Enrolment No:	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Supplementary Semester Examination, July 2020

Course: Substation Design **Semester: VI**
Program: B.Tech Electrical & PSE **Time 03 hrs.**
Course Code: EPEG-3008 **Max. Marks: 100**

Instructions:

1. **Attempt all the questions (Theory, Numerical, Case study etc.) on A4 size blank sheets.**
2. **Attempt all questions serially as per question paper.**
3. **Answer should be neat and clean. Draw a free hand sketch for circuits/tables/schematics wherever required.**
4. **Scan the whole answer script and check the resolution carefully before upload on the blackboard. Note that answer scripts will be considered for evaluation only through Blackboard. No other mode of submission is acceptable.**
5. **You are expected to be honest about each attempt which you make to progress in life**

SECTION A - 40 Marks

S. No.		Marks	CO
Q 1	a) A medium volume manufacturing facility with a capacity of producing 2 parts/minute actually produced 800 parts in a planned running 2 shifts of 8 hrs each. It had breaks and scheduled maintenance for 40 min and also faced 40 min breakdowns and 1 hour 20 min for changeover and adjustment. Number of rejects and re works were10 and 6 parts respectively. Calculate its overall effectiveness. b) With the help of diagram, explain the static sealing system between the two GIS modules	**10+10**	**CO 3,4**
Q 2	a) A substation consist of one 3 phase incoming 33/11 kV transformer feeder and three 11 kV outgoing feeders, and one of the feeder is feeding to domestic utilities at 415V levels, draw its SLD. b) Explain the bus zone protection scheme using distance protection	**10+10**	**CO 2,3**

SECTION B [Numerical and Short/broad Answers] 60 Marks

NOTE : The submission time of the Question Paper Answer Sheet is 24 Hhrs from the scheduled time (*exceptional provision due to extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas*).
No Submission will be entertained after 24 Hrs

Q 3	Discuss the sequence of control action during a line fault on HVDC overhead line.	**10**	**CO3**
Q4	With the help of SLD, show the location of all the electrical equipment of a substation which has 2 buses connected with a transformer.	**10**	**CO 3**
Q 5	Draw and explain the structure of Medium Voltage metalclad Switchgear with SF_6 Circuit breaker.	**10**	**CO 4**
Q 6	Discuss the scheme suitable for the interstate transmission system operating on two different frequencies & the sending end & receiving end voltage levels are 400kV AC and 220kV AC respectively.	**10**	**CO 1**
Q 7	A chemical plant was expected to run for 100hrs/week continuously with production capacity of 1000 metric ton/hr. At the end of the week it produced 200,000 tones together with a waste of 2000 tones. It had 120 min breakdowns and 460 minutes changeover and adjustment. Calculate overall plant effectiveness.	**10**	**CO 2**
Q 8	Generate the process flow chart for the establishment of a new substation.	**10**	**CO 2**

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