	Ha	all Ticket Number :		
	Co	de: 19A454T	R-19	
		III B.Tech. I Semester Supplementary Examinations July 2022 Digital Communication	2	
	-	( Electronics and Communication Engineering ) ax. Marks: 70 swer any five full questions by choosing one question from each unit ( 5x14 = *********	ne: 3 Hours 70 Marks )	
			Marks CO	Blooms Level
		UNIT-I		
1.	a)	Draw the block diagram of a PCM system and explain each block in detail.	7M	
	b)	Derive an expression for channel noise and quantization noise in DM system.	7M	
		OR		
2.	a)	Derive the relation for signaling rate and transmission bandwidth		
		in a PCM system.	7M	
	b)	What are the problems encountered in linear delta modulation and explain in detail.	7M	
		UNIT-II		
3.	a)	Show that the approximate transmission bandwidth for FSK is given by $B_T = 2R(1+h/2)$ where 'h' is the digital modulation index		
	F)	and 'R' is the bit rate.	7M	
	b)	Explain with neat block diagram the generation and recovery of DPSK signals.	7M	
	,	OR		
4.		Write the comparisons among binary modulated band pass signaling scheme (ASK, PSK and FSK).	7M	
	b)	The bit stream 11011100101 is to be transmitted using DPSK. Determine the encoded sequence and the transmitted phase		
		sequence.	7M	
5.	a)	Explain the two important implications of Shannon-Hartley theorem.	6M	
	b)	An information sources produce sequences of independent symbols having the following probabilities.		
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		
		using Shannon-Fano procedure.		
		i. Construct a binary code.		
		ii. Determine the efficiency and redundancy.	8M	

14M

OR

6. Prove that the rate of information transfer over the channel capacity is given by Dt = [H(X) - H(X|Y)] rs bits/sec.

# UNIT-IV

7. The parity check bits of a (8, 4) block code are generated by

C5 = d1 + d2 + d4C6 = d1 + d2 + d3C7 = d1 + d3 + d4

### C8 = d2 + d3 + d4

where d1, d2, d3 and d4 are message bits. Find:

- (a) the generator matrix and parity check matrix for this code.
- (b) the minimum weight of this code.

14M

8M

## OR

- 8. a) Show that the minimum Hamming distance of a linear block code is equal to the minimum number of columns of its parity check matrix that are linearly dependent show also that the minimum Hamming distance of a Hamming code is always equal to 3.
  - b) Explain applications of block codes for error control in data storage systems.
     6M

# UNIT-V

9. Consider a (6, 3) generator matrix.

$$G = \begin{vmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{vmatrix} \begin{vmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{vmatrix}$$

Find

- (a) all the code vectors of this data.
- (b) the parity check matrix for this code.
- (c) the minimum weight of this code. 14M

### OR

- 10. a) What is a convolution code? How it is generated. 7M
  - b) Explain in detail the convolution coder with a suitable diagram. 7M \*\*\*END\*\*\*

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		III B.Tech. I Semeste	er Su	ppl	eme	enta	ry E	xam	inat	ions	July	2022		
			gita	-	-				-					
	Ma	( Electronics x. Marks: 70	anc	d Cc	mm	iunic	atio	n En	gine	ering	g)	Time: 3	Нош	°C
		swer any <i>five full</i> questions by	choo	osing	g one	ques	stion	fron	ı eacł	ı uni	t ( 5 x			-
				:	****	***								Blooms
						7						Marks	CO	Level
1.	a)	(i) Determine the continuous tir				_ of x	<i>(t</i> ) an	d <i>h(t</i>	)					
	ω)	x(t) = u(t+1) - u(t-1),							,.					
		(ii) Find the Fourier series of th	( )	``		``		ow.						
		$x(t) = 1 + \sin \check{S}_0 t + 2\cos \check{S}_0 t$	-											
		$x(l) - 1 + \sin 3_0 l + 2\cos 3_0 l$	<i>i</i> + 20	.05	23 <sub>0</sub> <i>l</i> -	$(\frac{1}{4})$						7M	CO1	L4, L3
	b)	$X\left(e^{j0}\right) = \sum_{n=-\infty}^{\infty} x[n]$												
		$M(c) \sum_{n=-\infty} M[n]$												
		Find the numerical value of $A =$	$=\sum_{n=1}^{\infty}n$	$\left(\underline{1}\right)$	n									
			n=0	(-)								7M	CO1	L3
2		(i) Derform the circular convolu	ution	OF of th			a tu (							
2.	a)	(i) Perform the circular convolution $(r_1) = \frac{1}{2} \left[ \frac{1}{2} + \frac{1}{2} + \frac{1}{2} \right]$		,	ie ioi	lowin	giwo	seq	uence	35.				
		$x_1(n) = \{ [2], 1, 2, 1 \},  x_2(n) = \{ [$		,										
	b)	<ul><li>(ii) Explain Parseval's theorem</li><li>(i) Write the difference between</li></ul>			onvo	olution	n and	l circi	ılar co	าทุงกา	lution	7M	CO1	L3, L2
	0)									51110				14
		(ii) Find the 4-point DFT of the	sequ	ienco	ex(n)	() = c		$\frac{1}{4}$ ).				7M	CO1	L1, L3
				JNIT										
3.	a) Þ	Explain how the IDFT can be c	-			-		-					CO1	L5
	b)	An 8-point sequence is given b		n)=	{2,2,	2,2,1	,1,1,	1} . C	ompu	ite th	e 8-po			
		DFT by radix-2 DIT FFT algorit	hm.	OF								7M	CO1	L4
4.	a)	(i) Calculate the percentage	savin			ulatio	on in	256·	-point	radi	x-2 F	FT,		
		compared to the direct FFT				<b>-</b>						714		L4,
	b)	(ii) Compare the radix-2 DIT F Compute the circular convolution					2001	anca	e usir	na ra	div-2 l		CO1	L2
	0)	FFT algorithm.		uio	TONO	wing	ooqu	enee	0 001	ig iu		511		
		$x_1(n) = \{ [1], 2, 1, 2 \},  x_2(n) = \{ [$	4,3,	2,1								7M	CO1	L3
			l	JNIT	-111	]							001	20
5.	a)	For the mentioned below speci		on de	esign	a lo	<i>w</i> pa	ss IIR	digit	al Bu	tterwo	orth		
		filter using bilinear transformati												
		$0.8 \le H\left(e^{j\tilde{S}}\right) \le 1 \qquad 0 \le \tilde{S} \le 0.$												
		$H\left(e^{j\tilde{S}}\right) \leq 1 \qquad 0.6f \leq \tilde{S} \leq 1$	$\leq f$									7M	CO2	L4
												Pad	<b>1</b> of	2

