

Internal Examination 2019
MATHEMATICS(HONOURS)

Eighth Paper

Full Marks-25

Time- One Hours

Group-A

1. Answer any three question.

$5 \times 3 = 15$

a) i) Define rounding-off error.

ii) Write down the approximate value of $\frac{\pi}{4}$ correct to four significant figures and then find Absolute error, Relative error and Relative percentage error.

iii) Prove that, $\Delta \log f(x) = \log\left[1 + \frac{\Delta f(x)}{f(x)}\right]$. 1+2+2

b) Establish Newton's forward interpolation formula, stating error term.

c) i) State differentiation formulae based on Newton's forward and backward formula.

ii) The function $f(x)$ is tabulated below, for different values of x .

x	0	5	10	15	20
$f(x)$	1.5708	1.5738	1.5828	1.5981	1.6200

Compute the first and second derivatives of $f(x)$ at $x = 0$ and $x = 18$

2+3

d) By integrating Newton's forward interpolation formulae, obtain the basic form of Simpson's $\frac{1}{3}rd$ rule for numerical integration, stating error term.

e) Find the positive roots of the equation $x^3 - 3x + 1.06 = 0$ by method of bisection, correct to three decimal places.

Group-B

2. Answer any two question.

$5 \times 2 = 10$

a) i) Explain the 'do-while statement' in C.

ii) What do you mean by Compiler and Interpreter?

iii) Write down the decimal number $(178)_{10}$ in binary system. 2+2+1

b) Write a program in C to find the real root of the equation $x^2 = \sin x$ correct to four decimal places.

c) convert decimal numbers 35 and 37 into binary system and obtain their division using binary arithmetic.

d) Write a C program for arranging the numbers in ascending and descending order.