

**Third Semester BE Degree Examination March 2021
(CBCS Scheme)**

Time: 3 Hours

Max Marks: 100 marks

Sub: Analog Electronics**Q P Code: 62302****Instructions:** 1. Answer **five full** questions.

2. Choose one full question from each module.

3. Your answer should be specific to the questions asked.

4. write the same question numbers as they appear in this question paper.

5. Write Legibly

Module – 1

- 1 a Compare the characteristics of CB,CC and CE configuration with necessary circuits and represent them in re model. 10 marks
- b What is transistor biasing? Explain the fixed bias circuit with relevant equations and circuit 10 marks

Or

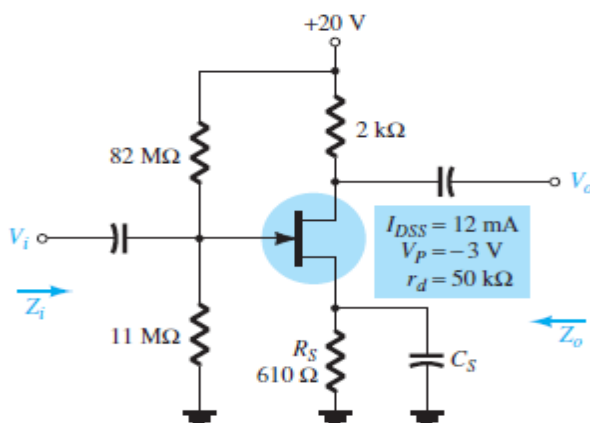
- 2 a Derive an expression for A_v, Z_i, Z_o for emitter follower circuit using re model. 10 marks
- b Determine the values of R_1 and R_c for voltage divider bias circuit with $V_{cc}=20V, R_2=22 K\Omega, R_E=1 K\Omega$ and $I_C=2.5mA$ 10 marks

Module – 2

- 3 a Explain low frequency response of FET amplifier and derive an expression for cut off frequencies defined by input and output circuits. 10 marks
- b Determine the lower cut off frequency for the FET amplifier using the following parameters $C_G=0.01\mu F, C_C=0.5\mu F, C_S=2\mu F, R_{sig}=10K\Omega, R_G=1M\Omega, R_D=4.7K\Omega, R_S=1K\Omega, R_L=2.2K\Omega, I_{DSS}=8mA, V_p=-4V, r_d=\infty\Omega, V_{DD}=20V, V_{GSQ}=-2V, I_{DQ}=2mA$ 10 marks

Or

- 4 a Derive an expression for Z_i and Z_o, A_v for common gate configuration for JFET. 10 marks
- b For JFET voltage divider bias calculate Z_i, Z_o and A_v and also find V_o if $V_i=25mV(rms)$ 10 marks



Module – 3

- 5 a Consider common drain amplifier circuit with $g_m=1\text{ m A/V}$ and $r_o=150\text{ K}\Omega$ let $R_{sig}=1\text{ M}\Omega$ and $R_L=15\text{ K}\Omega$ find R_{in} , R_{out} , A_v and G_v 10 marks
- b From small signal operation of an amplifier derive an expression for DC bias point, signal current in Drain terminal (i_D), voltage gain and trans conductance 10 marks

Or

- 6 a Explain CS amplifier with necessary circuit and equations with and without source resistance 10 marks
- b Explain the different types of internal capacitances in MOSFET and explain the gate capacitive effect. 10 marks

Module – 4

- 7 a For a voltage series feedback amplifier topology. Obtain an expression for A_v , R_{if} and R_{of} . 10 marks
- b A crystal oscillator has $L=0.334\text{ H}$, $C=0.065\text{ pF}$, $C_M=1\text{ pF}$, $R=5.5\text{ K}\Omega$ calculate its series and parallel resonating frequency and find Q of the crystal 10 marks

Or

- 8 a Briefly explain Barkhausen criterion for oscillations and explain RC phase shift oscillator with necessary circuit and equations 10 marks
- b With neat circuit diagram explain the operation of BJT colpitts oscillator. 10 marks

Module – 5

- 9 a With neat circuit diagram, explain the operation of a transformer coupled class A power amplifier. 10 marks
- b Derive an expression for second harmonic distortion in power amplifier using 3-point method. 10 marks

Or

- 10 a With neat circuit diagram explain the operation of a class B push pull power amplifier and derive its conversion efficiency.. 10 marks
- b Briefly explain series voltage regulator and shunt voltage regulator with necessary block diagrams. 10 marks
