

Hall Ticket Number :

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R-15

Code: 5G453

III B.Tech. I Semester Regular & Supplementary Examinations November 2018

Computer System Architecture

(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

1. a) Explain about Arithmetic Logic Shift unit (ALU) in a computer. 7M
- b) Draw and explain the block diagram of a computer. 7M

OR

2. a) Convert the following binary numbers to decimal: 101110; 1110101; and 110110100. 7M
- b) Convert the following decimal numbers to binary: 1231; 673; and 1998. 7M

UNIT-II

3. Design and explain 4-bit binary adder and 4-bit arithmetic circuit to perform addition using full adders. 14M

OR

4. Design a digital circuit that performs the four logic operations of exclusive OR, Exclusive-NOR, NOR, and NAND. Use two selection variables. Show the logic diagram of one typical stage. 14M

UNIT-III

5. What is the difference between a microprocessor and a microprogram? Is it possible to design a microprocessor without a microprogram? Are all microprogrammed computers also microprocessors? 14M

OR

6. a) Explain Division algorithm with example. 7M
- b) List and Explain about Addressing modes. 7M

UNIT-IV

7. a) Explain Cache memory organization with Associative mapping? Explain how it improves the memory access time? 7M
- b) Explain various mapping procedures of cache memory with an example. 7M

OR

8. a) List four peripheral devices that produce an acceptable output for a person to understand. 7M
- b) What is the difference between isolated I/O and memory-mapped I/O? What are the advantages and disadvantages of each? 7M

UNIT-V

9. a) Illustrate with an example an arithmetic pipeline. 7M
- b) Explain about RISC pipeline. 7M

OR

10. a) Draw a space-time diagram for a six-segment pipeline showing the time it takes to process eight tasks. 7M
- b) Determine the number of clock cycles that it takes to process 200 tasks in a Six-segment pipeline. 7M

Hall Ticket Number :

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R-15

Code: 5G351

III B.Tech. I Semester Regular & Supplementary Examinations November 2018

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)

UNIT-I

1. a) Explain with neat block diagram encoding of analog signals using pulse code modulation technique 8M
- b) A television signal with a bandwidth of 4.2 MHz is transmitted using binary PCM. The number of quantization levels is 512. Calculate the transmission bandwidth and output SNR 6M

OR

2. a) Derive an expression for signal to noise ratio of delta modulation system 8M
- b) Give the comparison of DPCM and DM with standard PCM 6M

UNIT-II

3. a) Derive an expression for signal to noise ratio of baseband signal receiver 7M
- b) Obtain the expression for transfer function of optimum filter 7M

OR

4. a) State and prove the properties of matched filter 8M
- b) With a neat sketch explain the working of correlation receiver 6M

UNIT-III

5. a) Explain generation and detection methods of ASK scheme 8M
- b) Draw the spectrum of BPSK system and discuss its bandwidth requirements 6M

OR

6. a) Describe the M-ary PSK system 8M
- b) Compare and contrast various digital modulation schemes 6M

UNIT-IV

7. a) Write short notes on joint entropy, condition entropy and mutual information 6M
- b) A continuous time signal is band limited to 5 KHz. The signal is quantized in eight levels of a PCM system with probabilities 0.25, 0.2, 0.2, 0.1, 0.1, 0.05, 0.05 and 0.05. Calculate the entropy and rate of information. 8M

OR

8. a) Derive an expression for channel capacity of continuous channel in the presence of white Gaussian noise. 8M
- b) Construct the Shannon-Fano code for the word **HELLO** 6M

UNIT-V

9. a) Discuss about the error detection and error correction capabilities of linear block codes 8M
- b) Construct a (7, 4) binary systematic cyclic code using a generator polynomial $g(x) = x^3+x^2+1$ for the data: 1010 6M

OR

10. Explain the viterbi decoding of convolutional codes 14M

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R-15

Code: 5GA51

III B.Tech. I Semester Regular & Supplementary Examinations November 2018

Managerial Economics and Financial Analysis

(Common to CE, ME & ECE)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. Define Price elasticity, Income elasticity and Cross price elasticity of demand. What are the different methods of measuring Price Elasticity of demand? Derive relationship between Price Elasticity of Demand and Marginal Revenue?