				11-100	•
	b)	Explain mathematically how the signal can be detected buried in noise by using FIR filter.	7M	CO2	L5
		OR			
6.	a)	<ul><li>(i) Compare between IIR and FIR filter?</li><li>(ii) How the best window is decided for design of FIR filter by windowing method?</li><li>(iii) What is Gibb's oscillation and how it can be avoided?</li><li>(iv) What is Butterworth filter?</li></ul>	7M	CO2	L1, L5, L2, L1
	b)	Design an ideal differentiator with frequency response as mentioned below:			
		$H\left(e^{j\check{S}}\right) = j\check{S}e^{\frac{-j\check{S}N}{2}} \qquad -f \leq \check{S} \leq f$			
		Use Hamming window with N=5.	7M	CO2	L3
7.	a)	Consider an i/p sequence $x(n) = \left(\frac{1}{2}\right)^n u(n)$ feed to the down sampler with a			
		down sampling by a factor of 2. Determine the o/p spectrum $Y(e^{jS})$ .	7M	CO3	L4
	b)	Proof that the up-sampler and down-sampler are linear.	7M	CO3	L4
		OR			
8.	a)	Show that the two systems shown in below Fig. (Where k is some integer) are			
		equivalent. Assume that $h_k(n) = h_0(n) \cos\left(\frac{2f nk}{L}\right)$ .			
		$x(n) \longrightarrow \textcircled{1}_{k}(z) \longrightarrow y_{0}(n) \qquad x(n) \longrightarrow \textcircled{1}_{k}(z) \xrightarrow{y(n)}_{k}(z) \xrightarrow{u(n)}_{k}(z) \xrightarrow{y(n)}_{k}(z) \xrightarrow{u(n)}_{k}(z) \xrightarrow{y(n)}_{k}(z) \xrightarrow{y(n)}_{k}(z$			
		$\cos \frac{2\pi}{2} kn$	714		
	L.)		7M	CO3	L5
	b)	<ul><li>(i) Where multirate signal processing used?</li><li>(ii) What is fractional sampling rate conversion?</li></ul>			L2,
		(iii) Find the relation between i/p and o/p of a fractional rate conversion.	7M	CO3	L3, L3
9.	a)	Explain the idea behind signal compression. Explain briefly about one method			
	,	for signal compression.	7M	CO4	L2, L4
	b)	What are the differences between the stationary and non-stationary signals? What parameters are used to define the non-stationary signals and define them?	7M	CO4	L1, L3
		OR			
10.	a)	(i) Considering an oversampling ADC system with maximum analog signal			
		frequency of 4 kHz and ADC resolution of eight bits, determine the oversampling rate to improve the ADC resolution to 12-bit resolution.			L4, L5
		(ii) What information is obtained from the spectrum of the signal?	7M	CO4	L1
	b)	Explain the different blocks musical sound processing.	7M	CO4	L2
		***END***			

Code: 19A453T

Hall	Ticket Number :			
Code	: 19A45FT	R	-19	
	III B.Tech. I Semester Supplementary Examinations July <b>Electronic Measurements and Instrumentation</b> (Electronics and Communication Engineering)			
	Marks: 70 ver any five full questions by choosing one question from each unit (5 x ******		e: 3 Ho 9 <b>Marl</b>	
		Marks	СО	Blooms Level
1.	UNIT–I Describe the different types of errors in measurement.	14M	CO1	L1
2.	<b>OR</b> Explain the working ramp type & dual slope integrator based digital voltmeters.	14M	CO1	L2
3.	<b>UNIT–II</b> Illustrate the working of sweep frequency generator and draw the relevant diagram.	14M	CO2	L2
4.	OR Describe the wave analyzers principle.	14M	CO2	L2
5.	UNIT–III Show the working mechanism of dual trace oscilloscope with the help of neat circuit diagram. OR	14M	CO3	L2
6.	Elaborate the measurement procedure of the voltage and frequency using cathode ray oscilloscope.	14M	CO3	L4
7.	<b>UNIT-IV</b> Explain the principle of Wheatstone bridge, also describe about guarded Wheatstone bridge.	14M	CO4	L4
8.	OR Discuss the working principle of Q-meter	14M	CO4	L4
9.	UNIT–V Explain the principle of strain gauge using neat diagram. OR	14M	CO5	L2
10.	Describe the displacement transducer. ***END***	14M	CO5	L2

