

Total No. of Questions : 4]

SEAT No. :

PA-5

[Total No. of Pages : 2

[5931] -7
S.E. (E & TC)
ELECTRONIC CIRCUITS
(2019 Pattern) (Semester - I) (204181)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw the neat sketch wherever necessary.*

- Q1)** a) Explain construction and working of N-Type Enhancement MOSFET in details? [5]
- b) List the non-Ideal characteristics of MOSFET? What is channel length modulation. Explain in details? [5]
- c) Design a common source amplifier with voltage divider bias for $I_D = 1\text{mA}$, $V_{DS} = 6.4\text{V}$, $V_{TN} = 2.0\text{V}$, $V_{DD} = 10\text{V}$ and $K_n = 0.80 \text{ mA/V}^2$. Assume suitable data as require. [5]

OR

- Q2)** a) Using V-I characteristics, show in which regions MOSFET operates? Write drain current equation for the respective regions? [5]
- b) How Body effect & Temperature effect will impact on overall performance of MOSFET? [5]
- c) Determine the current I_D and O/P voltage V_{DS} for the DC bias MOSFET circuit using voltage divider bias using parameter as, $R_{G1} = 270\text{K}\Omega$, $R_{G2} = 240 \text{ K}\Omega$, $R_S = 3.9\text{K}\Omega$, $R_D = 10\text{K}\Omega$, $V_{DD} = 5\text{V}$, $K_n = 0.16\text{mA/V}^2$, $V_{GS} = 2.45\text{V}$, $V_{TN} = 1.2\text{V}$ [5]

P.T.O.

- Q3)** a) Explain the effect of negative feedback on amplifier circuit? [5]
- b) Draw block diagram of current series feedback amplifier and derive equation of gain, R_{if} and R_{of} ? [5]
- c) Draw a RC phase shift oscillator and calculate Frequency of oscillation for $R = 8.9\text{kohm}$ and $C = 0.1\ \mu\text{F}$. [5]

OR

- Q4)** a) Calculate the value of R_{if} , R_{of} , A_{vf} for a voltage series feedback amplifier for given specification $R_1 = 1.2\text{K}\Omega$, $A_v = 75$, $R_o = 7.3\text{K}\Omega$, $\beta = 0.20$. [5]
- b) Compare all four types of feedback amplifier with parameter A_{vf} , bandwidth, R_{if} , R_{of} and output? [5]
- c) What is barskhauen criteria for sustain oscillation? Explain working of oscillator? [5]
