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Question Bank for all

Code No: R1621041 **R16** SET - 1

II B. Tech I Semester Supplementary Examinations, May - 2018
ELECTRONIC DEVICES AND CIRCUITS
(Com to ECE, EIE and ECC)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Explain the terms mobility and conductivity of a Semiconductors in detail (2M)
   b) Define Diffusion capacitance and Transition capacitance of a PN junction diode (3M)
   c) What is the need for filters in power supplies (2M)
   d) What are the different configurations of BJT (2M)
   e) Define biasing and explain the Need for biasing (2M)
   f) Explain the Generalized analysis of small signal model in detail (3M)

PART –B

2. a) Define Hall effect and Derive Hall coefficient expression along with applications of Hall effect (7M)
   b) In a P-type semiconductor the resistivity of the bar is $220X10^{3}\Omega$, width is 2mm, Magnetic flux is 0.1 wb/m^2, I=5μ amps, V_H=28m volts Find the Hole mobility of a Semiconductor Bar. (7M)

3. a) The reverse saturation current I_o in a germanium diode is 6μA. Calculate the current flowing through the diode when the applied forward biase voltages are 0.2,0.3 and 0.4 V at room temperature. (10M)
   b) Describe the principal of operation of an LCD (4M)

4. a) A 230V, 50 z voltage is applied to the primary of 5:1 step down center-tap transformer used in a full-wave rectifier having a load of 900Ω. If the diode resistance and secondary coil resistance together has a resistance 100Ω , determine (i)DC voltage across the load (ii) DC current flowing through load (iii)DC owe delivered to the load (iv) PIV across diode (v) ripple voltage and its frequency. (7M)
   b) Derive the expression for a ripple factor in a full-wave rectifier with resistive load in detail (7M)

5. a) Draw the circuit diagram of an NPN junction transistor CE configuration and describe the static input and output characteristics. Also, Define active, saturation and cutoff regions and saturation resistance of a CE transistor (7M)
   b) Determine I_C, I_E and α for a transistor circuit having IB=15μA and β=150. (7M)

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6. a) A transistor amplifier V_{cc}=12V, R_1=8KΩ, R_2=4KΩ, R_e=1KΩ and R_l=1.5KΩ.Assume V_{be}=0.7V Determine the operating point and draw the DC and AC load line. (7M)
   b) Explain the collector to base bias method along with circuit diagram and derive the stability factor for it (7M)

7. a) In the CE amplifier calculate the mid frequency voltage gain and lower 3-dB point. The transistor has h-parameters h_{fe}=400 and h_{ie}=10kΩ, the circuit details are Rs=600Ω, R_L=5KΩ, Re=1KΩ, Vcc=12V R1=15KΩ,R2=2.2.KΩ and Ce=50μF. (7M)
   b) Draw the circuit diagram of CB amplifier and explain its operation in detail (7M)

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