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 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.**]**

SET-E

1(a).	Investigate the maximum and minimum values of f(x) =$(x+p)^6.(x-Q)^5$ by using first time derivative, where P is the last two digits and Q is the reverse order of last two digits of your ID number.	CO2	**Cr**	**2**
1(b).	If $V=(x^2+y^2-z^2)^{\frac{1}{M}}$ then evaluate $V_{xx}+V_{yy}+V_{zz}$, where $M$the sum of all digits of your ID number is.	CO1	**E**	**2**
1(c).	Verify Euler's theorem to consider a homogeneous function of x, y, r whose degree is the sum of all digits of your ID number.	**CO2**	**E**	**2**
2(a).	Evaluate the following Integrals : $(i)\int \frac{dx}{x(x+n)(x^n+2)}$ $(ii)\int \frac{dx}{a+b\cos x}$ Where n 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).	Establish the reduction formula for $\int \tan^{\mathrm{m}}\mathrm{x}\, x^n\, \mathrm{dx}$ and hence evaluate I_5.	**CO1**	**Ap**	**2**
3(b).	Write two properties of definite integral and verify it with considering an example which degree is sum of last two digit of your ID number	**CO2**	**Ap**	**2**
3(c).	Evaluate $\int_0^{\pi/2} \sin^5\theta \cos^4\theta \, d\theta$ by using Gamma-Beta function and also verify the result.	**CO1**	**E**	**2**
4(a).	Evaluate $\iiint_R (Ax^2+By-Cz^2x)dxdydz$, where R: $0\le x\le A, 0\le y\le B, 0\le z\le C$ where A be the first , B be the third digit of your ID number and C is the square root of sum of all digits of course code.	**CO1**	**E**	**3**
4(b).	Apply the limit of a sum to find $\int_a^b x^3\,dx$.	**CO2**	**Ap**	**3**
5(a).	Evaluate the area of the region bounded by the parabolas $\mathrm{y}^2=4\mathrm{ax}$ and $\mathrm{x}^2=$ Kay , where K is the sum of largest two digits of your ID number.	**CO2**	**E**	**3**
5(b).	Obtain the volume of $\mathrm{r}=\mathrm{a}(1+\cos\theta)$, Also write the name of the curve and explain a, r .	**CO1**	**Ap**	**3**
6.	Viva/Viva-Quiz: The time of viva/viva-quiz will be declared in Google classroom.			**20**