L	Cor	de: 19A451T	R-19		
		III B.Tech. I Semester Supplmentary Examinations July 2022			-
		Microprocessors & Interfacing			
		(Electronics and Communication Engineering )			
	Ма		ne: 3 H	ours	
	Ans	swer any five full questions by choosing one question from each unit ( 5x14 =	70 Ma	ırks )	
		*****		~ ~	Bloo
			Marks	СО	Le
۱.		With a neat sketch describe in detail the architecture and working of 8086	14M	1	
		microprocessor.	1411	I	
	-)	OR	014	4	
2.	a)	Explain the physical memory organization in an 8086 system.	8M	1	
	b)	Explain the following addressing modes of 8086 with suitable examples: (i) Direct addressing (ii) Immediate addressing	6M	1	
		(i) Direct addressing (ii) Immediate addressing UNIT–II	OIVI	I	
3.		Illustrate the pin configuration of 8086 microprocessor and explain about the	14M	2	
J.		OR	14101	2	
1	2)	Discuss about the minimum mode operation of 8086 with relevant block diagram.	7M	2	
1.	a) b)				
	b)	What is DMA controller? Explain how DMA operations are performed.	7M	2	
_		UNIT-III			
5.		Draw and explain the architecture of 8255 and also explain the various modes of operation.	14M	3	
		OR	1411	3	
2	2)				
5.	a)	What are the advantages of 8259? With a neat sketch explain the interfacing of cascaded 8259s with 8086.	7M	2	
	b)	Explain in detail about the interrupt structure of 8086.	7M	2	
	0)		7 101	2	
7.		Elaborate about			
•		i) TTL to RS232C conversion			
		ii) RS232C to TTL conversion	14M	3	
		OR			
3.	a)	Discuss the necessity of communication interfaces in detail.	7M	3	
	b)	What is an 8253 programmable interval timer/counter? Explain its Architecture.	7M	3	
	- /	UNIT-V		-	
).	a)	Distinguish between Pentium and Pentium pro processors.	7M	4	
	b)	Write about the salient features of 80386.	7M	4	
	~)	OR		-	
).	a)	Discuss in brief about Pentium Pro processor.	7M	4	
	b)	What is the need of advanced processors, give suitable example with			
	2)	necessary diagram?	7M	4	
		***END***		-	

		Hall Ticket Number :	R-1	0	
	C	Code: 19A45BT		7	
		III B.Tech. I Semester Supplementary Examinations July 2	022		
		Advanced Digital Design Concepts (Electronics and Communication Engineering)			
	Ν	Aax. Marks: 70	Time: 3	Hours	
	/	Answer any five full questions by choosing one question from each unit ( 5x1	4 = 70 N	/arks )	
		******	Marks	со	Blooms
		UNIT-I	Marko	00	Level
1.	a)	Design a CMOS transistor circuit for 2-input XOR gate and explain			
••	с,	its operation	7M	CO1	L6
	b)	Distinguish CMOS with TTL logic families.	7M	CO1	L4
		OR			
2.		Explain in detail about dynamic electrical behavior of CMOS.	14M	CO1	L2
-					
3.	a)	Explain component instantiation in VHDL?	4M	CO2	L2
	b)	Design a 16X1 Multiplexer with 4X1 Multiplexers. <b>OR</b>	10M	CO2	L4
4.		Explain in detail about the operators in VHDL with examples?	14M	CO2	L2
				002	
		UNIT-III			
5.	a)	Analyze the various abstraction levels in VHDL	9M	CO3	L6
	b)	Distinguish concurrent and sequential signal assignment statements with			
		an example.	5M	CO3	L4
•		OR			
6.	a)	Explain delay models- Inertial delay model, Transport delay model with examples.	8M	CO3	L2
	b)	Design 3 to 8 decoder using case statement in VHDL.	6M	CO3	L4
	0)		OW	000	<b>-</b> ·
		UNIT-IV			
7.	a)	Design a 4-bit comparator in behavior model using VHDL syntax.	8M	CO4	L4
	b)	Explain barrel shifter with neat diagram?	6M	CO4	L4
		OR			
8.		Design a 16- Bit-ALU which can perform minimum of 16 operations.	14M	CO4	L6
		UNIT-V			
9.	a)	Write a VHDL program for Master slave JK – FF.	10M	CO5	L2
	b)	Distinguish Latches and Flipflops	4M	CO5	L4
		OR			
10		Discuss about Synchronous design methodology?	14M	CO5	L4
		***END***			

