Q.P. Code: 18EC0403

Dee	No					Laborer		T.			1		
Reg	. NO:												
	SIDDE	IART	HINS	TITU	TE O	FEN (AU	GINE	OMO	NG& US)	TEC	HNOI	LOGY:: PUTTUR	
	B.Teo	ch II Y	'ear ll	Seme	ester	Sup	pleme	entar	y Exa	mina	ations	February-2022	
					S	IGNA	ALS &	SYS	TEMS	5			
	2.1			(E	Electri	cal an	d Elec	etroni	cs Engi	ineer	ing)		
l'ime	: 3 hours						DAD	TA				Max. Marks: 60	
				(Ang	vor al	1 the	PAR	<u>1-A</u>	v 2 - 1	10 M	orka)		
1	a How	oro eve	toma	(Alls)	od?	I the C	Zuesti	ons 5	x 2 - 1		arks)		214
1	h What	are the	Meri	te of E	ourie	. Tran	sform	2					21VI 2M
	c What	is anti	-aliasi	no filte	ourrer >r?	IIIaii	3101111	•					21VI 2M
	d What	are the	-anasi	erties (of cros	ss cor	relatio	n for	enerov	sign	als		21VI 2M
	e What	is the	Z-tran	sform	of uni	it sten	siona	17	energy	Sign	uis.		2M
	e windt	is the		5101111	or an	n step	PAR	T-R					
				(Ans	swer a	all Fiv	e Unit	s 5 x	10 = 50) Ma	rks)		
				(UNI	T-I)		
2	a Find	which	of the	signal	s are (أدعيتهم	orno	n_cau	eal				5M
4	$(i) \mathbf{x}(t)$	$t = e^{2t}$	$u(t_1)$	(ii) y	t(t)=3	sinc 2	t (iii)	$\mathbf{x}(\mathbf{n}) =$	5a1. 11(n+4)	-11(n.	.2)	(iv) x(t) = u(-n)	JIVI
	h Sketc	h the f	ollowi	ng sig	nals	Sinc 2		X(II)	u(II++)	-u(11	2)		5M
	(i) 2	u(t+2)	-2.0(t)	-3)(ii)	u(t+4)) 11(-t+	-4) (iii) $r(t)$ -	r(t-1)-1	·(t-3)	-r(t-4)	(iv) $\pi(t-2)$	JIVI
	(1) 2	u(t + 2)	2 4(1	5)(11)	alleri) (())	(II) (III		1((1) 1	(1)	1((1))	$(1\mathbf{v})\mathbf{n}(12)$	
2	XX /1						O	R	• .1				103.6
3	What are	e the ba	asic op	beratio	ns on	signa	Is? IIIt	istrate	e with a	an ex	ample		10M
	UNIT-II												
4	Find the trigonometric Fourier series for the periodic signal $x(t)$ shown in below								10M				
							† ×(t)						
					1			Λ		1			
				/			1/		/				
							V						
				-2π	-π		0	π	2π	31	π		
	G	1.0					0	R			0		107.5
5	State and	1 Prove	e the p	roperti	ies of	Conti	nuous	time	Fourie	r trai	nsform	?	10M
							UNIT	Γ-III					
6	Consider	r a stał	ole LT	I syste	m tha	t is ch	aracte	rized	by the	diffe	erential	equation	10M
	$d^2y(t)/dt$	² +4dy((t)/dt+3	3y(t) =	dx(t)/	dt+2x	x(t) fin	d the	respon	se fo	r an in	put $x(t) = e^{-t} u(t)$.	
							0	R					
7	a Consi	der a	stab	le LI	FI S	ystem	char	acteri	ized b	by t	he di	fferential equation	6M
	dy(t)/	dt+2y(t)=x(t)), Find	its in	npulse	e respo	onse.					
	b Find t	the Ny	quist F	Rate an	nd Ny	quist	Interva	al of t	he follo	owin	g signa	lls.	4M
	(i)x(t)=	1+cos	2000	$\pi t + s$	in 400	$00 \pi t$		(ii) x(t	:)=10	sin 40	πt cos 300πt	
							UNI	Γ-ΙV					
8	a	ha		lation	of th		1(1)		(0)			6M
Ū	Find t	.ne aut	the DC	lation	of the	e signa	u x(t)=	= a sir	$1 (\omega_0 t +$	-0).			414
	D DISTIN	iguisn	ine EN	but and	LISD								41VI

R18

Page 1 of 2

Q.P.	Code: 18EC0403	R18
	OR	
9	Explain the extraction of a signal from noise by filtering	10M
	UNIT-V	
10	a State and prove initial and final value theorems of Z-transform?	5 M
	b State and prove time differentiation and time integration property of Laplace transform	5M
	OR	
11	a Find the Laplace transforms and region for the following signals (i) $x(t)=e^{-5t}u(t-1)$ (ii) $x(t)=e^{2t}\sin 2t$ for $t \le 0$ (iii) $x(t)=t e^{-2 t }$	5M
	b Find the Laplace transform of the signal $x(t) = e^{-at} u(t) - e^{-bt} u(-t)$ and also find it ROC	ts 5M

END