

# **Class Test -1<sup>st</sup> KOE-038 Electronics Engineering Branches: EE & CH**

Time: 1 Hour

MM: 15

Note: Attempt all questions.

Q1. Attempt all parts:

- i. Briefly discuss the resistances of p-n junction diode.

06

CO1

OR

Draw and briefly discuss the structure of p-type Si and n-type Si.

- ii. What is cut-in voltage of a p-n junction diode? Also draw the V-I characteristics curve.

CO1

OR

Draw and explain the working of zener diode with the help of VI characteristic curve.

- iii. Draw and briefly discuss the working of full wave bridge rectifier.

CO2

Q2. Attempt all parts:

09

CO1 & CO2

- i. Determine  $V_o$  for each the networks of Fig. 1 (a) and (b):

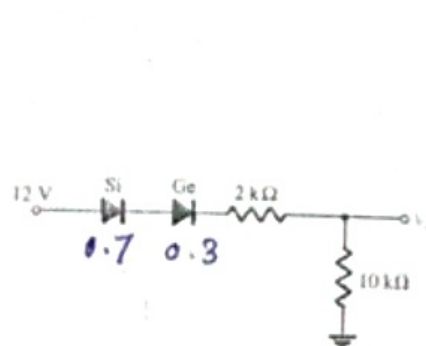


Figure 1 (a)

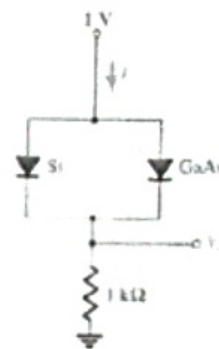


Figure 1(b)

- ii. Determine  $v_o$  for each network of Fig. 2 for the input shown.

CO2

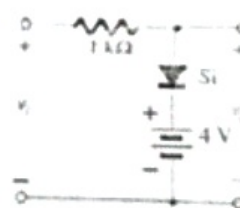
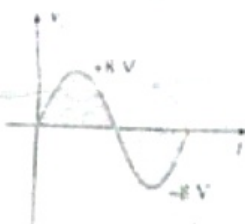


Figure 2

- iii. Design a clamper to perform the function indicated in Fig. 3.

CO2

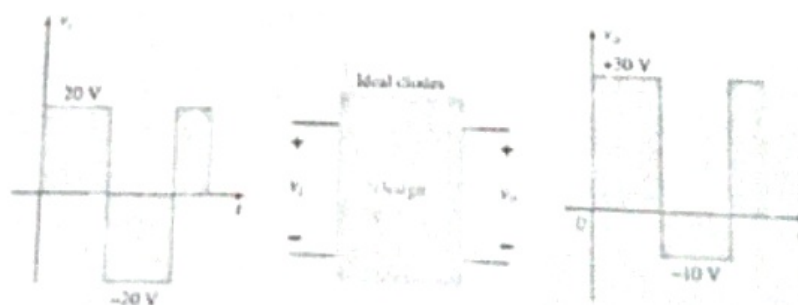


Figure 3

OR

Draw and explain the working of clippers and clamper circuits.

**Odd Semester 2022-23**  
**Class Test -1<sup>st</sup> KOE-038 Electronics Engineering Branches: EE & CH**

Time: 1 Hour

MM: 20

Q1. Attempt any *two* parts:

- i. Draw the piecewise-linear equivalent circuit, simplified equivalent circuit and ideal equivalent circuit of Si Diode. 06  
C01
- ii. Explain the following: C01
  - A. Zener Diode
  - B. LED
- iii. What are the different types of diode resistances? Briefly Explain. C01

Q2. Attempt any *three* parts:

- i. Draw the full wave bridge rectifier and its output waveform for sinusoidal waveform. 09  
C02
- ii. Sketch  $v_o$  for the network of Figure 1 and determine the dc voltage available. C02

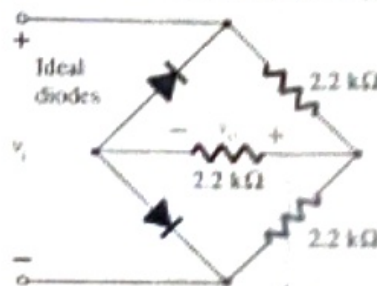
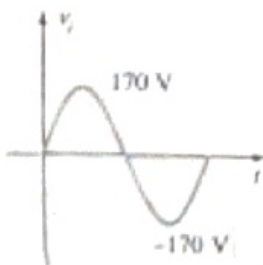


