



UNIVERSITY OF THE PUNJAB

First Semester – 2019

Examination: B.S. 4 Years Program

Roll No. in Fig.

Roll No. in Words.

PAPER: Applied Mathematics
Course Code: MATH-122 Part-I (Compulsory)

MAX. TIME: 30 Min.

MAX. MARKS: 10

Signature of Supdt.

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer, cutting and overwriting is not allowed. (1x10=10)

- The number 90.05950×10^3 has --- significant digits
(a) 3 (b) 4 (c) 5 (d) 6
- Order of convergence of Secant method is
(a) 1 (b) 4.618 (c) 2 (d) 9
- Jacobi method is a --- method
(a) Non-iterative (b) iterative (c) infinite (d) algebraic
- If $f(y)$ is a real continuous function in $[x_0, x_1]$, and $f(x_0)f(x_1) < 0$, then for $f(y) = 0$, there is (are) --- in the domain $[x_0, x_1]$.
(a) one root (b) an undeterminable number of roots (c) no root
(d) at least one root
- If $x = 6$ is a root of $f(x) = 0$, then the factor of $f(x)$ is ---.
(a) $x + 6$ (b) 6 (c) $x - 6$ (d) x
- The value of C for the density function $f(x) = Cx$, $0 \leq x \leq 2$ is
(a) $\frac{3}{2}$ (b) $\frac{5}{2}$ (c) $\frac{1}{2}$ (d) None
- In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?
(a) $\frac{1}{3}$ (b) $\frac{3}{4}$ (c) $\frac{7}{19}$ (d) $\frac{8}{21}$
- Mean of a binomial distribution is
(a) np (b) $\frac{np}{q}$ (c) $np(1 - q)$ (d) $np(1 - p)$
- There are 30 players and we have to make a team of 10 players, then we have
(a) $\frac{30!}{30!(30-10)!}$ (b) $\frac{30!}{10!(30-10)!}$ (c) $\frac{10!}{30!(30-10)!}$ (d) None
- The convergence of which of the following method is sensitive to starting value?
(a) False position (b) Gauss Seidal method (c) Newton-Raphson method
(d) All of these



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Course Code: MATH-122 Part – II

MAX. TIME: 2 Hrs. 30 Min.

MAX. MARKS: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Answer these questions.

(2+3+2+3+3+3+2+2+ = 20)

- If A and B are events of sample space S , then prove that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. (2)
- Prove that mean, median and mode are equal in normal distribution function. (3)
- 400 passengers have made a reservation for an airplane flight. If the probability that a passenger will not show up is 0.02. Find the probability that exactly 4 will not show up. (2)
- Find the value of C in the following probability distribution function of a continuous random variable "y":

$$f(y) = \begin{cases} C(3-y)(3+y), & 0 \leq y \leq 3, \\ 0, & \text{elsewhere.} \end{cases}$$
 (3)
- Find the root of the function up to three decimal places by applying simple iteration method $f(x) = x^3 - 4x + 1$, taking an initial value $x = 1.5$. (3)
- Evaluate $\int_0^2 \frac{dx}{1+x+x^2}$ using trapezoidal rule, for $n = 5$. (3)
- If $S_x^2 = 10.0$, $S_y^2 = 485,578.8$, $\sum(X - \bar{X}) = 159.45$, $\sum(Y - \bar{Y}) = 7,767,660$ and $\sum(X - \bar{X})(Y - \bar{Y}) = 28,768.4$, then find $Cov(x, y)$ and r_{xy} . (2)
- State the fundamental laws of probability. (2)

Q.3. Answer the following questions.

(3 x 10 = 30)

- (a) Solve the following system of equations by using Gauss's Elimination method. (6+4)

$$\begin{aligned} 9x_1 + 2x_2 + 4x_3 &= 20 \\ x_1 + 10x_2 + 4x_3 &= 6 \\ 2x_1 - 4x_2 + 10x_3 &= -15 \end{aligned}$$

- For any two events A and B , prove that $P(A \cap B) = P(A) \cdot P(B)$.
- (a) Find the root of the function correct up to three decimal places by applying the Newton Raphson's method $f(x) = x^2 - 1$, take $x_0 = 1$. (6+4)
 - (b) Write the algorithm for the Bisection method for solving a non linear equation.
- Define correlation and correlation coefficient. The table below shows the number of absences "x" in a Calculus course and the final exam grade "y" for seven students. Find the correlation coefficient. (10)

x	1	0	2	6	4	3	3
y	95	90	90	55	70	80	85