International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Assignment Test Autumn-2020
Course Code: **EEE-2301**
Time: **5 hours** (Writing **-4 hours 30 minutes** + **30 minutes** submission time)

Program: B.Sc. Engg. (EEE)
Course Title: **Electronics-I**
Full Marks: **50** (**Written** 30 + **Viva/Viva-Quiz**-20)

[Answer each of the questions **(1-5)** from the followings; Figures in the right margin indicate full marks.**]**

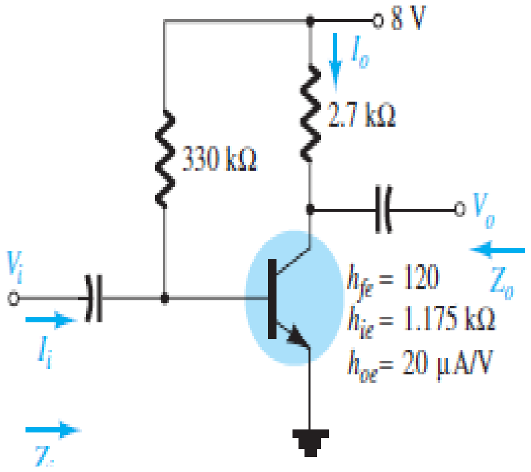
Don't blindly copy any answer from book/internet/friend. There is serious penalty for plagiarism. A straight zero will be given for the cause. Please write from your own understanding

Question Distribution Procedure	
Last Two digits of Student ID	**SET Number**
Even , Even	**SET-A**
Even , Odd	**SET-B**
Odd , Even	**SET-C**
Odd , Odd	**SET-D**

SET-B

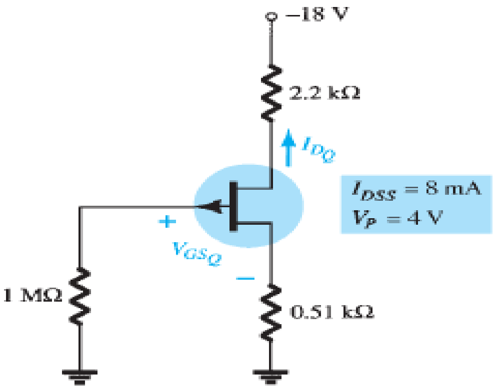
1(a).	Evaluate the equations for voltage gain, current gain, input impedance, and output impedance for a BJT using low-frequency re-model for CE configuration.	**CO3**	**Ev**	**03**
1(b).	For CE fixed biased amplifier circuit shown in **"Fig: 1"**,	**CO2**	**Ev**	**03**

determine:
a. Z_i & Z_o.
b. A_v.
d. A_i.



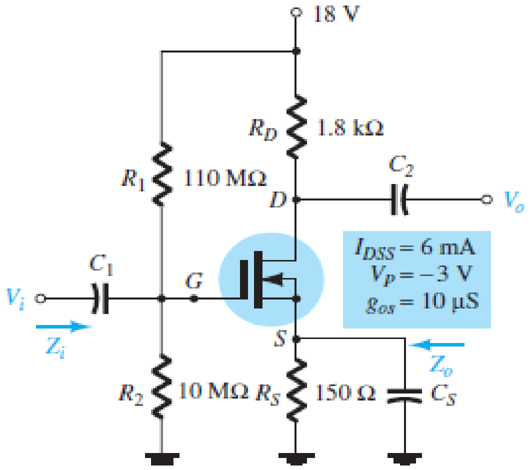
"Fig: 1" Fixed biased CE amplifier circuit.

2(a).	How will you achieve impedance matching with transformer coupling?	**CO1**	**U**	**01**
2(b).	Show that the magnitude of single-ended voltage gain at either collector of a differential amplifier is $A_v = \frac{R_C}{2r_e}$; where the symbols have their usual meaning.	**CO3**	**Ap**	**03**
2(c).	With a neat circuit diagram, explain the working principle of direct coupled transistor amplifier.	**CO1**	**U**	**02**
3(a).	For the network of **"Fig: 2"**, determine: **a.** I_{DQ} and V_{GSQ}. **b.** V_{DS} .	**CO2**	**Ev**	**02**



"Fig: 2", Self biasing circuit of an n-channel JFET.

3(b).	Design a self-bias network using a JFET transistor with I_{DSS} = 8mA and V_P = - 6V to have a Q-point at I_{DQ}= 4 mA using a supply of 14V. Assume that $R_D = 3R_S$ and use standard values.	**CO3**	**Cr**	**03**
3(c).	Explain the effect of temperature on FET.	**CO1**	**U**	**01**
4(a).	Explain the construction, operation and characteristics of an n- Channel depletion type MOSFET.	**CO1**	**An**	**03**
4(b).	Explain the significance of threshold voltage of a MOSFET.	**CO1**	**U**	**01**
4(c).	Derive the expression for transconductance of MOSFET.	**CO1**	**An**	**02**
5(a).	The network shown in **"Fig: 3"**, is an n-channel D-MOSFET amplifier circuit, resulting in V_{GSQ} = 0.35 V and I_{DQ} = 7.6 mA. a. Determine g_m and compare to g_{mo} . b. Find r_d . c. Calculate Zi and Av	**CO2**	**Ev**	**03**



"Fig: 3", n-channel D-MOSFET amplifier circuit.

5(b).	Determine the maximum and minimum peak-point voltage for a UJT with $V_{BB} = 25$ V. Given that UJT has a range of $\eta = 0.74$ to 0.86	**CO2**	**Ev**	**02**
5(c).	Draw the equivalent circuit and characteristics curve of UJT.	**CO1**	**R**	**01**
6.	Viva-Quiz: The time of viva-quiz will be declared in google classroom.	**CO1**		**20**

Prepared by

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