International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Assessment Test Autumn-2020	Program: B.Sc. Engg. (EEE)
Course Code: **EEE-2415**	Course Title: **Transmission and Distribution of Electrical Power System**
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-A

1(a).	**Evaluate** the power factor and **design** a sending end power circle diagram with pointing all the parameters considering XY and MN as the real power and the reactive power. X and Y are the last two digits of your student ID (If X=Y=0, then choose X=1), M and N are the first two digits of your student ID. Choose the difference of 100 and XY as the radius.	**CO1**	**E, C**	**04**
1(b).	**Summarize** the importance of power circle diagram in power system.	**CO1**	**C**	**02**
2(a).	**Compare** between the on-load and off-load tap changing transformer. **Conclude** your opinion about the superiority between the two transformers.	**CO2**	**E, C**	**02+01 =03**
2(b).	A loop of XY MW at a p.f. of 0.N lagging is supplied by a 3-phase line whose voltage has to be maintained at PQ kV at each end. If line resistance and reactance per phase are N ohm and 1M ohm respectively, **calculate** the capacity of synchronous condenser to be installed for the purpose. M, N, P, Q, X and Y are the continuous sequence of your six digits student ID (If X=Y=0, then choose X=1).	**CO2**	**E**	**03**
3(a).	Choose (X+1) cm as the core diameter, (3X+1) cm as the internal sheath diameter, and 2X kV as the potential difference between conductor and sheath, **deduce** the expression for potential gradient in a single-core cable. X and Y are the last two digits of your student ID (If X=Y=0, then choose X=1).	**CO3**	**E**	**04**
3(b).	In a Murray loop test for ground fault on 5XYm of cable having a resistance of X.YΩ/km, the faulty cable is looped with a sound cable of same length and area of cross-section. If the ratio of other two arms of the testing network at balance is 3:1, **evaluate** the distance of the fault from the testing end of cables X and Y are the last two digits of your student ID (If X=Y=0, then choose X=1).	**CO3**	**E**	**02**
4(a).	In a 3X kV overhead line there are 2 units in the string of insulators. If the capacitance between each insulator pin and earth is MX% of self-capacitance of each insulator, **find** (i) the distribution of voltage over 3 insulators and (ii) string efficiency. Here, M is the first digit and X is the 2^{nd} last digit of your student	**CO3**	**E**	**04**

	ID.			
4(b).	**Draw** a typical pin type insulator, and **show** the flashover and puncture in the figure.	**CO3**	**Ap, U**	**02**
5(a).	Two tram cars (A &B) (X+1) km and (3X+1) km away from a sub-station return XYA and (1/2)XY A respectively to the rails. The sub-station voltage is 6PQ Vdc. The resistance of trolley wire is 0.2M Ω/km and that of track is 0.02N Ω/km. **Calculate** voltage across each tram car. M, N, P, Q, X and Y are the continuous sequence of your six digits student ID (If X=Y=0, then choose X=1).	**CO1**	**E**	**03**
5(b).	**Discuss** the steps of developing a phasor diagram to find the sending end voltage considering the power factor referred to receiving end voltage while solving the A.C. distribution problems.	**CO1**	**C**	**03**
6.	Viva/Viva-Quiz: The time of viva/viva-quiz will be declared in google classroom.	**CO1, CO2, CO3**	**U, An, Ap**	**20**