Total No. of Questions : 8] *[Total No. of Printed Pages : 4*

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.
{H$Ýht nm±M àíZm| H$mo hb H$s{OE&

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 should be treated as final.

1. a) Find a positive value of $(17)^{1/3}$ correct to six decimal places by Newton-Raphson method.
$(17)^{1/3}$

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

2. a) Evaluate $\int_1^2 \frac{1}{x} dx$ by Simpson's $\frac{1}{3}^{rd}$ rule.

2 2
1

&

b) Evaluate $\int_4^{5.2} \log e^x dx$ by Simpson's $\frac{3}{8}^{th}$ 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 $\frac{dy}{dx} = xy,\ y(0) = 1, h = 0.1$.

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4. a) Write three properties of Laplace transform.

b) Find the Laplace transform of

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

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.

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$$10x + 2y + z = 9$$
$$2x + 20y - 2z = -44$$
$$-2x + 3y + 10z = 22$$

   b) If 10% of bolt's produced by a machine are defective. Determine the probability that out of 10 bolts, chosen at random

      i) 1

      ii) None

      iii) At most 2 bolts will be defective

      i) 1

      ii)

      iii)

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.

x^3 ^{2} $3x - 3$ b

8. a) Find the Fourier transform of

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

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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$p(x = 1) = 0.01487, p(x = 2) = 0.04461$ V~ $p(x = 3)$

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