(i) find the mean

(ii) the coefficient of correlation

(iii) the ratio's of $\sigma_x^2 : \sigma_y^2$

(b) Explain properties of Regression-coefficients.

Section–IV

8. (a) The height of 10 males of a given locality are found to be 70, 67, 62, 68, 61, 68, 70, 64, 64, 66 inches. Is it reasonable to believe that the average height is greater than 64 inches ? Test at 5% significance level assuming that for 9 degree of freedom P (t > 1.83) = 0.05.

(b) Ten individuals are choosen at random from a normal population and their heights are found to be 63, 63, 66, 67, 68, 69, 70, 70, 71, 71 inches. Test if the sample belongs to the population whose mean height is 66".

9. (a) The demand for a particular spare part in a factory was found to vary from day to day In a sample study the following information was obtained.

Days	Mon.	Tues.	Wed.	Thurs.	Fri	Sat.
No. of parts demanded	11 24	1 125	11 10	1120	1 126	11 15

Test the hypothesis that the number of parts demanded does not depend on the day of the week.

(b) Discuss ANOVA for two way classified data.

B.Sc. 4th Semester (Hons.) New Scheme
Examination, May–2016
CHEMISTRY
Paper–I
Mathematics–IV Optional

Time allowed : 3 hours] *[Maximum marks : 40*

Note : *Attempt **five** questions in all, selecting at least **one** question from each section. **Q. No. 1 is compulsory.***

Compulsory Question

1. (a) Evaluate $\int_0^6 \frac{1}{1+2x} dx$ by using trapezoidal rule.

(b) Find Newton Raphson formula for finding $\sqrt{N}$.

(c) From 25 tickets, marked 1 to 25 number, one is drawn at random. Find the chance that it is multiple of 5 or 7.

(d) State statistical definition of probability.

(e) Find the rank correlation for the following data

x	1	2	3	4
y	2	3	4	1

(f) Write a short note on scatter diagram.

(g) Write a short note on ANOVA.

(h) Find the value of t for 9 degree of freedom at 5% level of significance for single tail test is _____.

Section–I

2. (a) Using Newton Raphson formula find the value of $\sqrt[3]{28}$.

(b) Find a root of $x^3 - x - 1 = 0$ using Bisection method.

3. (a) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ taking 7 ordinates by applying Simpson's $\frac{3}{8}$th rule.

(b) Evaluate $\int_0^5 \frac{dx}{4x+5}$, dividing the range into 10 equal parts by applying Simpson's $\frac{1}{3}$rd rule.

Section–II

4. (a) Two cards are drawn at random from a well-shuffled pack of 52 cards. What is the probability that (i) Both aces (ii) only one ace (iii) None of them is ace (iv) at least one ace.

(b) A bag contains 50 tickets numbered 1, 2, 3, ..., 50 four are drawn at random and arranged in ascending order of the magnitude $(x_1 < x_2 < x_3 < x_4)$. What is the probability that (i) $x_1 = 30$ (ii) $x_2 = 30$ (iii) $x_3 = 30$ (iv) $x_4 = 30$.

5. (a) State and prove addition law of probability.

(b) Three are three urns having the following compositions of black and white balls

urn 1 : 7 white and 3 black balls

urn 2 : 4 white and 6 black balls

urn 3 : 2 white and 8 black balls

One of these urn is chosen at random with probabilities 0.20, 0.60 and 0.20 respectively. From the chosen urn two balls are drawn at random with replacement. Calculate the probability that both these balls are white.

Section–III

6. (a) Calculate the coefficient of correction between X and Y of the following :

X	1	3	4	5	7	8	10
Y	2	6	8	10	14	16	20

(b) Calculate the coefficient of correction for ranks from the following data :-

(5, 8), (10, 3), (6, 2), (3, 9), (19, 12), (5, 3), (6, 17), (12, 18) (8, 22), (2, 12), (10, 17), (19, 20)

7. (a) The lines of regression in a bivariate distribution are $X + 9Y = 7$ and $Y + 4X = \frac{49}{3}$