Hall Ticket Number :										

R-17

Code: 7G353

III B.Tech. I Semester Supplementary Examinations August 2021

Analog & Digital Integrated Circuit Applications

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.		Discuss the operation of Op-Amp block diagram and its characteristics.	14M	CO1	L2
		OR			
2.	a)	List the types of ICs and Interpret circuit complexity.	7M	CO1	L2
	b)	Identify the applications of Opamp and its advantages.	7M	CO1	L1
		UNIT–II			
3.		Explain the operation of mono stable multi vibrator using 555 timers. Derive the expression of time delay of mono stable multi vibrator with 555 timers.	14M	CO1	L2
		OR			
4.	a)	Analyze the basic principle of successive approximation type ADC	8M	CO1	L4
	b)	Restate the operation of Zero Cross Detector and Window Detector.	6M	CO1	L2
		UNIT–III			
5.		Analyze the operation of CMOS Inverter and its characteristics.	14M	CO2	L4
		OR			
6.	a)	Apply NAND circuit with TTL technology.	10M	CO2	L3
	b)	What are the advantages and disadvantages of above?	4M	CO2	L2
		UNIT–IV			
7.		Define encoder and explain with neat structure of 8X3 encoder. Write the VHDL program for standard IC 74x148.	14M	CO3	L2
		OR			
8.		Discuss about functions and libraries in VHDL with an examples.	14M	CO3	L2
		UNIT–V			
9.		Explain the operation of Universal Shift Register with VHDL Program.	14M	CO3	L2
		OR			
10.		Write a VHDL program for D flip-flop and S R flip-flop.	14M	CO3	L3

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Hall Ticket Number :										

R-17

Code: 7G355

III B.Tech. I Semester Supplementary Examinations August 2021

Antennas and Wave Propagation

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Define Reciprocity Theorem as applicable to antennas. State the antenna theorems and relate them to reciprocity theorem.	7M		
	b)	The maximum radiation intensity of a 90% efficiency antenna is 200 mW/st. Find the directivity and gain (dimensionless and in dB) i) The input power is 125.66 mW ii) Radiated power is 125.66 mW	7M		
		OR			
2.	a)	Derive Radiation resistance of half dipole antenna.	6M		
	b)	A voltage source of amplitude V= (50+40j) V with source impedance of 50 Ω is connected to an antenna having a radiating resistance Rrad=70 Ω, loss resistance Rloss=1 Ω and reactance of j25Ω. Calculate (i) Real power delivered by the voltage source. (ii) Real input power to the antenna (iii) Power radiated by the antenna and (iv) Power dissipated in the antenna. (CO3)	8M		
		UNIT–II			
3.	a)	Find the radiation pattern and phase pattern of 10-element isotropic linear array with an element spacing d == λ/2 working at a frequency of 12 MHz when it is functioning in broadside mode and endfire mode?	7M		
	b)	Discuss the application of linear array. Explain the advantages and disadvantage of linear array.	7M		
		OR			
4.	a)	What is a parasitic element? Explain when the parasitic element acts as a reflector and director with the help of proper diagram.	8M		
	b)	Explain the characteristics of folded dipole.	6M		
		UNIT–III			
5.		Explain the design parameter of helical antenna with practical design considerations; also write the expression for the HPBW, BWFN and axial ratio.	14M		
		OR			
6.	a)	Give various causes of side lobes in the pattern of the dish antennas.	8M		
	b)	Write short notes on a. Dielectric Lenses b. Zoning	6M		

UNIT–IV

7. What is the field strength due to ground wave according to Sommerfeld? What are the factors that are incorporated into this formula? 14M

OR

8. a) Describe the phenomenon of ground wave propagation. 7M

   b) A VHF communication link is established with 35 watt transmitter at 90 MHz. Determine

      a) The distance up to which LOS communication may be possible if the height of the transmitting and receiving antenna are 40 m and 25 m respectively.

