Marks: 30   **Time: 01Hours**

Instructions:
1. Attempt all questions.
2. Draw neat and clean circuit diagram/block diagram and waveforms.
3. **Maintain the Sequence of Answer.**
4. Assume data if necessary with proper justification.

Q.1   Attempt Any One: 06

(a)   List out the different types of biasing methods in BJT. Draw the circuit diagram of   06
fixed bias circuit and derive the equations for all necessary parameters.

(b)   Draw the AC equivalent of Common Drain configuration. And derive the equation   06
for voltage gain, input impedance and output impedance.

Q.2   Attempt Any Two: 12

(a)   A transistor with $\beta=45$ is used with
collector to base resistor RB biasing with
quiescent value of 5V for VCE. If
VCC=24V, RC=10kΩ, RE=270Ω, find the
value of RB (Fig. 1).

Fig. 1

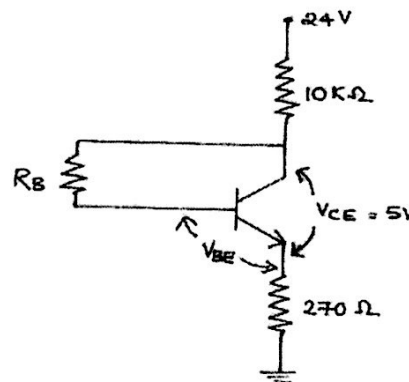(b)   For the circuit shown in figure,   06
determine the value of IC and VCE.
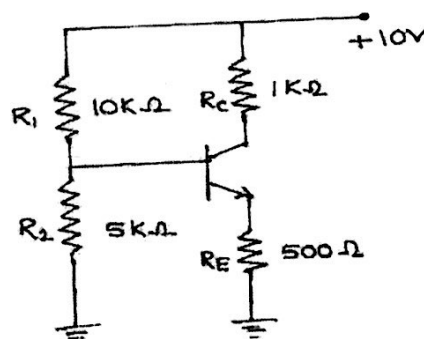Assume VBE=0.7V and $\beta=100$ (Fig. 2).

Fig. 2

Scanned by CamScanner

(c) Determine V_C and V_B for the circuit diagram shown in Fig. 3.

$R_C = 1.2 \, K\Omega$

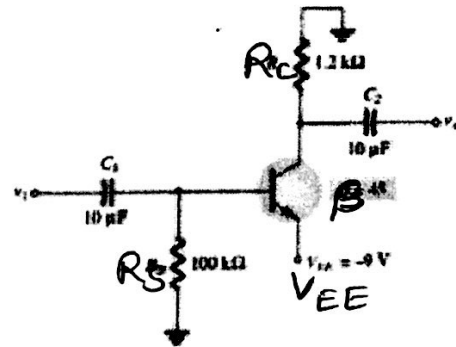$R_S = 100 \, K\Omega$

$\beta = 45$

$V_{EE} = -9V$

06

Fig. 3

Q.3 For the network given in Fig. 4, determine : (i)I_{DQ} , V_{GSQ} (ii)V_G , V_D , V_S (iii)Voltage Gain (iv)Input Impedance (v)Output Impedance

$R_1 = 110 \, K\Omega$

$R_2 = 910 \, K\Omega$

$R_c = 2.2 \, K\Omega$

$R_E = 1.1 \, K\Omega$

$I_{DSS} = -10 \, mA$
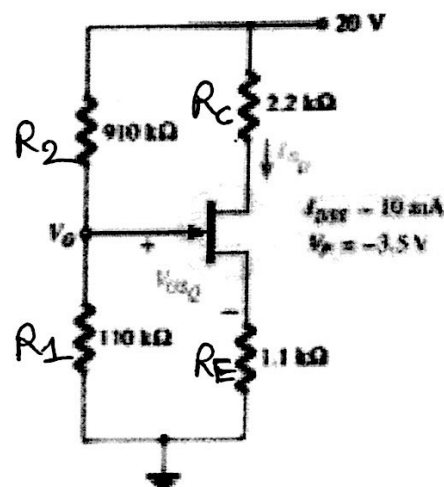
$V_P = -3.5 \, V$

$V_{DD} = 20 \, V$

06

Fig. 4

Q.4 **Attempt any Two: (Each 03 marks):**

06

For the circuit shown in following Figures explain the working of the circuit, draw the output voltage and the transfer characteristics. In each case assume $V_y=0$, $R_f=0$ and $R_r=\infty$.
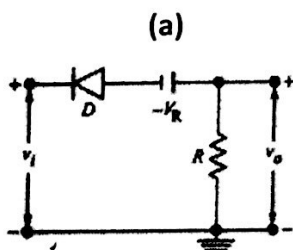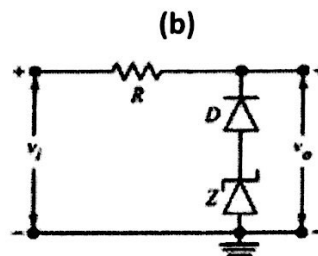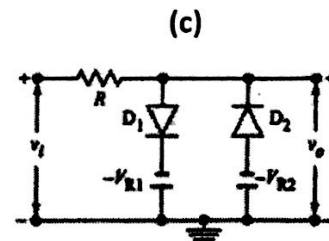
(a)

Fig. 5

(b)

Fig. 6

(c)

Fig. 7

***