| Total Pages: 01 | Total Time: 120 Minutes |
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| Premier University | |
| Department of Computer Science & Engineering | |
| 3rd Semester Special Retake Final Exam, Spring 2020 (Total 50 Marks) | |
| Course Code: MAT 201 | Course Title: Engineering Mathematics-III |

Instructions: Answer any five questions. Each question carries equal marks.

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| 1 | | Find $z^{1/n}$; for n=4, z = 1-i in $\boldsymbol{C}$ (, the Argand Plane). | 10 |
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| 2 | | Evaluate $\int_c(1-z)dz$, where $c = z(t) = t - it^2$, $0 \le t \le 1$ in $\boldsymbol{C}$. | 10 |
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| 3 | | Let $f(z) = 1/z$, (z is in $\boldsymbol{C}$) and c is the unit circle about the origin oriented counterclockwise. Can we apply Cauchy Integral Theorem to evaluate $\oint_c f(z)dz$? Evaluate $\oint_c f(z)dz$, if possible. | 10 |
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| 4 | | Find the direction cosines and direction angles of the vector $\vec{F} = \hat{i} + 2\hat{j} - 2\hat{k}$. | 10 |
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| 5 | | Find the length of the curve c given by: x = 2Cost, y = 2Sint, z = t; $0 \le t \le 2$. | 10 |
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| 6 | | $\vec{F}(x,y) = y\hat{i} + 2xy\hat{j}$. Let C be the regular closed curve consisting of line segments from (0, 0) to (1, 0), (1,0) to (1,1), and (1, 1) to (0, 0). Verify the Green's Theorem by showing that $\int_c(F_1dx + F_2dy) = \iint_D[(\partial F_2/\partial x) - (\partial F_1/\partial y)]dxdy$. | 10 |
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| 7 | | Let S be the sphere of radius r about the origin, given in spherical coordinates by: $x = r\mathrm{Sin}\phi\mathrm{Cos}\theta$, $y = r\mathrm{Sin}\phi\mathrm{Sin}\theta$, and $z = r\mathrm{Cos}\phi$, $0 \le \theta \le 2\pi$, and $0 \le \phi \le \pi$. Let $\vec{F} = 4yz\hat{j}$, and $\vec{F}$ and div$\vec{F}$ are continuous over S, and the region V is enclosed by S. Compute both sides of Gauss's formula (as given in the class) and show that they are equal. | 10 |
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| 8 | | The measure of skewness ($S_kP_1$) of a distribution is 0.3. The mode and median are 50 and 55 respectively. Find the mean, standard deviation, and $S_kP_2$ of the distribution. | 10 |
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| 9 | | Find the probability of getting exactly two heads in six tosses of a fair coin. | 10 |
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| 10 | | Suppose that X has a normal probability distribution with mean 5 and standard deviation 2. Determine the value of $P(1<x<8)$, for x in X (; you do not need to give values from the table). | 10 |