DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Semester Examination – May - 2019

Branch: ELECTRONICS & TELECOMMUNICATION **Sem.:- II**

Subject with Subject Code:- SIGNALS & SYSTEMS (BTEXC404) **Marks: 60**

Date:- 22/05/2019 **Time:- 3 Hr.**

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Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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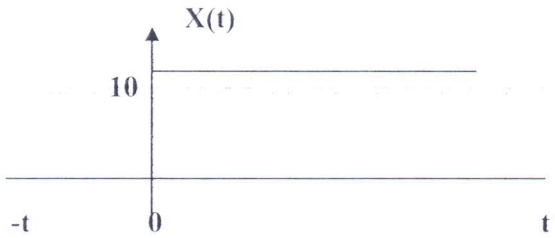
(Marks)

Q.1. Attempt the following **(6x2=12 M)**

A) What is mean by signal? Explain Elementary signal.

B) Sketch the even & odd components of step signal shown in fig.



OR

B) State & Explain sampling theorem & find nyquist rate of $x(t)=\sin 200\pi t$

Q.2. Attempt the following **(6x2=12 M)**

A) Find the convolution of $x(n)=\{1,2,3,4,5\}$ with $h(n)=\{1,2,3,3,2,1\}$

B) $x(n)= (1/5)\, u(n)$, $h(n)=3^n\, u(n)$ find $y(n)=x(n)*h(n)$

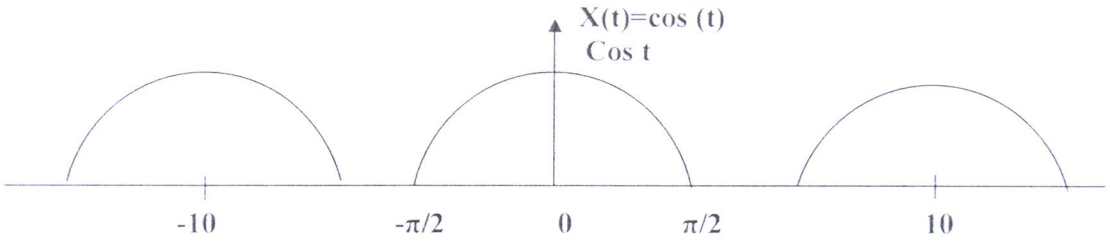
OR

B) What are the properties of convolution? Explain Commutative Property of convolution.

Q.3. Attempt the following **(6x2=12 M)**

A) Explain Dirichlet conditions for existence of fourier series

B) Find Exponential Fourier series for the signal shown in fig.



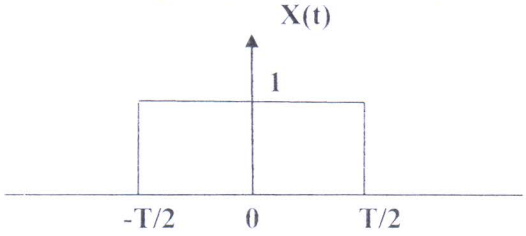
OR

B) Explain the properties of fourier series

Q.4. Attempt the following **(6x2=12 M)**

A) Find the fourier transform of x(t)=e^{-at} u(t) a>0

B) Consider the rectangular pulse shown in fig.which is gate function find fourier transform.



OR

B) Find Fourier transform of x(n)={2,-1,2,-2}
↑

Q.5. Attempt the following **(6x2=12 M)**

A) Given the laplace transform of x(t) $\overset{LT}{\longleftrightarrow}$ $\frac{2s}{s^2+2}$ Where x(t)=0 for t<0
Determine the Laplace Transform of the following signals

1) x(3t)
2) x(t-2)

B) Obtain Inverse Laplace transform of X(S) = $\frac{(s-1/2)}{\left(s+\frac{1}{2}\right)(s+1/4)}$ ROC:σ>-1/4

Q.6. Attempt the following **(6x2=12 M)**

A) Define following terms
1) Random Experiment
2) Sample Space
3) Probability

B) A box contain 3 red,4 white & 5 black balls. One ball is drawn random find the probability that it is, 1) red 2) not black 3) Black or white

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