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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUE															R	
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B.Tech I Year II Semester Supplementary Examinations February-2022																
SEMICONDUCTOR PHYSICS																
(Electronics and Communication Engineering)																
3 h	ours									C	0,	Ν	lax. N	/arks: (60	
				(A	nswer	all Fi	ve Un	its 5 x	12 =	60 Ma	urks)					
а	Write	e the r	ostula	ites of	classi	cal fre	e elec	tron th	eorv.	List th	neir dr	awba	icks.		6	M
b	Disc	uss th	e adv	antage	es of	quanti	um fro	ee ele	ctron	theor	y ove	r the	clas	sical fi	ree	
	elect	ron th	eory.	U											6	IVI
OR																
a	Expl	ain the	e vario	us sou	irces c	of elect	trical 1	resista	nces i	n meta	ıls.				6	6M
b	Defi	ne the	follow	ving te	erms: (i) Mea	an free	e path	(ii) R	elaxat	ion tir	ne (i	ii) M	obility	6	6M
							UN	IT-II								
a	Wha	t is in	trinsic	semie	condu	ctor? I	Explai	n the	forma	tion o	f extr	insic	semi	conduc	tor 6	M
	with	dopin	g.						c				1			
Derive the expression for electrical conductivity of an intrinsic semico														ctor.	6	M
9	Desc	rihe tl	ne vari	iation	of wie	th of	denlet	JK tion re	orion i	n for	vard a	nd re	werse	hias o	fa	
pn-junction diode.													, 01as 0	6	5M	
b	b Differentiate drift and diffusion currents.															5M
	UNIT-III															
a	Deriv	Derive the eigen function and eigen values of a particle, which is moving in a														
	infin	infinite depth of one dimensional potential box.												8	SM	
b	An e	An electron moving in one dimensional potential box of width 4 Å. Predicts the													the	476.07
	mini	mum (energy	and f	irst ex	cited e	energy	of an	electi	on.					4	IVI
OR																
a	List	the int	egral f	form o	f Max	well's	s equat	tion. C	dive th	eir sig	gnifica	inces			6	5 M
b	State	and e	xplain	1 Stoke	e's the	orem.									6	5 M
							UNI	T-IV								
a	Disti	nguisl	ı betw	een sp	ontan	eous e	missio	on and	l stimu	ılated	emiss	ion.			4	M
b	Disc	uss the	e const	tructio	n wor	king n	nechai	nism c	of He-	Ne las	er wit	h nea	t diag	gram.	8	BM
							(DR								
a	Drav	v the	olock	diagra	m of	optica	l fiber	r com	munic	ation.	Desc	ribe	each	and ev	ery 8	BM
h	block	(in co	ommur	iicatio	n syst	em.	***									43.4
D	LISU	ine ap	pricati	ons of	optica	ai nde	rs.	IT V							4	+1VI
	Wilse	tic	notaal	malas		+ +la = -	UN	11-V	from	tool	ala				-	5 N /
a h	w na	i is na ain ho	notech w the	surfac	y: Lis	to vol	lume *	ages o	or nano	es in r	anom	ateri	ale		2	
IJ	LAJI		w the	Surrac	e area	10 00			loroas	05 III I .	anom	atori	a13.		,	/ 181
a	Desc	ribe tl	ne ball	millir	ng met	hod to	prepa	are na	nomat	erials.					7	7M
	N SI a b a b a b a b a b a b a b a b a b a	No: SIDDH B.Tec 3 hours a Write b Disce elect a Expl b Defin a Wha b Deriv a Desc pn-ju b Diffe a Desc pn-ju b Diffe	No: SIDDHARTI B.Tech I Y B.Tech I Y Descuss the solution b Discuss the b Discuss the b Define the a What is in with dopin b Derive the a Describe the pn-junction b Differentia a Derive the infinite dep b An electro minimum of a List the int b State and e a Distinguish b Discuss the a Draw the I block in co b List the app a What is na b Explain ho a Describe the	 No: SIDDHARTH INS B.Tech I Year II B.Tech I Year II hours a Write the postular b Discuss the advector theory. a Explain the various b Define the follow a What is intrinsice with doping. b Derive the expression a Describe the variant of the product of the expression a Derive the eiger infinite depth of the depth of t	No: SIDDHARTH INSTITU B.Tech I Year II Sema (Elect 3 hours (A a Write the postulates of b Discuss the advantage electron theory. a Explain the various sou b Define the following te a What is intrinsic semio with doping. b Derive the expression f a Describe the variation pn-junction diode. b Differentiate drift and of a Derive the eigen func- infinite depth of one di b An electron moving in minimum energy and f a List the integral form o b State and explain Stoke a Distinguish between sp b Discuss the construction a Draw the block diagrar block in communication b List the applications of a What is nanotechnolog b Explain how the surface a Describe the ball millin	 No: SIDDHARTH INSTITUTE O B.Tech I Year II Semester SEMI (Electronics) 3 hours (Answer) a Write the postulates of classic b Discuss the advantages of electron theory. a Explain the various sources or b Define the following terms: (a What is intrinsic semiconduct with doping. b Derive the expression for elected a Describe the variation of with doping. b Differentiate drift and diffusi a Derive the eigen function a infinite depth of one dimensional differentiate drift and diffusi a Derive the eigen function a infinite depth of one dimensional differentiate drift and diffusi a Derive the integral form of Max b State and explain Stoke's the a Distinguish between spontantion discuss the construction word a Draw the block diagram of block in communication syster b List the applications of optical a What is