

Code: ME3T1, AE3T1

**II B.Tech - I Semester – Regular/Supplementary Examinations
November 2018**

**NUMERICAL AND STATISTICAL METHODS
(Common for ME, AE)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks
11x 2 = 22 M

1. a) Give the iterative scheme for \sqrt{N} by Newton- Raphson's Method.
- b) Find $\Delta^3(x-1)(x-2)(x-3)$.
- c) Write Milne's predictor and corrector formula.
- d) Using Picard's method find $y(0.1)$ for the differential equation $y' = x^2 + y^2$, $y(0) = 1$.
- e) Give formula to solve differential equation in Runge-Kutta method.
- f) If a coin is tossed 100 times, 27 heads are appeared. What is the expectation of the distribution?
- g) Give any two properties of the normal curve.
- h) Find the standard error of mean, if the sample of size 100 is drawn from a population having standard deviation 3.49.
- i) Write a note on point estimation and interval estimation.
- j) Explain the Student-t test for sample mean.
- k) Define the level of significance in testing of hypothesis.

PART – B

Answer any **THREE** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Find the real root of the equation $\cos x = xe^x$ using the method of false position. 8 M

b) Use the Newtons forward interpolation formula to find $f(x)$, for the data 8 M

X	0	2	3	6
f(x)	0	6	12	42

3. a) Using Euler's method find $y(1)$ for the differential equation $\frac{dy}{dx} = x^2 + y^2, y(0) = 1$ taking $h=0.1$ 8 M

b) Apply Milne's predictor-corrector method to get the solution of the differential equation $\frac{dy}{dx} = x - y^2$, at $x=0.8$ given that $y(0.2) = 0, y(0.4) = 0.0795, y(0.6) = 0.1762$. 8 M

4. a) In a distribution exactly normal, 7% of the items are under 35 and 89% are under 63. What are the mean and standard deviation of the distribution? 8 M

b) The p.d.f of a continuous random variable is $f(x) = A + Bx, 0 \leq x \leq 2$. If the mean of the distribution is $1/3$ find A and B. 8 M

5. a) Samples of size 2 are taken from the population 2, 3, 6, 8 and 11. Consider all the samples without replacement from the population. Find (i) The mean of the population (ii) Standard deviation of the population (iii) The mean of sampling distribution of means (iv) The standard deviation of the sampling distribution of means.

8 M

b) What is the maximum error one can expect to make with probability 0.90 when using the mean of a random sample size $n=64$ to estimate the mean of population with variance is 2.56?

8 M

6. a) In a sample of 1000 people in Karnataka 620 are vegetarians and the rest are non vegetarians. Can we assume that both vegetarians and non vegetarians are equally popular in the state at 1% level of significance?

8 M

b) Samples of students were drawn from two universities and from their weights in kilograms, mean and standard deviations are calculated and shown below. Make a large sample test to test the significance of the difference between the means.

8 M

	Mean	S.D	Sample size
University A	55	10	400
University B	57	15	100