

KATWA COLLEGE  
B.A./B.Sc. Part-III (Honours)(1+1+1) Practical  
Examination, 2020  
Subject: Mathematics  
Paper: IX  
(Practical Using C Program)  
Time: 2 Hours      **Full Marks: 50**

Answer the all questions .

You are required to write the followings:

Write the working formula, algorithm for two problems.

Then write a suitable program in C (with out Compilation )

Marks Distribution(For each problem)

Working Formulae :- 5

Algorithm :- 10

Programme:- 10

1. Using the Fourth order Runge-Kutta method find the values of Y at

$X = 0.1, 0.2, \dots, 1.0$  taking  $X_0 = 0.0, Y_0 = 1.0, h = 0.1$  from the differential equation:

$$\frac{dY}{dX} = \frac{6X^2 + \cos(X^2 + \frac{11Y}{10} + \frac{J}{9})}{\sqrt{4.1X^2 + 3Y + 2.1}}$$

correct upto 6 places of decimals.

[5 + 10 + 10]

2. Using the Simpson's one-third rule , find the value of the integral, taking 50 equal sub-intervals:

$$\int_1^2 \frac{3.5X^2 + 2X + \cos(12X + \frac{J}{12})}{\sqrt{7X + 3}} dX$$

correct upto 6 places of decimals. The output should contain the limits of integration, the length of the sub-interval and the value of the integral.

[5 + 10 + 10]