OR

2. Define Managerial Economics. Discuss the nature and scope of Managerial Economics. What is the relationship of Managerial Economics with Microeconomics?

UNIT-II

3. What is the shape of long-run average cost curve and explain why? Differentiate between Economies of Scale and Economies of Scope with suitable examples.

OR

4. Define and show graphically the Break even point of a firm. Find out the break even output (Q*) of a firm if total cost (TC) = Rs. 6310; total revenue (TR) = Rs. 4130; fixed cost (FC) = Rs. 4980; variable cost (VC) = Rs. 1330 and present output (Q) = 5.

UNIT-III

5. Compare and Contrast the Short-run and Long-run equilibrium conditions under Perfect competition and Monopoly market.

OR

6. Define Oligopoly market structure. Describe how price and output is determined under Stackelberg Duopoly model.

UNIT-IV

7. Why is capital important for a firm? What are the various sources of raising capital? Elaborate.

OR

8. What is capital budgeting? Define Net Present Value and Discount Rate. Write a brief note on Pay Back Method.

UNIT-V

9. What do you understand by the term 'Ledger' and 'Trial Balance'? Name two methods of preparing a Trial Balance. Prepare a purchase book from the following information:

- a) Purchase of goods costing Rs. 5000/- from M/s Ramesh & Co. vide invoice no. 120 dated 15/09/2017.
- b) Purchase of Fixed Assets costing Rs. 8000/- from M/s Renu & Co. vide invoice no. 016 dated 20/09/2017.
- c) Paid wages of Rs. 600/- in cash vide receipt no.16 dated 25/09/2017.

OR

10. What is the meaning of Accounting Ratios? What are the objectives of ratio analysis? List out the advantages and limitations of ratio analysis.

Hall Ticket Number :

R-15

Code: 5G354

III B.Tech. I Semester Regular & Supplementary Examinations November 2018

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

1. a) Define Antenna Gain, Radiation resistance and Beam width of an Antenna. 7M
b) Write short notes on Reciprocity Theorem. 7M

OR

2. Obtain Expression for the field and Power radiated by a Half Wave Antenna and calculate radiation resistance of the Antenna. 14M

UNIT-II

3. Define Broadside and End fire Arrays. What are the conditions for a linear array of N-isotropic elements to radiate in End fire and Broadside modes? 14M

OR

4. a) Write short notes on Parasitic Elements. 7M
b) Explain the Working of a Folded Dipole Antenna. 7M

UNIT-III

5. a) Describe the Parabolic Reflector Antenna used at Micro Wave frequency. 7M
b) Describe the Cassegrain method of feeding a Parabolic Reflector. 7M

OR

6. Describe the construction and basic principles of operation of a Helical Antenna under normal mode of operation and Axial mode of operation. What are its applications? 14M

UNIT-IV

7. Discuss the Phenomenon of Ground Wave Propagation at long and medium waves. Show that this gives one of the most reliable methods of radio communication. 14M

OR

8. Write short notes on
i) Ground wave Propagation 4M
ii) Maximum Usable Frequency 6M
iii) Effects of Earth's Magnetic field on Ionospheric Propagation. 4M

UNIT-V

9. Describe how the Ionosphere layers D, E, F1 and F2 are formed and how they affect the Propagation of Radio waves. 14M

OR

10. Discuss the following
i. Critical Frequency 4M
ii. Skip Distance 4M
iii. Derive an expression for the refractive index of the ionosphere in terms of electron number density and frequency. 6M

Code: 5G352

III B.Tech. I Semester Regular & Supplementary Examinations November 2018

Control Systems

(Electronics and Communication Engineering)

