field strength.
  - (d) All of above.
- 10 Suspension galvanometers have \_\_\_\_\_ current sensitivity.
  - (a) High.
  - (b) Medium.
  - (c) Low.
  - (d) Zero.

- Q2 Answer the following questions (Any ten) (20)
- (1) What is the resistivity?
  - (2) What are Thermister?
  - (3) Define temperature coefficient.
  - (4) Define permittivity.
  - (5) Define mutual inductance.
  - (6) Explain the function of the core in transformers.
  - (7) Explain the principle of the galvanometer.
  - (8) What is Critical damping?
  - (9) What is swamping resistors?
  - (10) What is multiplier resistance?
  - (11) What is shunt resistance?
  - (12) Define the term volt meter sensitivity.
- Q3 (a) Give an account on the Voltmeter Ammeter method of the resistance measurement. (5)
- (b) Write a note on the wire wound type variable resistors. (5)
- OR
- Q3 (a) Draw the circuit of the Wheatstone bridge, explain its working and derive an expression for unknown resistance. (5)
- (b) Draw the neat diagram of the carbon compound resistors and explain it. (5)
- Q4 (a) List the properties of the capacitors and explain the electrolytic capacitors and paper capacitors in detail. (5)
- (b) What are Trimmers? With necessary diagram explain the construction of the Trimmer capacitors. (5)
- OR
- Q4 (a) Write a note on the fixed inductors. (5)
- (b) Write a note on the taped coil and auto transformer type variable inductors. (5)
- Q5 (a) Give an account on the Suspension Galvanometer. (5)
- (b) Discuss the torque and deflection of the galvanometer. (5)
- OR
- Q5 (a) Draw neat diagram of the PMMC and explain its working. (5)
- (b) Discuss the dynamic behavior of the galvanometer. (5)
- Q6 (a) Draw the basic circuit of DC volt meter and derive an expression for the multiplier resistance for the voltmeter. (5)
- (b) Design a multirange DC voltmeter for the 0-10V, 0-50V and 0-250V ranges. The internal resistance of the coil ( $R_m$ ) is  $100\Omega$  and Full scale deflection current ( $I_{fsd}$ ) is 1mA. (5)
- OR
- Q6 (a) Explain how PMMC galvanometer can be converted in to an Ammeter and derive an expression for the Shunt resistance for an ammeter. (5)
- (b) A 1 mA full scale deflection current meter movement with an internal resistance of  $100\Omega$  is to be converted into a 0 – 100 mA ammeter. Calculate the value of the shunt resistance required. (5)

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(2)