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Question Paper Code: 53B05

B.E./B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Biomedical Engineering

15UBM305- SEMICONDUCTOR DEVICES AND CIRCUITS

(Regulation 2015)

Duration: 1:15hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The forward voltage across a conducting silicon diode is about CO1- R
(a) 0.3 V (b) 1.7 V (c) -0.7 V (d) 0.7 V
2. $\beta_{dc} =$ _____ CO1- App
(a) I_B / I_E (b) I_C / I_E (c) I_C / I_B (d) None of the above
3. What is the ratio of I_D / I_{DSS} for $V_{GS} = 0.5 V_P$? CO2- R
(a) 0.25 (b) 0.5 (c) 1 (d) 0
4. Which of the following FETs has the lowest input impedance? CO2- U
(a) JFET (b) Depletion MOSFET
(c) Enhancement MOSFET (d) None of the above
5. Which of the h-parameters corresponds to r_e in a common-base configuration? CO3- U
(a) h_{ib} (b) h_{fb} (c) h_{rb} (d) h_{ob}
6. Class _____ amplifiers are normally operated in a push-pull configuration in order to produce an output that is a replica of the input. CO3- R
(a) A (b) B (c) C (d) AB
7. Only the condition $\beta A =$ _____ must be satisfied for self-sustained oscillations to result. CO4- R
(a) 0 (b) 1 (c) -1 (d) None of the above
8. Sinusoidal oscillators operate with _____ feedback. CO4- R
(a) Positive (b) Negative (c) Zero (d) None of the above

9. Which of the following is not a necessary component in a clamper circuit? CO5- R
(a) Diode (b) Capacitor (c) Independent DC supply (d) Resistor
10. The clipping level in amplifier is determined by CO5- R
(a) AC supply voltage (b) Control voltage (c) Reference voltage (d) Input voltage

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Construct the CB and CE configuration of BJT and its working mechanism. CO1- U (8)
12. Construct the JFET with neat diagrams and working mechanisms. CO2- U (8)
13. Analyze the h-parameter model of CE amplifier and derive its voltage gain, current gain, input impedance and output impedance. CO3- Ana (8)
14. Explain the construction and working of Colpitts oscillator and derive the expression for frequency of oscillation. CO4- U (8)
15. Explain the operation of astable multivibrator with neat diagram. Also give its output waveforms. CO5- U (8)