R-19         R-19         II B. Tech. II Semester Supplementary Examinations July/August 2022 Analog IC Applications (Electronics and Communications Engineering))         Max. Marks: 70       Time: 3 Hours Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)         Marks       co       Time: 3 Image: 3 Hours Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)         Marks       co       Time: 3 Image: 3 Hours Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)         Marks       co       Image: 3 Hours Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)         Marks       co       Image: 3 Hours Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)         Marks       co       Image: 3 Hours Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)         Marks       co       Image: 3 Hours Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)         Marks       co       Image: 3 Hours Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)         Image: 3 Hours       Marks       Co       Li         Design an ann-inverting Op Amp with gain -120.       Image: 3 Hours       Image: 3 Hours         Marks       Co       List       O		ŀ	Hall Ticket Number :															7
II B.Tech. II Semester Supplementary Examinations July/August 2022 Analog IC Applications (Electronics and Communication Engineering) Max. Marks: 70 Iime: 3 Hours Answer any five full questions by choosing one question from each unit (\$x14 = 70 Marks) IIIII a) Describe the internal block diagram of an Op-amp and explain each block in detail. UNIT-I I. a) Describe the internal block diagram of IG741. 4MM co1 L2 OR IIIIIIII IIIIIIII IIIIIIIIIIIIIIIII		C	ode: 194441T										<u> </u>		R	-1	9	
Max. Marks: 70       Time: 3 Hours         Answer any five full questions by choosing one question from each unit (\$x14 = 70 Marks )       Blooms         unit $UNIT-I$ Marks       co         1. a)       Describe the internal block diagram of an Op-amp and explain each block in detail.       10M       Co1       L2         b)       Draw and explain the pin diagram of Ic741.       4M       Co1       L2         0R       0R       Co1       L2         1. a)       Describe the internal block diagram of Ic741.       4M       Co1       L2         0R       0R       Co1       L2         1. a)       What is an IC? List out the IC Classifications and Explain       8M       Co1       L1         b)       Design a non-inverting Op Amp with gain -120.       6M       Co2       L3         1. a)       Explain the operation of current to voltage converter using Op-Amp.       7M       Co2       L2         0R       0R       Co2       L1       b)       Explain the operation of basic Integrator circuit using IC 741.       7M       Co2       L3         b)       Explain the operation of Schmitt Trigger circuit using IC 741.       7M       Co2       L3         b)       Illustrate the operation of Schmitt Trigger circuit using IC 741.	II B.Tech. II Semester Supplementary Examinations July/August 2022 Analog IC Applicaitons																	
UNIT-I       1. a) Describe the internal block diagram of an Op-amp and explain each block in detail.       10M       C01       L2         b) Draw and explain the pin diagram of Ic741.       4M       C01       L2         b) Draw and explain the pin diagram of Ic741.       4M       C01       L2         b) Design a non-inverting Op Amp with gain -120.       6M       C01       L6         UNIT-I       Junit-II       7M       C02       L3         b) Explain the operation of Subtractor circuit using IC 741.       7M       C02       L2         OR       0R       7M       C02       L3         b) Explain the operation of Subtractor circuit using IC 741.       7M       C02       L3         b) Explain the output of Op-amp integrator circuit for an applied unit step input and sine input signal       7M       C02       L3         b) Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       C02       L3         b) Explain the operation of Schmitt Trigger circuit using IC 741.       7M       C03       L3         b) Explain the operation of Schmitt Trigger circuit using IC 741.       7M       C03       L3         b) Explain the operation of Precision Half-wave Rectifier.       7M       C03       L4         b) Design an astable multivibrator can be used as Square wave gener	Max. Marks: 70 Time: 3 Hours Answer any five full questions by choosing one question from each unit ( $5x14 = 70$ Marks )																	
1. a) Describe the internal block diagram of an Op-amp and explain each block in detail.       10M       Co1       L2         b) Draw and explain the pin diagram of lc741.       4M       Co1       L2         OR       2. a) What is an IC? List out the IC Classifications and Explain       8M       Co1       L1         b) Design a non-inverting Op Amp with gain -120.       6M       Co1       L6         UNIT-II         3. a) Illustrate the operation of Subtractor circuit using IC 741.       7M       Co2       L3         b) Explain the operation of current to voltage converter using Op-Amp.       7M       Co2       L2         OR         4. a) Examine the output of Op-amp integrator circuit or an applied unit step input and sine input signal       7M       Co2       L3         DIIT-III         5. a) Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       Co3       L3         DIIT-III         5. a) Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       Co3       L3         DIIT-III         5. a) Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       Co3       L3         DINIT-IV       7M       Co3									-1						Mark	s	CO	
detail.       10M       CO1       L2         b)       Draw and explain the pin diagram of Ic741.       4M       CO1       L2         OR       0R       01       L2         2. a)       What is an IC? List out the IC Classifications and Explain       8M       CO1       L6         Design a non-inverting Op Amp with gain -120.       6M       CO1       L6	4	-)				L							1.					
b) Draw and explain the pin diagram of Ic741. 0R Co1 0R 2. a) What is an IC? List out the IC Classifications and Explain 8M Co1 L1 b) Design a non-inverting Op Amp with gain -120. 6M Co1 L2 UNIT-II 3. a) Illustrate the operation of Subtractor circuit using IC 741. 7M Co2 L3 b Explain the operation of current to voltage converter using Op-Amp. 7M Co2 L1 b) Explain the operation of current to voltage converter using Op-Amp. 7M Co2 L1 b) Illustrate the operation of basic Integrator circuit for an applied unit step input and sine input signal 7M Co2 L1 b) Illustrate the operation of Schmitt Trigger circuit using IC 741. 7M Co2 L1 b) Illustrate the operation of Schmitt Trigger circuit using IC 741. 7M Co2 L1 b) Illustrate the operation of Schmitt Trigger circuit using IC 741. 7M Co3 L2 <b>UNIT-II</b> 5. a) Illustrate the operation of Schmitt Trigger circuit using IC 741. 7M Co3 L2 <b>D</b> Explain the operation of Precision Half-wave Rectifier. 7M Co3 L2 <b>D</b> Explain the operation of Precision Half-wave Rectifier. 7M Co3 L2 <b>D</b> Explain the operation of Precision Half-wave Rectifier. 7M Co3 L2 <b>D</b> Explain the operation of Operation using block schematic of a PLL. 8M Co4 L2 <b>D</b> Design an astable multivibrator for output frequency of 1KHz 5M Co4 L2 b) Discuss how PLL can be used for AM demodulation. 6M Co4 L2 <b>D</b> Discuss how PLL can be used for AM demodulation. 6M Co4 L2 <b>D</b> Discuss how PLL can be used for AM demodulation. 6M Co4 L2 <b>D</b> Discuss how PLL can be used of Flash ADC? And With the help of a neat diagram explain its operation. <b>D N N</b> Co5 L2 <b>N N</b> this is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation. <b>N N</b> Co5 L2 <b>N N</b> this help of neat diagram explain the operation of counter type ADC. 6M Co5 L2 <b>D N N</b> Co5 L2 <b>D D</b> Classify the types of ADC and Explain the principle of operation of dual- Slope ADC with necessary diagrams. 14M Co5 L2	1.	a)		DIOC	k dia	igran	n of a	an Op	o-am	p an	d ex	plain	each	DIOCK		M	CO1	L2
