

17321

21718

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) 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) Why is an intrinsic semiconductor doped ?
- (b) Define line and load regulation.
- (c) List four applications of LED.
- (d) What is the need of regulated power supply ?
- (e) Why transistor is called as bipolar device ?
- (f) List different types of FET.
- (g) Draw symbol of NPN and PNP transistor.
- (h) Draw the circuit diagram of voltage divider biasing.
- (i) What is Barkhausen Criterion ?
- (j) Draw truth table & write Boolean expression of Ex-OR gate.

- (k) Draw symbol of NAND gate. State its truth table and write its Boolean expression.
- (l) State the need of cascade amplifier.
- (m) List the advantages of RC coupled amplifier.
- (n) Why common emitter configuration is commonly used ?

2. Attempt any FOUR of the following :

16

- (a) Derive the relationship between α and β of a transistor.
- (b) Compare Shunt and Series Regulator. (4 points)
- (c) What is photodiode ? Draw the symbol and explain the operation of photodiode.
- (d) Draw circuit diagram of Bridge Rectifier with Shunt capacitor filter along with its Input/Output waveforms.
- (e) Draw and explain RC phase shift Oscillator.
- (f) Compare between CB, CE & CC transistor configuration. (4 points)

3. Attempt any FOUR of the following :

16

- (a) Classify power amplifier on basis of operating point with appropriate sketch.
- (b) Draw characteristics of UJT and label each region and all important points.
- (c) Design AND gate using NOR gates only.
- (d) Draw the single stage RC coupled amplifier circuit and explain its operation.
- (e) Draw symbol of LED and explain its working principle.
- (f) Compare RC and LC filter. (four points)

4. Attempt any FOUR of the following :**16**

- (a) Draw and explain Hartely Oscillator circuit diagram.
- (b) Draw the circuit diagram of transistorized series voltage regulator and explain it's operation.
- (c) Draw and explain self-biasing of a transistor.
- (d) Draw and explain Class-A power amplifier circuit diagram.
- (e) Compare JFET and BJT. (4 points)
- (f) Explain the operating principle of LASER and list applications of LASER diode.

5. Attempt any FOUR of the following :**16**

- (a) Define following :
 - (i) Radix
 - (ii) Bit
 - (iii) Nibble
 - (iv) Byte
- (b) Draw the circuit of any one type of phase shift oscillator and explain it's operation.
- (c) Draw the circuit diagram of crystal oscillator and explain its working.
- (d) Explain how zener diode can be used as a voltage regulator.
- (e) Explain the working principle of depletion and enhancement type MOSFET.
- (f) Draw the frequency response curve of single stage RC coupled amplifier.
Why gain falls in low frequency and high frequency region ?

P.T.O.

6. Attempt any FOUR of the following :**16**

- (a) With neat diagram explain working of NPN transistor.
 - (b) Define μ , g_m and r_d and state relation between μ , g_m and r_d .
 - (c) Draw symbol and VI characteristics of zener diode and label all regions in it.
 - (d) State the need of cascade amplifier and draw circuit diagram of 2-stage direct coupled amplifier.
 - (e) Compare RC coupled, transformer coupled and direct coupled amplifier based on four points.
 - (f) Compare half wave and full wave rectifier on basis of PIV, ripple factor, efficiency & TUF.
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