Mugberia Gangadhar Mahavidyalaya

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Internal Assessment Examination ::Dept. of Mathematics

Mathematics(Hon.):: Sem-III

Numerical Analysis: CT-7(2019)

Answer any two : $10 \times 2 = 20$

1.(i) Derived Newton-Gregory formula : $f(x+kh) = \sum_{i=0}^{k} \left({}^kC_i\right) \Delta^i f(x)$. **V.H. 97, 01, 05**

(iii) Write down the following numbers correct upto 4 fignificant figures?

(a) 0.00305, 200.51, 630, 0.01020 (b) 0.0063945, 0.090038 **VU-04**

(iii) What is the degree of precision(D.P)? Find the D.P of Simson 1/3 rule.

2(i)Prove that Newton Cotes' coefficients satisfy the relation $\sum_{i=0}^{n} k_i^{(n)} = 1$.

V.H. 03; B.H. 03

(ii) Prove that Newton Cotes' coefficients satisfy the relation $k_i^{(n)} = k_{n-i}^{(n)}$.,

V.H. 03; B.H. 05

(iii)Derived Simpson's One-third Rule from Newton cotes formula. OR Weddle's Rule from Newton cotes formula C.H. 01, 05; V.H. 01

(3)(a) What is the difference between interpolation and extrapolation formulas?

(b) State the Fundamental theorem of difference calculus.

(c) What is Confluent Divided Differences?

(d) Using Newton's divided difference formula to find $f(5)$ from the following table:

x	0	2	3	4	7	8
$y = f(x)$	4	26	58	112	466	668