International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Assessment Autumn 2020	Program: B.Sc. Engg. (EEE)
Course Code: **EEE 4801**	Course Title: **Power System Protection**
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 from the followings; Figures in the right margin indicate full marks. Answer script must be submitted through online method within 5 hours from starting time. Also, write down the Q. Set on the front page of your answer script]

Q. Set-B

1(a).	According to constructional feature, which circuit breaker is smaller than other circuit breaker? Describe its operation with proper sketch.	**CO2**	**R**	3
1(b).	An air blast circuit breaker is designed to interrupt a transformer magnetizing current of **XX**A (r.m.s) chops the current at an instantaneous value of 7A. If the values of L and C in the circuit are 35.2H and 0.0023uF, find the value of voltage that appears across the contact of the breaker. Assume that all the inductive energy is transferred to the capacitance. **XX** is the 1st two digits of your ID.	**CO2**	**E**	1
1(c).	Discuss different types of circuit breaker contact point.	**CO1**	**U**	2
2(a).	Which types of protection can be possible using Buchholz relay for transformer protection? Describe its operation with proper sketch.	**CO2**	**An**	3
2(b).	A three-phase transformer of **xxx**/**zzzz** line volt is connected in star/delta. The protective transformers on 220V side have a current ratio of 500/5. What should be the CT ratio of 11000V side? **xxx is the 1st three digits of your ID and zzzz is the last four digits of your ID.**	**CO1**	**E**	2
2(c).	Draw the schematic diagram of earth fault protection of transformer.	**CO1**	**R**	1
3(a).	How many protections can be possible using modified differential protection of alternator. Discuss with proper sketch.	**CO2**	**U**	4
3(b).	A star connected, 3-phase, **YY**MVA, **R.R** kV alternator s protected by circulating current protection, the star point being earthed via a resistance r. Estimate the value of earthing resistor if 85% of the stator winding is protected against earth fault. Assume an earth fault setting of 25%. Neglect the impedance of the alternator winding. **YY is the 1st two digit of your ID and R.R is the 1st two digit of your ID**	**CO3**	**E**	2
4.	Discuss the operation of different types of time graded overcurrent protection for 33kV line. Which system is more effective comparing to those systems?	**CO2**	**U,An**	6
5(a).	For designing a numerical relay, which features should be considered?	**CO1**	**An**	2
5(b).	For designing a 11kV line protection system, what will be the arrangements of numerical relay?	**CO3**	**U**	2
5(c).	Discuss different types of lightening stroke.	**CO1**	**R**	2
6.	Viva/Viva-Quiz: The time of viva/viva-quiz will be declared in google classroom.			**20**