Figure 1

- iii. Draw the circuit of positive logic OR gate with the help of diodes. C02
- iv. Design a clamper to perform the function indicated in Fig. 2. C02

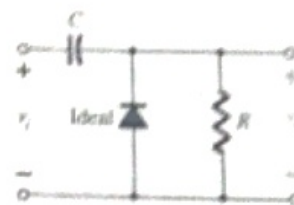
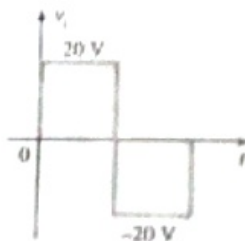


Figure 2

Q3. Attempt any *one* parts:

- i. Draw and discuss the common base configuration of BJT. Also draw the input and output characteristics. 05  
C03
- ii. Explain the construction and working of n-Channel JFET. Also draw the V-I characteristics curve. C03

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**B. TECH.**  
**THIRD SEMESTER THEORY EXAMINATION, 2022-23**  
**KOE-038**  
**ELECTRONICS ENGINEERING**

**Time: 03 Hours****Max. Marks: 100**

Note:

- Attempt all questions. All questions carry equal marks.

- Attempt any **FOUR** parts of the following: 4×5      CO
  - Explain the formation of the depletion layer in an unbiased PN junction diode. Why a semiconductor acts as an insulator at ordinary temperature? CO1
  - Differentiate between majority carriers and minority carriers. Also write down the expression for diode current. CO1
  - Define knee voltage and breakdown voltage with respect to diode. CO1
  - Define forward static and dynamic resistances of diode. CO1
  - With neat sketch explain principle and operation of Zener diode? CO1
  - Draw and discuss the diode equivalent circuits with the suitable diagrams. CO1
- Attempt any **FOUR** parts of the following: 4×5      CO
  - Explain the working of Center Tapped Full Wave Rectifier? What is the importance of peak inverse voltage? CO2
  - What is voltage multiplier? Discuss the voltage doubler with the help of suitable diagram. CO2
  - Draw the output waveform of the Figure 1. CO2



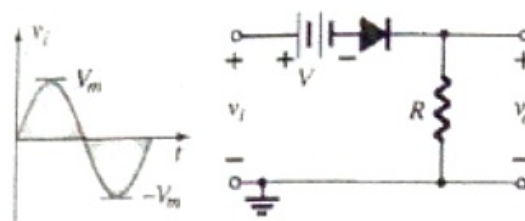


Figure 1

- d. Draw the output waveform of the Figure 2.

CO2

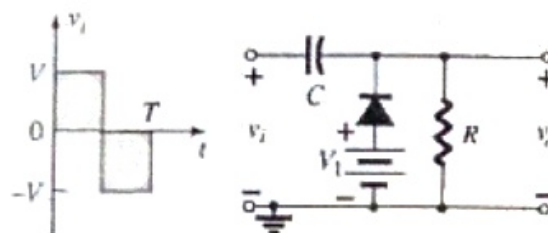


Figure 2

- e. (i) For the network of Figure 3, determine the range of  $R_L$  and  $I_L$  that will result in  $V_{RL}$  being maintained at 10 V. CO2  
(ii) Determine the maximum wattage rating of the diode.

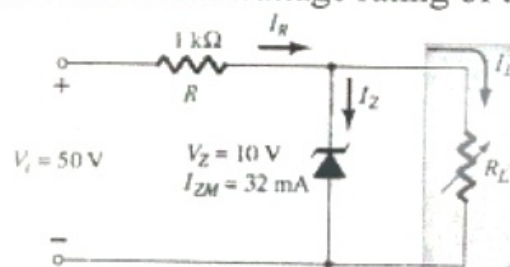


Figure 3

- f. Differentiate between tunnel diode and normal PN junction diode? CO2

3. Attempt any **TWO** parts of the following: 2×10 CO  
 a. Draw and explain the common emitter configuration with help of V-I characteristics curve. Also derive the  $r_e$  model of common emitter configuration. CO4  
 b. Using the parameters  $P_{Dmax}$ ,  $V_{CEmax}$ ,  $I_{Cmax}$  and  $V_{CEsat}$  sketch the boundaries of operation for the device. CO4  
 Determine the dc bias voltage  $V_{CE}$  and the current  $I_C$  for the voltage divider configuration of Figure 4