2. a)       What is an IC? List out the IC Classifications and Explain       8M       C01       L1         b)       Design a non-inverting Op Amp with gain -120.       6M       C01       L6         UNIT-II         3. a)       Illustrate the operation of Subtractor circuit using IC 741.       7M       C02       L3         b)       Explain the operation of current to voltage converter using Op-Amp.       7M       C02       L1         b)       Illustrate the operation of Do-amp integrator circuit for an applied unit step input and sine input signal       7M       C02       L1         b)       Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       C03       L3         cons       UNIT-III       7M       C03       L3         b)       Explain the operation of Schmitt Trigger circuit using IC 741.       7M       C03       L3         b)       Explain the operation of Precision Half-wave Rectifier.       7M       C03       L3         c)       Explain the operation of Precision Trigger circuit using IC 741.       7M       C03       L4         b)       Explain the operation of Precision so as table multivibrator can be used as Square wave generator.       9M       C03       L4         b)       Design an astable multivibrator for output frequency of 1KH		b)		pin (	diag	ram o	of Ic7	41.										
b)       Design a non-inverting Op Amp with gain -120.       6M       CO1       L6         UNIT-II       Illustrate the operation of Subtractor circuit using IC 741.       7M       CO2       L3         b)       Explain the operation of current to voltage converter using Op-Amp.       7M       CO2       L1         4.       a)       Examine the output of Op-amp integrator circuit of an applied unit step input and sine input signal       7M       CO2       L1         b)       Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       CO3       L3         c)       UNIT-II       7M       CO3       L3         b)       Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       CO3       L3         b)       Explain the operation of Precision Half-wave Rectifier.       7M       CO3       L3         b)       Explain how astable multivibrator can be used as Square wave generator.       9M       CO3       L4         b)       Design an astable multivibrator of AM demodulation.       6M       CO4       L2         f       a)       Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b)       Discuss how PLL can be used for AM demodulation.       6M       CO4       L2				-	-		OR	2										
UNIT-II         3. a) Illustrate the operation of Subtractor circuit using IC 741.       7M       CO2       L3         b) Explain the operation of current to voltage converter using Op-Amp.       7M       CO2       L2         OR       4. a) Examine the output of Op-amp integrator circuit for an applied unit step input and sine input signal       7M       CO2       L1         b) Illustrate the operation of basic Integrator circuit using op-amp       7M       CO2       L3         colspan="2">UNIT-II         5. a) Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       CO3       L3         b) Explain the operation of Precision Half-wave Rectifier.       7M       CO3       L2         OR       0R       03       L4         b) Design an astable multivibrator can be used as Square wave generator.       9M       CO3       L4         b) Design an astable multivibrator for output frequency of 1KHz       5M       CO4       L2         VINT-IV       7. a) Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b) Discuss how PLL can be used for AM demodulation.       6M       CO4       L2         VINT-V       9. a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.       8M       CO5	2.	a)	What is an IC? List o	ut the	e IC	Clas	sifica	tions	and	Exp	lain				8	N	CO1	L1
3. a)       Illustrate the operation of Subtractor circuit using IC 741.       TM       CO2       L3         b)       Explain the operation of current to voltage converter using Op-Amp.       TM       CO2       L2         OR         4. a)       Examine the output of Op-amp integrator circuit for an applied unit step input and sine input signal       TM       CO2       L1         b)       Illustrate the operation of basic Integrator circuit using op-amp       TM       CO2       L3         UNIT-III         5. a)       Illustrate the operation of Schmitt Trigger circuit using IC 741.       TM       CO3       L3         DNT-III         5. a)       Illustrate the operation of Schmitt Trigger circuit using IC 741.       TM       CO3       L3         DNT-III         OR         CO3       L3         Discurs how astable multivibrator can be used as Square wave generator.       PM       CO3       L4         Discurs how astable multivibrator for output frequency of 1KHz       SM       CO4       L2         Discurs how PLL can be used for AM demodulation.       6M       CO4       L2         DINIT-IV         7. a)       Explain the basic principle of operation		b)	Design a non-invertir	ng Op	o Am	ıp wit	h ga	in -1:	20.						6	N	CO1	L6
3. a)       Illustrate the operation of Subtractor circuit using IC 741.       TM       CO2       L3         b)       Explain the operation of current to voltage converter using Op-Amp.       TM       CO2       L2         OR         4. a)       Examine the output of Op-amp integrator circuit for an applied unit step input and sine input signal       TM       CO2       L1         b)       Illustrate the operation of basic Integrator circuit using op-amp       TM       CO2       L3         UNIT-III         5. a)       Illustrate the operation of Schmitt Trigger circuit using IC 741.       TM       CO3       L3         DNT-III         5. a)       Illustrate the operation of Schmitt Trigger circuit using IC 741.       TM       CO3       L3         DNT-III         OR         CO3       L3         Discurs how astable multivibrator can be used as Square wave generator.       PM       CO3       L4         Discurs how astable multivibrator for output frequency of 1KHz       SM       CO4       L2         Discurs how PLL can be used for AM demodulation.       6M       CO4       L2         DINIT-IV         7. a)       Explain the basic principle of operation						l	JNIT	-11	1									
OR         4. a) Examine the output of Op-amp integrator circuit for an applied unit step input and sine input signal       7M       CO2       L1         b) Illustrate the operation of basic Integrator circuit using op-amp       7M       CO2       L3 <b>UNIT-III UNIT-III</b> 7M       CO3       L3         b) Explain the operation of Schmitt Trigger circuit using IC 741.       7M       CO3       L3         b) Explain the operation of Precision Half-wave Rectifier.       7M       CO3       L4         b) Design an astable multivibrator can be used as Square wave generator.       9M       CO3       L4         b) Design an astable multivibrator for output frequency of 1KHz       5M       CO4       L2 <b>UNIT-IV UNIT-IV V</b> CO4       L2         7. a) Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b) Discuss how PLL can be used for AM demodulation.       6M       CO4       L2 <b>OR OR OR</b> CO4       L2         b) Discuss how PLL can be used for AM demodulation.       6M       CO4       L2 <b>OR OR O</b> L1       M       CO4       L1 <b>OR O</b> <td>3.</td> <td>a)</td> <td>Illustrate the operatio</td> <td>on of</td> <td>Subt</td> <td>L</td> <td></td> <td></td> <td>ising</td> <td>IC 7</td> <td>41.</td> <td></td> <td></td> <td></td> <td>7</td> <td>N</td> <td>CO2</td> <td>L3</td>	3.	a)	Illustrate the operatio	on of	Subt	L			ising	IC 7	41.				7	N	CO2	L3
