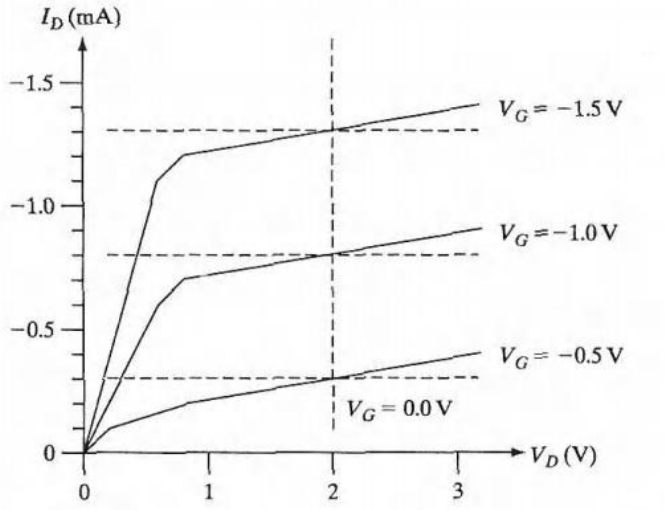
Assignment-SeT-2 EEE-3607(6F-Au19)

International Islamic University Chittagong
Department of Electrical and Electronic Engineering
Assignment (autumn-2019), EEE-3607, Section: F,
Marks : 5x8 =40

June 14, 2020 at 2 PM **Assignment Question Set-2**

QN	Questions	Marks	CO-PO	Blooms Taxonomy
1a₂	(i) **Draw** the I-V Characteristic of a p-n junction. From the **understanding** of the I-V curve, show that p-n junction has a rectifying type of behavior. (ii) Hence, **explain** the characteristic of avalanche breakdown and **Zener** breakdown of a diode with comparisons.	2+3=5	CO-1 & PO-1	Understanding , Applying
1b₂	**Define** the types of capacitance associated with a p-n junction. **Explain** their Characteristics with the emphasis to (i) depletion width and (ii) charge storage.	1+2=3	-	Remembering, Applying
2a₂	**Diagrammatically** give the idea of three terminals current (i.e **current transportation**) of a bipolar junction transistor (**BJT**) . **Explain** its behavior as a current control device. Find an expression for the Base terminal current $\mathbf{I_B}$ of a BJT.	2+1+2 =5	CO-2 & PO-3	Applying
2b₂	"Ebers-Moll model" also known as "Coupled Diode Model"- **Justify** with equivalent circuit.	3	-	Applying
3a₂	**Draw** the structure of a N- channel JFET**,** hence write the condition for following terms: i. Pinch-off region, ii. Ohmic region and iii. Active region. Explain these terms by drawing Circuit Diagram and N-Channel JFET Drain Characteristic (i.e. I-V Characteristic) with External Bias**.**	2+3=5	CO-3 & PO-4	Applying
3b₂	**Explain Ohmic junction** with band diagram when a metal and semiconductor are brought into contact. What are the **Importance** of MISFET Devices?	3	-	Applying Remembering,
4a₂	**Differentiate** between depletion type and enhancement type MOSFET with practical symbols and three operating regions. Consider the following MOSFET characteristics:  i. Calculate the transconductance at V_D= (-)1.5V. ii. What is the apparent threshold voltage at V_D= (-)1.5V? iii. Is this an n-channel or p-channel device? Explain why. Is this depletion mode device or enhancement mode device? Explain why	2+0.75 x4=5	CO-3 & PO-4	Analyzing
4b₂	"JFET is normally in 'ON' state while enhancement type MOSFET is in 'OFF' state"- explain the statement. Explain the mechanism used in HEMT to increase the channel conductivity without doping.	1+2=3	-	Applying
5a₂	Suppose you are to install solar cell on a piece of glass for your wristwatch. What type of solar cell would you choose and why? Why n-type material is used in the illuminating side of a solar cell?	2+3=5	-	Remembering, Understanding
5b₂	What is "*load line*"? Suppose you have a solar cell with I_{SC}= 170mA and V_{OC}=0.67V. Draw the load line for a 5Ω load. Find the fill factor if I_m=150mA and V_m=0.56V.	1+2=3	-	Remembering Applying

Prof. M. Delawer Hossain
Course teacher EEE3607(6F-Au19)
Dept. EEE,IIUC