**Methodist College of Engineering and Technology**

**Department of Electronics and communication Engineering**

**Electronic Devices Question Bank**

**Subject: Electronic Devices SEM: III sem**

**UNIT-1**

**Short answer questions:**

1. What is diffusion current?
2. What is drift current?
3. Explain the term Transition capacitance of a p-n diode?
4. Explain the term Diffusion capacitance of a p-n diode?
5. Write down diode current equation?
6. **Problems on diode current equation....imp**
7. Explain break down mechanism in diodes?
8. What is difference between avalanche and zener diode?
9. Short notes on generation and recombination of carriers?

**Long answer questions:**

1. Energy band structure in intrinsic and extrinsic silicon?
2. Poisson and continuity equation?
3. What is p-n junction? Explain the formation of depletion region in unbiased condition?
4. Explain the operation of p-n diode under forward and reverse biased condition and draw its V\_I (volt-ampere) characteristics?
5. Explain switching characteristics of diode?
6. Write shorts notes on zener diode and explain its application as voltage regulator?
7. Write short notes on schottky diode and write down its applications?

**UNIT-2**

**Short answer questions:**

1. what is rectifier? what are the important characteristics of rectifier?
2. Explain the following terms.(Definations)
3. Ripple factor
4. Peak inverse voltage(PIV)
5. Efficiency
6. Transformer utilization factor(TUF)

3. What are the disadvantages of half wave rectifier?

4. What are the advantages of full wave rectifier over HWR?

5. Stae advantages and disadvantages of bridge rectifier?

6. Explain the necessity of bleeder resistance?

7. short notes on LED,PHOTODIODE?

**Long answer questions:**

1. Explain the working of Half Wave Rectifier and derive all the necessary parameters of HWR?
2. Explain the working of Full Wave Rectifier and derive all the necessary parameters of FWR?
3. Explain the working of bridge Wave Rectifier and derive all the necessary parameters of bridge wave?(Hint:-FWR parameters applicable for bridge wave also )
4. Explain HWR/FWR with Capacitive(C) filter and derive its ripple factor?
5. Explain HWR/FWR with Inductive (L) filter and derive its ripple factor?
6. **Problems :- Calculation of Ripple Factor for C,L filters(imp)**
7. **Problems :- Calculation of necessary parameters for HWR/FWR without filter (imp)**

UNIT-3

**Short answer questions:**

1. What is early effect? or base width modulation?
2. What is punch through effect?
3. Write short notes on emitter efficiency, transport factor, large signal current gain? (Topic:-current components of BJT)
4. Define α, β, γ and give the relationship between them?
5. Explain the working of NPN transistor?
6. Explain the working of PNP transistor?
7. **Problems on: To cal IE, IC, IB, α, β, γ?**
8. What do you understand Q-point(operating point)?what is its significance?
9. **What is thermal runaway effect in BJT? What is the condition to avoid thermal runaway?(IM**P)

**Long answer questions:**

1. Explain the input and output characteristics of transistor in **CE (common emitter)** configuration with diagrams?
2. Explain the input and output characteristics of transistor in **CB (common base)** configuration with diagrams?
3. Explain the input and output characteristics of transistor in **CC (common collector)** configuration with diagrams?
4. Derive general expression for stability factor(S)?

5 . Derive Stability factor derivations for i) **fixed biasing circuit (imp)**

ii) Collector to base biasing circuit and iii) **Voltage divider biasing circuit(imp)?**

1. **Problems on biasing circuits to cal stability factor?**

**UNIT-4**

**Short answer questions:**

1. Define H-parameter for transistor?(hint :-hie, hre, hoe, hfe derivations from 2 h-parameters equations)
2. Draw the small signal low frequency h-parameter model for transistor?
3. Explain approximate model over exact model of transitor?
4. Draw the transistor in CE configuration using H\_π model?

**Long answer questions:**

1. Draw the small signal hybrid model of CE/CB/CC amplifier and derive its expressions for its Ai, Av, Ri, Ro, Ais, Avs?

2. Draw the approximate model of CE/CB/CC amplifier and its expressions for its Ai, Av, Ri, Ro?

**3. problems on CE/CB/CC amplifiers using h-parameters model.(imp)**

**UNIT-5**

**Short answer questions:**

1. Difference between FET and BJT?
2. Difference between FET and MOSFET?
3. Difference between Enhancement MOSFET and depletion MOSFET?
4. Define jfet parameters? show µ=gm\*rd

**Long answer questions:**

1. working of N-channel JFET and draw its V-I characteristics?

2.working of N/P –channel depletion MOSFET and draw its drain and transfer characteristics?

3. working of N/P –channel enhancement MOSFET and draw its drain and transfer characteristics?

4. **problems on drain current (ID) equation(imp)**

Id=idss(1-vgs/vp)^2

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