NED UNIVERSITY OF ENGINEERING & TECHNOLOGY
FIRST YEAR (Computer Science)
SPRING SEMESTER EXAMINATIONS 2024
Batch 2023

SEAT NO. CT-23024

: 3 Hours

Dated : 24-JUL-24
Max Marks : 60

Differential & Integral Calculus - MT-171

ons: Attempt all questions. All questions carry equal marks.

n 1 CLO 1 12 Marks

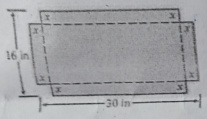
open box is to be made from a 16-inch by 30-inch piece of card-board by cutting out squares of equal size from four corners and bending up the sides.

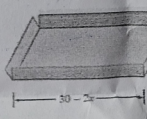
Let V be the volume of the box that results when the squares have sides of length x. Define a formula for V as a function of x.

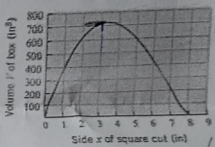
Identify the domain of $V(x)$.

Use the graph of V given in figure to estimate the range of $V(x)$.

Describe in words what the graph tells you about volume. (4)







Discuss the continuity of the function $f(x) = \begin{cases} 0, & x \le -3 \\ \frac{x-3}{x^2-9}, & -3 < x < 3 \\ \frac{1}{6}, & x \ge 3 \end{cases}$ at $x = -3$ and $x = 3$. (4)

dentify the asymptotes (vertical, horizontal, and/or slant) for the function $g(x) = \frac{2x^2-x-3}{x-2}$. (4)

CLO 1 12 Marks

ion 2

mplify $\frac{(\sqrt{3}+i)^3(-1+i)^4}{(1-\sqrt{3}\,i)^6}$. (4)

t the all four 4^{th} roots of $1 + i$. (4)

De Moivre's Theorem to express $sin^5\theta$ in the powes series of $\sin\theta$. (4)

CLO 2 12 Marks

3

oximate the value of $sin\ 46^0$ using Taylor Series about $x = \frac{\pi}{4}$.

nternational airline has a regulation that each passenger can carry a suitcase having the sum of its width, h and height less than or equal to 135 cm. Select the dimensions of the suitcase of maximum volume that enger may carry under this regulation.

neers use the radius of curvature in road design to determine the appropriate curvature of roads and ways. To ensures safe and efficient navigation for vehicles, particularly at higher speeds on a parabolic

ed $y^2 = 8x$, choose the points on which radius of curvature $\rho = \frac{125}{16}$.

P.