



Paper ID : 261036

Printed Page: 1 of 2

Subject Code: BEC201

Roll No:

B.TECH.

(SEM. II) THEORY EXAMINATION 2025-26
FUNDAMENTALS OF ELECTRONICS ENGINEERING

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief.

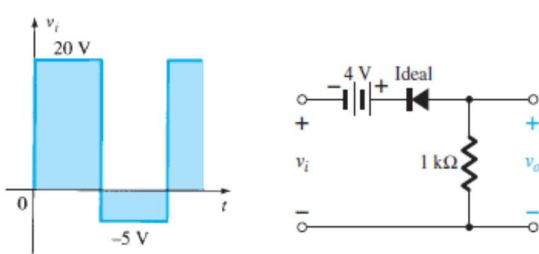
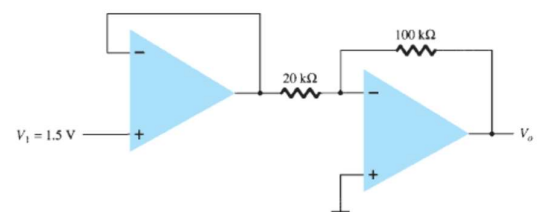
02 x 7 = 14

Q no.	Question	CO	Level
a.	Describe the difference between intrinsic and extrinsic semiconductors.	CO-1	K1
b.	Define I_{CBO} and I_{CEO} .	CO-2	K1
c.	Write-down the different parameters of practical operational amplifier and compare it with ideal amplifier.	CO-3	K1
d.	Which are the Universal logic gates? Design a 2-input AND gate using any one of the Universal logic gates.	CO-4	K1
e.	A 500-watt carrier power is modulated to depth of 90%; calculate the total power in the modulated wave.	CO-5	K1
f.	Briefly explain the working of LED.	CO-1	K1
g.	What are the key operational and structural differences between a Bipolar Junction Transistor (BJT) and a Field Effect Transistor (FET)?	CO-2	K1

SECTION B

2. Attempt any three of the following:

07 x 3 = 21

Q no.	Question	CO	Level
a.	Draw the circuit diagram and explain the working of full wave bridge rectifier. Determine v_o for network of figure for the input shown: 	CO-1	K3
b.	Draw the construction and working of n-channel JFET. What is pinch off condition in JFET?	CO-2	K3
c.	Explain the differential mode & common mode operation. Calculate the output voltage for the circuit of Figure: 	CO-3	K3
d.	I. Convert the following numbers: (i) $(110010110)_2 = ()_{16}$ (ii) $(B2D)_{16} = ()_8$ (iii) $(21.25)_{10} = ()_2$ II. Subtract the following using r's complement: (i) $(76548)_{10} - (96541)_{10} =$ (ii) $(11010011)_2 - (10110011)_2 =$	CO-4	K3
e.	Briefly discuss the electromagnetic spectrum. Why the modulation is needed in communication system?	CO-5	K3



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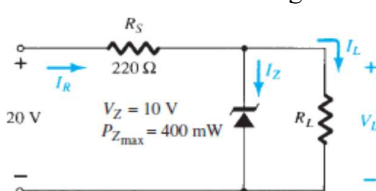
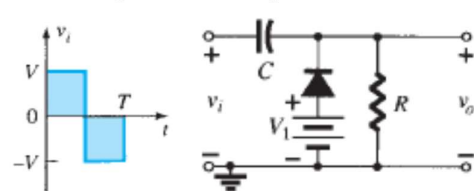
TIME: 3 HRS

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SECTION C

3. Attempt any one part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Explain the working of Zener diode as a voltage/shunt regulator. Determine V_L, I_L, I_Z, and I_R for the network of Figure if $R_L = 180 \Omega$. 	CO-1	K3
b.	What is voltage doubler? Briefly discuss any one. Sketch v_o for network of Figure for the input shown. (Consider ideal diode) 	CO-1	K3

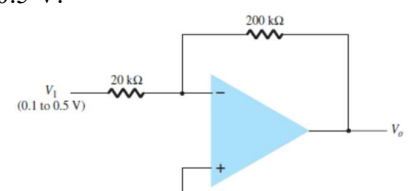
4. Attempt any one part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Draw the common emitter configuration of NPNBJT and explain it with the help of input-output V-I Characteristics curves.	CO-2	K3
b.	Explain the channel formation in Enhancement type MOSFET. Also differentiate between depletion and enhancement type MOSFET.	CO-2	K3

5. Attempt any one part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Discuss the following with respect to operational amplifier: (i) Virtual ground (ii) Slew Rate (iii) Unity follower	CO-3	K3
b.	What does CMRR indicate? What is the ideal value of CMRR for an op-amp? What is the range of the output voltage in the circuit of figure if the range can vary from 0.1 V to 0.5 V. 	CO-3	K3

6. Attempt any one part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Minimize the expression using K-Map $f(A, B, C, D) = \sum m(1, 3, 7, 8, 10, 11, 13, 14, 15)$ Implement the NAND gates on minimized expression.	CO-4	K3
b.	State the De Morgan's theorem. Realize the given function using NAND gates: $F = B'D' + B'C' + A'C'D$	CO-4	K3

7. Attempt any one part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Discuss the wireless communication. Also draw block diagram of cellular communication & explain each block.	CO-5	K3
b.	Write short notes on any two: (i) Up-linking & Down-linking (ii) Radar Communication (iii) Amplitude Modulation	CO-5	K3