PAPER ID-311293

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

BTECH
(SEM III) THEORY EXAMINATION 2023-24
ELECTRONICS ENGINEERING

TIME: 3HRS **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**

Q no.	Question	Marks	CO
a.	Define diode resistance and diode capacitance.	2	1
b.	Define the depletion layer in a PN junction diode.	2	1
c.	Explain how clippers and clampers work.	2	2
d.	Explain the concept of DC biasing in BJTs.	2	3
e.	Differentiate between JFETs and MOSFETs.	2	3
f.	What is the purpose of a summing amplifier?	2	4
g.	What is the purpose of a digital voltmeter (DVM)?	2	5

SECTION B

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

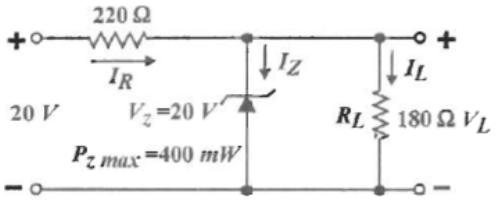
a.	Explain the concept of semiconductor materials and their role in the formation of PN junction diodes. Discuss the properties of silicon and germanium in this context.	7	1
b.	Explain the principles of full-wave rectification using diodes.	7	2
c.	Explain the emitter-follower configuration of a BJT transistor, discussing its characteristics, applications, and advantages.	7	3
d.	Discuss differential amplifier circuits and their applications in amplification and signal processing.	7	4
e.	Discuss the principles of operation of a digital voltmeter (DVM) using ramp technique	7	5

SECTION C

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

a.	Explain the breakdown mechanisms in Zener diodes, distinguishing between Zener breakdown and avalanche breakdown.	7	1
b.	Explain the working and V-I characteristic of p-n junction diode.	7	1

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

a.	Explain voltage multiplier circuits and their applications in generating high-voltage DC from low-voltage AC sources. Discuss different types of voltage multipliers and their characteristics.	7	2
b.	Differentiate between clipper and clamper circuits. Determine V_L, I_L, I_Z and I_R for the following circuit 	7	2

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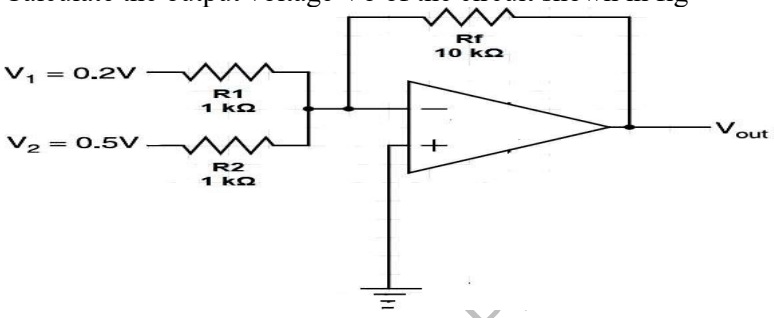
5. Attempt any *one* part of the following: 7 x 1 = 7

a.	Describe the construction and characteristics of Junction Field Effect Transistors (JFETs)	7	3
b.	Explain the operation and characteristics of depletion type Metal-Oxide-Semiconductor Field Effect Transistors (MOSFETs	7	3

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

a.	Define Op-Amp parameters such as input offset voltage, output offset voltage, input biased current, and input offset current.	7	4
b.	Calculate the output voltage Vo of the circuit shown in fig 	7	4

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

a.	Explain the operation and features of digital multimeters (DMMs)	7	5
b.	Explain how to measure voltage, current, phase, and frequency using a Cathode Ray Oscilloscope (CRO).	7	5