



**B. Tech. Degree III Semester Supplementary Examination in
Marine Engineering December 2014**

MRE 301 ENGINEERING MATHEMATICS III

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) Derive the sampling distribution of mean of samples taken from a normal population. (10)
 (b) A random sample of size 35 is taken from a normal population with mean 30 and S.D 4. Find the probability that sample mean is atleast 2. (10)

OR

- II. (a) Obtain the regression lines for the following data. (10)
 $x : 10 \quad 20 \quad 30 \quad 40 \quad 50$
 $y : 18 \quad 22 \quad 31 \quad 42 \quad 10$
- (b) Fit a straight line of the form $y = a + bx$ to the following data. (10)
 $x : 1 \quad 2 \quad 3 \quad 4 \quad 5$
 $y : 110 \quad 131 \quad 118 \quad 92 \quad 81$

- III. (a) Define: (i) OR gate (ii) NAND gate (iii) NOR gate. (10)
 (b) Convert the Boolean expression to sum of product (10)
 $(\bar{A} + \bar{B} + C), (\bar{A} + B + \bar{C}), (A + \bar{B} + \bar{C})$.

OR

- IV. (a) Write a note on binary codes. (10)
 (b) State De-Morgan's law. Write the uses of it. (10)

- V. Prove that : (4+4+8+4=20)

$$(i) \mu = \frac{E^{1/2} + E^{1/2}}{2}$$

$$(ii) E = e^{hD}$$

$$(iii) 4 = \frac{8^2}{2} + \delta \sqrt{1 + \delta^2 / 4}$$

$$(iv) \delta = E^{1/2} + E^{-1/2}$$

OR

- VI. Solve:

$$(i) y_{n+3} - 3y_{n+2} + 4y_n = 0$$

$$(ii) y_{n+2} - 4y_n = 2^n$$

$$(iii) (E^2 - 5E + 6)y = x + 2^x$$

(6+6+8=20)

(P.T.O.)

- VII. (a) Apply Stirling's formula to evaluate $y_{3.6}$ from the table given below: (10)
- | | | | | | | |
|-------|--------|--------|--------|------|-------|-------|
| x : | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 |
| y : | 24.145 | 22.043 | 20.225 | 18.6 | 17.26 | 16.04 |

- (b) Apply Lagrange's formula to evaluate y from the following table. (10)

x :	5	6	9	11
y :	12	13	14	16

OR

- VIII. (a) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by trapezoidal rule. Where $L = 0.1$. (10)

- (b) Find the first derivative at $x = 15$ from the following table. (10)

x :	15	17	19	21	23	25
y :	3.9	4.1	4.3	4.6	4.8	5

- IX. (a) Design an algorithm for the factorial of a positive integer. (10)

- (b) What do you mean by Bubble sort problem? (10)

OR

- X. (a) Write a note on Linear search problem. (10)

- (b) Design an algorithm for $\sin x$. (10)
