

B. Tech. Sem -III (E & TC Engg.) (2014 COURSE) (CBCS) :
WINTER - 2018

SUBJECT: ELECTRONIC DEVICES AND APPLICATIONS

Day: Monday
Date: 26/11/2018

W-2018-2323

Time: 10.00 AM TO 01.00 PM
Max Marks. 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data, if necessary.

- Q.1** For voltage divider biasing circuit using transistor has following parameters: **(10)**
 $R_1 = 68 \text{ k}\Omega$, $R_2 = 25 \text{ k}\Omega$, $R_C = 2.5 \text{ k}\Omega$, $R_E = 1.5 \text{ k}\Omega$, $\beta = 100$ and $V_{CC} = 16\text{V}$. Determine the co-ordinates of operating point of Transistor. Draw DC load line on output characteristic and show location of Q point on it. Also comment on region of operation.
- OR**
- Q.1** Determine all resistor values of voltage divider biasing circuit using transistor, **(10)**
if $V_{CC} = 12\text{V}$, $V_{CE} = 6\text{V}$, $I_C = 4\text{mA}$, $S = 20$, $\beta = 100$, $V_E = 1\text{V}$.
- Q.2** For CE amplifier with bypass capacitor, transistor has hybrid parameters as **(10)**
 $h_{ie} = 1.1 \text{ k}\Omega$, $h_{fe} = 50$, $h_{rc} = 2.5 \times 10^{-4}$, and $h_{oe} = 25 \times 10^{-6} \text{ A/V}$. If circuit has $R_1 = 100 \text{ k}\Omega$, $R_2 = 10 \text{ k}\Omega$, $R_C = 4.7 \text{ k}\Omega$, $R_E = 1 \text{ k}\Omega$. & $R_S = 10 \text{ k}\Omega$. Determine A_I , A_V , A_{VS} , Z_i , Z_o .
- OR**
- Q.2** Compare transistor CE, CB and CC configuration amplifiers with their **(10)**
performance parameters.
- Q.3** Determine V_{DSQ} , V_{GSQ} , I_{DQ} and g_m for N - channel JFET self bias circuit, **(10)**
if $V_{DD} = 20\text{V}$, $R_D = 3.3 \text{ k}\Omega$, $R_G = 1\text{M}\Omega$, $R_S = 1\text{k}\Omega$, $I_{DSS} = 6\text{mA}$
and $V_p = -4\text{V}$.
- OR**
- Q.3** The JFET with bypass capacitor amplifier has $r_d = 60 \text{ k}\Omega$, $V_p = -4\text{V}$, $I_{DSS} = 10\text{mA}$, $V_{DSQ} = 9.24\text{V}$, $R_{source} = 50 \text{ k}\Omega$. Determine A_V , Z_i , Z_o for this circuit. **(10)**
- Q.4** Explain following non-ideal characteristics of E-MOSFET. **(10)**
i) Finite output resistance
ii) Body effect
iii) Sub threshold conduction
iv) Temperature effect
v) Break down effect
- OR**
- Q.4** Draw the construction and explain in detail the working of n channel E-MOSFET along with its transfer characteristics and output characteristics. **(10)**
- Q.5** Draw and explain in detail monostable multivibrator using BJT. **(10)**
- OR**
- Q.5** Explain in detail voltage Tripler and Voltage quadrupler configuration. **(10)**
- Q.6** Draw and explain the construction and working of LED and photodiode. **(10)**
- OR**
- Q.6** Explain in detail art work design and fabrication process of single sided PCB. **(10)**