Register Number:……………..

KUMARAGURU
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GENERAL INSTRUCTIONS TO THE CANDIDATES

1. Candidates are instructed to answer the questions as per Bloom's Taxonomy knowledge level (K_1 to K_6)
2. Candidates are strictly instructed not to write anything in the question paper other than their roll number.
3. Candidates should search their pockets, desks and benches and handover to the Hall Superintendent/ Invigilator if any paper, book or note which they may find therein as soon as they enter the examination hall.
4. Candidates are not permitted to bring electronic watches with memory, laptop computers, personal systems, walkie-talkie sets, paging devices, mobile phones, cameras, recording systems or any other gadget / device /object that would be of unfair assistance to him / her.
5. Corrective measures as per KCT examination policies will be imposed for malpractice in the hall like copying from any papers, books or notes and attempting to elicit the answer from neighbours.

B.E DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2014)

Second Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U14ECT202 :Electron Devices

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The path of an electron in a uniform magnetic field is [K_1]

a) Parabolic b) Circular

c) Straight Line d) Square

2. Matching type item with multiple choice code [K_1]

List I	List II
A. P-type Semi-conductor	i. Antimony
B. Conductor	ii. Carbon
C. N-type Semi-conductor	iii. Arsenic
D. Insulator	iv. Copper

	A	B	C	D
a)	ii	iv	i	iii
b)	iv	iii	ii	i
c)	ii	iii	iv	i
d)	iii	i	iv	ii

3. The potential energy barrier in joules developed across an open circuited PN junction equals [K_1]

a) Vo b) qVo

c) Vo /q d) -Vo

4. Consider the following procedure for formation of depletion layer in diode [K_1]

1. Diffusion 2. Density mismatch 3. Recombination 4. Junction formation

a) 1-4-3-2 b) 2-3-4-1

c) 4-2-3-1 d) 3-2-4-1

5. Field Effect Transistor is a [K_1]

a) voltage controlled device b) current controlled device

c) reactance controlled device d) resistance controlled device

6. Ebers Moll model is based on assumption that ……… spreading resistance can be neglected. [K_1]

a) Emitter b) Base

c) Source d) Drain

7. Assertion (A): Opto electronic devices operates as an electrical to optical or optical to electrical transducer [K_2]

Reason (R): Opto electronic devices either produce light or use light in their operation.

a) Both A and R are individually true and R is correct explanation of A. b) Both A and R are individually true and R is not the correct explanation of A.

c) A is true but R is false d) A is false but R is true

8. The terminals of SCR are [K_1]

a) Emitter, Base & Collector b) Gate, Source and Drain

c) Anode , Cathode & Gate d) Emitter, Base1 & Base2

9. Match list I with list II and select the correct answer using the codes given below [K_1]

List I	List II
A. VLSI	1. Less than 100 components/chip
B. MSI	2. Between 500 and 300000 components/chip
C. SSI	3. More than 300000 components/chip
D. LSI	4. Less than 500 components/chip

a) 3 – 1 - 4- 2 b) 2- 1- 4- 3

c) 4 –3 - 2 -1 d) 3 – 4 - 1 -2

10. The monolithic diode has a high breakdown voltage of around ……… [K_1]

a) 35 V b) 50 V

c) 60 V d) 70 V

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. Define deflection sensitivity. [K_1]

12. What is the trajectory of charge in uniform electric field? [K_1]

13. In a P-type semi-conductor, the Fermi level is 0.3eV above the valence band at room temperature of 300°K. Determine the new position of the Fermi level for temperature of 350°K. [K_2]

14. Compare Avalanche and zener breakdown. [K_2]

15. Express the relationship between α and β. [K_1]

16. Define amplification factor transcondutance of JFET. [K_1]

17. Define Forward break over voltage of SCR. [K_1]

18. List the applications of photo diode and photo transistor. [K_2]

19. Name the photo sensitive material used in Photolithography process. [K_1]

20. What are the advantages and limitations of Integrated circuits? [K_2]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. (i) Explain the operation of UJJ with necessary diagrams. (7) [K_2]

(ii) Explain the operation of saw tooth generator using UJT. (7) [K_2]

22. (i) Define Hall effect. (2) [K$_2$]

(ii) Explain magnetic defection in cathode ray tube. (12) [K$_2$]

23. (i) State continuity equation and prove that concentration of charges is independent of time with zero electric field. (7) [K$_2$]

(ii) Derive the diode current equation. (7) [K$_2$]

24. (i) Explain with necessary diagram the operation of Bipolar transistor in common base configuration Enhancement. (7) [K$_2$]

(ii) Explain the characteristics of Enhancement MOSFET different regions of operations. (7) [K$_2$]

25. (i) With necessary diagrams explain the operation of Tunnel diode. (10) [K$_2$]

(ii) State the difference between photodiode and phototransistor. (4) [K$_2$]

26. With necessary diagrams explain in detail about the fabrication of IC. [K$_1$]

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