

**B.TECH SEM - III (2007 COURSE) (E & TC ENGG.) : WINTER -
2017**

SUBJECT: ELECTRONIC DEVICES

Day: **Monday**
Date: **22/01/2018**

Time: **10.00 AM TO 01.00 PM**
Max. Marks: 80

W-2017-2394

N.B.:

- 1) Q. No. 1 and Q. No. 5 are **COMPULSORY**. Out of the remaining attempt any **TWO** sections from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the set ions should be written in **SEPARATE** answer book.
- 4) Assume suitable data if necessary.

SECTION-I

- Q.1** a) State and prove that mass action law. Define and volt- equivalent of (06)
temperature.
- b) Write short note on clipping circuits. (04)
- c) Give reason: common base configuration does not need bias stabilization. (04)
- Q.2** a) Derive the expression for the current density in terms of concentration of (06)
electron, electron charge, mobility and electric field density.
- b) Determine the Junction potential for a silicon p-n junction at $T = 800^0\text{K}$ for: (07)
i) $N_A = 10^{15} \text{ cm}^{-3}$ $N_D = 10^{17} \text{ cm}^{-3}$
ii) $N_A = N_D = 10^{17} \text{ cm}^{-3}$
- Q.3** a) Explain with neat circuit diagram the operation of full wave voltage Tripler (06)
circuit.
- b) A silicon p-n junction diode has a reverse saturation current of $0.1 \mu\text{A}$ at 25^0C . (07)
Calculate its forward and reverse dynamic resistance at 105^0C for 0.8 V .
- Q.4** a) State significance of the following BJT parameters: (07)
i) h_{fe}
ii) I_{CO}
iii) V_{CBO}
- b) What is the need or necessity of having multistage amplifier? Explain with (06)
reasons.

P. T. O.

SECTION-II

- Q.5** a) Explain the characteristics parameter of the JFET. (05)
b) Explain the use of MOSFET in VLSI device. (05)
c) State properties of laminates used in PCB. (04)

- Q.6** a) Explain different types of JFET, its operation and its schematic symbols. (06)
b) Determine the value of R_s required to self-bias an N- channel JFET with $I_{DSS} = 50 \text{ mA}$, $V_P = -10\text{V}$ and $V_{GSQ} = -5\text{V}$. (07)

- Q.7** a) Explain E- MOSFET characteristics and its parameters. (06)
b) For the E-MOSFET circuit shown in fig. (1). Calculate the D.C. bias point [$V_T = 3\text{V}$; $I_{D(ON)} = 6\text{mA}$ at $V_{GS(ON)} = 8\text{V}$.] (07)

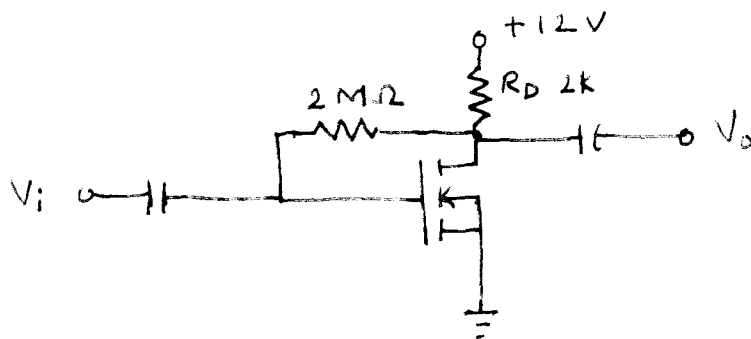


Fig. 1.

- Q.8** a) Explain the frequency response of BJT amplifier. (06)
b) Explain important precautions to be taken while preparing PCB layout. Also explain hard solders and soft solders. (07)