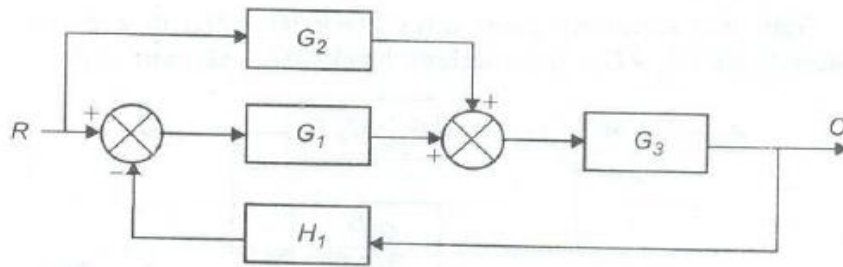
Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) Define the terms which are associated with Signal Flow Graph. 4M
- b) For given Block diagram as shown in Fig below, draw the SFG, and find the transfer function. 10M



OR

2. a) Explain the difference between the Open loop and Closed loop systems? List few examples. 5M
- b) Derive the transfer function of armature controlled D.C. Servomotor? 9M

UNIT-II

3. a) Define the standard input test signals used in control system analysis. 5M
- b) The open loop transfer function of a unity feedback system is given by $G(s) = \frac{K}{s(sT + 1)}$, where K and T are positive constant. By what factor should the amplifier gain K be reduced, so that the peak overshoot of unit step response of the system is reduced from 75% to 25%. 9M

OR

4. a) Write the procedure for constructing Routh array for three cases. 7M
- b) Consider the characteristic equation is $S^5 + S^4 + 2S^3 + 2S^2 + 3S + 5 = 0$ and analyze the system stability using Routh-Hurwitz stability criterion. 7M

UNIT-III

5. Consider a unity feedback system having a open loop transfer function $G(s) = \frac{K}{s(1 + 0.5s)(1 + 4s)}$
 - a) Sketch the polar plot 8M
 - b) Determine the value of K for the Gain Margin to be 20dB. 3M
 - c) Determine the value of K for the Phase Margin to be 30°. 3M

OR

6. For the given open loop transfer function $G(s) = \frac{1}{s(1 + 2s)(1 + s)}$
 - a) Obtain the Magnitude and Phase Plots 8M
 - b) Determine Gain cross over frequency and Phase cross over frequency. 3M
 - c) Determine Gain Margin and Phase Margin. 3M

UNIT-IV

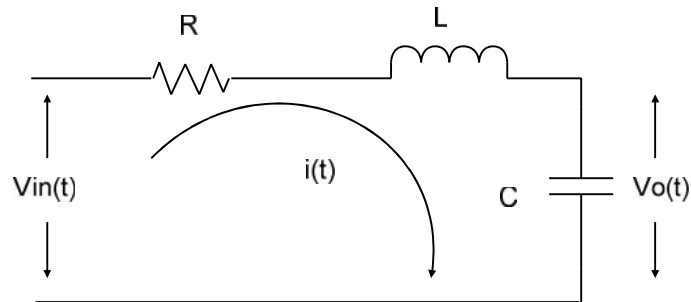
7. a) For a certain system $G(s) = \frac{0.025}{s(1+0.5s)(1+0.05s)}$ design a suitable lag compensator to give velocity error constant = 20 sec⁻¹ and phase margin = 40° 10M
- b) What are the effects of Lead – Lag compensator? 4M

OR

8. a) Explain with suitable example the procedure for designing Lead Compensator. 9M
- b) Describe the effects and limitations of lag compensator. 5M

UNIT-V

9. a) Obtain the state model of given electrical system.



- b) Write the Properties of State Transition Matrix. 6M

OR

10. a) Define the terms Controllability and observability and write necessary conditions for verification of controllability and observability? 9M
- b) What are the advantages of State space analysis? 5M
