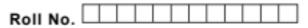


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Total No. of Pages : 02

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B.Tech. (EE) (2011 Onwards Elective-II) (Sem.-7) DIGITAL SIGNAL PROCESSING Subject Code : BTEE-804C M.Code : 71938

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

## SECTION-A

## Write briefly :

- 1. What is an Energy and Power signal?
- 2. Define recursive and non-recursive system.
- Determine the fundamental period of the signal.

$$x(n) = \cos\left(\frac{30\pi n}{105}\right)$$

4. Check for following system is stable or unstable.

$$y(n) = x\left(\frac{1}{2n}\right)$$

- 5. State the convolution property of Fourier Transform.
- 6. What is ROC in Z-Transform?
- 7. State the time reversal property of Z-transform.
- 8. Why the result of circular and linear convolution is not same?
- 9. What are the various methods to design IIR filters?
- 10. Write the steps involved in FIR filter design.

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## SECTION-B

- 11. Explain the classification of discrete systems.
- 12. Find the Z-transform and sketch the ROC :

$$x(n) = a^n \cos \omega_0 nu(n)$$

13. Obtain inverse Z-transform of :

$$X(Z) = \frac{1 - \frac{1}{2}z^{-1}}{1 - \frac{1}{4}z^{-2}} |z| > 1/2$$

- 14. Compute the Fourier Transform of  $x(n) = 2^n u(n)$ .
- 15. Determine the length-4 sequence from its DFT :

$$X(K) = [2, 1-j, 0, 1+j]$$

## SECTION-C

16. The system function of analog filter is as given

$$H_a(S) = \frac{s+0.1}{(s+0.1)^2+9}$$

17. Design a FIR low pass filter using Kaiser Window having following specifications :

Pass-band cut-off frequency = 150 Hz Stopband cut-off frequency = 250 Hz Passband ripple = 0.1 dB Stopband attenuation = 40 dB Sampling frequency = 1000 Hz

- 18. a) State and prove convolution property of DFT.
  - b) Determine the length-4 sequence from its DFT

$$X(K) = [2, 1-j, 0, 1+j]$$

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

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