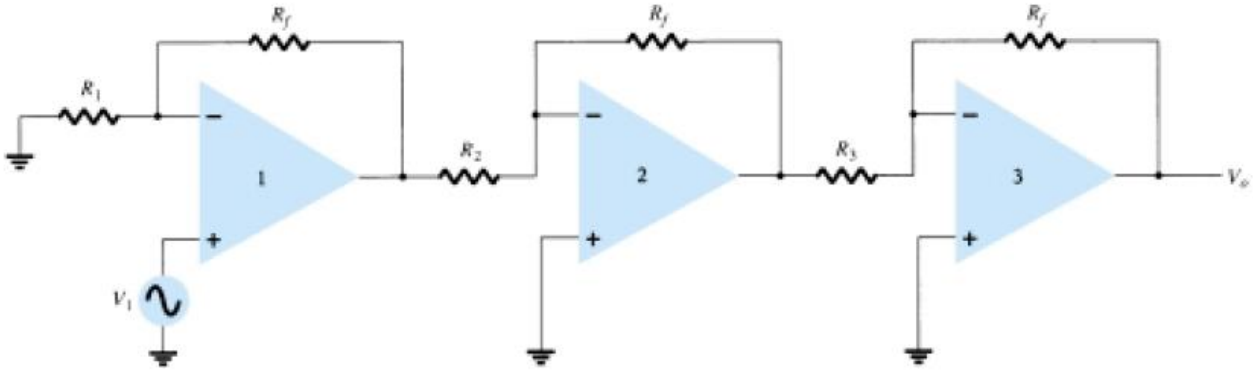
School of Electrical and Electronics Engineering
CIA II Examinations June 2021
Class: I B. Tech (CSBS)

Course Code: EIE 110 **Course name: principles of Electronics**
Duration: 90 Min **Max Marks: 50**

ANSWER ALL QUESTIONS

PART – A **10 * 02 = 20**

1. Briefly explain the construction of NPN transistor.
2. Draw a transistor biased with fixed bias and write the necessary equations for the input and output loop.
3. What is meant by early effect with respect to transistor?
4. Briefly explain the action of transistor as a switch.
5. How do you define pinch off voltage for the JFET?
6. The partial datasheet of 2N5459 JFET indicates that typically I_{DSS} = 9 mA and $V_{GS(OFF)}$ = -8V(maximum). Using these values, determine the drain current for V_{GS} = 0 V, -1 V, and -4 V
7. List any four characteristics of ideal Op-Amp.
8. An operational amplifier is supplied with ±12 volts. The non-inverting input is grounded. 1 volt is applied at the inverting input terminal through the input resistance of 1 KΩ. The feedback resistor is having the value of 50KΩ. Determine the output voltage.
9. Determine the output voltage of an integrator circuit using Op-Amp.
10. Calculate the output voltage Vo, if R_f = 470 KΩ, R_1 = 4.3 KΩ, R_2 = 33 KΩ, R_3 = 33 KΩ and the input voltage is 80μV.



PART – B **3 * 10 = 30**

11. A field effect transistor is constructed with a metal oxide layer between gate and substrate. There will be a channel for flow of charge carriers during the construction. Identity the device. Draw the schematic diagram of this device. Explain its working and also analyse the characteristics between different voltages and currents.

12. An NPN transistor is configured in common base configuration. You are performing a test to study its characteristics. From these characteristics, you are determining the relation between the output current and the input current. From this data along with current equation of the transistor, how do you obtain the current gain of the same NPN transistor when it is connected in common emitter configuration. Explain in detail with necessary expressions.

13. You have been assigned a task of amplifying three different voltages and adding them to get the output. You must use maximum of only two operational amplifiers and the liberty to use any number of resistors. How do you achieve your task? Draw the necessary circuit and derive the output voltage. Write the condition at which these three voltages are added without amplification.