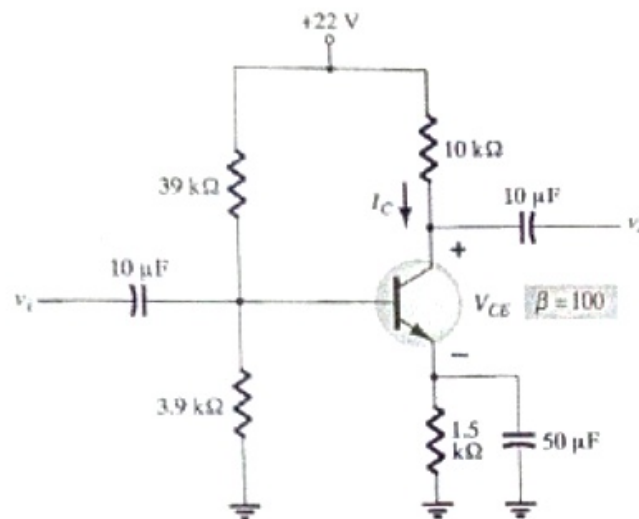


Figure 4

c. Attempt any two parts:

CO4

- (i) Why the input impedance in FET is very high in comparison with BJT?
- (ii) Explain the performance of JFET as a voltage variable resistor
- (ii) Draw the <sup>Drain</sup>~~Gate~~ and transfer characteristics of an n-channel depletion type MOSFET.

4. Attempt any **TWO** parts of the following:

2×10

CO

- a. (i) State assumptions made for analysing ideal op-amp.
- (ii) Define CMRR and why does an op-amp have high CMRR?

CO4

- b. Explain what way is the voltage follower a special case of the non-inverting amplifier?

CO4

What is the range of the voltage gain adjustment in the circuit of Figure 5?

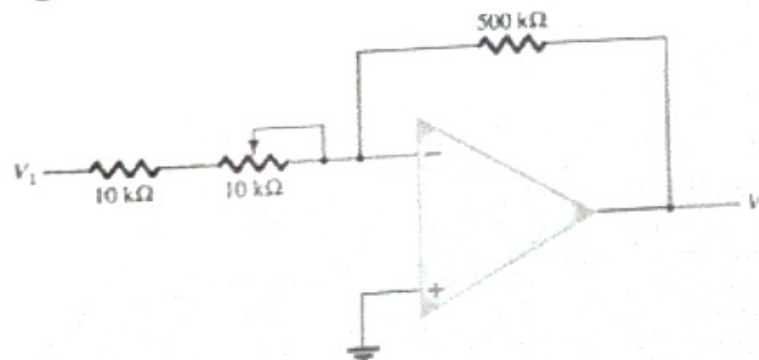


Figure 5

- c. What is meant by slew rate in an op amp? CO4  
 Calculate the output voltage  $V_2$  and  $V_3$  in the circuit of Figure 6.

