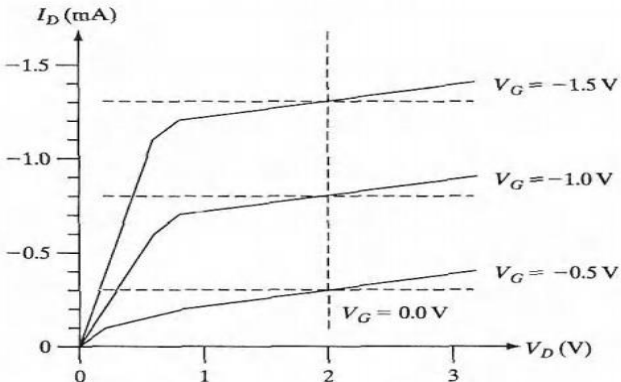



Assignment-Set-1-EEE3607-6f-Au19
 International Islamic University Chittagong
 Department of Electrical and Electronic Engineering
 Assignment (autumn-2019), EEE-3607, Section: F,
 Marks : **5x8 =40** ,
 Starting time : **June 14, 2020 at 2 PM**

SET-1

QN	Questions	Marks	CO-PO	Blooms Taxonomy
1a ₁	What do you understand by carrier injection in a PN junction? On the basis of your understanding show diagrammatically the direction of current in a <i>pn</i> junction (forward bias) due to injection of minority carriers. From this diagram, write the expressions for (i) concentration of injected carriers ($p_{n(0)}$ & $n_{p(0)}$), (ii) diffusion length (L_h & L_e), (iii) diffusion coefficient (D_h & D_e) and their practical applications.	1+1+3 =5	CO-1 and PO-1	Understanding
1b ₁	Explain diagrammatically the possible “biasing” conditions for the standard PN Junction Diode . Write the expressions for Diode Equations with applications (forward & reverse bias conditions) with the meaning of the symbols.	1.5x2= 3	-	Applying
2a ₁	Describe the construction of NPN or PNP Transistor with the <u>idea of carrier transportation in the forward and reverse junctions</u> . Explain emitter efficiency and base transport factor of a transistor with diagram.	3+2=5	CO-2 and PO-3	Creating + Applying
2b ₁	What are the Modes of operation of BJT Transistor? Explain the conditions of modes with diagram. What are the difference between NPN and PNP transistors which are used to build many electrical and electronic projects?	2+1=3	-	Remembering Applying
3a ₁	Draw the structure of a N-channel JFET , hence write the condition for following terms: i. Cut-off region, ii. Triode region and iii. Saturation region. Explain these terms by drawing Circuit Diagram and N-Channel JFET Drain Characteristic (i.e I-V Characteristic) with Shorted Gate .	2+3=5	CO-3 and PO-4	Applying
3b ₁	Explain formation of a Schottky junction with band diagram (both forward and reverse bias Condition), when a metal and semiconductor are brought into contact.	3	-	Applying
4a ₁	Differentiate between depletion type and enhancement type MOSFET with practical symbols and three operating regions. Consider the following MOSFET characteristics:  <ol style="list-style-type: none"> Calculate the transconductance at $V_D = (-)1.0V$. What is the apparent threshold voltage at $V_D = (-)1.0V$? Is this an n-channel or p-channel device? Explain why. Is this depletion mode device or enhancement mode device? Explain. 	2+0.75 x 4 =5	CO-3 and PO-4	Analyzing-
4b ₁	If we apply a negative voltage between metal and semiconductor of a MOSFET, why positive charges accumulate at the surface of the semiconductor? How an electron gets hot in a MOSFET and what can we do to compensate it?	1+2=3	-	Remembering, Applying
5a ₁	What type of materials are used for LASER and why? Explain the difference in working of LASER and LED. Why LASER can be used to cut glass?	1+2+2 =5	-	Remembering, Applying
5b ₁	What is “ <i>Fill factor</i> ”? Suppose you have a solar cell with $I_{SC} = 150mA$ and $V_{OC} = 0.7V$. Draw the load line for a 2Ω load. Why we cannot get 100% solar energy from solar cell?	3	-	Remembering, Applying



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