Hall Ticket Number :

Code: 4G37C

IV B.Tech. I Semester Supplementary Examinations November 2018
Digital Signal Processing
(Electrical and Electronics 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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UNIT–I

1. a) Obtain the DTFS coefficients of $x(n) = \cos\left(\frac{16\pi}{13}n + \frac{\pi}{6}\right)$. Plot its magnitude and phase.   6M

   b) Find the N point DFT of the sequence.
   $x(n) = 4 + \cos^2(\frac{2\pi n}{N})$; n = 0,1,2,…….N-1. For N=8   8M

OR

2. a) Evaluate linear convolution of the following sequences using DFT and IDFT x(n) = {2,1} and h(n) = {1,2}   8M

   b) Prove the following properties:
      i) Convolution periodic discrete time sequences.
      ii) Time shift property of discrete time aperiodic sequence.   6M

UNIT–II

3. a) Find the Eight point DFT of the sequence, x(n) = {1,1,0,-1,-1,-1,0,1} by Decimation in frequency FFT algorithm. Use the Eight point radix-2 DIT–FFT algorithm to find the DFT of the sequence

   $x(n) = \{\frac{1}{\sqrt{2}}, 1, \frac{1}{\sqrt{2}}, 0, -\frac{1}{\sqrt{2}}, -1, -\frac{1}{\sqrt{2}}, 0\}$ 7M

   b) The DFT X(K) of sequence is given as
      $X(K) = \{0, 2\sqrt{2}(1-j),0,0,0,0,0,2\sqrt{2}(1+j)\}$

   Determine the corresponding time sequence x(n) using DIF-FFT and draw its flow graph.   7M

OR

4. a) What are the differences and similarities between DIT and DIF – FFT algorithm? Discuss in-place computation in the case of decimation in frequency algorithm.   6M

   b) Let $x(n) = \left(1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)$ and h(n) = (1, 1, 1, 1). Compute the DFTs of x(n) and h(n)by the decimation in frequency algorithm. Using the above results, evaluate the circular convolution of x(n) and h(n).   8M

UNIT–III

5. a) Design an analog Butterworth filter that has a gain of -2dB at 20rad/sec. and attenuation in excess of 10dB beyond 30 rad/sec.   7M

   b) Find H(z) using impulse invariance method for the following transfer function.

   $H_a(s) = \dfrac{(s+a)}{(s+a)^2 + b^2}$ 7M

OR

6. a) Design a Butterworth low pass digital filter using bilinear transformation to meet the following specification.

    i) An acceptable pass band ripple of 1db

    ii) A pass band edge of 0.3 rad. &

    iii) Stop band attenuation of 40db or greater beyond 0.6 rad.   8M

    b) The transfer function of a system is given by

$$H(z) = \frac{\frac{1}{4}z^{-1}}{1 - \frac{3}{4}z^{-1} + \frac{1}{8}z^{-2}}$$

    Realize the above using direct form I, direct form II.   6M

UNIT–IV

7. a) Explain the frequency sampling method of designing FIR filters and draw the corresponding block diagram.   7M

    b) The frequency response of an FIR filter is given by

    H( ) = e-j3 (1 + 1.8cos3 + 1.2cos2 +0.5cos)

    Determine the coefficients of the impulse response h(n) of the FIR filter   7M

OR

8. a) Design a FIR low pass filter with the frequency response, using rectangular window.

$$h_d(\omega) = e^{\frac{-j\omega_c(N-1)}{2}} \quad -\frac{\pi}{2} \leq \omega \leq \frac{\pi}{2}$$

    = 0   ; elsewhere

    For N=7   7M

    b) A filter is to be designed with the following desired frequency response

$$H_d(\omega) = 0 \; ; \; -\frac{\pi}{4}<\omega<\frac{\pi}{4}$$

$$= \; e^{-j2\omega}; \qquad \frac{\pi}{4}<|\omega| <\pi$$

    Find the frequency response of the FIR filter designed using rectangular window defined as given below: $w_R(n) = 1$; -5 n 5   7M

UNIT–V

9. a) Analyse the basic concepts of spectral analysis of non-stationary signals. Explain how short-time Fourier transform used in the analysis.   7M

    b) With the diagram, explain the oversampling sigma-delta A/D converter structure.   7M

OR

10. a) Why signal compression is required? With the relevant block diagram discuss the functioning of signal compression system.   7M

    b) Explain the concept of single echo filter and multiple echo filter of time domain operations in musical sound processing.   7M

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III B.Tech. I Semester 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)
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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.

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Code: 4G353

III B.Tech. I Semester Supplementary Examinations November 2018

Digital IC Applications

(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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UNIT–I

1. a) What is fan-in and fan-out of a logic family?

    b) What is diode logic? Why it is not preferred?

OR

2. a) Describe the evolution of TTL families.

    b) Describe the propagation delay of a logic element and what are its effects?

UNIT–II

3. a) List out any five important features of VHDL

    b) Present syntax of VHDL architecture definition

OR

4. a) What is an entity? Write down the syntax of entity?

    b) What is a library? What is the importance of library?

UNIT–III

5. a) Explain the importance of null statement in VHDL with an example

    b) Explain about inertial delay and transport delay with an example

OR

6. a) Explain the structure of various loop statements in VHDL using examples

    b) Write a VHDL code for 1x4 demultiplexer using behavioral modeling.

UNIT–IV

7.   Design a 5-to-32 decoder using 74x138s and explain its operation

OR

8.   Design a 32-to-1 multiplexer using 74x151s and explain its operation

UNIT–V

9. a) Design a positive edge triggered D flipflop with preset and clear using NAND gates

    b) Explain the clocked synchronous state-machine structure with necessary diagrams

OR

10. a) Write a vhdl code for D latch using structural style

    b) Write a vhdl code for upcounter with enable and clear inputs

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