      b) Evaluate field strength at the receiver end. 7M

UNIT–V

9. a) Discuss about virtual ray path, critical frequency, MUF, LUF, OF, Virtual height and Skip distance. 9M

   b) Discuss the structure of ionosphere. 5M

OR

10. a) Prove that refraction index of ionosphere is

$$n = \left(1 - \frac{81N}{f^2}\right)^{1/2}$$

8M

   b) Write short notes on Impact of Solar Activity and Multi hop propagation. 6M

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Hall Ticket Number :										

R-17

Code: 7G159

III B.Tech. I Semester Supplementary Examinations August 2021

Computer System Architecture

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full* questions by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Discuss about the error detection using parity bit code with examples	7M	CO1	L2
	b)	Explain the different types of computers	7M	CO1	L2
		OR			
2.	a)	With the help of a block diagram, explain the process of addition / subtraction using two's complement number	8M	CO1	L2
	b)	Differentiate between error detection and error correction. Explain with an example how Hamming code is used for error detection	6M	CO1	L2
		UNIT–II			
3.	a)	Discuss about the arithmetic logic shift unit with examples.	7M	CO1	L2
	b)	Differentiate between circular shift and arithmetic shift with proper example.	7M	CO1	L2
		OR			
4.	a)	Describe various computer instruction formats with neat sketches.	7M	CO1	L1
	b)	Explain how registers are connected to common bus in the computer with a neat diagram.	7M	CO1	L2
		UNIT–III			
5.	a)	Define Addressing modes? Explain the following addressing modes: i) Index Addressing mode ii) Immediate Addressing mode iii) Relative Addressing mode iv) Direct Addressing mode	8M	CO2	L1
	b)	Explain the basic organization of microprogrammed control unit	6M	CO2	L2
		OR			
6.	a)	Define address sequencing? Discuss.	7M	CO2	L1
	b)	Explain the basic computer instruction formats.	7M	CO2	L2
		UNIT–IV			
7.	a)	Draw a neat block diagram of memory hierarchy in a computer system. Compare the parameters size, speed and cost per bit in the hierarchy.	7M	CO2	L5
	b)	Explain the functions of typical input-output interface.	7M	CO2	L2
		OR			
8.	a)	Explain ROM and RAM with respect to their block diagrams.	7M	CO2	L2
	b)	Define Virtual Memory. Explain the process of converting virtual addresses to physical addresses with a neat diagram.	7M	CO2	L1
		UNIT–V			
9.	a)	Define inter process arbitration? Explain how it is implemented in multiprocessor architecture.	7M	CO3	L1
	b)	Differentiate serial arbitration logic and parallel arbitration logic with neat sketches.	7M	CO3	L2
		OR			
10.	a)	Demonstrate the interconnection structure for multiprocessor system.	7M	CO3	L3
	b)	Describe Arithmetic pipeline.	7M	CO3	L2

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Hall Ticket Number :										

