



COMSATS University Islamabad, Islamabad Campus

Terminal Examination Spring 2020

Course Title:	Multivariable Calculus	Course Code:	MTH105	Credit Hours:	3(3,0)
Course Instructor/s:	Dr. M. Bilal Ashraf	Program Name:	BCS/BSE		
Semester:	Batch:	Section:	Date:		
Time Allowed:	120 mins		Maximum Marks:	35	
Student's Name:			Reg. No.		
Student's Signature			Marks Obtained		

IMPORTANT:

- Past pictures of your answer sheets after the respective question and resubmit the file in PDF format.
- Write your, department, section and registration number on first page of question paper and on registration number on each page of your answer sheet.

Q. No. 1

(5)

Find the parametric equations for the line L through $P_1(3, 1, -2)$ and $P_2(-2, 7, -4)$. At what point does L intersect the xy-plane?

Answer: Paste pictures of solution here

Q. No. 2)

(5)

Find the absolute maximum and minimum values of

$$f(x, y) = x^2 + y^2$$

On the closed triangular plate bounded by the lines $x = 0$, $y = 0$, $y + 2x = 2$ in the first quadrant.

Answer: Paste pictures of solution here

Q. No. 3)

(5)

Reverse the order of integration and evaluate the integral

$$\int_0^9 \int_{\sqrt{y}}^3 \sin x^3 dx dy$$

Answer: Paste pictures of solution here

Q. No. 4)

(5)

Sketch the region of integration, determine the order of integration in terms of changing the order of integration, for the $\iint_R (x^3 + 4y) dA$ where R is the region bounded by the lines $y = x^2$ and $y = 2x$.

Answer: Paste pictures of solution here

Q. No. 5)

(5)

Let R be the region bounded by the graphs of the equations $y = \sqrt{x}$ and $y = \sqrt{3x-18}$ and $y = 0$. If f is continuous on R, express the double integral $\iint_R (1+4y) dA$.

Answer: Paste pictures of solution here

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Answer: Paste pictures of solution here

Q. No. 5)

(5)

Let R be the region bounded by the graphs of the equations $y = \sqrt{x}$ and $y = \sqrt{3x-18}$ and $y = 0$. If f is continuous on R , express the double integral $\iint_R (1+4y) dA$.

Answer: Paste pictures of solution here

Q. No. 6)

(5)

Use polar coordinates to evaluate $\int_{-a}^a \int_0^{\sqrt{a^2-x^2}} (x^2 + y^2) dy dx$

Answer: Paste pictures of solution here

Q. No. 7)

(5)

A lamina bounded by the lines $xy^2 = 1$, $y = 1$ and $y = 2$ with the density function $\delta(x, y) = x^2 + y^2$. Find the moment of inertia and radius of gyration about the coordinate axis and about the origin.