Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ECE/Electronics Engg/Electronics & Computer Engg)
(2012 to 2017)   (Sem.–4)
SIGNALS AND SYSTEMS
Subject Code : BTEC-402
M.Code : 57594

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

Answer briefly :

Q1   What are the classifications of continuous time signals?

Q2   Compare energy and power signal.

Q3   Define Fourier transform and Z-transform.

Q4   Define Ensemble.

Q5   What is the condition of LTI system to be stable?

Q6   What do you mean by impulse response of any system?

Q7   What is the significance of difference equations?

Q8   State Bayes theorem.

Q9   Define Central Limit Theorem.

Q10   What are the steps to perform convolution?

SECTION-B

Q11 Determine the Fourier series representation for $x(t) = 2\sin(2\pi t - 3) + \sin(6\pi t)$.

Q12 Prove that for BIBO stable discrete time LTI system the ROC of the system function includes unit circle.

Q13 Find Fourier transform of unit step function.

Q14 State and prove sampling theorem for low pass signals.

Q15 Derive the relation between correlation and convolution between two sequences.

SECTION-C

Q16 A continuous time LTI system is described by the difference equation:

$$d/dt\ y(t) + 5\ y(t) = x(t)$$

Determine, the response of the system to the input $x(t) = e^{-2t} u(t)$ using Fourier Transform.

Q17 A discrete time LTI system is given by $y(n) - \frac{1}{2} y(n-1) = x(n) + x(n-1)$, Determine, frequency response and impulse response of the system.

Q18 Compute Z- transform and ROC of the signal $(1/2)^n u(n)$, plot Pole-Zero pattern.

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.