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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

M.TECH

FIRST YEAR (SEMESTER-II) THEORY EXAMINATION (2020-2021)

(Objective Type)

Subject Code: AMTVL0215

Subject: Nanoscale Devices: Modeling &Simulation

Max. Mks. : 40

Time : 70 Minutes

General Instructions:

All questions are compulsory.

Question No- 1 to 5 are objective type question carrying 2 marks each.

Question No- 6 to 20 are also objective type/Glossary based question carrying 2 marks each.

S.No	Question Content	Question Image	Category	Sub Category	Marks	Type	Difficulty	Correct	Option1	Option2	Option3	Option4
1	for solving the MOS electrostatics _____ used		Single Choice Questions	Single Choice Questions	2	Single Choice	Smart	Poisson's equation	Poisson's equation	labmert equation	Poisson's equation AND labmert equation Both	None of these
2	Which of the following are the super conducting wires?		Single Choice Questions	Single Choice Questions	2	Single Choice	Smart	YBCO	YBCO	Ni	Pt	Au
3	FinFET was developed to overcome the		Single Choice Questions	Single Choice Questions	2	Single Choice	Smart	short-channel effect	short-channel effect	large-channel effect	mid-channel effect	no channel effect
4	Bypass capacitors are used to		Single Choice Questions	Single Choice Questions	2	Single Choice	Smart	remove RF from non-RF circuits	remove RF from non-RF circuits	couple RF around an amplifier	neutralize amplifiers	reduce the Miller effect
5	Modern power devices are based on the IGBT, which is a combination of an		Single Choice Questions	Single Choice Questions	2	Single Choice	Smart	SCR and a MOSFET	SCR and a MOSFET	diode and BJT	BJT and MISFET	None of these
6	Short-channel effects arise when control of the channel region by the gate is affected by …………... from source and drain		Glossary I	Glossary I	2	Single Choice	Smart	electric field lines	electric field lines	doping concentration	thin buried oxide	
7	influence on the channel can be reduced by increasing the…………... in the channel region		Glossary I	Glossary I	2	Single Choice	Smart	doping concentration	electric field lines	doping concentration	thin buried oxide	
8	Short-channel effects can be reduced in FDSOI MOSFETs by using a ………………. and an underlying ground plane		Glossary I	Glossary I	2	Single Choice	Smart	thin buried oxide	electric field lines	doping concentration	thin buried oxide	
9	Under low drain voltages , the device operates like a…………………..with the gate voltage controlling the ………………..		Glossary II	Glossary II	2	Single Choice	Smart	Resistor, on-current	Resistor, on-current	Current source, on-current	Resistor	
10	Under high drain bias , the device operates like a ……….. with the gate voltage controlling the magnitude of the …….		Glossary II	Glossary II	2	Single Choice	Smart	Current source, on-current	Resistor	Current source, on-current	Resistor, On current	

S.No	Question Content	Question Image	Category	Sub Category	Marks	Type	Difficulty	Correct	Option1	Option2	Option3	Option4
11	A good transistor should display a high ……..		Glossary II	Glossary II	2	Single Choice	Smart	Resistor	Resistor	Current source, on-current	Resistor, On current	
12	Semiconductor nanowire most often formed from a silicon precursor by etching of a solid or through catalyzed growth from a ………..		Glossary III	Glossary III	2	Single Choice	Smart	vapor phase	vapor phase	electrical conductivity	valence	
13	Silicon nanowires are efficient thermoelectric generators because they combine a high.....		Glossary III	Glossary III	2	Single Choice	Smart	electrical conductivity	vapor phase	electrical conductivity	valence	
14	The HOMO are analogous to the ……………... band of a semiconductor		Glossary III	Glossary III	2	Single Choice	Smart	valence	vapor phase	electrical conductivity	valence	
15	SOI technologies were first developed for radiation-hardened ……………………….. applications		Glossary IV	Glossary IV	2	Single Choice	Smart	military and space	military and space	increase	decrease	
16	Radiation-induced trapped charge in the buried oxide can…………...the leakage current of partially depleted transistors		Glossary IV	Glossary IV	2	Single Choice	Smart	increase	military and space	increase	decrease	
17	Radiation-induced trapped charge in the buried oxide can……………the threshold voltage and increase the leakage current of fully depleted transistors.		Glossary IV	Glossary IV	2	Single Choice	Smart	decrease	military and space	increase	decrease	
18	Input offset current is basically defined as the algebraic _____ the base current of two transistors.		Glossary V	Glossary V	2	Single Choice	Smart	difference between	difference between	current to voltage convertor	faulty sample-and-hold circuitry	
19	A transconductance amplifier is also called _____		Glossary V	Glossary V	2	Single Choice	Smart	current to voltage convertor	difference between	current to voltage convertor	faulty sample-and-hold circuitry	
20	Inaccurate analog-to-digital conversion may be due to _____		Glossary V	Glossary V	2	Single Choice	Smart	faulty sample-and-hold circuitry	difference between	current to voltage convertor	faulty sample-and-hold circuitry	