Sir Syed University of Engineering & Technology
Faculty of Computing & Applied Sciences
Department of Software Engineering

Online End Semester Examinations (Spring 2021)

Course Code with Title	MS-103: Calculus and Analytic Geometry	**Program**	BS (Software Engineering)
Instructor	M. Etezaz Ibrahim/Maria Rashid	**Semester**	2ND
Start date & Time	June 17, 2021 at 08:30 AM **Submission Deadline**	June 17, 2021 at 1:30PM	
Maximum Marks	50		
Students must meet their submission deadline as there is no re-take or re-attempt after the deadline.			

IMPORTANT INSTRUCTIONS:

Read the following Instructions carefully:

- All Questions carries equal marks
- Attempt All Questions on MS-Word. Font theme and size must be Times New Roman and 12 points respectively. Use line spacing 1.5.
- You may provide answers HANDWRITTEN. The scanned solution must be submitted in PDF file format (Use any suitable Mobile Application for Scanning)
- For Diagrams, you can use paper and share a clear visible snapshot in the same Answer Sheet.
- Arrange questions and their subsequent parts in sequence.
- Make sure that your answers are not plagiarized or copied from any other sources. In case of plagiarism, **ZERO** marks will be awarded.
- Provide relevant, original and conceptual answers, as this exam aims to test your ability to examine, explain, modify or develop concepts discussed during the course.
- Recheck your answer before the submission on **VLE** to correct any content or language related errors.
- You must upload your answers via the VLE platform ONLY.
- **Please calculate the following values before you start solving the paper**.

You may need these. Write last three Numeric digit of your roll no.

For example if your roll is 2020-SE-001 hence digits are

0*	0**	1***

For example if your roll No is 2020-SE-149, hence digits are

1*	4**	9***

*** Consider *a* as a First Digit of your roll number**
****Consider *b* as a Second Digit of your roll number.**
***** Consider *c* as a Last Digit of your roll number.**
 # Condition of *d* mentioned with question.

You must follow general guideline for students before online examination and during online examination which had already shared by email and WhatsApp.

This paper has a total of 03 pages including this title page

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Q.1. **(10)**

(i) Calculate partial derivative $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}, where$
$f(x,y) = (x^{a+1}+y^{a+1})^{a+1}$

(ii) Calculate $\frac{dw}{dt}$ by Chain rule $where$
$w = x^2+y^2,\ x = cost,\ y = d,\ at\ t = a\pi$

Consider $\boldsymbol{d = sint}$ if your roll number of last digit from 0 to 3, $\boldsymbol{d = cost}$ if your roll number of last digit from 4 to 6, $\boldsymbol{d = sect}$ if your roll number of last digit from 7 to 9

Q.2. **(10)**

(i) Use L Hopital rule to find the limit: $\lim_{x\to 0} \frac{d}{(c+1)x^2}$

Consider $\boldsymbol{d = sinx}$ if your roll number of last digit from 0 to 3, $\boldsymbol{d = cosx}$ if your roll number of last digit from 4 to 6, $\boldsymbol{d = tanx}$ if your roll number of last digit from 7 to 9

(ii) Estimate the first two terms of the Maclaurin series expansion of the function.
$f(x) = (b+1)(d)\pi x$

Consider $\boldsymbol{d = sin}$ if your roll number of last digit from 0 to 3, $\boldsymbol{d = cos}$ if your roll number of last digit from 4 to 6, $\boldsymbol{d = tan}$ if your roll number of last digit from 7 to 9

Q.3. **(10)**

(i) Evaluate the integral $\int_0^{c+1} d^{-1}ydy$

Consider $\boldsymbol{d = cos}$ if your roll number of last digit from 0 to 3, $\boldsymbol{d = sin}$ if your roll number of last digit from 4 to 6, $\boldsymbol{d = tan}$ if your roll number of last digit from 7 to 9

(ii) Evaluate the integral $\int_0^{\pi}(a+b+c)x^2(d)dx$

Consider $\boldsymbol{d = e^x}$ if your roll number of last digit from 0 to 3, $\boldsymbol{d = cosx}$ if your roll number of last digit from 4 to 6, $\boldsymbol{d = sinx}$ if your roll number of last digit from 7 to 9

Q.4. **(10)**

(i) Evaluate the integral $\int_0^{a\pi}\int_0^{d} dydx$

Consider $\boldsymbol{d = cosx}$ if your roll number of last digit from 0 to 3, $\boldsymbol{d = sinx}$ if your roll number of last digit from 4 to 6, $\boldsymbol{d = x}$ if your roll number of last digit from 7 to 9

(ii) Find the angle between the vectors $\vec{A} = ai + bj,\ \vec{B} = 4j + 3k$

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Q.5. **(10)**

(i) Find the area of a triangle with vertices $P(0,0,0)$, $Q(1,2,3)$, $R(a,b,c)$

(ii) Find the parametric equation for the line through $P(a,b,c)$ parallel to $\vec{V} = ai + bj - ck$
