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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations August-2021
ELECTRONIC DEVICES

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

- 1 a Write down the diode current equation. 2M
- b Calculate the ripple factor of a LC filter with FWR for a inductance of 10H and Capacitance of 8μ for 50Hz AC input supply. 2M
- c Define Q Point of BJT. 2M
- d Draw the circuit diagram for single stage RC coupled amplifier using BJT. 2M
- e Illustrate the need for oxidation process in IC fabrication? 2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

- 2 a Describe the energy band structure of open circuited PN Junction. 5M
- b Derive the expression for transition capacitance of a PN Junction diode. 5M

OR

- 3 a Define clamper circuit. describe about positive and negative clampers with neat circuit diagrams. 5M
- b Determine the factor by which the reverse saturation current of a silicon diode will get Multiplied when the temperature is increased from 27°C to 82°C . 5M

UNIT-II

- 4 a Draw the circuit diagram of Full wave rectifier and explain its operation with the help Of waveforms. 5M
- b Derive the expressions for Ripple Factor and Efficiency of Full Wave Rectifier. 5M

OR

- 5 a Draw and discuss the VI characteristics of a Zener Diode. 5M
- b Illustrate the characteristics and applications of a photodiode 5M

UNIT-III

- 6 a Describe the Input and Output characteristics of BJT in CC Configuration. 5M
- b Define early effect of a BJT and explain breakdown in transistors. 5M

OR

- 7 a Derive the stability factors S , S' and S'' of a Transistor Voltage Divider bias. 6M
- b Discuss about Thermal Runaway and Thermal Resistance. 4M

UNIT-IV

- 8 a Analyze the importance of hybrid model of BJT amplifier at low frequencies? Draw the hybrid model for CE transistor and derive the parameters 6M
- b Compare the CE, CB and CC transistor amplifier parameters. 4M

OR

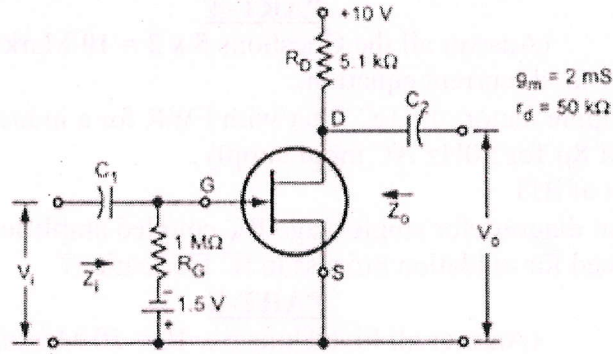
- 9 a Draw the circuit diagram of a single stage RC coupled Amplifier and discuss the steps used for design the circuit. 5M
- b For a CB transistor amplifier driven by a voltage source of internal resistance $R_s = 1200\Omega$, the load Impedance of $R_L = 1000\Omega$. The h parameters are $h_{ib} = 22\Omega$, $h_{rb} = 3 \times 10^{-4}$, $h_{fb} = -0.98$, $h_{ob} = 0.5\mu\text{A/V}$. Calculate current gain, voltage gain, input impedance and output impedance using exact analysis and approximate analysis. 5M

UNIT-V

- 10 a Draw and explain the operation and characteristics of n-channel enhancement type MOSFET. 5M
 b Differentiate between depletion and enhancement MOSFET. 5M

OR

- 11 a Draw and explain the small signal model of FET at low frequency. 5M
 b For the circuit shown in Fig. determine input impedance, output impedance and voltage gain, 5M



END