

Code: CE3T1

**II B.Tech - I Semester–Regular/Supplementary Examinations
November 2016**

**MATHEMATICAL METHODS
(CIVIL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) Find the reciprocal of 18 using Newton-Raphson's method.
- b) Find the second difference of the polynomial $x^4 - 12x^3 + 42x^2 - 30x + 9$ with interval of differencing $h = 2$.
- c) Write Runge - Kutta fourth order formula.
- d) Compute y at $x = 0.25$ by Euler's method given $y' = 2xy, y(0) = 1$.
- e) One card is drawn from a regular deck of 52 cards. What is the probability of card being either red or king?
- f) Let X denote the number of heads in a single toss of four fair coins. Determine $P(X < 2)$ and $P(1 < X \leq 3)$.
- g) A fair of coin is tossed six times. Find the probability of getting four heads.
- h) Find the value of the finite population correction factor for $n=10$ and $N=100$.
- i) Define Estimate and Estimator.
- j) Write about one tailed and two tailed tests.

- k) A coin is tossed 960 times and head turned up 183 times. Is the coin biased?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2.

- a) Find a real root of the equation $x \log_{10}(x) = 1.2$ using False position method. 8 M

- b) From the following table find $f(33)$, by Newton's forward interpolation formula. 8 M

x	30	35	40	45	50
$f(x)$	15.9	14.9	14.1	13.3	12.5

3.

- a) Using Euler's method find $y(0.2)$ and $y(0.4)$ given

$$y' = y + e^x, y(0) = 0$$

8 M

- b) Apply Milne's method to find a solution of $y' = x - y^2$ in range $0 \leq x \leq 1$ for the boundary condition $y(0) = 0$. 8 M

4.

- a) State and prove Baye's theorem. 8 M

- b) Find mean and standard deviation of a normal distribution in which 7% of items are under 35 and 89% are under 63. 8 M

5.

- a) A population consists of five numbers 2,3,6,8 and 11. Consider all possible samples of size two which can be drawn with replacement from this population. Find

- i) The mean of the population
- ii) The standard deviation of the population
- iii) The mean of the sampling distribution of means and
- iv) The standard deviation of the sampling distribution of means. 8 M

- b) Find 95% confidence limits for the means of a normality distributed population from which the following sample was taken 15,17,10,18,16,9,7,11,13,14 8 M

6.

- a) The means of two large samples of size 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D 2.5 inches at 5% level of significance. 8 M

- b) Producer of 'gutkha', claims that the nicotine content in his 'gutkha' on the average is 1.83mg. Can this claim accepted if a random sample of 8 'gutkha' of this type have the nicotine contents of 2.0, 1.7, 2.1, 1.9, 2.2, 2.1, 2.0, 1.6mg? Use 0.05 level of significance. 8 M