PAPER ID-420320

Subject Code: KOE095

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

BTECH
(SEM VIII) THEORY EXAMINATION 2021-22
MODELING OF FIELD-EFFECT NANO DEVICES

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

Notes:

- *Attempt all Sections and Assume any missing data.*
- *Appropriate marks are allotted to each question, answer accordingly.*

SECTION-A	Attempt **All** of the following Questions in brief	Marks **(10X2=20)**	**CO**
Q1(a)	What is a nano-device?		
Q1(b)	Define modeling.		
Q1(c)	What do you mean by transistor?		
Q1(d)	Define triple gate.		
Q1(e)	What is 0D channel?		
Q1(f)	Define ionizing.		
Q1(g)	What is a VT device?		
Q1(h)	Explain RF circuit.		
Q1(i)	What do you mean by semiconductor?		
Q1(j)	What is a gate stack?		

SECTION-B	Attempt **ANY THREE** of the following Questions	Marks **(3X10=30)**	**CO**
Q2(a)	What do you mean by MOSFET? Discuss the MOSFET scaling in detail?		
Q2(b)	Define electrostatics. Discuss 1D and 2d MOS electrostatics in detail.		
Q2(c)	Write a note on the Carbon nanotube.		
Q2(d)	What is ballistic nano transistor? Discuss a general modal for ballistic nano transistor.		
Q2(e)	What is the impact of device performance on digital circuits? Discuss.		

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	**CO**
Q3(a)	What are multi gate transistors? Discuss any two types of such transistors with their applications.		
Q3(b)	Discuss the concept of quantum effects in detail.		

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	**CO**
Q4(a)	What do you understand by asymmetry effect? Discuss in detail.		
Q4(b)	Explain the following: (i) Double gate MOS system., (ii) Scattering.		

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	**CO**
Q5(a)	Write the note on the following: (i) Evaluation of I-V characteristics., (ii) Band structure of Graphene.		
Q5(b)	What do you understand by single electron charging? Discuss in detail.		

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	**CO**
Q6(a)	Discuss about the Radiation effects in SOI MOSFETs.		
Q6(b)	Explain the following: (i) Scaling effects. (ii) FET's.		

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	**CO**
Q7(a)	Write a note on the SRAM design with detail diagram.		
Q7(b)	(i) Explain operational amplifier. (ii) Successive approximation DAC.		