

17213

15162

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. Answer any TEN :

20

- (a) Define inductance and capacitance.
- (b) State any four applications of BJT.
- (c) State the majority and minority carriers in p-type and n-type of extrinsic semiconductor.
- (d) Draw the block diagram of multi-stage amplifier.
- (e) State the effect of forward bias and reverse bias on depletion width of p-n junction diode.
- (f) Give the classification of ICs.
- (g) State the need of rectification.
- (h) Define transistor and draw the symbol of pnp and npn transistor.
- (i) What is meant by avalanche breakdown ?
- (j) List any four advantages of ICs.
- (k) Draw the ideal V-I characteristic of p-n junction diode.
- (l) List the application areas of electronics.

- 2. Attempt any FOUR :** **16**
- (a) Give the classification of electronic components with two examples of each.
 - (b) List the four specifications of p-n junction diode.
 - (c) Explain the working principle of npn transistor with the help of diagram.
 - (d) Write the function of each component used in single stage CE amplifier.
 - (e) Explain the V-I characteristic of p-n junction diode with the help of circuit diagram.
 - (f) With neat ckt diagram, explain how transistor work as a switch.
- 3. Attempt any FOUR :** **16**
- (a) Explain working of thermistor.
 - (b) Draw V-I characteristic of tunnel diode and show different regions on the characteristic curve.
 - (c) Define alpha and beta of a transistor and give the relation between them.
 - (d) Sketch the construction of n-channel J-FET and explain its working principle.
 - (e) Compare FET and BJT (any four points).
 - (f) Give the operating principle of crystal oscillator with its circuit diagram.
- 4. Attempt any FOUR :** **16**
- (a) Draw experimental set-up to plot the V-I characteristic of LED.
 - (b) Draw the circuit diagram of Half wave rectifier and explain its working with input-output waveforms.
 - (c) Draw the transfer characteristic of n-channel J-FET and give the meaning of I_{dss} & $V_{GS\ off}$.
 - (d) Draw two stage transformer coupled amplifier and define bandwidth of an amplifier.
 - (e) State the need of filter and explain 'C' type filter with diagrams and waveforms.
 - (f) Explain the operation of transistor astable multivibrator with waveforms.

5. Attempt any FOUR :**16**

- (a) Explain the operating principle of varactor diode.
- (b) Distinguish between Bridge rectifier and centre tap full wave rectifier (any four points).
- (c) Explain the working of transistor Bistable multivibrator using circuit diagram.
- (d) Define the following terms :
 - (i) P/V of diode
 - (ii) Efficiency of Rectifier
 - (iii) Rectification
 - (iv) Ripple factor
- (e) Explain the working of two stage RC coupled amplifier with neat circuit diagram.
- (f) Explain the working of zener as a voltage regulator.
- (g) Draw the experimental set-up to plot input and output characteristics of CE configuration.

6. Attempt any FOUR :**16**

- (a) Compare pn junction diode and zener diode (any four points).
 - (b) Compare LC and CLC filter for components used, ripple factor, waveforms.
 - (c) Explain the working principle of n-channel depletion type of MOSFET.
 - (d) Explain the working of direct coupled amplifier with circuit diagram.
 - (e) Explain the working of voltage divider biasing technique of transistor.
 - (f) Draw the block diagram of regulated power supply and explain the working of each block.
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