R-17

Code: 7G352

III B.Tech. I Semester Supplementary Examinations August 2021

Control Systems

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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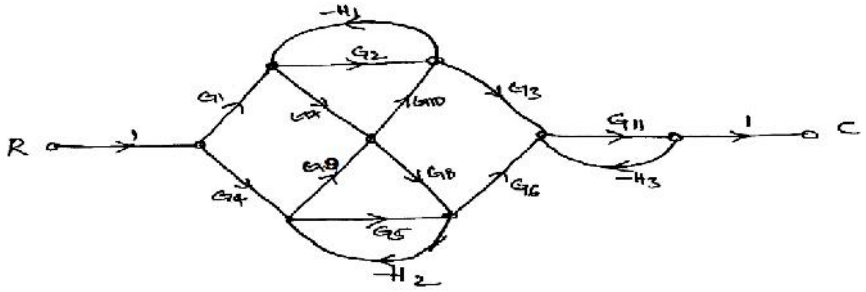
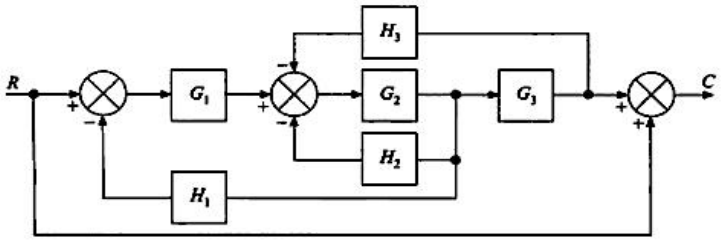
			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Classify various types of Control Systems.	6M	CO1	L2
	b)	Find the Transfer function of signal flow graph given below by using Mason's gain formula. 	8M	CO1	L1
		OR			
2.		For the system shown in the below figure obtain the transfer function using block diagram Reduction technique. 	14M	CO1	L2
		UNIT–II			
3.		For a unity feedback control system, the open loop transfer function $G(s) = 10(s+2)/ s2(s+1)$. Find: i) position, velocity and acceleration error constants. ii) Steady state error when the input $R(s) = (3/s) - (2/ s^2) + (1/3 s^3)$.	14M	CO2	L1
		OR			
4.	a)	Explain the Routh-Hurwitz criterion to determine the stability of the system.	6M	CO2	L2
	b)	Examine the characteristic equation $s^4 + 2 s^3 + s^2 + 4s + 2 = 0$ for stability.	8M	CO2	L4
		UNIT–III			
5.	a)	A system has one open loop pole & two closed loop poles in Right Half of s- plane. Show that the Nyquist plot encircles the (-1+j0) point once in clockwise direction.	7M	CO3	L2
	b)	Addition of poles to the loop transfer function reduces the closed loop stability of the system. Justify by Nyquist plots.	7M	CO3	L4

OR

6.	a)	Explain the term frequency response analysis.	4M	CO3	L2
	b)	Show that in Bode magnitude plot the slope corresponding to a quadratic factor is -40 dB/dec.	4M	CO3	L2
	c	Explain with the help of examples b) Minimum phase function ii) Non minimum phase function iii) All pass function	6M	CO3	L2

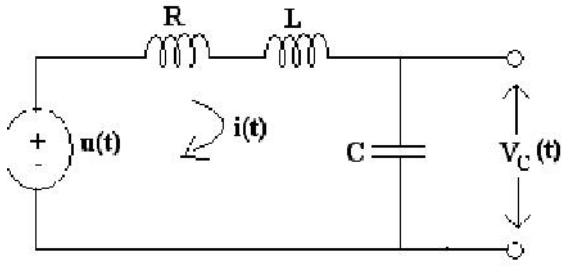
UNIT–IV

7.		Design a Lag compensator for the unity feedback system whose closed loop transfer function C(s) / R(s) = K / (s (s+4) (s+80) + K) is to meet the following specifications P.M ≥33 º. And Kv ≥30.	14M	CO4	L6

OR

8.		Distinguish LEAD and LAG compensators.	14M	CO4	L4

UNIT–V

9.	a)	Obtain the state-space representation of the transfer function system in the controllable canonical form. $$G(s) = \frac{s^2 + 3s + 3}{s^2 + 2s + 1}$$	7M	CO5	L3
	b)	Consider the RLC network shown in figure. Write the state variable representation. 	7M	CO5	L1

OR

10.	a)	List the properties of state transition matrix.	6M	CO5	L1
	b)	Construct the state model for a system characterized by the differential equation. Y ¨+ 5y˙ + 6y = u.	8M	CO5	L5

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Hall Ticket Number :										

