International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Examination Spring 2020   Program: B.Sc. Engg. (EEE)
Course Code: **Math-1107**   Course Title: **Mathematics I**
Time: **5 hours** (Writing - **4 hours 30 minutes** + **30**   Full Marks: **50** (**Written** 30 + **Viva/Viva-Quiz**-20)
minutes submission time)

[Answer each of the questions (**1-5**) from the followings; Figures in the right margin indicate full marks.]
SET-O

1(a).	If $V = (x^2 - y^2 + z^2)^{\frac{1}{P}}$ then evaluate $V_{xx} + V_{yy} + V_{zz}$,where P is the sum of all digits of your ID number..	CO1	E	2
1(b).	Investigate the maximum and minimum values of f(x) $=(x - A)^5.(x + B)^6$ by using first time derivative, where A is the last two digits and b is the reverse order of last two digits of your ID number.	CO2	Cr	2
1(c).	Verify Euler's theorem to consider a homogeneous function of p, y, q whose degree is the sum of all digits of your ID number.	CO1	An	2
2(a).	Evaluate the following Integrals : $(i)\int \dfrac{dx}{x(x-m)(x^m+2)}$ $(ii)\int \dfrac{dx}{b+a\cos x}$ Where m is the sum of all digits of your ID number.	CO2	An	4
2(b).	Explain the physical meaning of $\int f(x)dx$ and also its effect in EEE.	CO1	An	2
3(a).	Write two properties of definite integral and verify it with considering an example which degree is sum of last two digits of your ID number	CO2	Ap	2
3(b).	Establish the reduction formula for $\int \sec^m x\, x^n$ dx and hence evaluateI_5.	CO1`	Ap	2
3(c).	Evaluate $\int_0^{\pi/2} \sin^6\theta \cos^5\theta\, d\theta$ by using Gamma-Beta function and also verify the result.	CO1	E	2
4(a).	Apply the limit of a sum to find $\int_b^a x^3\, dx$.	CO1	Ap	3
4(b).	Evaluate $\iiint_R (Px^2 + Qy - Rz^2y)dxdydz$, where $R: 0 \le x \le P, 0 \le y \le Q, 0 \le z \le R$ where P be the first , Q be the third digit of your ID number and R is the square root of sum of all digits of course code.	CO2	C	3
5(a).	Obtain the volume of $r = a(1 - \cos\theta)$, Also write the name of the curve and explain a, r .	CO2	An	3
5(b).	Evaluate the area of the region bounded by the parabolas $y^2 = kax$ and $x^2 = 4ay$, where K is the sum of largest two digits of your ID number.	CO1	Ap	3
6.	Viva/Viva-Quiz: The time of viva/viva-quiz will be declared in Google classroom.			20