Modersated-SEE-EEE3607-(6F-Au20) DMDH

Semester End Assignment Autumn-2020

International Islamic University Chittagong **Department of Electrical and Electronic Engineering**	
Semester End Assignment Autumn-2020	Program: B.Sc. Engg. (EEE)
Course Code: **EEE-3607**	Course Title: **Solid State Devices**
Time: **5 hours (4 hours 30 minutes** for Assignments + **30 minutes for** submission time)	Full Marks: **50** [Assignments -**30** (5x6) + **Viva 10+ Quiz**-10]

[Answer the following questions. *All Questions are Compulsory.* Figures in the right margin indicates full marks. Answer script must be submitted through online method within 5 hours from starting time. Also, write down the Q. Set on the front page of your answer script] Your admit card must be uploaded with scripts**.**

Q N	Description of questions	Marks	COs & POs	Cognitive learning
1(a).	In a Zener diode, both P and N – regions are heavily doped-*explain* with a neat diagram. *What* is meant by avalanche breakdown?	1.5+0.5 =2	**CO-1:** Understand the physics of semiconductor devices.**PO-1:** Engineering Knowledge.	Evaluating& Understanding
1(b).	*Deduce* the expressions for Diode Equations with applications (forward & reverse bias conditions) with the meaning of the symbols and diagrams.	2		Creating
1(c).	*Explain* with diagram the formation of a PN junction.	2		Evaluating
2(a).	*Draw* a PNP transistor in CB configuration as well as draw the input and output characteristics and mark the cutoff saturation and active regions with *explanation.*	1+1=2	**CO-2:** Develop the designing skill from the idea of carrier transportation in solid**. PO-3:** Design/ Development of Solutions.	Applying& Evaluating
2(b)	There are three parameters are used to *define* BJT transistor performance. Define those and *relate* those analytically.	1+1=2		Understanding & Analyzing
2(c)	*Formulate* emitter current in terms of collector current of a transistor.	02		Evaluating
3(a)	*Draw* the circuit diagram for determining Drain Characteristic for an N-Channel JFET with external bias. Hence, *explain* following terms by showing in the Drain Characteristic: i. Pinch-off region, ii. Saturation region, iii. Breakdown region and iv. Ohmic region.	01+02= 03	**CO-3**: Working principle of BJT, FET, and Solar Cell well as knowledge for device design. **PO4:**Conduct Investigations of Complex Problems	Applying & Evaluating
3(b)	*Illustrate* the Characteristic of GaAsFET as used in RF and Microwave technology. *Compare* characteristic of Schottky junction in regard to forward and reverse biasing.	02+1= 03		Applying & Analyzing

4(a)	*Draw* the I-V characteristic of MOSFET and *explain* different mode of operations. *Compare* the main constructional differences between a MOSFET and a BJT.	01+02+01 =04	**CO-3**: Working principle of BJT, FET, and Solar Cell well as knowledge for device design. **PO4:**Conduct Investigations of Complex Problems	Applying , Evaluating &Analyzing
4(b)	Draw and analyze the low frequency small-signal equivalent model of MOSFET.	0.5 +1.5 =2		Applying & Analyzing
5(a)	Explain optical absorption. Illustrate the working principle of the PN junction as solar cell.	01+2= 3		Evaluating &Applying
5(b)	Explain following terms of a solar cell with diagram: i. Short circuit photo current, ii. Open circuit photo voltage and Solar cell fill factor.	03		Evaluating

(Prof. M. Delawer Hossain
Course Teacher: EEE3607 (6F-Au20)

Chairman 3rd Year Exam. Committee-2020
Dept. EEE, IIUC

A. Calculation of percentage Learning order and Level of Questions set in the SEE of Au2020.

Course Code; EEE3607 (6F-Au20) Course Title : Solid State Devices .
Semester: Autumn-2020 Year- 3rd year.....
Prepared by: Prof. Dr M Delawer Hossain Date: June 1,2021

Question Number	1. Lower Order learning			2. Higher Order Learning			Marks
	Remember	Understand	Applying	Analyzing	Evaluating	Createing	
1	-	0.5	-	-	3.5	2	06
2	-	1	1	1	3	-	06
3	-	-	3	1	2	-	06
4	-	-	2	1	3	-	06
5	-	-	1	-	5	-	06
Total Marks	**X=0**	**Y=1.5**	Z=7	x=3	y=16.5	z=2	30
% of marks in each Order of Learning	% = [(**0+1.5+7**)/ 30]x100 = (8.5/30)x100 = 28.3 =28.3%			% =([x+y+z)/ 30] x100= (21.5)/30= 71.7%			100%
% of marks in each Level	**Level 1&2(support)= [(X+Y**)/30]x100= (1.5/30)x100=5%		**Level 3&4(Explore)=** [(**Z+x**)/30] x100= (10/30)x 100=33.3%	**Level 5&6(Explore)=** [(**Z+x**)/30] x100= (18.5/30)x 100=61.7%			

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