

2nd Internal Examination

Semester III

Department of Mathematics

Nabadwip Vidyasagar College

F.M.: 40

Time: 100 Minutes

MATH-H-CC-T-05

1. Answer any two questions $5 \times 2 = 10$

a) Show that if the function $f(x)$ has a finite derivative at $x = c$, then it is continuous there.

Is its converse true? $3 + 2$

b) State and prove Darboux's theorem.

c) State Rolle's theorem. Verify this theorem for the function $f(x) = x^2$ in $[-1,1]$. $2 + 3$

d) State and prove Lagrange's mean value theorem.

MATH-H-CC-T-06

2. Answer any two questions $5 \times 2 = 10$

a) If G be a finite cyclic group of order n , generated by a , prove that a^m is a generator of G if and only if m is prime to n .

b) State and prove Lagrange's Theorem.

c) Prove that the union of two subgroup is a subgroup if and only if one is contained in another.

d) Prove that a subgroup H of a group G is a Normal sub-group of G if and only if for every $x \in G$ and for every $h \in H$, $xhx^{-1} \in H$.

MATH-H-CC-T-07

3. Answer any two questions $5 \times 2 = 10$

a) Prove that Bisection Method for finding real root is a surely convergent method and converging to a real root. State precisely what are the condition used for this method. $3 + 2$

b) Establish Lagrange's Interpolation Formulae. When do this formula used? $4 + 1$

c) Describe the Newton-Raphson Method for finding the real root of algebraic and transcendental equation and also stating the order of convergence.

d) Find a root of the equation $3x - \cos x - 1 = 0$, by Regula-Falsi method, correct upto four significant figures.

MATH-H-SEC-T-01

4. Answer the following questions $5 \times 2 = 10$

a) Write a short note on any two of the following: $2 \frac{1}{2} \times 2 = 5$

(i) If Statement (ii) If-else Statement (iii) Do-while Statement
(iv) While Statement (v) For statement (vi) Break Statement.

b) Write a C Programme for any one of the following:

(i) Matrix Addition (ii) Matrix Subtraction

(iii) Matrix Multiplication