4. a)       Examine the output of Op-amp integrator circuit for an applied unit step input and sine input signal       7M       CO2       L1         b)       Illustrate the operation of basic Integrator circuit using op-amp       7M       CO2       L3         5. a)       Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       CO3       L3         b)       Explain the operation of Precision Half-wave Rectifier.       7M       CO3       L2         OR       0       CO3       L4         b)       Design an astable multivibrator can be used as Square wave generator.       9M       CO3       L4         b)       Design an astable multivibrator for output frequency of 1KHz       5M       CO4       L2         7. a)       Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b)       Discuss how PLL can be used for AM demodulation.       6M       CO4       L2         0R       CO3       L4       CO4       L1         b)       Discuss how PLL can be used for AM demodulation.       6M       CO4       L2         0R       List the applications of astable multivibrator and explain in detail.       14M       CO4       L1         9. a)       What is the main disadvantage of Flash ADC? And Wit		b)	Explain the operation	n of c	urrer	nt to	volta	ge co	onve	rter u	ising	Op-/	Amp.		7	N	CO2	L2
input and sine input signal 7M CO2 L1 b) Illustrate the operation of basic Integrator circuit using op-amp 7M CO2 L3 UNIT-III 5. a) Illustrate the operation of Schmitt Trigger circuit using IC 741. 7M CO3 L3 b) Explain the operation of Precision Half-wave Rectifier. 7M CO3 L2 OR CO3 L4 b) Design an astable multivibrator can be used as Square wave generator. 9M CO3 L4 b) Design an astable multivibrator for output frequency of 1KHz 5M CO3 L6 UNIT-IV 7. a) Explain the basic principle of operation using block schematic of a PLL. 8M CO4 L2 b) Discuss how PLL can be used for AM demodulation. 6M CO4 L2 OR 8. List the applications of astable multivibrator and explain in detail. 14M CO4 L1 9. a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation. 6M CO5 L2 OR 10. Classify the types of ADC and Explain the principle of operation of dual- Slope ADC with necessary diagrams. 14M CO5 L4																		
b)       Illustrate the operation of basic Integrator circuit using op-amp       7M       CO2       L3         UNIT-III       UNIT-III       7M       CO3       L3         b)       Explain the operation of Schmitt Trigger circuit using IC 741.       7M       CO3       L3         b)       Explain the operation of Precision Half-wave Rectifier.       7M       CO3       L2         OR       0R       03       L4         b)       Design an astable multivibrator can be used as Square wave generator.       9M       CO3       L4         b)       Design an astable multivibrator for output frequency of 1KHz       5M       CO3       L6         7. a)       Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b)       Discuss how PLL can be used for AM demodulation.       6M       CO4       L2         OR       0R       0R       14M       CO4       L1         9.       a)       What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.       8M       CO5       L2         0R       0R       0S       L2       0R       12         10.       What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.	4.	a)				mp ir	ntegr	ator	circu	iit fo	r an	appl	lied ι	unit st		Л	<u> </u>	14
UNIT-III         5. a) Illustrate the operation of Schmitt Trigger circuit using IC 741.       7M       CO3       L3         b) Explain the operation of Precision Half-wave Rectifier.       7M       CO3       L2         OR       0R       03       L4         b) Design an astable multivibrator can be used as Square wave generator.       9M       CO3       L4         b) Design an astable multivibrator for output frequency of 1KHz       5M       CO3       L6         IUNIT-IV       7.       a) Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b) Discuss how PLL can be used for AM demodulation.       6M       CO4       L2         OR       08       CO4       L2         a) Explain the applications of astable multivibrator and explain in detail.       14M       CO4       L1         B.       List the applications of astable multivibrator and explain in detail.       14M       CO4       L1         9.       a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.       8M       CO5       L2         b) With help of neat diagram explain the operation of counter type ADC.       6M       CO5       L2         IIII       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		b)		-		c Inte	arat	or cir	cuit i	usino	- 00 -	amp						
<ul> <li>5. a) Illustrate the operation of Schmitt Trigger circuit using IC 741.</li> <li>b) Explain the operation of Precision Half-wave Rectifier.</li> <li>OR</li> <li>6. a) Explain how astable multivibrator can be used as Square wave generator.</li> <li>9M CO3 L4</li> <li>b) Design an astable multivibrator for output frequency of 1KHz</li> <li>5M CO3 L6</li> </ul> 7. a) Explain the basic principle of operation using block schematic of a PLL. <ul> <li>8M CO4 L2</li> <li>b) Discuss how PLL can be used for AM demodulation.</li> <li>CO3</li> <li>CO4</li> <li>CO5</li> <li>CO5<td></td><td>~)</td><td></td><td></td><td>baon</td><td></td><td>grat</td><td></td><td></td><td>Joinig</td><td>op</td><td>amp</td><td></td><td></td><td></td><td>••</td><td>002</td><td>LU</td></li></ul>		~)			baon		grat			Joinig	op	amp				••	002	LU
b) Explain the operation of Precision Half-wave Rectifier. OR 6. a) Explain how astable multivibrator can be used as Square wave generator. b) Design an astable multivibrator for output frequency of 1KHz T. a) Explain the basic principle of operation using block schematic of a PLL. b) Discuss how PLL can be used for AM demodulation. OR 8. List the applications of astable multivibrator and explain in detail. 9. a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation. b) With help of neat diagram explain the operation of counter type ADC. 10. Classify the types of ADC and Explain the principle of operation of dual- Slope ADC with necessary diagrams. 14M CO5 L2	-	- )			<b>~</b> .				<u> </u>									
OR6. a)Explain how astable multivibrator can be used as Square wave generator. Design an astable multivibrator for output frequency of 1KHz9MCO3L4b)Design an astable multivibrator for output frequency of 1KHz5MCO3L6UNIT-IV7. a)Explain the basic principle of operation using block schematic of a PLL. Discuss how PLL can be used for AM demodulation. OR8MCO4L2INIT-V8.List the applications of astable multivibrator and explain in detail.14MCO4L1UNIT-V9. a)What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation. OR8MCO5L2b)With help of neat diagram explain the operation of counter type ADC. OR6MCO5L2OR10.Classify the types of ADC and Explain the principle of operation of dual- Slope ADC with necessary diagrams.14MCO5L4	5.									-		41.						
