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

BTECH
(SEM III) THEORY EXAMINATION 2021-22
ELECTRONIC DEVICES

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 is meant by tunneling?	2	1
b.	Define Quantum efficiency in LED.	2	1
c.	Differentiate between Diffusion and Drift.	2	2
d.	Define the relation between resistance and current.	2	2
e.	Write Poisson and continuity equation.	2	3
f.	What is meant by "Early Effect"?	2	3
g.	Differentiate between JFET and MESFECT.	2	4
h.	Draw the circuit diagram of Bipolar Junction transistor.	2	4
i.	Write properties of MOS Capacitor.	2	5
j.	Draw the circuit diagram of LED.	2	5

SECTION B

2. Attempt any *three* of the following: 3 x 10 = 30

Q no.	Question	Marks	CO
a.	Define Semiconductor. Explain different kind of semiconductor devices with proper diagram.	10	1
b.	How the doping effect the performance of semiconductors with example?	10	2
c.	Enumerate the Switching characteristics of the PN diode with suitable circuit and waveforms. Write the break down condition of PN diode.	10	3
d.	Draw a circuit diagram to determine the CB characteristics of an NPN transistor. Also explain the input and output characteristics.	10	4
e.	Describe the Output and transfer characteristics of MOSFET.	10	5

SECTION C

3. Attempt any *one* part of the following: 1 x 10 = 10

Q no.	Question	Marks	CO
a.	Outline the theory of light generation in light emitting diode, with necessary expression for internal external quantum efficiencies.	10	1
b.	Drive and evaluate the expression for Schrodinger Wave Equation.	10	1

4. Attempt any *one* part of the following: 1 x 10 = 10

a.	Explain the different kind of energy bands in intrinsic and extrinsic silicon with proper example.	10	2
b.	Calculate the fermi level position in Si containing 1016 Phosphorus atoms/cm3 at 100 degree assuming 45% of impurities are ionized at this temperature. Also calculate the hole concentration.	10	2

5. Attempt any *one* part of the following: 1 x 10 = 10

a.	Explain the small signal switching models with proper waveforms and example.	10	3
b.	Express the diode current in PN junction diode with the proper derived expression.	10	3

6. Attempt any *one* part of the following: 1 x 10 = 10

a.	Define the Schottky diode. Deduce the expression for current voltage relation in a Schottky barrier diode.	10	4
b.	Illustrate the Ebers-Moll model with its characteristics and example.	10	4

7. Attempt any *one* part of the following: 1 x 10 = 10

a.	Discuss the structure of an N channel depletion type MOSFET with a neat diagram.	10	5
b.	Write short notes with circuit diagram on: (i) Photodiode (ii) Solar Cell.	10	5