



KINGS

COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2008-2009 / ODD SEMESTER

QUESTION BANK

SUBJECT CODE : EC1201

SEM / YEAR : III / II

SUBJECT NAME : ELECTRONIC DEVICES

UNIT - 1

ELECTRON BALLISTICS AND APPLICATION

PART – A (2 Marks)

1. Define electron volt?
2. State the relationship between electric field intensity, and potential?
3. An electron beam from rest is accelerated by a potential of 200V. Find the final velocity of the electron?
4. What is deflection sensitivity of a CRT?
5. Calculate the time taken by an electron which has been accelerated through a potential difference of 100 volts to transverse a distance of 2cm. Given $q = 1.602 \times 10^{-19} \text{ C}$ & $m = 9.1 \times 10^{-31} \text{ kg}$.
6. State two applications of magnetic deflection?
7. What is doping?
8. What is intrinsic and extrinsic semiconductor?
9. What are acceptor & donor?
10. Draw crystal diagram of intrinsic & extrinsic semi conductor?

PART – B

1. With relevant diagrams, explain about the motion of an electron in an electric field & magnetic field? **(16)**
2. a) Explain the motion of an electron in an uniform magnetic field & derive the expressions for the period and angular velocity of the particle? **(12)**
 b) How a p – type and n-type semiconductor can be obtained? **(4)**

3. Explain electrostatic deflection sensitivity and magneto static deflection sensitivity in a CRT? (16)
4. a)What is Hall Effect? Explain its principle and uses? (8)
b) Compare electrostatic & magneto static deflection sensitivity in a CRT?(8)
5. i) Explain Insulator, Semiconductor& Conductor with help of Energy band Structure? (4)
ii)Explain the motion of an electron in parallel and perpendicular electric and magnetic field with neat diagram? (12)

UNIT – 2

SEMICONDUCTOR DIODES

PART – A (2 Marks)

1. List out the common diode applications?
2. State mass action law?
3. Define avalanche breakdown ?
4. Define zener breakdown?
5. What is tunneling?
6. What are the current components of a diode?
7. Define forward recovery time and reverse recovery time?
8. Differentiate photodiode and light emitting diode.
9. Compare PiN diode and Avalanche Photo diode?
10. Define clipper and clamper.

PART – B

1. Explain the forward and reverse bias operation and VI characteristics of a PN Junction diode. (16)
2. a)Derive the diode current equation? . (8)
b)Discuss the current components of PN junction diode? (8)
3. a)Explain any two applications of diode with neat diagram . (8)
b)Explain the characteristics and applications of Varactor diode? (8)
4. a)Explain the characteristics and applications of zener diode? (8)
b)Explain the mechanism of avalanche and zener break down? (8)

5. Explain the working principle, characteristics, applications, advantages & disadvantages of Tunnel diode? (16)
6. Write short notes on the following diodes? (16)
 - i) Backward diode
 - ii) p-i-n diode
 - iii) Point contact diode
 - iv) Photo diode
7. a) Explain the structure, characteristics and applications of Scottky Diode. (8)
 b) Explain the switching characteristics of PN junction diode. (8)
8. a). Discuss about the p-i-n diode, photo diode, APD & LED (12)
 b) Define diffusion and drift current. (4)

UNIT – 3

BJT & FET

PART – A (2 Marks)

1. Define pinch - off voltage?
2. Derive the relation between pinch - off voltage & drain current?
3. What is a MOSFET?
4. What is a MESFET?
5. What is VMOS?
6. What is CMOS?
7. What is early effect?
8. What is thermal runaway?
9. What is meant by reverse saturation current?
10. Differentiate $V_{GS(off)}$ and cut-off in JFET.

PART - B

1. a). Explain the operation of PNP & NPN transistor? (12)
 b). What is transistor? State its types (4)
2. a). Explain the current components of a transistor? (8)
 b). Explain the transistor switching time? (8)
3. a). Explain Ebers – Moll model . (8)
 b). Compare CE – CB – CC Configuration? (8)
4. a). Explain the input & output characteristics of CE configuration of a

- transistor? (12)
- b). State FET& its types? (4)
5. a) Explain the input & output Characteristic of CB configuration of a transistor? (12)
- b) State about the VMOS Devies? (4)
6. a) Explain the input & output characteristics of CC Configuration of a transistor? (12)
- b). State about the CMOS Devies? (4)
7. Explain the construction & characteristics of JFET (16)
8. Explain the construction & characteristics of EMOSFET (16)
9. Explain the construction & characteristics of DMOSFET? (16)

UNIT – 4

TRANSISTOR BIASING

PART – A (2 Marks)

1. What is operating point (or) Q point (or) bias point (or) quiesient point?
2. What are the various biasing methods of BJT?
3. What is the need for biasing?
4. What is biasing stability?
5. What are the factors that affect the stability of the Q-point?
6. What are the biasing methods of FET?
7. Express the relation between I_c , I_{cbo} & β ?
8. In which region the transistor has to be operated to act as
 - a) a Switch
 - b) an amplifier
9. Define
 - a) DC load line
 - b) AC load line
10. What can we analyze from a load line?

PART - B

1. Compare the following
 - a) D MOSFET & EMOSFET
 - b) n-channel MOSFET & p-channel MOSFET. (16)
2. a). What are the applications of JFET? Explain JFET as VVR. (8)
- b). Explain the biasing technique for enhancement MOSFET? (8)
3. Prove that the voltage divider biasing provide better stability than other techniques? (16)

4. a) Why fixed biased circuit is not used in practice? . (12)
- b) Derive the stability factor?. (4)
5. a) Discuss about the selection of Q-point? . (10)
- b). Compare FET & BJT? (6)
6. a). Derive the relation between α , β and γ ? . (8)
- b). Derive the relation between S, S' & S'' of fixed bias technique. (8)

UNIT – 5

POWER SUPPLY & POWER AMPLIFIER

PART – A (2 Marks)

1. What are the basic elements of regulated power supply?
2. What is ripple factor?
3. What is a rectifier?
4. Define regulation of a rectifier?
5. Define efficiency of a rectifier?
6. What is a filter and state its types?
7. What is SMPS?
8. Define intrinsic stand –off ratio?
9. What is a regulator and state its types?
10. What do you mean by power control devices?

PART – B

1. Explain the operation FWR with neat circuit diagram & waveforms and derive I_{dc} , I_{rms} , V_{dc} , V_{rms} (16)
2. Define I_{dc} , I_{rms} , V_{rms} , ripple factor (γ), regulation & efficiency(η) , PIV & TUF? (16)
3. Explain the operation of a capacitor filter with FWR & derive the ripple factor? (16)
4. Explain the series & shunt voltage regulators? (16)
5. Explain the block diagram SMPS of & its operation with neat sketch? (16)
6. a) Write short notes on SUS. (4)
- b) Compare LMPS & SMPS? (4)
- c) State short notes on PUT & PNP diode? (8)
7. Explain the operation & characteristics of diac? (16)
8. Explain the two transistors model of SCR? (16)

9. Explain the operation & characteristics of TRIAC? **(16)**
- 10.a) Explain the zener voltage regulators? **(8)**
- b) Explain the monolithic linear regulators? **(8)**
- 11.Explain the operation & characteristics of UJT? **(16)**
