B.E. Electronics Engineering / Electronics Telecommunication / Communication Engineering
Third Semester (CBS Pattern)

EN/ET 302 – Electronic Devices & Circuits

P. Pages : 3 **GUG/W/18/1489**

Time : Three Hours * 1 1 7 3 * Max. Marks : 80

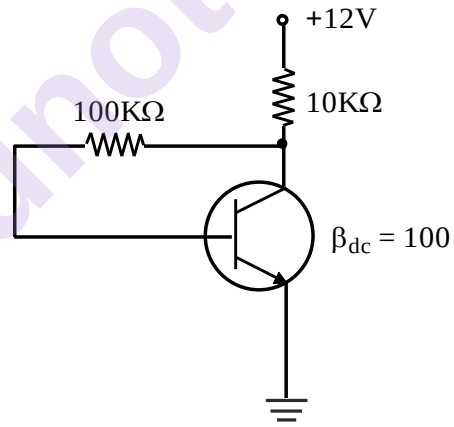
Notes : 1. All questions carry marks as indicated.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Draw and explain the circuit diagram of CE amplifier configuration with its input and output characteristics. **8**

b) Design a fixed biased circuit using a silicon transistor having β value of 100, $V_{CC} = 10V$, $V_{CE} = 5V$ and $I_C = 5mA$. **8**

OR

2. a) Calculate the Q – point values (I_C and V_{CE}) for the circuit shown in fig. below. **8**



b) Derive the expression for V_B, I_E, V_{CE} and stability factor for voltage divider bias circuit using BJT. **8**

3. a) Explain the construction and operation of JFET with suitable diagram. **8**

b) For JFET, if $I_{DSS} = 20mA$, $V_{GS(off)} = -5V$ and $g_{mo} = 4mS$ or mA/V. Determine the transconductance for $V_{GS} = -4V$ and find I_D at this point. **8**

OR

4. a) Explain n – channel depletion type MOSFET in detail. **8**

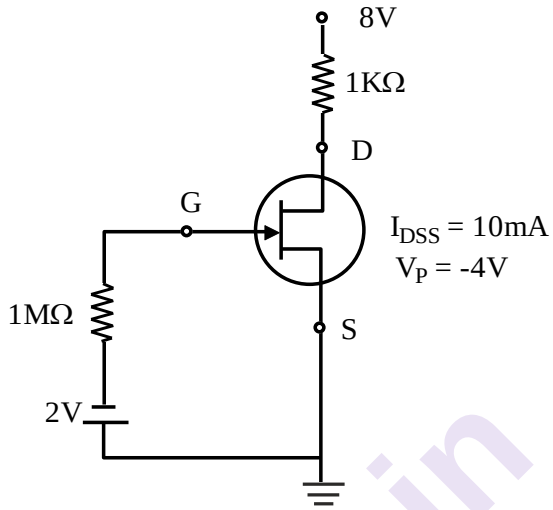
b) For the circuit shown in fig. Calculate : **8**

i) V_{GSQ}

ii) I_{DQ}

iii) V_{DS}

iv) V_D

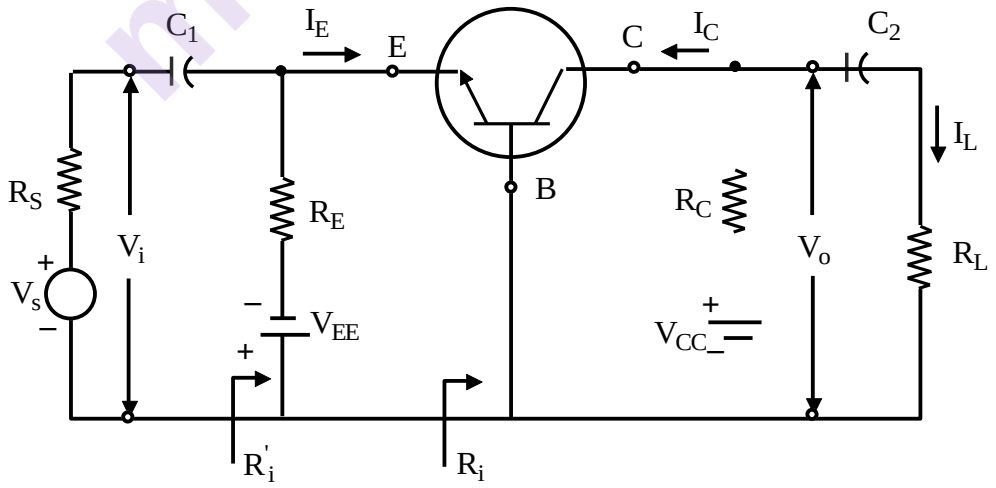


5. a) Write short notes on the following : **8**

i) Hybrid model for two part network.

ii) Hybrid equivalent circuit of a transistor.

b) A common base amplifier as shown in fig. below has the following components **8**
$R_S = 600\Omega$, $R_C = 5.6K$, $R_E = 5.6K$, $R_L = 39K$. The transistor parameter are $h_{ie} = 1K$, $h_{fe} = 85$ and $h_{oe} = 2\mu A/V$. Calculate R_i, R_o and A_V.



OR

6. a) State and explain Miller's theorem. **8**

b) Compare common emitter, common base and common collector configuration on basis of their parameters. **8**

7. a) Explain the RC coupled amplifier and transformer coupled amplifier in detail. **8**

b) A class B, push pull amplifier drives a load of 16Ω, connected to the secondary of the ideal transformer. The supply voltage is 25V. If the number of turns on the primary is 200 and the number of turns on the secondary is 50. Calculate maximum power output, dc power input, efficiency and maximum power dissipation per transistor. **8**

8. a) Explain the advantages and disadvantages of class B push pull amplifier. **8**

b) What is cross over distortion in amplifiers? How can it be eliminated. **8**

9. a) Write down different types of feedback networks in an amplifier. Explain any one in detail. **8**

b) Find the capacitor C and h_{fe} for the transistor to provide a resonating frequency of 10 KHz of a transistorized phase shift oscillators. Assume, $R_1 = 25K\Omega$, $R_2 = 57K\Omega$, $R_C = 20K\Omega$, $R = 7.1K\Omega$ and $h_{ie} = 1.8K\Omega$. **8**

OR

10. a) What is Barkhausen criteria. Explain RC phase shift oscillator in detail with suitable diagram and expression. **8**

b) In a transistorized Hartley Oscillator the two inductances are 2mH and $20\mu H$ while the frequency is to be changed from 950 KHz to 2050 KHz. Calculate the range over which the capacitor is to be varied. Neglect the mutual inductance. **8**

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