

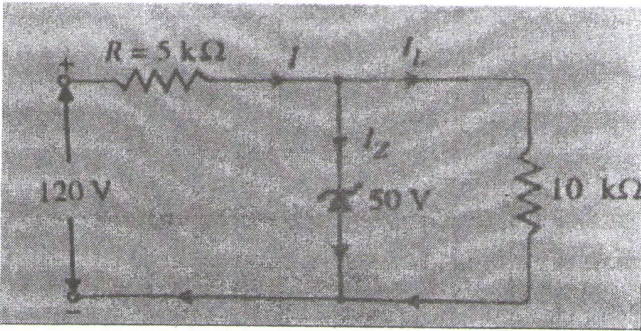
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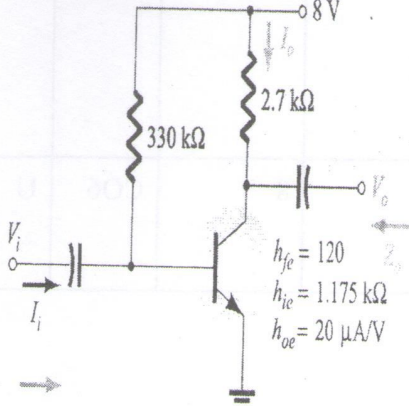
K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

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| <p>Nov – Dec 2022</p> <p>Program: B.Tech Electronics And Telecommunication</p> <p>Examination: SY Semester: III</p> <p>Course Code: EXL303 and Course Name: Electronic Devices and Circuits</p> <p>Duration: 2.5 Hours Max. Marks: 60</p> |
| <p>Instructions:</p> <p>(1) All questions are compulsory.</p> <p>(2) Draw neat diagrams wherever applicable.</p> <p>(3) Assume suitable data, if necessary.</p> |

| | | Max. Marks | CO | BT level |
|-------------|--|------------|-----|----------|
| Q 1 | Solve any six questions out of eight: | 12 | | |
| i) | Explain input characteristic of MOSFET. | 2 | CO3 | U |
| ii) | Compare I/V characteristic of rectifier diode and Zener diode. | 2 | CO1 | Ap |
| iii) | State advantages of Multistage Amplifier | 2 | CO2 | Ap |
| iv) | Explain limitation of self bias BJT circuit. | 2 | CO4 | U |
| v) | Explain hybrid model for BJT. | 2 | CO3 | U |
| vi) | Define gain of Differential amplifier. | 2 | CO5 | U |
| vii) | Compare Class A and Class AB amplifier. | 2 | CO6 | Ap |

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|------------|---|-----------|-----|----|
| viii) | Explain Miller Effect. | 2 | CO3 | Ap |
| Q.2 | Solve any four questions out of six. | 16 | | |
| i) | Explain the construction of MOSFET | 4 | CO1 | U |
| ii) | For a self bias circuit for BJT perform dc analysis. | 4 | CO2 | An |
| iii) | “At high frequency ac equivalent circuit of MOSFET is modified”. Comment. | 4 | CO3 | An |
| iv) | Derive for Voltage gain A_v of CE amplifier (Voltage divider network). | 4 | CO4 | Ap |
| v) | Explain the Limitation of Class A amplifier and suggest a solution. | 4 | CO5 | Ap |
| vi) | Appraise with the help of circuit diagram, how differential pair rejects ripple in the circuit whereas other amplifiers fails to do the same | 4 | CO6 | Ap |
| Q.3 | Solve any two questions out of three. | 16 | | |
| i) |  <p>For the circuit shown find :</p> <ol style="list-style-type: none"> The out put voltage, Voltage drop across series resistance, Current through Zener Diode | 8 | CO1 | Ap |

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|------|---|----|-----|----|
| ii) | Explain the working of Class B amplifier. | 8 | CO2 | U |
| iii) | Draw the circuit diagram and explain operation of two transistor current source. State its applications | 8 | CO4 | Ap |
| Q.4 | Solve any two questions out of three. | 16 | | |
| i) |  <p>(a) Z_i. (b) Z_o. (c) A_v. (d) A_i.</p> | 8 | CO5 | Ap |
| ii) | <p>The fixed-bias configuration had an operating point defined by $V_{GSQ} = -2\text{ V}$ and $I_{DQ} = 5.625\text{ mA}$, with $I_{DSS} = 10\text{ mA}$ and $V_P = -8\text{ V}$. The network is redrawn as Fig. with an applied signal V_i. The value of y_{os} is provided as $40\text{ }\mu\text{S}$.</p> <p>a. Determine g_m. b. Find r_d. c. Determine Z_i. d. Calculate Z_o. e. Determine the voltage gain A_v</p> | 8 | CO3 | Ap |

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| <p>iii)</p> | <p>Compare differential pair E-MOSFET with MOSFET amplifier on voltage gain criteria.</p> | <p>8</p> | <p>CO6</p> | <p>U</p> |