

Numerical Computing (CS2008)

Sessional-I Exam

Date: Sep 23; 2024

Course Instructor(s)

Dr. Mubashir Qayyum

Dr. Aziz ur Rehman

Dr. Tauseef Saeed

Dr. Sidra Afzal

Mr. Usman Javed

Ms. Iqra Yaqoot

Total Time (Hrs): 1

Total Marks: 60

Total Questions: 03

Attempt all questions on the answer book. Programmable calculators are not allowed.
Don't write anything on a question paper except your name and roll number.

Q1. (a) A test performed on a *NPN* transistor gives the following result:

Base current f (mA)	0.01	0.02	0.03	0.04	0.05
Collector current I_c (mA)	1.2000	2.5000	23.6000	4.3000	5.3400

Calculate the value of collector current for the base current of (i) 0.005 mA and (ii) 0.045 mA using the best suitable formulae. **Points (20)**

Note: Throughout the computation, you need to take 4 digits after decimal place.

Q1. (b) A thermocouple gives the following output for rise in temperature:

Temperature ($^{\circ}$ C)	10	20	30
Output (mV)	0.4000	0.8550	1.2890

Find the Temperature in thermocouple for 1 mV output. **Points (10)**

Note: Throughout the computation, you need to take 4 digits after decimal place.

Q2. Calculate the feasibility of composite Trapezoidal and composite Simpson rules by finding N and h for the desired accuracy of 1×10^{-6} to the following problem: **Points (10)**

$$I = \int_1^2 \frac{dx}{x}$$

Also, write a one/two liner conclusion on the basis of your findings.

- Q3. Evaluate $I = \int_1^2 \frac{dx}{x}$ by using composite Trapezoidal rule, and composite Simpson rule with $h = 0.25$. Also, find exact solution and compare with approximate results, and make conclusion. **Points (20)**

Note: Take 5 digits after decimal in all computations.