

International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Assessment Autumn-2020		Program: B.Sc. Engg. (EEE)
Course Code: Math-1202		Course Title: Mathematics II
Time: 5 hours (Writing 4 hours 30 minutes + 30 minutes submission time)		Full Marks: 50 (Written 30 + Viva/Viva-Quiz-20)
[Answer each of the questions (1-5) from the followings; Figures in the right margin indicate full marks.]		
1(a).	Determine the length of the shortest distance of the line $\frac{x-A}{A} = \frac{y+B}{B} = \frac{z-C}{-C}$ and $Y - axis$. Are they coplanar? Justify your answer in your own opinion. Here, C is the sum of all digits of your ID, A is the last digit of your ID if last digit is zero then take the largest digit of your ID, B is the sum of last two digits of your ID.	03
1(b).	Evaluate the condition of the two lines $x = ay + b = cz + d$ and $x = \alpha y + \beta = \gamma z + \delta$ will be coplanar and perpendicular, where a is the sum of last two digits of your ID, β is the sum of all digits of your ID, δ, c be the last digits of your ID, if last digit is zero then take the largest digit of your ID.	03
2(a).	Reduce the equation $Ax^2 + Ey^2 + 6z^2 - Byz + 4zx - Cxy + 72x - Dy + Fz + 110 = 0$ to the standard form and identify the conicoid, where, C is the sum of all digits of your ID, A is the last digit of your ID if last digit is zero then take the largest digit of your ID, B is the sum of last two digits of your ID, D is the sum of first & last digit of your ID, E is the subtract of last two digits of your ID, F is any number.	03
2(b).	Construct the equation of the of the two spheres which passes through the circle $x^2 + y^2 + z^2 = A$, $Cx - Ay + Bz = C$ and touches $X = 0$, plane where A is the last two digits of your ID, B is any number which is perfect square, C is the factorial of third digit of your ID number.	03
3(a).	Develop $\sin(A - B)\theta$ in terms of $\sin \theta$, where A is the sum of all digits of your ID number, B is the sum of last two digit of your ID number.	03
3(b).	(i) Evaluate the locus of the following $ AZ + B + Z - M = C - D $, where A is the sum of third & fourth digit of your ID number, B is the sum of your second & fourth digits of your ID number, C is the last two digits of your ID number, M is the sum of all digits of your ID number, D is the sum of last two digits of your ID. (ii) If $PA + iQB = \log(Rx + Sy)$, then evaluate A, B , where P is the sum of last two digits of your ID, Q is the largest digit of your ID, R, S be the first & last digits of your ID number.	03
4(a).	If $\cos^{-1}(Pu + iQv) = \alpha + i\beta$ then find the equation whose roots are $\cos^2 P\alpha$ and $\cosh^2 Q\beta$, where P is the last digit of your ID if last digit is zero then take the largest digit of your ID. Q is the sum of last three digits of your ID number.	02
4(b).	Find all solutions of the equation $\cosh Mx = N$, where M is the last digit of your ID if last digit is zero then take the largest digit of your ID, N is the sum of all digits of your ID number.	02
4(c).	Solve $\tan^{-1}Px - \cot^{-1}Qx = \tan^{-1}R$, where P is the last digit of your ID if last digit is zero then take the largest digit of your ID, Q is the sum of all digits of your ID, R is the sum of last two digits of your ID number.	02

5(a).	Sum to infinity the series: $\sin x + \frac{1}{A!} \sin Ax + \frac{1}{(B+2)!} \sin Bx + \dots \dots \dots \infty$ and $1 + \cos x + \frac{1}{A!} \cos Ax + \frac{1}{(B+2)!} \cos Bx + \dots \dots \dots \infty$, where A is the second digit of course code, B is the smallest odd number of your ID.	02
5(b).	Find the sum to infinity the series: $A\sqrt{B}(1 - \frac{1}{3^2} + \frac{1}{5 \cdot 3^2} - \frac{1}{7 \cdot 3^2} \dots \dots \dots \infty)$, where A is the sum of all digits of your ID, B is the sum of last four digits of your ID number.	02
5(c).	Sum to k term of the series $\tan^{-1} \frac{1}{1+A+1^2} + \tan^{-1} \frac{1}{1+B+2^2} + \tan^{-1} \frac{1}{1+C+3^2} \dots \dots$, where A is the first digit of your ID, B is any even number, C is any odd number.	02
6.	Viva/Viva-Quiz: The time of viva/viva-quiz will be declared in google classroom.	20