Turn Over



QP CODE: 24001093

Reg No	:	
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B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, MARCH 2024

Sixth Semester

B.Sc Electronics Model III

CORE COURSE - EL6CRT19 - DIGITAL SIGNAL PROCESSING

2017 Admission Onwards

FEEA773E

Time: 3 Hours

Part A

Answer any ten questions. Each question carries 2 marks.

- Find the time reversed version of x(n), if $x(n) = \{4, -2, 6, 3, 1, -3, 10\}$ 1.
- ↑

Max. Marks: 80

- 2. Test the system $y(n) = n^2 x(n)$ for time invariance.
- 3. Write the difference equation governing for a third order LTI system.
- 4. Define the Transfer Function of LTI system.
- 5. What are the advantages of FIR systems?
- 6. List any four properties of DFT.
- 7. How many multiplications and additions are involved in a 512 - point radix-2 DIT-FFT?
- 8. List any two techniques for digitizing the transfer function of an analog filter.
- 9. What is the relation between digital and analog frequency in impulse invariant transformation?
- 10. List any four features of TMS320C5x processor.
- 11. What is the function of software wait state generator of TMS320C5x processor?
- 12. How DSP is applied in the field of biomedical engineering?

 $(10 \times 2 = 20)$

Part B

Answer any six questions. Each question carries 5 marks.

- 13. Sketch and define unit step sequence, impulse signal, ramp signal and exponential signal.
- 14. Explain odd and even signals with examples.





- 15. Determine the Z- Transform and the ROC of the signal $x(n) = -b^n u(-n-1)$
- 16. Realise the given IIR filter in Direct Form II y(n) 4y(n-1) + 3y(n-2) = 2x(n) + 3x(n-1) + x(n-2)
- 17. Compute the DFT of the sequence $x(n) = \{1, 3, 2, -1\}$
- 18. Draw the butterfly diagram of an 8 -point DFT using radix-2 DIF- FFT.
- 19. Derive mapping equation of analog filter to digital filter transformation in Bilinear Transformation.
- 20. What are the steps involved in the design procedure for low pass digital butterworth IIR filter?
- 21. What are the specialized addressing modes of Digital Signal processors?

(6×5=30)

Part C

Answer any **two** questions. Each question carries **15** marks.

- 22. Show that the output of a LTI system is the convolution of input and impulse response of the system. Determine the response of the system for the input x(n) = aⁿ u(n) and impulse response h(n) = bⁿ u(n)
- 23. Explain the different methods for the realization of LTI systems.
- 24. What is meant by radix 2 FFT? Write the algorithm to determine the 8 -point FFT with necessary diagram.
- 25. Draw and explain the features and VLIW architecture of Digital Signal Processors.

(2×15=30)