B. Tech. Degree III Semester Supplementary Examination in Marine Engineering December 2015

MRE 301 ENGINEERING MATHEMATICS III

Time: 3 Hours   Maximum Marks: 100

$(5 \times 20 = 100)$

I. (a) Distinguish between parameter and statistic.   (10)
    (b) A random sample of size 36 is taken from a normal population with   (10)
        mean 25 and SD 5. Find the probability that sample mean is negative.

OR

II. (a) Fit a straight line to the following data.   (10)

x :	2	4	6	8
y :	12	14	18	6

    (b) Obtain the regression lines for the following data.   (10)

x :	10	15	20	25	30	35	40
y :	8	10	11	15	21	14	6

III. (a) Define Exclusive – OR and Exclusive – NOR gates.   (10)
     (b) Distinguish between weighted and Non-weighted binary codes.   (10)

OR

IV. (a) State De Morgan's law. What are the uses of it?   (10)
    (b) If $f(x,y,z) = (x \lor y) \land (x \lor y') \land (x' \lor z)$ be a given Boolean function, (10)
        determine its disjunctive normal form.

V. Prove that (i) $\Delta = E - 1$ $(4+4+4+4+4=20)$

    (ii) $\nabla = 1 - E^{-1}$

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

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

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

OR

VI. Solve (i) $y_{n+2} - 3y_{n+1} + 2y_n = 0$ $(6+7+7 = 20)$

    (ii) $y_{n+2} - 5y_{n+1} + 6y_n = 4^n$

    (iii) $(E^2 - 4E + 6)y_n = n + 3^n$

(P.T.O.)

VII.   (a)   Evaluate log 337.5 by Stirling's formula.   (10)

x :	310	320	330	340	350	360
Log x :	2.49	2.51	2.52	2.53	2.54	2.56

     (b)   Evaluate $\int_0^6 \dfrac{dx}{1+x}$ by Simpson's rule.   (10)

OR

VIII.   (a)   Find the first and second derivative at $x = 0$ if   (10)

x :	0	1	2	3	4	5
y :	4	8	15	7	6	2

     (b)   Find the Lagrange's interpolating polynomial if   (10)
$y(1) = 3$, $y(3) = 9$, $y(4) = 30$, $y(6) = 132$

IX.   (a)   Design an algorithm for e^x.   (10)

     (b)   What do you mean by Linear search problem?   (10)

OR

X.   (a)   Design an algorithm for factorial of a positive integer.   (10)

     (b)   Write a note on Bubble sort problem.   (10)

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