

Q.N.4. Attempt any two parts of the following:

a) sketch and explain the input and output characteristics of transistor in CE configuration.

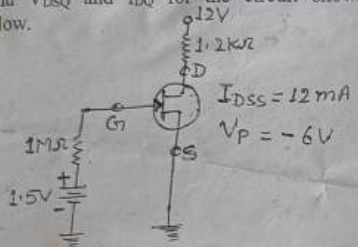
CO2

5

b) With neat sketch, explain the working of an n-channel JFET. Also draw the drain characteristics. Find V_{DSQ} and I_{DQ} for the circuit shown below.

CO2

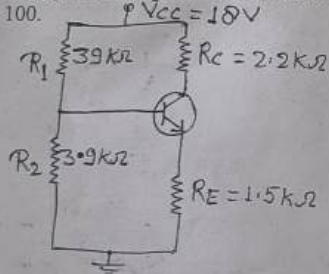
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c) For the following voltage divider circuit find I_{CQ} and V_{CEQ} . Assume germanium transistor and $\beta = 100$.

CO2

5



Q.N.5. Attempt any two parts of the following:

a) Derive the expression of the output of the difference amplifier.

CO3

5

b) Convert the following

- 1) $(AE7.3CA)_{16}$ into binary.
- 2) $(DEF.3BF)_{16}$ to octal
- 3) $(347.025)_8$ to Hexadecimal.

CO3

5

4) $(1101.011)_2$ to decimal number

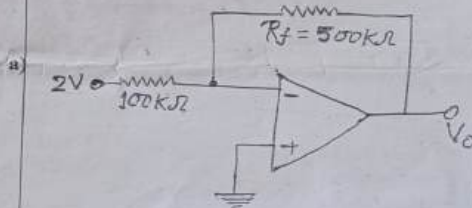
What do you mean by universal gate? Realize all basic gates using any universal gate.

c)

CO3

Q.N.6. Attempt any two parts of the following:

a) Enlist the characteristics of ideal op-amp. Also Derive the gain of the non-inverting op amp. Find the output of the following circuit.



CO3

b) What do you mean by virtual ground? Draw circuit diagram of differentiator and integrator and also derive the expression for their output.

CO3

c) What do you mean by feedback? Also explain concept of negative and positive feedback in OP-amp

CO3

Table 1: Mapping between COs and questions
(Number of COs may vary from course to course)

COs	Questions Numbers	Total Marks
CO1	Q1.(a),(b) Q2.(a) Q3.(a),(b),(c)	23
CO2	Q1.(c),(d) Q2.(d) Q4.(a),(b),(c)	23
CO3	Q1.(e),(f) (g)(h) Q2.(b)(c) Q5.(a),(b),(c) Q6.(a),(b),(c)	46

Name: _____
Student University Roll No.: _____

Printed Pages: 2

School of Engineering
Second Sessional Examination, Odd Semester (AS: 2023-24)
B. Tech: CSE-1A to CSE-1J [Year: 1st] [Semester: 1st]

Course Title: Basic Electronics Engineering
Course Code: NEC 4101

Max Marks: 60
Time: 3hrs

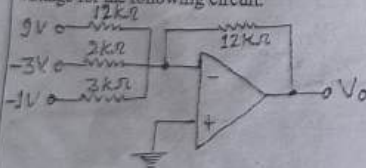
Instructions if any: Read the question Carefully.

SECTION 'A'		
Q.N.1. Attempt all parts of the following:		
	Course Objective	Marks
a) Free electrons and valence electrons are found in which band?	CO1	1
b) What do you mean by clipper?	CO1	1
c) What is the relationship between I_{CBO} & I_{CEO} ?	CO2	1
d) Write down the Shockley's Equation.	CO2	1
e) State DeMorgan's law.	CO3	1
f) Write down the truth table of XOR gate.	CO3	1
g) What do you understand by CMRR and slew rate?	CO3	1
h) Draw the circuit diagram of voltage follower and mention the gain.	CO3	1

SECTION 'B'

Q.N.2. Attempt any two parts of the following:

	Course Objective	Marks
a) Draw the circuit diagram of center-tap full wave rectifier and explain its working. A bridge rectifier circuit with $R_L = 200K\Omega$ is given an input of 230V, 50Hz from power mains through a transformer having turns ratio 8:1. Calculate I_{dc} , I_{rms} , ripple factor, P_{dc} , P_{ac} and rectification efficiency. Neglect the diode and secondary winding resistance.	CO1	6
b) Derive the expression of the output for inverting summing amplifier. Find the output voltage for the following circuit.	CO3	6



c) Perform the following subtraction using 1's complement and 2's complement.

CO3

6

d) Explain the construction and working of PNP transistor. Also derive the relationship between α & β .

CO2

6

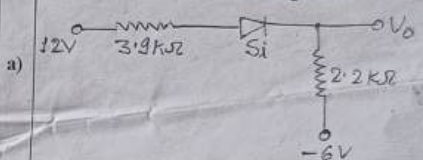
SECTION 'C'

Course Objective

Marks

Q.N.3. Attempt any two parts of the following:

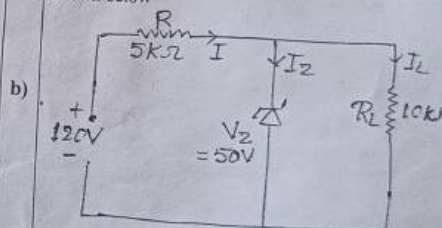
With neat sketch explain the working of PN junction diode in forward biased condition. Find the output voltage of the following circuit.



CO1

5

What do you mean by breakdown? Explain Zener and Avalanche breakdown mechanism. Determine V_L , V_R , I_Z for the zener network shown below



CO1

5

c) With neat diagram, explain the working principle and application of LED.

CO1

5