AP–503

B.Sc. Part—III (Semester—V) Examination

ELECTRONICS

(Measuring Instruments)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) Question No. **1** is compulsory.

(2) Draw neat diagrams wherever necessary.

1. (A) Fill in the blanks with appropriate words :

(i) Thermister is an example of ———— sensor

(ii) VCO stands for ————

(iii) Instrument used to trace response of muscle is known as ————

(iv) ———— is an energy-conversion device. 2

(B) Choose the correct alternative :

(i) Solar cell is a ———— transducer.

(a) analog

(b) digital

(c) active

(d) passive

(ii) IC 555 is used as ————.

(a) Voltage divider

(b) Timer

(c) Frequency divider

(d) Frequency modulation.

(iii) X-Ray is used for diagnosis of ————.

(a) Heart

(b) Brain

(c) Skin

(d) Bone

(iv) Mechanical sensors measure the change in ———— property of an object

(a) Heat

(b) Optical

(c) Mechanical

(d) Magnetic 2

(P) Draw the block diagram of digital frequency meter and explain the function of each block. 6

(Q) What is digital voltmeter ? Give its principle. 2

(R) What are the basic element of magnetic tape recorder ? Explain. 4

EITHER

6. (A) Explain the principle and working of Bent-Beam electrothermal actuator. 6

(B) What is actuator ? Explain the principle of DC motor as electromechanical actuator. 6

OR

(P) Explain strain gauge as a mechanical sensor. 6

(Q) Explain the working of phototransistor as an optical sensor with neat diagram. 6

EITHER

7. (A) Explain the operation of ECG with suitable block diagram. 6

(B) Draw the block diagram of X-Ray machine. Explain the operation of each block. 6

OR

(P) What is EEG ? Explain the operation of EEG with suitable diagram. 6

(Q) Draw a block diagram of instantaneous heart rate meter and explain each block. 6

(C) Answer in **one** sentence :

(i) What is digital display device ?

(ii) What is sensor ?

(iii) Give the two application of LED display.

(iv) What is pyrometer ? 4

EITHER

2. (A) Explain construction and working of inductive transducer. 6

(B) What are the basic parts of transducer ? Explain. 3

(C) Explain primary and secondary transducers. 3

OR

(P) What is capacitive transducer ? Explain its construction and working. 6

(Q) Draw the block diagram of generalised instrumentation system. 3

(R) State the principle of resistive transducer. 3

EITHER

3. (A) What is thermister ? Explain its principle and operation in measurement of temperature. 6

(B) Explain the operation of total radiation pyrometer with suitable diagram. 6

OR

(P) What is thermocouple ? Give its classification. 4

(Q) Explain the measurement of temperature using thermocouple. 4

(R) Draw the labelled diagram of infrared pyrometer and explain its principle. 4

EITHER

4. (A) What is timer ? Draw the block diagram of IC 555 and explain function of each block. 6

(B) Explain the use of PLL as FM demodulator. 4

(C) Astable multivibrator is connected with R_1 = 10 kΩ, R_2 = 2.2 kΩ and C = 100 µf. Find the frequency of its square wave. 2

OR

(P) Draw the function of PLL with suitable block diagram. 6

(Q) Define the Lock in range and capture range of PLL. 4

(R) Draw the circuit diagram of monostable multivibrator using IC 555. 2

EITHER

5. (A) What is recorder ? Give its classification. 3

(B) Draw the block diagram of X-Y recorder and explain the function of each block. 6

(C) Explain seven segmental display. 3

OR