END SEMESTER/RETEST EXAMINATION - 2019

Semester: 3rd

Subject Code: ET-305

ANALOG ELECTRONICS-I

Full Marks - 70

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Time - Three hours

The figures in the margin indicate full marks for the questions.

Instruction:

1. All questions of PART - A are compulsory.

PART-A

Marks - 25

l.	Fill	in the blanks : $1\times10=10$
	(a)	Atomic number of silicon is
	(b)	A diode has forward resistance of the order of
	(c)	The forward current in a diode is of the order of
		[Turn over

201/						2.						a distribution			_	,
ET-3	(a)		©	9	(a)	Writ		9	Θ	(b)	(8)	(£)			(e)	
291/ET-305/AE-I	Con	апта	The	The	Zener d	e tr		of A	A ze	The	AH	A h	The	IS	The	
E	mor	ngen	pha	valu	er d	ie o	pone	ectif	ner	ratio	ansis	ılf-w	The maxing rectifier is		Вагті	
	and	ient	The phase difference output voltages	le of	iode	Write true or false	nt to	cir	diod	of	A transistor has	ave	is _	١.	er p	
	nitte Volt	arrangement is 0°.	ffere ages	0,0	id s	se :	o rea	outp	e is	$I_c/I_{\scriptscriptstyle \rm I\! B}$	has	recti	B		otent	
2	r Co	••	in	fat	ive		ıch t	emo	zener diode is always	ß.		A half-wave rectifier uses	- ffici		ial o	
	Common Emitter Configu Current and Voltage Gain.		betw	ransi	a h		component to reach the load.	ves t	ys _	The ratio of I_c/I_B is called		uses	ency		fasi	
	urati		com	stor	ighly		oad.	he A allov		٦	ermi		The maximum efficiency of a rectifier is		licor	
	Common Emitter Configuration has Current and Voltage Gain.		the i	is les	do			circuit removes the AC comporectifier output and allows only	CS CS		terminal(s).		a f		PN	
	nas 1		The phase difference between the input and output voltages in a common emitter	The value of α of a transistor is less than 1.	Zener diodes have a highly doped p-n junction.	1×10=10	AN THE	mpo	connected		·	diode(s).	full-wave	* *1	The Barrier potential of a silicon PN junction	
	both		and	5 1.	p-n	=10	CENTR	circuit removes the AC component (S)/er output and allows only DC (S)	ted.			(s).	ave		tion	
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291/Et-305/AE-I									ΘΘ	(3	(9)	\odot		(e)	
305/	(iv)	(iii)	Œ	Ξ	WI	Choose	COL	sig) A		>			be		
Æ-I			an	8	When a trivalent impurity i semiconductor, it becomes		coupling.	nal,	adio	MOSEEL HAS LWO LEIHIIMAIS.		A JFET is also called unipolar transistor.	Field E device.	in ti	nsist	
	n-type semiconductor	p-type semiconductor	intri	an insulator	triva	the correct answer:	ųα	ther	recei	FEI	TITI	is	ffect	in their cut-off region.	ors t	
	emic	emic	ısic	ator	lent or, it	ect 2		l or	ver h	Has	1	also	Tran	cut-c	hat a	
3	:ondı	ondu	semi		impi bec	msw		he I	as on	LW0		calle	ısisto	off re	are f	
	ıctor	ıctor	cond		urity	 G		nust	ie sta	[6]		El G	or is	egion	ully	
			an intrinsic semiconductor		is ac			use	ge of			upol	a vo	12: len	40,	
7					ided			tra 60	amp		2	ET ET	ltage		์ " aı	
					to a	-		msfo	lifica			ansis	ope		e sa	
Turn over			74 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		(a) When a trivalent impurity is added to a pure semiconductor, it becomes	1×5=5		signal, then one must use transformer	A radio receiver has one stage of amplification.			tor.	Field Effect Transistor is a voltage operated device.		Transistors that are fully "ON" are said to	
								V								

Marks - 45	PART – B
(ii) 1.21	(b) Ripple factor of half-wave rectifier is
(i) 1.414	ipple factor of
0	(b) R

(c) Which of the following configuration is used (iv) 0.48

(i) Common base configuration.

for impedance matching?

- (ii) Common emitter configuration.
- (iii) Common collector configuration. CENTRAL LIBRER
- (iv) All configurations are equally suited.
- (d) In a transistor
- (i) $I_C = I_B + I_B$ (ii) $I_B = I_C + I_B$
- (iii) $I_E = I_C I_B$ (iv) $I_E = I_C + I_B$
- @ power amplifiers coupling is generally employed in
- (i) Transformer (ii) RC
- (iii) Direct
- (iv) Impedance

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4. Answer in short:

(a) Draw VI characteristic curve of forward biased PN junction diode

(b) Draw the symbol of zener diode and varactor diode.

What is zener breakdown?

(d) What is a filter circuit?

Draw a CE configuration circuit diagram for NPN transistor.

5. Answer any *five* of the following: $3\times5=15$

(a) What is doping? Differentiate between intrinsic and extrinsic semiconductor.

(b) Draw a full wave rectifier circuit showing its input and output waveform.

(c) What is biasing? Name different types of biasing used in transistor.

(d) Draw output characteristic of CE configuration and label it.

(e) For a single stage transistor circuit, if α = 0.95 and I_E = 1 mA, find I_C and $I_{B'}$

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- (f) Draw the symbol for n-channel JFET, N-channel MOSFET and UJT.
- 6. Answer any four of the following: $5\times4=20$
 - (a) What is zener diode? What are the essential conditions required for zener biasing? Write two applications of zener.
 - (b) What is α and β factor? Derive a relation between α and β .
 - (c) Compare CB, CE and CC configurations in terms of their current gain, voltage gain, input resistance and output resistance.
 - (d) Draw a two stages transformer coupled amplifier and draw its frequency response curve.
 - (e) Classify MOSFET. Explain the working of N-Channel MOSFET?

(f) Compare Class A, Class B, Class C and Class

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AB amplifier.

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