



17317

11718

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) *All questions are compulsory.*
 - (2) *Answer each next main question on a new page.*
 - (3) *Illustrate your answers with neat sketches wherever necessary.*
 - (4) *Figures to the right indicate full marks.*
 - (5) *Assume suitable data, if necessary.*
 - (6) *Use of Non-programmable Electronic Pocket Calculator is permissible.*
 - (7) *Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.*

Marks

1. A) Attempt **any six** :

12

- a) Define the term 'accuracy' and 'sensitivity'.
- b) State the types of standards of measurement.
- c) List four application of CRO.
- d) List four dynamic characteristics.
- e) State two advantages of moving coil instrument.
- f) What is the requirement of shunt in multirange ammeter ?
- g) What is the role of delay line in CRO ?
- h) State the need of signal generators (any two).

B) Attempt **any two** :

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- a) Draw the circuit diagram of DC ammeter using basic 'D' Arnsoval movement and derive the expression for shunt resistance.
- b) Give significance of calibration.
- c) List different types of errors and its source of generation/occurrence.

2. Attempt **any four** :

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- a) Describe the construction of PMMC instrument.
- b) Explain the working of rectifier type of AC voltmeter with neat diagram (any one).
- c) State the reason for voltmeter never connected in series with source of emf.
- d) Explain the block diagram of DFM (Digital Frequency Meter).
- e) Compare DSO with CRO (any four points).
- f) Explain the concept of time domain and frequency domain.

P.T.O.



3. Attempt **any four** :

- What is loading effect and sensitivity of multirange voltmeter ?
- How does electron beam generate horizontal ref line on CRT screen ?
- Write the steps (and procedure) for measurement of frequency and phase of signal by CRO.
- How does Half wave rectifier type AC analog voltmeter use to measure unknown voltage.
- Calculate the value of multiplier, if basic movement having (I_{fsd}) full scale deflection current of 10 mA and Internal resistance R_m of $50\ \Omega$ is used to measure 400 volts.
- Describe the block diagram of Ramp type of voltmeter.

4. Attempt **any four** :

- Compare analog instruments with digital instruments.
- A 2mA meter with internal resistance of $100\ \Omega$ is to be converted to 0 – 150 mA ammeter. Calculate the value of Shunt resistance required.
- State two advantages and two disadvantages of PMMC meter.
- Calculate the vertical input frequency if horizontal frequency is 1500 Hz for fig. (a) and fig. (b).

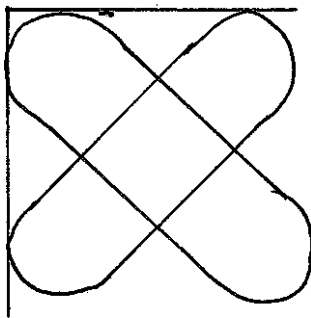


Fig. (a)

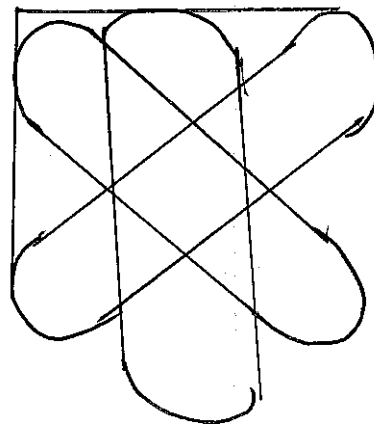


Fig. (b)

- Explain the block diagram of function generator.
- Explain the working principle of wave analyser with neat block diagram.

**5. Attempt any four :**

- a)
 - i) What is the resolution of $4\frac{1}{2}$ DMM.
 - ii) Write two uses of Video pattern generator.
- b) Find the phase relation for following fig. (c) and fig. (d).

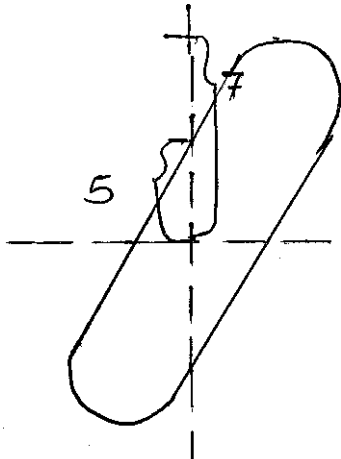


Fig. (c)

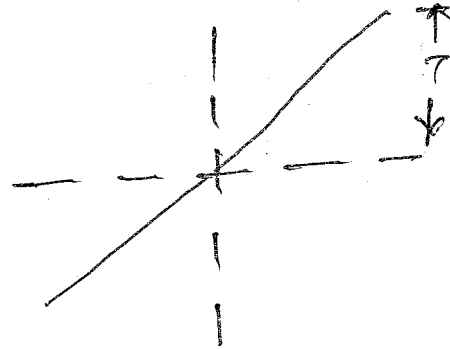


Fig. (d)

- c) Draw the block diagram of DSO.
- d) Draw and explain RF signal generator.
- e) Explain the block diagram of spectrum analyser.
- f) What is the use of Q meter ? Draw its neat diagram.

6. Attempt any four :

- a) Draw dual trace CRO and explain the function of Alt/Chop mode.
- b) How diode and transistor are tested with help of (i) DMM (ii) CRO ?
- c)
 - i) Draw characteristics of pulse and label it.
 - ii) Define – Rise Time, Overshoot.
- d) Explain the block diagram of Dual slope DVM.
- e) List the specification of DMM.
- f) Give the functions **any four** knob of following :
 - i) X-shift on CRO. 1
 - ii) CT MODE Button on CRO. 1
 - iii) Symmetry knob on function generator. 1
 - iv) Level knob on function generator. 1
 - v) V/div on CRO. 1
 - vi) Mono/Dual Button on CRO. 1