

Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name: Fundamental Mathematics for Computer

Subject Code: 4CS01IFM1

Branch: B.Sc.(IT)

Semester: 1

Date: 28/03/2017

Time: 10:30 To 01:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

- a) If two straight lines $y = m_1x + c$ and $y = m_2x + c$ are parallel then _____. (01)
- a) $m_1 > m_2$ b) $m_1 = m_2$ c) $m_1 < m_2$ d) $m_1 m_2 = -1$
- b) If $A = \{5,6,8,9\}$ and $B = \{1,3,5,8\}$ then $n(A - B) =$ _____. (01)
- a) $\{5,8\}$ b) 4 c) $\{6,9\}$ d) 2
- c) If A is a column matrix of order $m \times n$ then _____. (01)
- a) $m = 1$ b) $n = 1$ c) $m = n$ d) $m > n$
- d) If $A = [1 \ 0]$ and $B = [0 \ 1]'$ then $AB =$ _____. (01)
- a) $[1 \ 1]$ b) $[0 \ 0]$ c) $[0]$ d) $[1]$
- e) Intersection of two sets A and B is denoted by (01)
- a) $A \cap B$ b) $A \cup B$ c) $A \subset B$ d) $A \supset B$
- f) Point $A(-1, -3)$ is in the _____ quadrant. (01)
- a) First b) Second c) Third d) Fourth
- g) What is the distance between two points $A(0,3)$ and $B(1,5)$? (01)
- a) 0 b) 4 c) 5 d) none of these
- h) If $A = [1 \ 1]$ and $B = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$ then $AB =$ _____. (01)
- a) $[2 \ 1]$ b) $[1 \ 3]$ c) $[2]$ d) $[5]$



- i) If $y = 1/x^2$ then $\frac{dy}{dx} = \underline{\hspace{2cm}}$. (01)
 a) $-1/x^2$ b) 1 c) $-1/x^3$ d) none of these
- j) $\frac{d}{dx} \log ax = \underline{\hspace{2cm}}$ (01)
- k) $\frac{d}{dx} x \cdot \sin x = \underline{\hspace{2cm}}$. (01)
- l) $\int \tan x \, dx = \underline{\hspace{2cm}}$. (01)
- m) $\int \frac{1}{x^2 + 16} \, dx = \underline{\hspace{2cm}}$. (01)
- n) $\frac{d}{dx} \sin^{-1} x = \underline{\hspace{2cm}}$. (01)

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

- a) If $A = \{2,3,5\}$, $B = \{1,5\}$ and $C = \{1,2,3\}$ then prove that (05)
 $A \times (B - C) = (A \times B) - (A \times C)$.
- b) Find the matrix X of order 2×2 such that $C - X - AB = 0$. (05)
 Where $A = \begin{bmatrix} 2 & 1 \\ 5 & 3 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 3 \\ 2 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 1 \\ -1 & 2 \end{bmatrix}$.
- c) Solve the linear equation $2x + 3y = 5$ and $2y - x = 1$. By using matrix method. (04)

Q-3 Attempt all questions (14)

- If $U = \{y: 1 < y < 10\}$, $A = \{1,5,10,7,2\}$, $B = \{1,3,4,5,6,2\}$ and (05)
 a) $C = \{2,4,6\}$ then verify that
 i) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ ii) $(A \cup B)' = A' \cap B'$
- b) If $A = \begin{bmatrix} 1 & 3 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 5 \\ 4 & 6 \end{bmatrix}$ are two matrices then verify that (05)
 $(AB)^{-1} = B^{-1}A^{-1}$.
- c) Find the $Adj A$ of the matrix $A = \begin{bmatrix} 2 & 3 & 4 \\ 0 & 3 & 5 \\ 2 & 5 & 0 \end{bmatrix}$. (04)

Q-4 Attempt all questions (14)

- a) Find the equation of line passing through the point $A(5,4)$ and $B(2,5)$. (05)
 i) Find the distance between the points $A(6,4)$ and $B(2,1)$
- b) ii) In what ratio the line joining $A(5,12)$ and $B(2,9)$ is divided by a point (05)
 $P(3,10)$.
- c) Evaluate: $\cos(\pi/3) + \sin(5\pi/6) + \cos 4\pi + \sin(7\pi/6)$. (04)



Q-5 Attempt all questions (14)

If distance between the points (5,2) and (2, a) is 15 then find the value of a. (05)

a) also find the slope of line passing through given points after find a.

i) Find the distance between the points A(7,8) and B(1,0).

b) (05)

Find the equation of line passing through the point A(2,1) and B (-1,3). Also find slope of the line.

(04)

Prove the following:

c) i) $\tan^2 \theta - \sin^2 \theta = \sin^2 \theta \cdot \tan^2 \theta$.

ii) $1 + \frac{\tan^2 \theta}{\sec \theta + 1} = \sec \theta$.

Q-6 Attempt all questions (14)

a) Differentiate $\cos(\log(a^x))$ with respect to x. (05)

b) If $y = \frac{(x \sin x + \cos x)}{x^2}$ then find $\frac{dy}{dx}$. (05)

c) Evaluate : $\int x^2 \sin 3x dx$. (04)

Q-7 Attempt all questions (14)

a) Differentiate: $x^3 \sin(e^{2x})$. (05)

b) If $2x^3 + 4y^2 + xy = 0$ then find $\frac{dy}{dx}$. (05)

c) If $x = a \sin^3 \theta, y = b \cos^3 \theta$ then find $\frac{dy}{dx}$. (04)

Q-8 Attempt all questions (14)

a) Evaluate : $\int \frac{x}{2} + \frac{3}{x} + 3^x + x^5 + 3 \cos x dx$. (05)

In a class of 25 students .12 students taken mathematics, 8 students taken mathematics but not statistics. Find the number of students who taken statistics but not mathematics. (05)

c) Draw the graph of $\sin x$ in the interval $[-\pi, \pi]$. (04)

