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**Question Paper Code: R2405**

B.E./B.Tech. DEGREE EXAMINATION, MAY 2024

Second Semester

Electronics and Communication Engineering

R21UEC205- ELECTRONIC DEVICES

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (5 x 1 = 5 Marks)

1. If the ac supply is 60 Hz, what will be the ripple frequency of the half-wave rectifier? CO1 -U  
(a) 30 HZ                      (b) 60 HZ                      (c) 30 HZ                      (d) 60 HZ
2. In a BJT, if  $\beta = 100$ , then  $\alpha =$  CO2 -App  
a) 99                      b) 0.99                      c) 1.0                      (d) 1.01
3. The SI Units of the Process trans conductance Parameter is CO1-U  
a) V<sup>2</sup>/A                      b) A/V<sup>2</sup>                      c) V/A                      d) A/V
4. During reverse bias, a small current develops known as \_\_\_\_\_. CO1-U  
(a) Forward current                      (b) Reverse current  
(c) Reverse Saturation Current                      (d) Leakage Current
5. The Voltage gain of the transistor amplifier is low in \_\_\_\_\_. CO1 -U  
a) CB                      b) CE                      c) CC                      d) none of the above

PART – B (5 x 3= 15 Marks)

6. Find the efficiency of half wave rectifier if  $V_m=10V$ . CO3 -App
7. Determine the values of  $I_B$  and  $I_E$  for the transistor circuit if  $I_C = 80mA$  and  $\beta = 170$  CO1 -App
8. Why FET is called voltage controlled device? CO1- U
9. Differentiate acceptor impurities and donor impurities. CO1- U
10. Differentiate NPN and PNP transistor. CO1- U

PART – C (5 x 16= 80 Marks)

11. (a) A Half wave rectifier having a resistive load of  $1000\Omega$  rectifies an alternating voltage of  $325\text{V}$  peak value and the diode has a forward resistance of  $100\Omega$ . Calculate (a) peak, average and rms value of current (b) dc power output (c) ac power input (d) efficiency of the rectifier CO2-App (16)
- Or
- (b) A  $230\text{V}$ ,  $60\text{Hz}$  voltage is applied to the primary of a 5:1 step down, center tap transformer used in a full wave rectifier having a load of  $900\Omega$ . If the diode resistance and secondary coil resistance together has a resistance of  $100\Omega$ , determine (a) dc voltage across the load (b) dc current flowing through the load (c) dc power delivered to the load (d) PIV across each diode and (e) ripple voltage and its frequency. CO2-App (16)
12. (a) Analyze the current amplification factors of CB, CC and CE configuration and give the relation between  $\alpha, \beta$  and also derive the relation between  $\alpha, \beta$  and  $\gamma$ . CO4-An (16)
- Or
- (b) Design and analyze a CE amplifier with suitable transistor parameters impedance, admittance and gain and compare its input and output characteristics. CO4-An (16)
13. (a) Explain the construction, working and operating characteristics of N-channel JFET with relevant diagrams. CO1- U (16)
- Or
- (b) Derive the expression for depletion N channel MOSFET with suitable characteristic parameters CO1- U (16)
14. (a) Design a half wave rectifier using PN diode and calculate ripple factor and efficiency CO1- U (16)
- Or
- (b) Compute the  $V_{dc}$ ,  $V_{rms}$ , efficiency and peak factor of bridge rectifier. CO1-U (16)
15. (a) Describe the operation and input and output characteristics of Emitter follower with neat diagrams CO1-U (16)
- Or
- (b) Describe the operation and input and output characteristics of Base grounded configuration with neat diagrams. CO1- U (16)