R-17

Code: 7G351

III B.Tech. I Semester Supplementary Examinations August 2021

Digital Communication

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Explain about the noise in PCM systems.	7M	1 & 3	L2
	b)	With a neat sketch describe DPCM concept.	7M	1 & 3	L1
		OR			
2.	a)	What are the drawbacks of Delta Modulation (DM)? Describe how these draw backs are eliminated in Adaptive Delta Modulation (ADM).	7M	1 & 3	L1
	b)	Give the comparison of DPCM and DM with standard PCM.	7M	1 & 3	L1
		UNIT–II			
3.	a)	Define and draw the waveforms of ASK, FSK, PSK and DPSK for the data sequence 110100110111.	7M	1 & 3	L1
	b)	Compare the various digital modulation schemes	7M	1 & 3	L4
		OR			
4.	a)	Draw and explain the operating principle of ASK Modulator.	7M	1 & 3	L2
	b)	Describe the BPSK modulation technique with the help of a neat diagram.	7M	1 & 3	L1
		UNIT–III			
5.	a)	Explain the concept of amount of information and its properties.	7M	1 & 3	L2
	b)	Write a short note on Mutual information and Self information.	7M	1 & 3	L1
		OR			
6.	a)	Derive an expression for Shannon- Hartley theorem	7M	1 & 3	L1
	b)	Explain the following i) Bandwidth and S/N tradeoff ii) Channel Capacity	7M	1 & 3	L2
		UNIT–IV			
7.	a)	Apply Shannon–Fano coding procedure for the message ensemble and find the efficiency of the channel P=[0.4,0.2,0.12, 0.08, 0.08, 0.08, 0.04]	7M	2 & 3	L3
	b)	Give the matrix description for linear block codes.	7M	2 & 3	L1
		OR			
8.	a)	Explain the concept of Lempel-Ziv Code.	7M	2 & 3	L2
	b)	Explain about Error detection and Correction capabilities of Hamming codes.	7M	2 & 3	L2
		UNIT–V			
9.		What is the use of syndrome? Draw the (n-k) syndrome calculation circuit for (n, k) cyclic code? Explain.	14M	2 & 3	L3
		OR			
10.		Draw the State diagram, Tree diagram and Trellis diagram for k=3, rate=1/3 code generated by $g_1(x) = 1+x^2$, $g_2(x) = 1+x$, and $g_3(x)=1+x+x^2$.	14M	2 & 3	L3

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Hall Ticket Number :										

R-17

Code: 7G354

III B.Tech. I Semester Supplementary Examinations August 2021

Electronic Measurements and Instrumentation

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Classify and explain various types of errors in measurement	6M	CO1	L2
	b)	Explain various types of DVMs in measurement	8M	CO1	L6
		OR			
2.	a)	Explain the working principle of D'Arsonval galvanometer with the help of torque equation	6M	CO1	L2
	b)	Explain about the Dual Slope Integrating type Digital Voltmeter.	8M	CO1	L2
		UNIT–II			
3.	a)	Discuss the basic principle of AF wave analyzer with neat sketch. L2	6M	CO2	L2
	b)	Explain the working of heterodyne wave analyzer with neat diagram.	8M	CO2	L2
		OR			
4.	a)	Discuss the basic principle of Sweep frequency generator with neat sketch.	6M	CO2	L2
	b)	Explain the working of spectrum analyzer with neat diagram.	8M	CO2	L2
		UNIT–III			
5.	a)	Explain the Basic principle of Wheat stone Bridge and derive the expression for unknown resistance.	6M	CO3	L2
	b)	Explain Schering bridge with neat diagram and derive the expression for unknown Inductance.	8M	CO3	L2
		OR			
6.	a)	Explain the CRT and its applications.	14M	CO3	L6
	b)	Discuss the dual trace oscilloscope with suitable examples			
		UNIT–IV			
7.	a)	Explain the Basic principle of kelvin Bridge and derive the expression for unknown resistance.	6M	CO4	L2
	b)	Explain Wein bridge with neat diagram and derive the expression for unknown parameters'.	8M	CO4	L2
		OR			
8.	a)	Explain the principle of operation and construction of Q-meter.	6M	CO4	L2
	b)	Prepare the principle of operation and construction of AC bridge.	8M	CO4	L6
		UNIT–V			
9.	a)	Define a transducer. Explain the classification of transducers.	6M	CO5	L2
	b)	Explain the Data Acquisition system with neat sketch.	8M	CO5	L2
		OR			
10.	a)	Explain working of strain gauge with neat sketch.	6M	CO5	L2
	b)	Describe the Strip chart recorder with neat diagram.	8M	CO5	L2

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