

Total No. of Questions :8]

[Total No. of Printed Pages :2

[2]

Roll No

MEVD-104**M.E./M. Tech., I Semester**

Examination, June 2016

Digital Signal Processing*Time : Three Hours**Maximum Marks : 70***Note:** i) Attempt any five questions out of eight questions.

ii) All questions carry equal marks.

iii) Assume suitable data, if required.

1. a) Explain sampling theorem. Given $A = 10 \cos 100 \pi t$ and $B = 20 \cos 200 \pi t$:

Determine the Nyquist rate for the following :

- i) A^2 ii) B^3
 iii) AB iv) A^3B^2

- b) What are the various representation forms of the signals which explain orthogonality? Explain any one of them.

2. a) What do you mean by Nyquist Rate? Explain the need of such standards.

- b) What are the various Interpolation filters? Explain any one.

3. a) Determine DFT using DIF FFT for the following :

$$X(n) = (1, 0, 2, 0, 3, 0, 4, 0)$$

- b) Implement parallel and cascade form of the following system :

$$H(z) = \frac{Z^2}{(Z+2)(Z+4)(Z+6)}$$

4. a) Determine circular convolution of the following signals :

$$X(n) = (1, 0, 1, 0) \text{ and } X(n) = (1, 2, 3, 4)$$

- b) Determine inverse Z-transform of $X(z) = \text{Log}(1 + 9z)$.

5. a) Explain the principle of Windows method. Explain any one application of this method.

- b) Discuss about the Park McClellan's method.

6. a) Explain the effect of finite register length in FIR filter design.

- b) Discuss the various parameters related to FIR filter design. <http://www.rgpvonline.com>

7. a) How many types of filters have you studied here. Give a brief classification of filters.

- b) Write any five differences between the butterworth and chebyshev filters.

8. Write short notes (any four) :

- a) Elliptic approximation
 b) Pipelining
 c) Parallel processing
 d) FFT algorithms
 e) Folding techniques
