**18EC504**

**Hall Ticket Number:**

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| **III/IV B.Tech(Regular) DEGREE EXAMINATION** | | | |
| **February, 2021** | **Electronics & Communication Engineering** | | |
| **Fifth Semester** | **Digital Signal Processing** | | |
| **Time:** Three Hours | | **Maximum:**50 Marks | |
| *Answer ALL Questions from PART-A.* | | | (1X10 = 10 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X10=40 Marks) |
| **Part - A** | | | |

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| 1. | Answer all questions | | (10X1=10 Marks) | |
|  | a) | The signals that are discrete in time and quantized in amplitude are called\_\_\_\_\_\_\_\_\_\_\_\_\_ signals. | |  |
|  | b) | A system is said to be\_\_\_\_\_\_\_\_\_\_\_  *if Added signals pass through it* without interacting. | |  |
|  | c) | For a time-invariant system, its\_\_\_\_\_\_\_\_\_\_ do not change with time. | |  |
|  | d) | Define one-sided and two-sided Z-transform. | |  |
|  | e) | Why FFT is called so? | |  |
|  | f) | What is radix-2 FFT? | |  |
|  | g) | What are the limitations of impulse invariant method? | |  |
|  | h) | What is the relation between analog and digital frequencies in impulse invariant transformation? | |  |
|  | i) | What is the necessary condition for Linear phase realization of FIR systems? | |  |
|  | j) | Name Four basic design elements of discrete time system. | |  |
| **Part B** | | | | |
| 2. | a) | How are discrete-time signals classified? Differentiate between them. | | 5M |
| b) | Find the even and odd components of the signal.  . | | 5M |
| 3. | a) | Obtain the relation between DFT and Z Transform. | | 5M |
| b) | Find Z Transform including the region of convergence of | | 5M |
| 4. | a) | Find 4 point DFT of sequence x(n)={1,-1,2,-2} directly. | | 5M |
| b) | Find 4 point DFT of sequence x(n)={2,0,2,1} using DIT-FFT. | | 5M |
| 5. | a) | Derive 8 point DIT-FFT radix-2 algorithm and draw signal flow graph. | | 10M |
| 6. | a) | . | | 5M |
| b) | Compare bilinear and Impulse invariance. | | 5M |
| 7. |  | Design a Type-1 Chebyshev filter to meet following specifications: αp=3dB;αs=16dB; fp=1KHz and fs= 2KHz. | | 10M |
| 8. | a) | Illustrate Frequency response of FIR filter with rectangular window. | | 7M |
| b) | Explain the steps in the design of FIR filters by frequency sampling technique | | 3M |
| 9. | a) | Draw the direct form I, and direct form II, structures for the system given by: | | 5M |
| b) | Realize FIR linear phase filter for N, even. | | 5M |

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