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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(Electronics & Electrical) (2012 to 2017)
B.Tech.(Electrical & Electronics) (2013 Onwards)
(Sem.-6)

DIGITAL SIGNAL PROCESSING

Subject Code : BTEEE-601

M.Code : 71130

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

Write briefly :

1. Write down the basic elements of digital signal processing system?
2. What do you understand by LTI system?
3. Write Laplace and Z transform of $\sin(t)$ and $\cos(t)$.
4. Define sampling & Nyquist rate?
5. What is Goertzel algorithm? State its applications.
6. Distinguish between FIR and IIR filter.
7. What is the use of pipelining in DSP processor?
8. What is Gibbs phenomena?
9. What are benefits of representing a digital filter in the block diagram form?
10. State the desirable features of DSP processors.

SECTION-B

11. Find the z-transform of each of the following sequences :

a) $x(n) = 2^n u(n) + 3 \left(\frac{1}{2} \right)^n u(n).$

b) $x(n) = \cos(n\omega_0)u(n).$

12. Discuss Linear filtering approach for the computation of DFT.

13. Consider the causal linear shift-invariant filter with system function :

$$H(z) = \frac{1 + 0.875z^{-1}}{(1 + 0.2z^{-1} + 0.9z^{-2})(1 - 0.71^{-1})}$$

Draw a signal flow graph for this system using

a) Direct form I

b) Direct form II

14. Draw the architecture of TMS 320C5X.

15. Describe different types of finite word length effects present in Digital filters and ways to rectify them, with the help of examples.

SECTION-C

16. Find the Kaiser window parameters, β and N , to design a low-pass filter with a cut off frequency $\omega_c = \pi/2$, a stop band ripple $\delta_s = 0.002$, and a transition bandwidth no larger than 0.1π .

17. Discuss the importance of ROC in digital signal processing.

18. Write a short notes on :

a. Bilinear Transformation

b. Circular convolution

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC against the Student.