<ul> <li>6. a) Explain how astable multivibrator can be used as Square wave generator.</li> <li>9M CO3 L4</li> <li>b) Design an astable multivibrator for output frequency of 1KHz</li> <li>5M CO3 L6</li> </ul> 7. a) Explain the basic principle of operation using block schematic of a PLL. 8M CO4 L2 Discuss how PLL can be used for AM demodulation. OR 8. List the applications of astable multivibrator and explain in detail. 14M CO4 L1 9. a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation. b) With help of neat diagram explain the operation of counter type ADC. OR 10. Classify the types of ADC and Explain the principle of operation of dual-Slope ADC with necessary diagrams. 14M CO5 L4		0)		IUIF	Tecia					unei	•				71	VI	003	LZ
UNIT-IV         7. a) Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b) Discuss how PLL can be used for AM demodulation.       6M       CO4       L2         OR         8. List the applications of astable multivibrator and explain in detail.       14M       CO4       L1         UNIT-V         9. a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.       8M       CO5       L2         b) With help of neat diagram explain the operation of counter type ADC.       6M       CO5       L2         OR         10. Classify the types of ADC and Explain the principle of operation of dual-Slope ADC with necessary diagrams.       14M       CO5       L4	6.	a)	Explain how astable	multi	vibra	tor c	-		ed as	Squ	are	wave	gene	erator.	91	N	CO3	L4
7. a)       Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b)       Discuss how PLL can be used for AM demodulation.       6M       CO4       L2         OR         8.       List the applications of astable multivibrator and explain in detail.       14M       CO4       L1         9. a)       What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.       8M       CO5       L2         b)       With help of neat diagram explain the operation of counter type ADC.       6M       CO5       L2         OR         10.       Classify the types of ADC and Explain the principle of operation of dual-Slope ADC with necessary diagrams.       14M       CO5       L4		b)	Design an astable m	nultivi	brate	or for	outp	out fr	eque	ncy (	of 1k	Ήz	•		5	N	CO3	L6
7. a)       Explain the basic principle of operation using block schematic of a PLL.       8M       CO4       L2         b)       Discuss how PLL can be used for AM demodulation.       6M       CO4       L2         OR         8.       List the applications of astable multivibrator and explain in detail.       14M       CO4       L1         9. a)       What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.       8M       CO5       L2         b)       With help of neat diagram explain the operation of counter type ADC.       6M       CO5       L2         OR         10.       Classify the types of ADC and Explain the principle of operation of dual-Slope ADC with necessary diagrams.       14M       CO5       L4								11/	1									
b) Discuss how PLL can be used for AM demodulation. OR 8. List the applications of astable multivibrator and explain in detail. 9. a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation. b) With help of neat diagram explain the operation of counter type ADC. Classify the types of ADC and Explain the principle of operation of dual- Slope ADC with necessary diagrams. (M) CO3 (L2) (M) CO3 (L2)	7.	a)	Explain the basic prin	nciple	e of c	L			l 1 blo	ck so	hem	atic o	ofaP		8	И	C:O4	12
OR8.List the applications of astable multivibrator and explain in detail.14MCO4L19. a)What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.8MCO5L2b)With help of neat diagram explain the operation of counter type ADC.6MCO5L2OR10.Classify the types of ADC and Explain the principle of operation of dual- Slope ADC with necessary diagrams.14MCO5L4	••			•		•			•				Ji a i					
UNIT-V         9. a)       What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.       8M       CO5       L2         b)       With help of neat diagram explain the operation of counter type ADC.       6M       CO5       L2         OR         10.       Classify the types of ADC and Explain the principle of operation of dual-Slope ADC with necessary diagrams.       14M       CO5       L4		,																
<ul> <li>9. a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.</li> <li>b) With help of neat diagram explain the operation of counter type ADC.</li> <li>Classify the types of ADC and Explain the principle of operation of dual-Slope ADC with necessary diagrams.</li> <li>14M CO5 L4</li> </ul>	8.		List the applications of	of ast	table	mul	tivibr	ator	and e	expla	in in	deta	il.		14	N	CO4	L1
<ul> <li>9. a) What is the main disadvantage of Flash ADC? And With the help of a neat diagram explain its operation.</li> <li>b) With help of neat diagram explain the operation of counter type ADC.</li> <li>Classify the types of ADC and Explain the principle of operation of dual-Slope ADC with necessary diagrams.</li> <li>14M CO5 L4</li> </ul>								_V	]									
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OR         10.       Classify the types of ADC and Explain the principle of operation of dual- Slope ADC with necessary diagrams.         14M       CO5         L4		,			•								•			N	CO5	L2
10.Classify the types of ADC and Explain the principle of operation of dual- Slope ADC with necessary diagrams.14MCO5L4		b)	With help of neat diag	gram	exp	lain t		-	tion c	of cou	untei	<sup>-</sup> type	ADC	).	6	N	CO5	L2
Slope ADC with necessary diagrams. 14M CO5 L4	40			( . <del></del>	~								- <i>(</i> -		- 1			
	10.		• •				•	n the	e prir	ICIPIE	e of	opera	ation	ot du		M	CO5	4
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		III B.Tech. I Semester Supplementary Examinations July 20	)22		
		Antennas and Wave Propagation			
Ma	хM	(Electronics and Communication Engineering) arks: 70	lime: 3	8 Hour	γ γ
		any five full questions by choosing one question from each unit ( 5x1- ********			
			Marks	со	Blooms Level
		UNIT-I			
1.	a)	Explain the development of dipole antenna from a transmission line,			
		with a diagram.	5M	CO1	L1
	b)	Derive the field components of HWD and hence obtain its radiation resistance.	5M	CO1	L2
	c)	Compute the directivity of a current element Idl.	4M	CO1	L2
	0)	OR		001	L4
2.	a)	Define and explain the parameters of an antenna.	4M	CO1	L1
2.	b)	Compute the effective area of a pyramidal horn antenna with an		001	LI
	0)	example.	5M	CO1	L2
	c)	Explain the field regions for antenna measurements, with a neat			
	,	diagram.	5M	CO1	L2
		UNIT-II			
3.	a)	Explain the significance of antenna array factor. Derive an expression			
		for antenna array factor.	4M	CO2	L1
	b)	Distinguish 1. BEA from EFA	5M	CO2	L2
	c)	Explain the structure of Yagi Uda array. Bring out its design details	5M	CO2	L2
		OR			
4.	a)	Mathematically prove that the 3dB beam width of EFA is greater than			
	<b>ل</b> م)	that of 3 dB beam width of BSA.	5M	CO2	L2
	b)	Explain how the folded dipole geometry is fabricated from transmission lines, with diagrams.	5M	CO2	L3
	c)	Derive the Zin of folded dipole antenna	4M	CO2	L3 L4
	0)			002	L4
5.	a)	State and explain Babinet's principle for aperture antennas.	5M	CO3	L1
0.	b)	Explain offset feed reflector geometry with are a t diagram. For a	0101	005	LI
	5)	parabolic reflector of diameter 6m, illumination $\frac{n}{n} = 0.65$ , the frequency			
		of operation is 10GHz, find its beam width, directivity and capture			
		area.	5M	CO3	L2
	c)	Define and explain 1.Shadowing 2. f/d ratio	4M	CO3	L3
		OR			
6.	a)	Differentiate Primary radiator from secondary radiator	4M	CO3	L1
	b)	Explain the construction and principle of pyramidal horn antenna.	5M	CO3	L2
	c)	A pyramidal horn antenna having aperture dimensions of a=5.2cm and			
		b= 3.8cm is used at a frequency of 10 GHz. Calculate its gain and half	- • •	<b>6 6</b> -	
		power beam widths.	5M	CO3	L3

