22220

**11819**

**3 Hours / 70 Marks** Seat No. | | | | | | | | |

***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 of the following :** **10**

(a) Define passive components.

(b) Give classification of resistors in brief.

(c) Write down mathematical formula for capacitance and on which factor capacitance depends.

(d) State Faraday's law of electromagnetic induction.

(e) Draw V-I characteristics of P-N junction diode.

(f) Write the types of rectifiers in short.

(g) Draw symbol of photodiode and tunnel diode.

**2. Attempt any THREE of the following :** **12**

(a) Describe the construction and working of linear potentiometer.

(b) Explain fixed capacitor on the basis of construction and applications.

(c) Draw and explain constructional diagram of electrolytic capacitor.

(d) Explain the working of full wave rectifier with neat sketch.

**3. Attempt any THREE of the following :** **12**

(a) State any two properties of ferromagnetic materials in detail and write down any two applications of ferromagnetic materials.

(b) Describe air core inductor with neat sketch.

(c) Explain the working of schottky diode.

(d) State the need of filter and explain working of low pass filter.

**4. Attempt any THREE of the following :** **12**

(a) Explain polarized cell and depolarization of a cell with neat sketch.

(b) Write down classification of medical equipment on the basis of application and mention one example of each type.

(c) Explain Light Dependent Resistor (LDR) and Temperature Dependent Resistor (TDR).

(d) Compare variable capacitor with fixed capacitor (any two points of each).

(e) List any four materials used for construction of resistors along with its properties.

**5. Attempt any TWO of the following :** **12**

(a) Explain Zener diode along with its characteristics.

(b) Explain construction of P-N junction diode with neat sketch.

(c) Describe any four objectives of medical instrumentation system in detail.

**6. Attempt any TWO of the following :** **12**

(a) Define the following parameters of rectifier

(i) ripple factor (ii) ripple frequency

(iii) P/V of diode (iv) TUF

(b) State the full meaning of ECG, EEG, EMG signals and write any one specific use of these signals. Draw standard wave form of ECG.

(c) Explain merits and demerits of

(i) Ferrite core inductor

(ii) Iron core inductor

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