Roll No:

B. TECH.
(SEM I) THEORY EXAMINATION 2020-21
EMERGING DOMAIN IN ELECTRONICS ENGINEERING

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

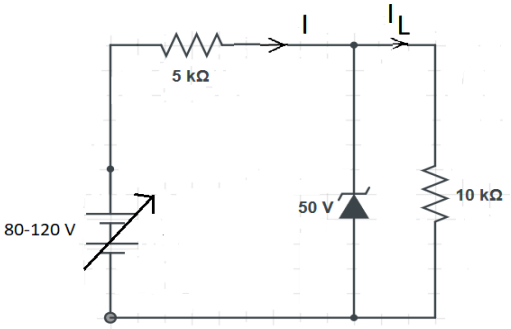
SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	Marks	CO
a.	What do you mean by the term doping? Why it is required?	2	1
b.	List any two advantages of modulation.	2	3
c.	Evaluate: $(637)_9 = (?)_5$	2	2
d.	Draw the VI characteristics of an ideal diode in forward and reverse bias conditions.	2	2
e.	State two differences between microprocessor and microcontroller.	2	3
f.	Why bridge type full wave rectifier is preferred over center tapped full wave rectifier. State two reasons.	2	1
g.	State two differences between FET and BJT.	2	4
h.	Differentiate between avalanche and zener breakdown.	2	1
i.	Find 1's and 2's complement of : 1101001	2	2
j.	State the basic difference between Bluetooth and Wi-Fi technology.	2	2

SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	(i) With help of neat circuit diagrams, explain the working of a full wave bridge rectifier. (ii) Define the term ripple factor. What is the value of the ripple factor for a half wave rectifier and a full wave rectifier?	6+4	3
b.	(i) With help of a neat diagram, explain the working of a voltage doubler circuit. (ii) Write a short note on varactor diode.	6+4	3
c.	For the circuit shown below, determine the value of maximum and minimum zener diode current. 	10	4
d.	(i) What are liquid crystal displays? Explain their working with help of a neat diagram. (ii) Determine the output waveform of the following circuit,	3+7	4

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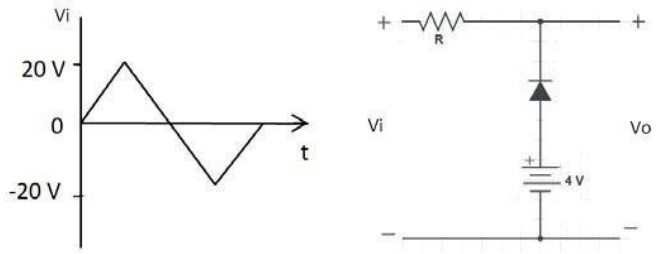
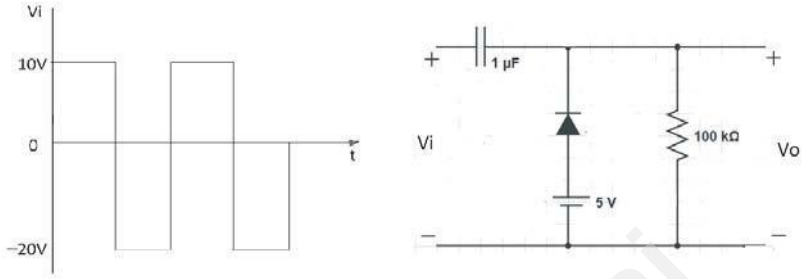
			
e.	(i) Determine the output waveform of the following circuit, by presenting all the necessary calculations which have been done to determine this output.  (ii) Derive the relationship between current amplification factor for Common Emitter and Common Base configuration of a bipolar junction transistor.	6+4	5

SECTION C

3. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Describe the construction of a npn bipolar junction transistor. Draw well labeled input and output characteristics of a npn transistor in Common Emitter Configuration. Also mark all the regions of operation	3+5+2	4
b.	Give the basic difference between an enhancement and depletion type MOSFET. Discuss the construction of a n channel depletion type MOSFET. Also draw its transfer and drain characteristics.	2+4+4	3

4. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	(i) What is an operational amplifier? Draw its block diagram. Write the characteristics of an ideal operational amplifier. (ii) With help of the circuit diagram, explain the working of OPAMP as differentiator.	5+5	3
b.	(i) What do you mean by IOT? Discuss its various components. (ii) Define the following terms: (1) CMRR (2) Peak Inverse Voltage	5+5	3

5. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Simplify the following function using K map $F(A, B, C, D) = \sum(1, 3, 4, 5, 6, 7, 9, 11, 13, 15)$ Also implement the simplified function using basic gates only.	6+4	4

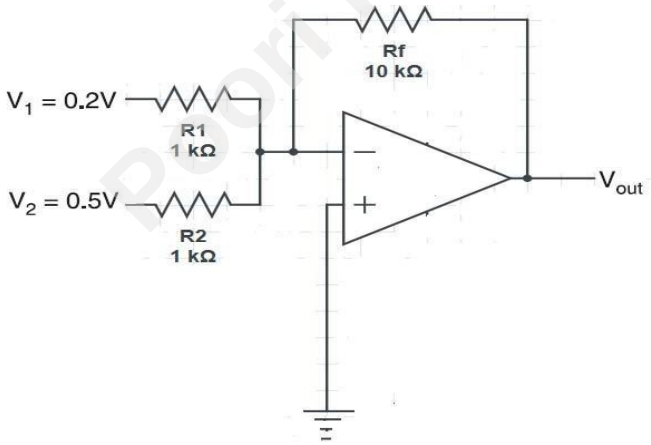
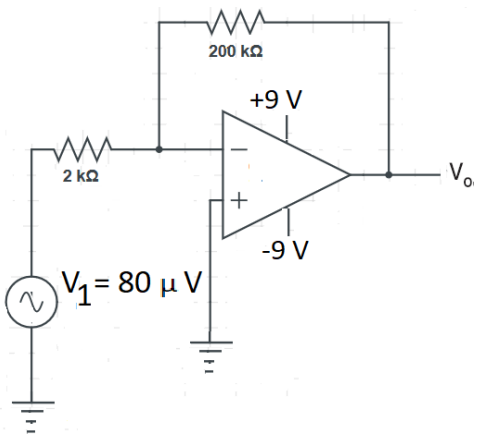
b.	By showing all the calculations, do as directed: (i) For a boolean function of 4 variables, $\sum(3,7,11,14,15) = \Pi(?)$	10	2

	(ii) $(110110.011)_2 = (?)_{16}$ (iii) $(231.36)_{10} = (?)_2$ (iv) $(11011.10)_2 = (?)_{10}$ (v) $(534)_8 = (?)_{10}$		

6. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	(i) What do you mean by amplitude modulation? Explain with help of proper waveforms. (ii) AM radio transmitter radiates 6 KW power when modulation percentage is 70 %. Determine the carrier power.	5+5	4
b.	(i) Write a short note on satellite communication system. (ii) Differentiate between CDMA and GSM?	5+5	3

7. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	(i) What are universal gates? Why are they called so? (ii) Implement XOR gate using NAND gate only.	5+5	2
b.	Determine the output for the following circuits: (i)  (ii)  	5+5	4

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