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		UNIT-IV			
7.	a)	Discuss the factors involved in the propagation radio waves.	4M	CO4	L1
	b)	Explain the advantages, limitations and applications of Ground waves.	5M	CO4	L2
	c)	Differentiate ground waves from Space waves.	5M	CO4	L2
		OR			
8.	a)	Derive the electric field intensity of ground waves along the surface of			
		earth.	10M	CO4	L3
	b)	Why the waves are to be vertically polarized in surface wave			
		propagation? Justify your answer.	4M	CO4	L4
		UNIT-V			
9.	a)	Explain two-ray model of tropospheric wave propagation. Derive the			
	ኤ)	electric field intensity at the receiving antenna.	7M	CO4	L2
	b)	At a 300Km <sup>I</sup> intens in ionosphere, the electron $c_{f_{1r}}$ at night is about $3 \times 10^{12}$ and the signal MJF is $f = 2f_{cr}$ is a transmission			
		distance of 600 km. Compute $f_{cv}$ , $\varepsilon_r$ , $\eta$ , $\beta$ , $V_p$ , $V_g$ ar, $d_{\ell i}$ .	7M	CO4	L3
		ÔR			
10.	a)	Draw the ionospheric profile diagram of sky wave propagation and			
	,	explain.	7M	CO4	L2
	b)	Derive the characteristic equations of ionosphere and explain them.	7M	CO4	L3
		***END***			