

JAYPEE UNIVERSITY OF INFORMATRION TECHNOLOGY, WAKNAGHAT  
TEST-3 EXAMINATION- May 2017  
M.Tech(CSE) IV Semester

COURSE CODE: 15M1WCI432

MAX. MARKS: 35

COURSE NAME: Advanced Computational Techniques in Engineering

COURSE CREDITS: 3

MAX. TIME: 2Hrs

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

*Standard normal probability tables will be made available.*

Q.1. [ 8 Marks. Each part is 1 mark]

- Block matrix operations can be useful in creating faster algorithms. How?
- List properties of exponential distribution.
- Define PDF of normal distribution.
- Define linear convergence.
- What is an ill conditioned system?
- List four real life applications of fourier transforms.
- Define rate of convergence in power series method?
- Explain the terms FLOP COUNTS and Memory Traffic ?

Q.2. [ 7 Marks] Find and sketch the fourier transform for the following function:

$$f(t) = \begin{cases} 1 & 1-T \leq t \leq 1+T \\ 0 & t < 1-T \text{ or } t > 1+T \end{cases}$$

Q.3. [ 7 Marks] X is a normally distributed variable with mean  $\mu = 30$  and standard deviation  $\sigma = 4$ . Find

- $P(x < 40)$
- $P(x > 21)$
- $P(30 < x < 35)$

Q.4. [ 7 Marks] Find the SVD decomposition of the matrix A below.

$$A = \begin{bmatrix} 3 & 2 & 2 \\ 2 & 3 & -2 \end{bmatrix}$$

Q.5. [ 6 Marks] Write short notes on the following

- Solution of Over Determined Linear Systems.
- Condition Numbers.
- Binomial distribution.
- Data Compression Techniques.