nanotechnology? List b Explain how the surface area a Describe the ball milling mether and surface area 	 No: (AU) SIDDHARTH INSTITUTE OF ENAL (AU) B.Tech I Year II Semester Support SEMICON (Electronics and C) a Write the postulates of classical freesing box (Answer all Finesing) a Write the postulates of classical freesing control (Answer all Finesing) a Write the postulates of classical freesing control (Answer all Finesing) a Write the postulates of classical freesing control (Answer all Finesing) a Write the postulates of classical freesing control (Answer all Finesing) a Write the postulates of classical freesing control (Answer all Finesing) a Explain the various sources of election theory. a Explain the various sources of election (Answer all Finesing) b Define the following terms: (i) Measer and the transmission of the following terms: (i) Measer and terms: (i)	No: (AUTONC SIDDHARTH INSTITUTE OF ENGINE (AUTONC B.Tech I Year II Semester Suppleme SEMICONDUC (Electronics and Comm 3 hours (Answer all Five Un UN a Write the postulates of classical free elec b Discuss the advantages of quantum fr electron theory. a Explain the various sources of electrical free b Define the following terms: (i) Mean free UN a What is intrinsic semiconductor? Explain with doping. b Derive the expression for electrical condu- a Describe the variation of width of depleted pn-junction diode. b Differentiate drift and diffusion currents. UN a Derive the eigen function and eigen va- infinite depth of one dimensional potenti b An electron moving in one dimensional minimum energy and first excited energy (a List the integral form of Maxwell's equat b State and explain Stoke's theorem. UN a Distinguish between spontaneous emission b Discuss the construction working mechan (a Draw the block diagram of optical fibers. UN a What is nanotechnology? List the advant b Explain how the surface area to volume reference of the surfa	No: SIDDHARTH INSTITUTE OF ENGINEERIN (AUTONOMOU B.Tech I Year II Semester Supplementary SEMICONDUCTOR I (Electronics and Communicati 3 hours (Answer all Five Units 5 x <u>UNIT-1</u> a Write the postulates of classical free electron th b Discuss the advantages of quantum free electron theory. OR a Explain the various sources of electrical resistat b Define the following terms: (i) Mean free path <u>UNIT-11</u> a What is intrinsic semiconductor? Explain the with doping. b Derive the expression for electrical conductivit OR a Describe the variation of width of depletion re pn-junction diode. b Differentiate drift and diffusion currents. <u>UNIT-111</u> a Derive the eigen function and eigen values infinite depth of one dimensional potential box b An electron moving in one dimensional potential box b List the integral form of Maxwell's equation. C b State and explain Stoke's theorem. UNIT-1V a What is nanotechnology? List the advantages of b Explain how the surface area to volume ratio in OR a Describe the ball milling method to prepare na	No: SIDDHARTH INSTITUTE OF ENGINEERING & ' (AUTONOMOUS) B.Tech I Year II Semester Supplementary Exam SEMICONDUCTOR PHYS (Electronics and Communication Er 3 hours (Answer all Five Units 5 x 12 = UNIT-] a Write the postulates of classical free electron theory. b Discuss the advantages of quantum free electron electron theory. OR a Explain the various sources of electrical resistances i b Define the following terms: (i) Mean free path (ii) R UNIT-II a What is intrinsic semiconductor? Explain the forma with doping. b Derive the expression for electrical conductivity of ar OR a Describe the variation of width of depletion region i pn-junction diode. b Differentiate drift and diffusion currents. UNIT-III a Derive the eigen function and eigen values of a 1 infinite depth of one dimensional potential box. b An electron moving in one dimensional potential 1 minimum energy and first excited energy of an electron WAR a List the integral form of Maxwell's equation. Give the b State and explain Stoke's theorem. INIT-IV a Distinguish between spontaneous emission and stimus b Discuss the construction working mechanism of He- OR a Draw the block diagram of optical fiber communic block in communication system. b List the applications of optical fibers. VINIT-V a What is nanotechnology? List the advantages of name b Explain how the surface area to volume ratio increas OR a Describe the ball milling method to prepare nanomation on the surface area to solume ratio increase OR b Describe the ball milling method to prepare nanomation on the optical fiber communication compares on the optical fibers on the optical fibers on the optical fibers on the optical fibers. OR a Describe the ball milling method to prepare nanomation the optical fibers on the optical fibers of name b Explain how the surface area to volume ratio increase OR	No:	No: SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOL (AUTONOMOUS) B.Tech I Year II Semester Supplementary Examinations SEMICONDUCTOR PHYSICS (Electronics and Communication Engineering) 3 hours (Answer all Five