Roll No .....

## BT-301(AU/CE/CM/EC/ME)-CBGS B.Tech., III Semester

Examination, December 2020

## Choice Based Grading System (CBGS) Mathematics-III

Time: Three Hours

Maximum Marks: 70

**Note:** i) Attempt any five questions.

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- ii) All questions carry equal marks.
  - g^r àíZm| Ho\$ g\_mZ A§H\$ h¢&
- iii)Draw neat sketches, if required.
- iv) In case of any doubt or dispute the English version question nould be treated as final.
- 1. a) Find a positive value of  $(17)^{\frac{1}{3}}$  correct to six decimal places by Newton-Raphson method.

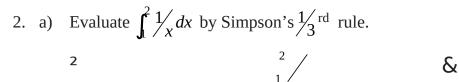
 $(17)^{\frac{1}{3}}$ 

b) Find the real root of the equation  $x \log_{10} x = 1.2$  by bisection method correct to four decimal places.

 $\log_{10}$  1.2

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- b) Evaluate  $\int_4^{5.2} \log e^x dx$  by Simpson's  $\frac{3}{8}$ <sup>th</sup> rule.
- 3. a) Find y(0.1) by Runge Kutta Method. Given  $y'' = y^3, y(0) = 10 \ y'(0) = 5$ . y(0.1)  $y'' = y^3, y(0) = 10 \ y'(0) = 5$ 
  - b) Use Euler's method to find y(0.4) from the differential equation  $\frac{dy}{dt} = xy$ , y(0) = 1, h = 0.1.

a) Write three properties of Laplace transform.

b) Find the Laplace transform of

$$F(t) = \begin{cases} 1 & 0 \le t < 2 \\ t - 2 & 2 \le t \end{cases}$$

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- 5. a) Find the probability of getting 4 heads in 6 tosses of fair coin.
  - b) What do you mean by probability density function?
- 6. a) Solve the following system

$$10x + 2y + z = 9$$

$$2x + 20y - 2z = -44$$

$$-2x + 3y + 10z = 22$$

by Gauss-Seidel method to two places of decimal.

0

$$10x + 2y + z = 9$$

$$2x + 20y - 22 = -44$$

$$-2x + 3x + 10z = 22$$

- b) If 10% of bolt's produced by a machine are defective.

  Determine the probability that out of 10 bolts, chosen at candom
  - i) 1
  - ii) None
  - iii) At most 2 bolts will be defective
  - i) 1
  - ii)
  - iii)

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7. a) The following table is given

x: 0 1 2 5

*y*: 2 3 12 147

What is the form of the function?

x: 0 1 2 5

y: 2 3 12 147

'\$bZ Ho\$ ê\$n 3¶m h¢?

b) Find by the method of Regula Falsi a root of the equation  $x^3 + x^2 - 3x - 3 = 0$  lying between 1 and 2.

 $a^{3} \quad a^{2} \quad 3x - 3$ 

8. a) Find the Fourier transform of

 $f(x) = \begin{cases} 1 & \text{for } |x| < a \\ 0 & \text{for } |x| > a \end{cases}$ 

b) The random variable x has a poisson distribution if p(x=1)=0.01487, p(x=2)=0.04461. Then find p(x=3).

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 $p(x = 1) = 0.01487, p(x = 2) = 0.04461 \ \mathbf{V} \sim p(x = 3)$ 

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