

17213

21819

3 Hours / 100 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 TEN of the following :

20

- (a) Draw the symbol of Fixed and variable inductor.
- (b) Give the relation between  $\alpha$  and  $\beta$ .
- (c) Draw symbol of Zener diode and Schottky diode.
- (d) Give two advantages and two disadvantages of Integrated circuits.
- (e) Draw V-I characteristics of PN diode.
- (f) List any two types of couplings used in amplifier.
- (g) Define  $\alpha$  and  $\beta$  with respect to transistor.
- (h) Draw the symbol of N-channel and p-channel JFET.
- (i) Define static resistance and dynamic resistance of diode.

- (j) Give the classification of IC's.
- (k) State the typical values of knee voltage for silicon and germanium diode.
- (l) Define passive components. Give the examples.

**2. Attempt any FOUR :****16**

- (a) Give four applications of electronics.
- (b) Describe the principle of operation of varactor diode.
- (c) Draw a circuit diagram of transistor as a switch and explain how transistor acts as a closed switch and open switch.
- (d) Draw the circuit diagram of single stage CE amplifier and give the function of each.
- (e) Draw the forward and reverse characteristics of Zener diode and describe in brief.
- (f) Define Oscillator. Give Bark Hausen criteria for sustained oscillations.

**3. Attempt any FOUR :****16**

- (a) Give the classification and use of different types of resistors.
- (b) With the help of waveform, explain the working of bridge type full wave rectifier.
- (c) Draw the construction of p-channel MOSFET and describe it's working.
- (d) Define 'Biasing of transistor'. Explain in brief voltage divider biasing.
- (e) A transistor has collector current  $I_C = 1.5 \text{ mA}$  and base current;  $I_B = 90 \mu\text{A}$ . Find  $\alpha$  and  $\beta$  of the transistor.
- (f) With suitable diagram, explain the working of astable multivibrator. Draw the necessary waveforms.

**4. Attempt any FOUR :****16**

- (a) Explain operation of P-N junction diode in forward biased condition.
- (b) Differentiate between Half wave rectifier and bridge full wave rectifier on the basis of
  - (1) No. of diodes, (2) Efficiency, (3) PIV, (4) D.C. output voltage.
- (c) Draw the diagram of PNP transistor. Describe its working.
- (d) Draw the net sketch of two stage transformer coupled amplifier.
- (e) Draw a circuit diagram of centre tap full wave rectifier with LC filter and explain the operation.
- (f) With suitable circuit diagram, explain the working of crystal oscillator.

**5. Attempt any FOUR :****16**

- (a) Draw V–I characteristics of tunnel diode and show different regions on the characteristic curve.
- (b) Define the following terms :
  - (1) PIV of diode
  - (2) Rectification
  - (3) Efficiency of rectifier
  - (4) Ripple factor
- (c) Define current gain and voltage gain. What is the need for multistage amplifiers ?
- (d) Draw the forward and reverse characteristics of zener diode and describe in brief.
- (e) List two advantages and disadvantages of R-C coupled amplifier.
- (f) Explain the operating principle of LED. State any two applications of LED.

**P.T.O.**

**6. Attempt any FOUR :****16**

- (a) Draw the characteristics of LDR. Explain how variation of resistance takes place with intensity of light.
  - (b) Draw the block diagram of regulated power supply and label it.
  - (c) Draw and explain drain characteristics of JFET.
  - (d) Draw the frequency response curve of a single stage RC coupled amplifier. Explain its behaviour at low frequencies and high frequencies (i.e. below 50 Hz and above 20 kHz respectively).
  - (e) Compare JFET and BJT, on any four points.
  - (f) With the suitable diagram, explain the working of capacitor filter. Draw the necessary waveforms.
-