



17317

21718

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. Attempt any five :

20

- a) Classify instruments and give example of each.
- b) Draw and explain working of PMMC instrument.
- c) Explain how shunt resistor type DC ammeter is measures current.
- d) List advantages of digital instruments over analog instruments (any 4).
- e) Draw the block diagram of vertical deflection system and explain.
- f) List different applications of CRO.
- g) Define signal generator and state necessity of signal generator.

2. Attempt any four :

16

- a) Define :
 - i) Accuracy
 - ii) Sensitivity
 - iii) Resolution
 - iv) Speed of response.
- b) Explain working of multirange DC voltmeter.
- c) Compare Analog instruments with digital instruments (4 points).
- d) Explain measurement of 'Time' and 'Frequency' using CRO.
- e) Draw and explain block diagram of function generator.
- f) Draw and explain block diagram of spectrum analyzer.

P.T.O.

**3. Attempt any four :**

- a) Give the classification of error and explain in brief.
- b) Derive the equation of torque of PMMC instruments.
- c) State the disadvantages of digital instruments.
- d) Draw and explain block diagram of Digital Multimeter (DMM).
- e) Draw and explain Dual beam Dual trace CRO.
- f) What do you mean by waveform analyzer ? State the necessity of waveform analyzer.

4. Attempt any four :**16**

- a) Classify 'standards' of measurement and explain each standard.
- b) Derive expression for shunt resistance of DC ammeter.
- c) List different applications of digital instruments.
- d) Draw neat labeled block diagram of digital storage oscilloscope and applications of DSO.
- e) Explain working of frequency selective wave analyzer.
- f) Draw and explain logic analyzer and state any two applications.

5. Attempt any four :**16**

- a) Draw and explain half wave rectifying type AC voltmeter.
- b) Draw and explain block diagram of digital frequency meter.
- c) Draw block diagram of CRO. Explain function of each block.
- d) Draw a neat diagram of pattern generator.
- e) State advantages of CRO over multimeter.
- f) Draw and explain circuit diagram of time base generator in CRO.

6. Attempt any four :**16**

- a) How phase shift can be measured using Lissajous pattern ?
 - b) Explain block diagram of radio frequency type signal generator.
 - c) Describe loading effect of voltmeter. How to avoid it ?
 - d) Draw and explain block diagram of ramp type digital voltmeter.
 - e) Draw and explain full wave rectifying type AC voltmeter.
 - f) Compare between single trace CRO and dual trace CRO.
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