

Hall Ticket Number :

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R-15

Code: 5G353

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)

UNIT-I

- | | Marks | CO | Blooms Level |
|---|-------|-----|--------------|
| 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

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|--|-----|-----|----|
| 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

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|--|-----|-----|----|
| 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

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|---|-----|-----|----|
| 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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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)

UNIT-I

- | | Marks | CO | Blooms Level |
|--|-------|----|--------------|
| 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

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|---|----|--|--|
| 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 is connected to an antenna having a radiating resistance $R_{rad} = 70$, loss resistance $R_{loss} = 1$ and reactance of $j25$. 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

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|---|----|--|--|
| 3. a) Find the radiation pattern and phase pattern of 10-element isotropic linear array with an element spacing $d = \lambda/2$ 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

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|---|----|--|--|
| 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

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|--|-----|--|--|
| 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

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|--|----|--|--|
| 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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Code: 5G351

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)

	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 drawbacks 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	7M	1 & 3	L2
ii) Channel Capacity			
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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Code: 5GA51

III B.Tech. I Semester Supplementary Examinations August 2021

Managerial Economics and Financial Analysis

(Common to CE, ME & ECE)

Max. Marks: 70

Time: 3 Hours

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

Marks CO Blooms
Level

UNIT-I

1. Explain the meaning of Managerial Economics and state its relationship with other functional areas in decision making.

OR

2. Answer any two principles of Managerial Economics
(a) Discounting Principle
(b) Incremental Concept
(c) Time Perspective

UNIT-II

3. What is elasticity of Demand and discuss the different types of price elasticity of Demand?

OR

4. Discuss the objectives, assumptions and importance of Break-even analysis.

UNIT-III

5. Explain Price-Output determination under perfect competition in long-run.

OR

6. Discuss the merits and demerits of Public and Private Sector Business Organizations.

UNIT-IV

7. From the following Trail Balance and additional information, you are required to prepare Final Accounts

From Prepare Final Accounts.

Particulars	Dr.	Cr.
	₹	₹
Capial		20,000
Sundry Debtors	5,400	
Drawings	1,800	
Plant & Mtachinery	7,000	
Sundry Creditors		2,800
Wages	10,000	
Purchases	21,000	
Opening Stock	4,000	
Bank Balance	3,000	
Carriage Charges	300	
Salaries	400	
Rent	900	
Sales		31,000
	53,800	53,800

Additional Information:

- (i) Closing Stock ₹ 1,800.
(ii) Outstanding Rent ₹ 300 and outstanding wages ₹ 500.
(iii) Charge Depreciation on Plant & Machinery at 20%.

OR

8. What is Capital Budgeting and how do you calculate the Net Present Value for the project?

UNIT-V

9. Explain any three ratios of the following
- (a) Debtors turn-over ratio
 - (b) Proprietary ratio
 - (c) Fixed assets turn-over ratio
 - (d) Absolute quick ratio

OR

10. With the help of the following ratios regarding XYZ Co, draw the Balance Sheet of the company for the year 2020.

(i)	Current Ratio	:	2.5
(ii)	Liquidity Ratio	:	1.5
(iii)	Net working Capital	:	₹ 3,00,000
(iv)	Stock Turnover Ratio (Cost of sales/closing stock)	:	6 times
(v)	Gross Profit Ratio	:	20 per cent
(vi)	Fixed Assets Turnover Ratio (on cost of sales)	:	2 times
(vii)	Debt Collection Period	:	2 months
(viii)	Fixed assets to shareholders net worth	:	0.80
(ix)	Reserve and surplus to capital	:	0.50
