Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 18

B.Tech. (Electrical & Electronics) (2018 Batch) (Sem.–4)

SIGNALS AND SYSTEMS

Subject Code : BTEE-404-18

M.Code : 77609

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 the mathematical and graphical representation of a unit step sequence.

2. Determine the even and odd components of $x(t) = cost + sint$.

3. What is Power Spectral Density?

4. State the necessary and sufficient conditions for the existence of the Fourier series representation for a signal.

5. Define Sampling Theorem.

6. What is meant by Difference Equation?

7. Explain Ergodic process.

8. Test the system $y(t) = 7\,x(t) + 5$ for linearity.

9. What is meant by Noise temperature?

10. How is the shot noise represented?

SECTION-B

11. Define Signal. Discuss the classification of signals with suitable example.

12. Determine the Fourier Transform of the unit step function u (t).

13. Discuss the convolution integral representation of LTI system.

14. Discuss the properties of Fourier transform and prove at least four of them.

15. Derive an expression for noise in an envelope detector.

SECTION-C

16. What is DTFT? Discuss various properties of DTFT.

17. a) Calculate the Z- transform of : x(n) = $a^n u(-n-1)$.

    b) Find the system function H(z) and unit sample response $h(n)$ of the system whose difference equation can be described by $y(n)\frac{1}{2y(n-1)} + 2x(n)$, where $y(n)$ and $x(n)$ are the output and input of system.

18. Write a short note on :

    a) Avalanche Noise

    b) Bipolar transistor noise