

Total No. of Questions : 4]

SEAT No. :

PC392

[6359]-512

[Total No. of Pages : 3

S.E. (ELECTRONICS / E&TC)(Electronics (VLSI Design & Tech.)

(Electronics & Comm. Adv. Comm. Tech.)(Insem)

ELECTRONIC CIRCUITS

(2019 Pattern) (Semester - III) (204181)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4.
- 2) Figures to the right indicate full marks.
- 3) Draw neat diagram wherever necessary.
- 4) Assume suitable data, if necessary.

Q1) a) Draw and explain transfer and drain characteristics of E-MOSFET. [5]

b) Define Threshold Voltage, Pinch-off Voltage, Ohmic Region, Drain Resistance, Trans-conductance of E-MOSFET. [5]

c) A common source amplifier circuit shown in the Figure [1] uses a E-MOSFET with $I_{D(ON)} = 200 \text{ mA}$ at $V_{GS(ON)} = 4 \text{ V}$, $V_T = 2 \text{ V}$ and $g_m = 23 \text{ mA/V}$. Assume $V_i = 25 \text{ mV}$. [5]

Find,

- i) V_{GS}
- ii) I_D
- iii) V_{DS}

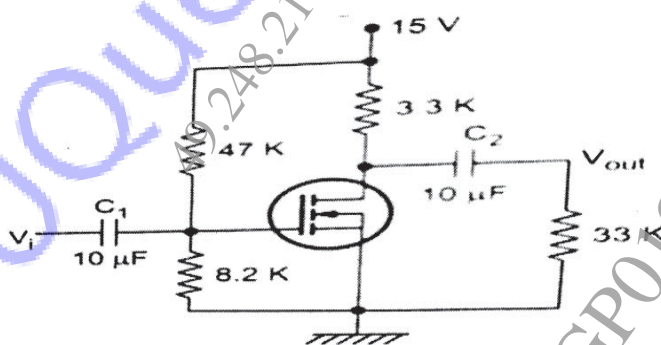


Figure [1]

OR

P.T.O.

- Q2) a) Draw the common source E-MOSFET amplifier and explain frequency response with diagram. [5]
- b) Explain any two non-ideal current-voltage characteristics of E-MOSFET. [5]
- c) Determine I_{DQ} , V_{DSQ} , V_{GSQ} and V_s for the E-MOSFET circuit shown in figure [2]. [5]

Given for E-MOSFET, $V_T = 3V$, $I_{D(ON)} = 5mA$, $V_{GS(ON)} = 6V$

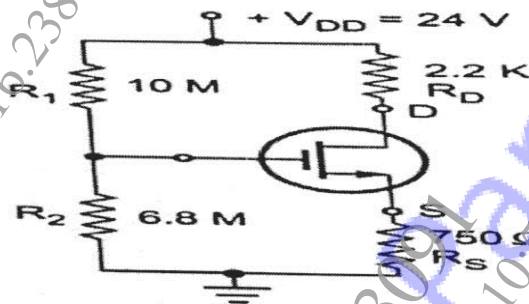


Figure [2]

- Q3) a) Explain advantages of negative feedback in amplifiers. [5]
- b) Explain effect of negative feedback on [5]
- i) Input impedance
 - ii) Output impedance
 - iii) Gain
 - iv) Bandwidth
 - v) Gain stability
- c) Identify topology of feedback and determine A_{vf} , R_{if} , R_{of} for the amplifier

shown in Figure [3]. For the MOSFET, $g_m = 2\text{mA/V}$, $r_d = 40\text{K}$. [5]

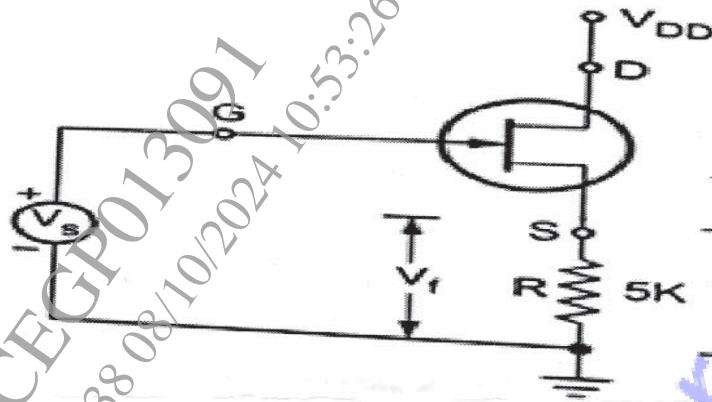


Figure [3]

OR

- Q4) a) Explain MOSFET as Resistor. [5]
- b) Draw circuit diagram of RC phase shift oscillator and calculate the operating frequency, if $R = 10\text{K}\Omega$ and $C = 5\text{nF}$. [5]
- c) Compare different types of feedback topologies with respect to different parameter. [5]

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