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R-17

Code: 7G373

IV B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Digital Signal Processing

(Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

- 1. a) Check the following filter for time invariant, causal and linear
 (i) $y(n) = (n-1)x^2(n+1)$ (ii) $y(n) = n^2 x(n-2)$ 7M
 b) How are discrete time signals classified? Differentiate between them. 7M

OR

- 2. a) Find the impulse response of the system described by the following difference equation: Assume all initial conditions are zero.
 $y(n)-2y(n-1)+4y(n-2)=x(n)+x(n-1)$ 8M
 b) What are the properties of LTI system? Explain them 6M

UNIT-II

- 3. a) Develop a radix-4 DIT FFT algorithm for evaluating the DFT for $N = 16$ 7M
 b) Find the DFT of the given sequence by using DIF FFT.
 $x(n) = \{0.5, 1.5, -0.5, -0.5\}$ 7M

OR

- 4. a) Given $x(n) = 2^n$ & $N = 8$. Find $X(k)$ using DIT FFT algorithm. Using in-place radix-2 decimation in Frequency FFT algorithm 10M
 b) Write the steps involved in DIT algorithm 4M

UNIT-III

- 5. a) Discuss the impulse invariant method and also explain its limitations 7M
 b) Compare the hamming and Kaiser windows 7M

OR

- 6. Write about the salient features of IIR Structures Direct form-I, Direct form- II 14M

UNIT-IV

- 7. a) List out the important properties of linear phase FIR filters. 7M
 b) Explain the characteristics of FIR digital filters. 7M

OR

- 8. a) Compare and contrast IIR and FIR filters. 5M
 b) Design a Filter with

$$H_d(e^{jw}) = \begin{cases} e^{-j3w} & ; -\pi/4 \leq w \leq \pi/4 \\ 0 & ; \pi/4 < w < 3\pi/4 \end{cases}$$

 Using Hamming Window for $N=7$ 9M

UNIT-V

- 9. a) Write Short notes on signal compression technique. 7M
 b) How non-stationary signals are analyzed with the help of DFT? 7M

OR

- 10. Write short notes on
 (a) A/D converters (b) D/A converters 14M

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R-17

Code: 7G273

IV B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Distribution of Electric Power

(Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) Derive the relation between load and loss factor. 7M
b) Define the terms connected load, maximum demand, load factor, plant utilization factor, coincidence factor? 7M

OR

2. Explain various loads and their characteristics? 14M

UNIT-II

3. a) Derive the relationship for voltage drop and power loss for uniformly radial type distribution load 7M
b) Explain objectives of distribution system protection in detail 7M

OR

4. a) Describe the principle of operation of (i) line sectionalizers (ii) circuit breaker 7M
b) Compare the radial and loop type primary feeders 7M

UNIT-III

5. a) List out the differences between indoor and outdoor substations? 7M
b) How is the design of distribution system done? Discuss the factors that contribute for design. 7M

OR

6. Explain with schematic diagrams, the substation equipment, components and layouts. 14M

UNIT-IV

7. a) List out the various causes of low power factor and methods of improving power factor. 7M
b) Derive the most economical power factor and constant Kw load and constant KVA type loads? 7M

OR

8. a) Name the different methods of voltage control and explain the application of series capacitors to feeders for voltage regulation. 7M
b) Compare and explain the role of shunt and series capacitors in power factor correction. 7M

UNIT-V

9. a) Explain the various factors affecting the distribution system planning 8M
b) Discuss about substation expansion 6M

OR

10. Discuss different types of distribution system planning models. 14M
