Roll No: | | | | | | | | | | | | |

BTECH
(SEM II) THEORY EXAMINATION 2023-24
BASIC ELECTRONICS

TIME: 3 HRS   M.MARKS: 70

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

SECTION A

1. **Attempt** *all* **questions in brief.**   **2 x 7 = 14**

a.	What is transition capacitance in a diode?
b.	What are Liquid-Crystal Displays (LCDs)?
c.	Outline the basic principle of an Oscilloscope.
d.	Define the DC biasing of BJTs.
e.	Explain the ideal characteristics of an Op-Amp.
f.	What are Varactor diodes used for?
g.	Explain Tunnel diodes.

SECTION B

2. **Attempt any** *three* **of the following:**   **7 x 3 = 21**

a.	Discuss the formation of the depletion layer in a PN junction diode. How does it affect the movement of charge carriers?
b.	Explain the concept of bias stabilization in BJTs. Why is it necessary, and what methods are used to achieve it?
c.	Draw and describe the block diagram of an Op-Amp, highlighting the key components and their roles.
d.	Explain the basic concept and working principle of a Digital Voltmeter (DVM).
e.	Derive the power calculation of AM signal. Calculate the percentage power saving when the carrier and one of the sidebands are suppressed in AM wave modulated to a depth of 75 percent.

SECTION C

3. **Attempt any** *one* **part of the following:**   **7 x 1 = 7**

(a)	Discuss the Zener breakdown mechanism. How does it differ from avalanche breakdown in Zener diodes?
(b)	Explain the working of clippers and clampers using diodes. Provide circuit diagrams and practical applications.

4. **Attempt any** *one* **part of the following:**   **7 x 1 = 7**

(a)	Explain the construction and characteristic curves of Junction Field Effect Transistors (JFET)
(b)	Describe the construction and operation of Metal-Oxide-Semiconductor Field-Effect Transistors (MOSFETs).

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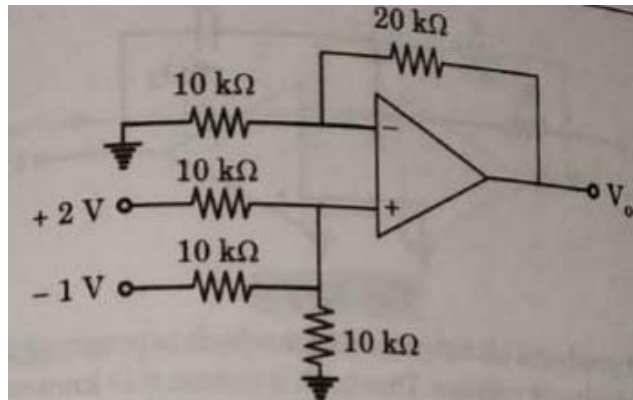
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5.   **Attempt any *one* part of the following:**   **7 x 1 = 7**

(a)	Explain the operation of a differential amplifier using Op-Amps. Find the output for the given figure
(b)	Explain the integrator circuit using Op-Amp. Also derive its output voltage

6.   **Attempt any *one* part of the following:**   **7 x 1 = 7**

(a)	Describe the construction and operation of a Cathode Ray Oscilloscope (CRO).
(b)	Compare Digital Storage Oscilloscopes (DSOs) with Analog Oscilloscopes

7.   **Attempt any *one* part of the following:**   **7 x 1 = 7**

(a)	Discuss the reasons for using modulation in communication systems. What are the demodulation techniques used in AM? Explain any one of them.
(b)	Draw and explain the basic elements of a communication system.