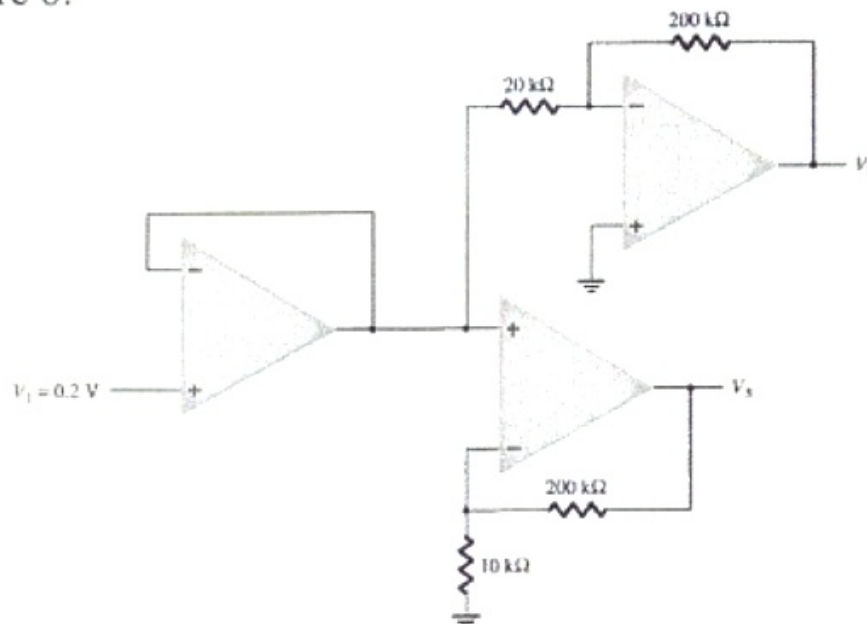


Figure 6

5. Attempt any **TWO** parts of the following: 2×10 CO
- Draw the block diagram of Ramp type digital multimeter and explain its working. What is the resolution of a  $4^{1/2}$  digit display? CO5
  - Draw the block diagram of basic CRO and explain the function of each block in detail. Also explain how CRO can be used to measure frequency and phase by Lissajous pattern? CO5
  - Write the short note on working of Digital Storage Oscilloscope. CO5
    - State and explain types of error and sources of error. Explain the difference between accuracy and precision.

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**B. TECH.**  
**THIRD SEMESTER THEORY EXAMINATION, 2021-22**  
**KOE-038**  
**ELECTRONICS ENGINEERING**

Time: 03 Hours

Max. Marks: 100

Note:

- Attempt all questions. Assume missing data suitably.

- Attempt any **FOUR** parts of the following: 4×5 CO
  - Draw Energy band diagram of conductor, semiconductor & insulator. CO1
  - What is knee or cut-in voltage? Also write its significance. CO1
  - Define what is zener voltage? Why is zener diode used as a voltage regulator? CO1
  - Define the static and dynamic resistances of a diode. CO1
  - Draw and discuss the VI characteristics of simple pn junction diode and zener diode. CO1
  - Discuss the simplified equivalent circuit and ideal equivalent of pn junction diode. CO1
- Attempt any **FOUR** parts of the following: 4×5 CO
  - Determine the level of  $V_o$  for network of Figure 1. CO2

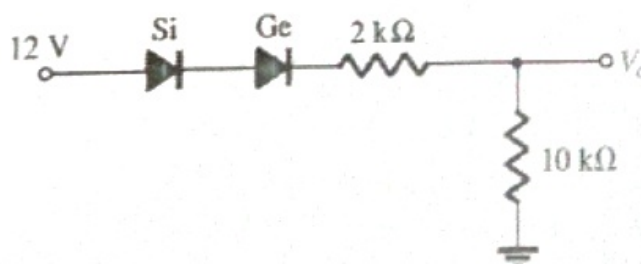


Figure 1



- ✧ Draw and explain the full wave bridge rectifier and also calculate the PIV for the same. CO2
- c. Determine  $V_o$  for the configuration of Figure 2. CO2

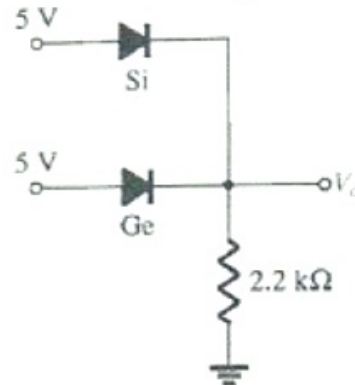


Figure 2

- d. Determine  $v_o$  for each network of Figure 3 for the input shown. CO2

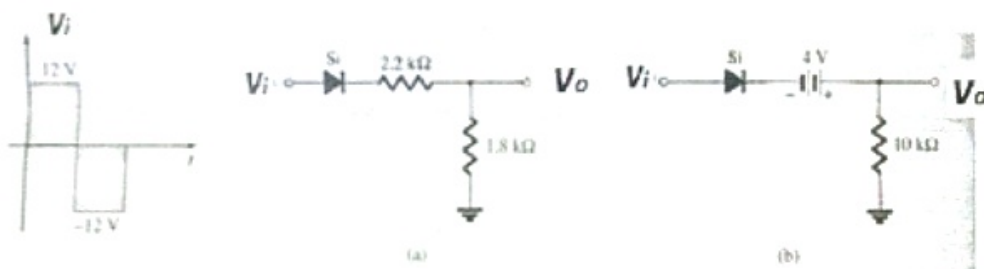


Figure 3

- e. Discuss the working of any two: CO2
- (i) LED
  - (ii) Tunnel Diode
  - (iii) Voltage doubler

