BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS:	BTECH	SEMESTER : VII
BRANCH:	CP&P/CE/CS/IT/ME	SESSION : MO/2022

SUBJECT: MA428 NUMERICAL AND STATISTICAL METHODS

TIME: 3:00 Hours   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	What are algebraic and transcendental equations? Give one example of each.	[2]	CO=1	BT=1.12
Q.1(b)	Explain Newton Raphson method.	[3]	CO=1	BT=1.10
Q.1(c)	Solve $x^3 - x - 1 = 0$ by bisection method.	[5]	CO=1	BT=1.25
Q.2(a)	Define forward and backward difference operator.	[2]	CO=2	BT=1.10
Q.2(b)	Given f(1)=15, f(2)=32, f(3)=64, f(4)=120, estimate f(1.5)	[3]	CO=2	BT=1.25

Q.2(c)	Use Gauss Seidel method to solve
	    $83x + 11y - 4z = 95$
	    $7x + 52y + 13z = 104$
	    $3x + 8y + 29z = 71$
		[5]	CO=2	BT=1.25

Q.3(a)	Which two problems are tackled in numerical integration?	[2]	CO=3	BT=1.31
Q.3(b)	Explain Trapezoidal rule.	[3]	CO=3	BT=1.32
Q.3(c)	Integrate $x^2/(1+x^2)$ between the limits 0 to 1 using Simpson's 1/3rd rule.	[5]	CO=3	BT=1.25
Q.4(a)	Explain why the classical definition of probability fails practically and how empirical definition of probability overcomes this drawback.	[2]	CO=4	BT=1.12
Q.4(b)	Two fair dice are rolled. Find the probability of getting an odd number in the first dice or a total of 7 from both the dice.	[3]	CO=4	BT=1.25
Q.4(c)	Find the moment generating function of Binomial distribution. Under what limiting conditions do we get Poisson distribution from Binomial distribution?	[5]	CO=4	BT=1.25
Q.5(a)	What is a statistical hypothesis? Give one example of parametric and one example of non parametric statistical hypothesis.	[2]	CO=5	BT=1.11
Q.5(b)	A coin is tossed 80 times and results in "Heads" 32 times. Is the coin fair? Test at 5% level of significance.	[3]	CO=5	BT=1.25
Q.5(c)	What are the properties of a good estimator and how are they tested?	[5]	CO=5	BT=1.32