Dr P.K Pandey

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- September 2018

B. Tech. III Semester (CE)

COURSE CODE: 18B11MA312 MAX. MARKS: 15

COURSE NAME: NUMERICAL METHODS

COURSE CREDITS: 4 MAX. TIME: 1 Hr

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

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1. (a) A student measured a rod as 0.667 metre though its true length was 2/3 metre. Find the *relative error* and *percentage error* in the measurement. [1.5 Marks], [CO1]

(b) Starting with initial approximation $x_0 = 1$, find the next approximation x_1 to $(2)^{1/3}$ by *Newton-Raphson method.* [1.5 Marks], [CO1]

2. Using (at least four iterations of) the *bisection method* find a root of equation $x + \tan x = 0$ that lies between 2 radian and 2.1 radian. [3 Marks], [CO1]

3. Solve the following system of equations by *Gauss elimination method*:
$10x + y + z = 12,\ 2x + 10y + z = 13,\ x + y + 5z = 7$ [3 Marks], [CO2]

4. Solve the following system of equations by *Doolittle's LU-decomposition method*:
$x + 5y + z = 14,\ 2x + y + 3z = 13,\ 3x + y + 4z = 17$ [3 Marks], [CO2]

5. Solve the following system of equations by *Jacobi's method*:
$x_1 + 2x_2 - 2x_3 = 1,\ x_1 + x_2 + x_3 = 0,\ 2x_1 + 2x_2 + x_3 = 0$ [3 Marks], [CO2]

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