- ✧ Sketch  $v_o$  for network of Figure 4 for the input shown. CO2

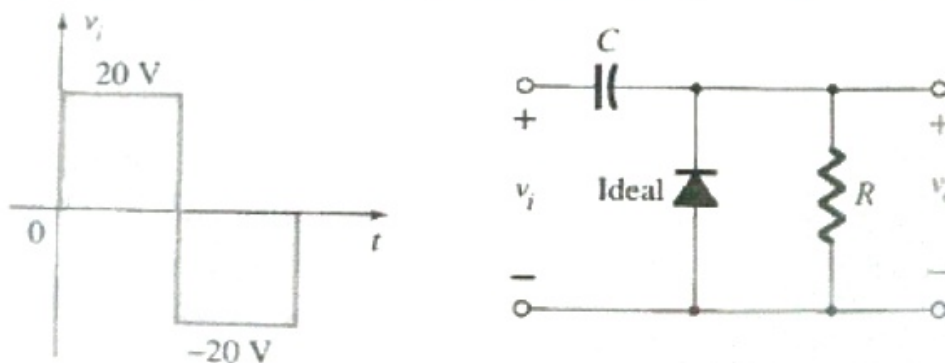


Figure 4



3. Attempt any **FOUR** parts of the following: 4×5 CO
- Draw the common base configuration circuit diagram and explain the working with the help of input and output characteristic curves. CO3
  - What are  $\alpha$  and  $\beta$ ? Derive the relation between alpha and beta? CO3
  - Determine the following for the fixed-bias configuration of Figure 5: CO3
    - $I_{BQ}$  and  $I_{CQ}$ , (ii)  $V_{CEQ}$ , (iii)  $V_B$  and  $V_C$ , (iv)  $V_{BC}$

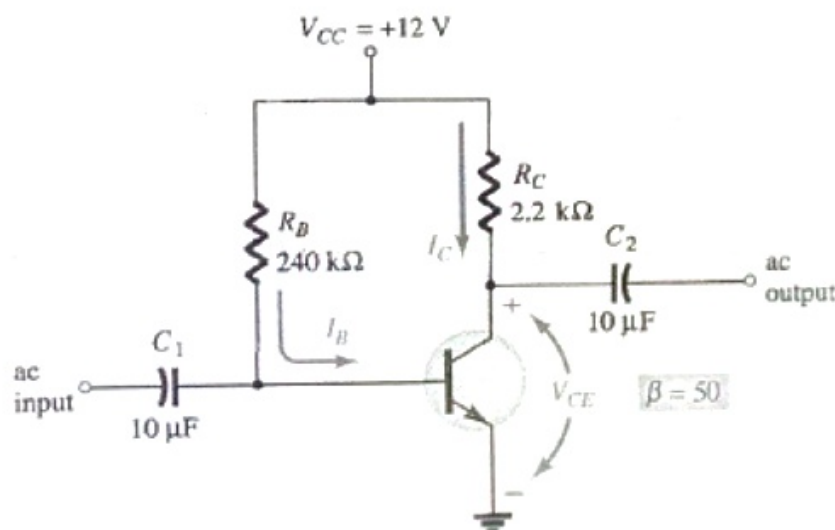


Figure 5

- What are the limits of operation for a transistor? CO3
- Justify the significance of pinch-off voltage with reference to JFET. CO3
- Discuss the construction and working difference between the depletion type and enhancement type MOSFET. CO3

4. Attempt any **TWO** parts of the following: 2×10 CO
- (i) What is unity follower? Draw the circuit. CO4  
(ii) Draw the adder circuit and also derive the mathematical expression.

- b. What is CMRR and discuss the significance?  
Calculate the output voltage for the circuit of Figure 6.

CO4

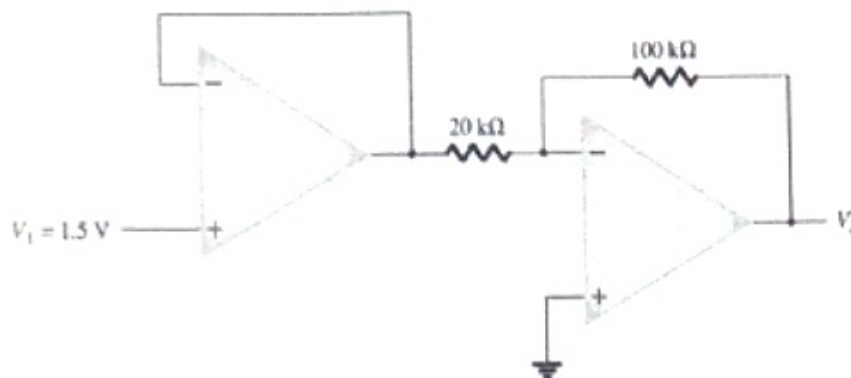


Figure 6

- c. (i) What output voltage results in the circuit of Figure 7 for an input of  $V_1 = -0.3$  V? CO4

