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**Question Paper Code:U3B04**

B.E./B.Tech. DEGREE EXAMINATION, NOV 2022

Third Semester

Biomedical Engineering

21UBM304- SEMICONDUCTOR DEVICES AND CIRCUITS

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. Define Doping. CO1- U
2. Write down the expression for Diode Current. CO1- U
3. In a n-channel JFET,  $I_{DSS} = 20 \text{ m A}$  and  $V_P = -6 \text{ V}$ . Calculate the drain current when  $V_{GS} = -3 \text{ V}$ . CO2- App
4. Why is FET preferred as a Buffer Amplifier? CO3- Ana
5. What are the two types of small signal model? CO1- U
6. Mention the application of Class C tuned amplifier. CO1- U
7. Define the feedback. CO1- U
8. What are the types of feedback? CO1- U
9. Write a short notes on astable Multivibrator? CO1- U
10. Define clampers? CO1- U

PART – B (5 x 16= 80Marks)

11. (a) (i) Explain the operation of forward biased and reverse biased PN junction diode. CO1-U (8)  
(ii) Briefly explain about avalanche and zener breakdown CO1-U (8)  
Or  
(b) Explain the input and output characteristics of transistor in CC configuration. Give the comparison of CB,CE,CC Configuration CO1-U (16)

12. (a) Explain the working of a P channel JFET and draw the V-I characteristics of it. CO1-U (16)
- Or
- (b) Explain in detail about construction and working principle for uni junction field effect transistor? CO1-U (16)
13. (a) Draw the small signal equivalent circuit of FET amplifier in CE connection and derive the equations for voltage gain, Input Impedance and output impedance. CO4-E (16)
- Or
- (b) Draw the small signal equivalent circuit of FET amplifier in CB connection and derive the equations for voltage gain, Input Impedance and output impedance. CO4-E (16)
14. (a) Draw the block diagram of current series feedback amplifiers and derive the expressions of input and output impedance. CO1-U (16)
- Or
- (b) Draw and explain the working of single tuned amplifiers. And also Discuss Nyquist criterion for stability of feedback amplifiers? CO1-U (16)
15. (a) Explain the construction and working of Monostable multivibrator with neat diagram? CO1- U (16)
- Or
- (b) Explain the construction and working of Sawtooth Oscillator with neat diagram? CO1- U (16)