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 mA at $V_{GS(ON)}$ = 4 V, V_T = 2V and g_m = 23 mA/V. Assume Vi = 25mV. **[5]**

Find,

i) V_{GS}

ii) I_D

iii) V_{DS}

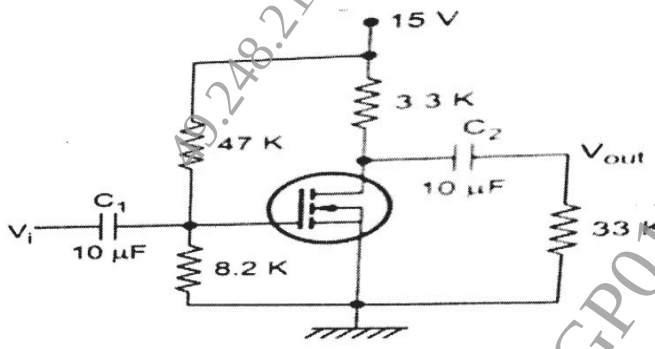

Figure [1]

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 Vs for the E-MOSFET circuit shown in figure [2]. **[5]**

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

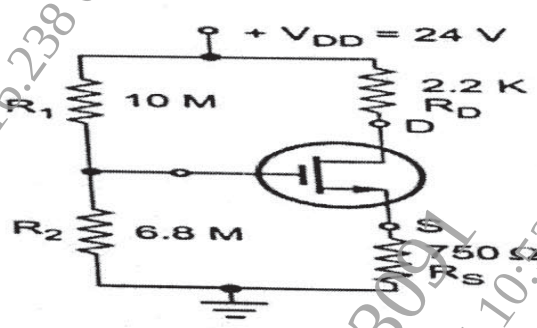

Figure [2]

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}, Rif, Rof for the amplifier

shown in Figure [3]. For the MOSFET, gm = 2mA/V, rd = 40K. **[5]**

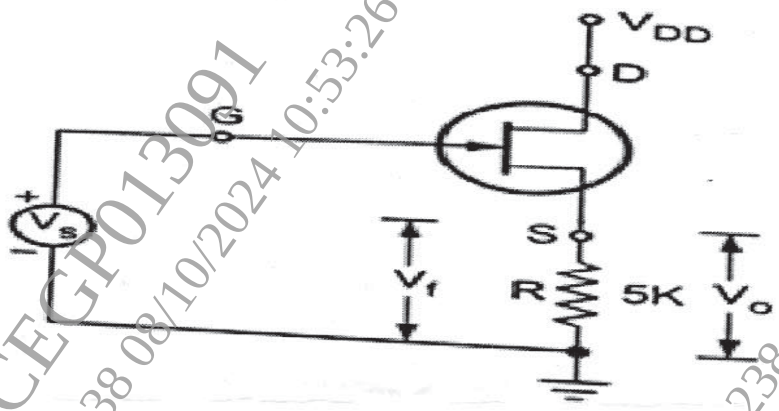

Figure [3]

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 KΩ and C = 5nF. **[5]**

c) Compare different types of feedback topologies with respect to different parameter. **[5]**

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