Units 5 x 12 = 60 Marks) UNIT-1 a Write the postulates of classical free electron theory. List their dr b Discuss the advantages of quantum free electron theory over electron theory. OR a Explain the various sources of electrical resistances in metals. b Define the following terms: (i) Mean free path (ii) Relaxation the UNIT-II a What is intrinsic semiconductor? Explain the formation of extra with doping. b Derive the expression for electrical conductivity of an intrinsic semi- OR a Describe the variation of width of depletion region in forward a pn-junction diode. b Differentiate drift and diffusion currents. UNIT-III a Derive the eigen function and eigen values of a particle, wh infinite depth of one dimensional potential box. b An electron moving in one dimensional potential box of width minimum energy and first excited energy of an electron. OR a List the integral form of Maxwell's equation. Give their significa b State and explain Stoke's theorem. UNIT-IV a Distinguish between spontaneous emission and stimulated emisss b Discuss the construction working mechanism of He-Ne laser wit OR a Draw the block diagram of optical fiber communication. Desc block in communication system. b List the applications of optical fibers. UNIT-V a What is nanotechnology? List the advantages of nanotechnology b Explain how the surface area to volume ratio increases in r.anom OR a Describe the ball milling method to prepare nanomaterials.	No:	No: SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PI (AUTONOMOUS) B.Tech I Year II Semester Supplementary Examinations February SEMICONDUCTOR PHYSICS (Electronics and Communication Engineering) 3 hours Max. M (Answer all Five Units 5 x 12 = 60 Marks) UNIT-1 a Write the postulates of classical free electron theory. List their drawbacks. b Discuss the advantages of quantum free electron theory over the class electron theory. OR a Explain the various sources of electrical resistances in metals. b Define the following terms: (i) Mean free path (ii) Relaxation time (iii) M UNIT-II a What is intrinsic semiconductor? Explain the formation of extrinsic semi with doping. b Derive the expression for electrical conductivity of an intrinsic semiconductor OR a Describe the variation of width of depletion region in forward and reverse pn-junction diode. b Differentiate drift and diffusion currents. UNIT-III a Derive the eigen function and eigen values of a particle, which is mo infinite depth of one dimensional potential box. b An electron moving in one dimensional potential box of width 4 Å. Pr minimum energy and first excited energy of an electron. OR a List the integral form of Maxwell's equation. Give their significances. b State and explain Stoke's theorem. UNIT-IV a Distinguish between spontaneous emission and stimulated emission. b Discuss the construction working mechanism of He-Ne laser with neat diag OR a Draw the block diagram of optical fiber communication. Describe each block in communication system. b List the applications of optical fibers. UNIT-V a What is nanotechnology? List the advantages of nanotechnology. b Explain how the surface area to volume ratio increases in ranomaterials. OR a Describe the ball milling method to prepare nanomaterials.	No: SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUD (AUTONOMOUS) B.Tech I Year II Semester Supplementary Examinations February-2022 SEMICONDUCTOR PHYSICS (Electronics and Communication Engineering) 3 hours Max. Marks: ((Answer all Five Units 5 x 12 = 60 Marks) UNIT-1 a Write the postulates of classical free electron theory. List their drawbacks. b Discuss the advantages of quantum free electron theory over the classical free electron theory. OR a Explain the various sources of electrical resistances in metals. b Define the following terms: (i) Mean free path (ii) Relaxation time (iii) Mobility UNIT-II a What is intrinsic semiconductor? Explain the formation of extrinsic semiconductor. OR a Describe the variation of vidth of depletion region in forward and reverse bias of pn-junction diode. b Differentiate drift and diffusion currents. Duriferentiate drift and diffusion currents. b An electron moving in one dimensional potential box. b An electron moving in one dimensional potential box of width 4 Å. Predicts minimum energy and first excited energy of an electron. OR a List the integral form of Maxwell's equation. Give their significances. b State and explain Stoke's theorem. DITI-IV a Discuss the construction working mechanism of He-Ne laser with neat diagram. OR a Draw the block diagram of optical fiber communication. Describe each and ev block in communication system. b List the applications of optical fibers. DITI-V a What is nanotechnology? List the advantages of nanotechnology. b Explain how the surface area to volume ratio increases in ranomaterials. OR a Describe the ball milling method to prepare nanomaterials.	No:

b Mention the applications of nanomaterials in the field of science and technology. **5M**

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