

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Test 2 EXAMINATION- October 2017

B.Tech II Semester (Civil Engg.)

COURSE CODE: 10B11MA312

MAX. MARKS: 25

COURSE NAME: NUMERICAL METHODS

COURSE CREDITS: 4

MAX. TIME: 90 Mins

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Use of scientific calculator is allowed.

1. Solve the following set of equations using Crout's method: (5)

$$2x + y + 4z = 12$$

$$8x - 3y + 2z = 20$$

$$4x + 11y - z = 33.$$

2. Show that $E \equiv 1 + \frac{1}{2}\delta^2 + \delta\sqrt{1 + \frac{\delta^2}{4}}$. (5)

3. Determine the Hermite polynomial of degree 4 which fits the following data: (5)

x	$f(x)$	$f'(x)$
0	0	0
1	1	0
2	0	0

4. Fit a cubic spline curve for the following data with end conditions $y'(0) = 0.2$ and $y'(3) = -1$ (5)

x	0	1	2	3
y	0	0.5	3.5	5

5. The rain resistance R (lbs/ton) is measured for the following values of its velocity V (km/hr). (5)

V	20	40	60	80	100
R	4	9	15	26	38

If R is related to V by the formula $R = a + bV^2$, find a and b using least square method.
