# Government College of Engineering, Aurangabad

(An Autonomous Institute of Government of Maharashtra)

**S.E (E&TC) Rev - F.T.**

End Semester Examination Nov/Dec 2016

## ET 244: Signals & Systems

21 NOV 2016

*Time: Three Hours* *Max. Marks. 60*

*"Verify the course code and check whether you have got the correct question paper"*

**N.B:-**

1. Attempt all questions Q.1 to 5
2. Figure to the right indicates full marks
3. Assume suitable data if necessary and state it clearly
4. Use graph paper and semilog paper

Q 1 Attempt **any one** of the following **06**

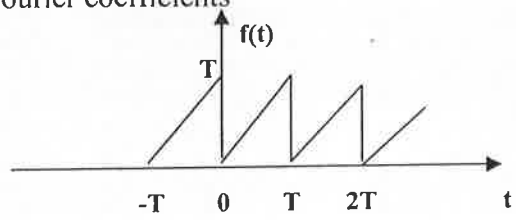
(a) Consider a system with impulse response h[n]={1, **1** ,-1} and x[n]={**1**,2,3,4} **06**

Find output y[n] using graphical convolution method.

(b) Discuss different properties of a system. **06**

Q 2 Attempt **any TWO** of the following **18**

(a) Show the exponential Fourier series of the following signal and hence Interpret trigonometric Fourier coefficients **09**




(b) Explain frequency response of LTI system. **09**

(c) Interpret DTFT of the following sequence of length 'L' **09**

$x(n) = A \{ \text{for } 0 \leq n \leq L-1\}$

$= 0 \{$ ------otherwise $\}$

Q 3 **Attempt any TWO of the following** **18**

(a) Summarize how Laplace transform is applied to any electrical circuit. **09**

(b) Interpret the Laplace transform of the following functions. **09**

i) $f(t) = t^n$ ii) unit ramp function

iii) $f(t) = (t-3)^2$ iv) sin(at)

PTO

(c) Demonstrate the inverse $z$ transform of **09**

$$x(z) = \frac{z}{3z^2 - 4Z + 1}$$

if the regions of convergence re (i) $|z| > 1$, (ii) $|z| < 1/3$ (iii) $1/3 < |z| < 1$

Q 4 Attempt **any one** of the following **06**

(a) What is aliasing? What are its effects? How the aliasing process is eliminated. **06**

(b) State Sampling theorem. Define Nyquist rate. and Nyquist interval. Discuss different methods of sampling.

Q **5** Organize a brief information about **any TWO** of the following: **12**

(a) Probability density & distribution function. **06**

(b) Auto & Cross correlation **06**

(c) Bay's theorem **06**

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