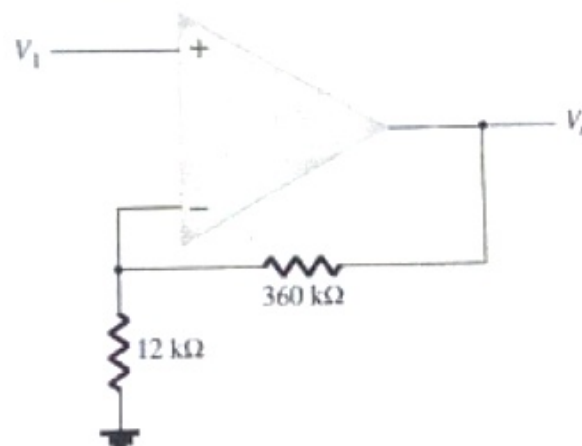


Figure 7

- (ii) Draw the circuit of Integrator and derive the expression.

5. Attempt any **TWO** parts of the following: 2×10 CO
- Draw and explain the functional block diagram of CO5 multimeter. Write advantages and disadvantages of digital multimeter.
  - Draw the diagram of cathode ray tube and explain the CO5 function of each part.
  - Write short notes on any two: CO5
    - Lissajous patterns,
    - 3½ digit and 4½ digit multimeter,
    - Digital Storage Oscilloscope

KOE-038 Electronics Engineering

Time: 1 Hour

M.M.:10

Note: Attempt all question.

1. Attempt any one part:

CO3 [2]

a. Briefly explain the working of depletion type MOSFET.

b. Write down the differences of depletion and enhancement MOSFET.

2. Attempt any two parts:

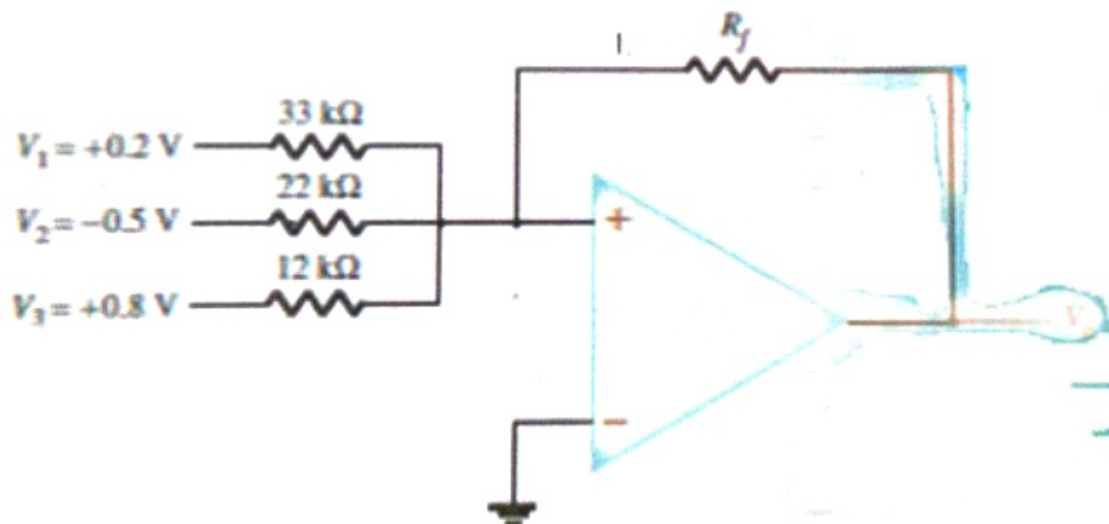
CO4 [6]

a. Draw and derive the expression:

(i) Non-Inverting Amplifier Circuit (ii) Differentiator Circuit

b. Briefly explain (i) CMRR (ii) Slew Rate

c. Calculate the output voltage  $V_0$  developed by the circuit for  $R_f=330k\Omega$  and  $R_f=68k\Omega$



3. Attempt any one part:

CO5 [2]

a. Draw and explain the functional block diagram of digital multimeter.

b. Draw and explain the working of dual slope Analog to Digital conversion.