Reg. No. : | | | | | | | | | | |

Question Paper Code: 36401

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Sixth Semester

Electronics and Communication Engineering

01UEC601 - DIGITAL SIGNAL PROCESSING

(Regulation 2013)

Duration: 1:45 hour Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1. What is Zero padding? What is the purpose of it?
2. What is pre-warping?
3. Write the equation of Hamming and Blackman window functions.
4. Define zero input limit cycle oscillations
5. Give the steps in multistage sampling rate converter design.
6. Find the IDFT of Y(k)={1,0,1,0}.
7. Mention any two procedures for digitizing the transfer function of an analog filter.
8. What is the reason that FIR filter is always stable?
9. What are the advantages of floating point point arthimatic?
10. List out the applications of Multirate signal processing.
11. What are the differences and similarities between DIF and DIT algorithms?
12. What is pre-warping?
13. Write the equation of Hamming and Blackman window functions.
14. Define zero input limit cycle oscillations.
15. Give the steps in multistage sampling rate converter design.

PART – B (3 x 10= 30 Marks)

(Answer any three of the following questions)

16. Compute the Eight point DFT of the sequence
x(n) = {0.5, 0.5, 0.5, 0.5, 0, 0, 0, 0}
using the in-place radix-2 DIT FFT algorithm. (10)

17. The specifications of the desired low pass filter is

$0.7 \leq |H(e^{jw})| \leq 1; \quad 0 \leq \omega \leq \pi/2$

$|H(e^{jw})| \leq 0.2 \quad ; \quad 3\pi/4 \leq \omega \leq \pi$

Design a digital butter worth filter using bilinear transformation. Assume T=1sec. (10)

18. Design a Low Pass Filter with 11 coefficients for the following Specifications: pass frequency edge is 0.25*kHz* and sampling frequency is 1*kHz* using hanning window. (10)

19. A digital system is characterized by the difference equation y(n)= 0.95y(n-1) + x(n) with x(n)= 0.875, n=0. Assume b=4 bits. Find out limit cycle of oscillation and estimate the dead band of the system. (10)

20. Discuss the sub band coding of speech signal with a suitable example. (10)