2018

CBCS

3rd Semester

ELECTRONICS

PAPER—GE3T

(Honours)

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Instrumentation

Group—A

1. Answer any *five* questions :   5×2

   (a) What is PMMC type instruments ?   2

(b) What is shunt type ohm-meter ?   2

(c) What are the different types of multimeter ?   2

(d) Write down differences between dual trace oscilloscope and dual beam oscilloscope.   2

(e) Write two application of audio oscillator.   2

(f) Write application or ECG.   2

(g) What are the advantages of instrumentation amplifier ?   2

(h) Define gauge factor in case of transducer.   2

Group—B

2. Answer any *four* questions :   4×5

(a) With neat diagram explain in details the construction of PMMC instruments.   5

(b) Name four types of electrical pressure transducer and describe one application of each type.   2+3

(c) (i) Give the block diagram of elements of a digital data acquisition system.

(ii) What is the percentage error for remote amplifier where the resistance of the wire is 1 W, the load resistance is 10 kW, power supply current is 50 mA and the output of the amplifier is 1 V?

3+2

(d) Draw the block diagram of wideband sweep frequency generator and explain the operation. 2+3

(e) (i) Discuss the relative merits of electrostatic and magnetic deflection system.

(ii) The deflection sensitivity of a CRT is 0.2 mm/V. Calculate the unknown voltage which where applied to the vertical plates causes 2 mm shift of the light spot. 3+2

(f) Draw the basic circuit used in a solid-state electronic DC voltmeter. Explain its action. How you modify the circuit to measure ac voltage. 1+2+2

Group—C

3. Answer any *one* question : 1×10

(a) (i) What do you mean by deflection sensitivity? Derive an expression for deflection sensitivity of a CRT using magnetic deflection.

(Turn Over)

(ii) The deflection system in a CRt employs a magnetic field of 10^{-4} T acting over an axial length of 4 cm is placed 24 cm from the screen. If the accelerating voltage is 600 volt, find the deflection of the spot on the fluorescent screen.   (2+5)+3

(b) (i) What is an instrumentation amplifier ? Explain the working of instrumentation amplifier using transducer bridge.

(ii) A resistance strain gage with a gage factor of 2 is fastened to a steel member subjected to a stress of 1050 ug/cm^2. The modules of elasticity of steel is approximately 2.1×10^6 kg/cm^2. Calculate the change in resistance of the strain gage element due to the applied Stress.   (2+5)+3