

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

Online End Semester Examination, May 2020

Course: Advanced Power Transmission Systems, PSEG405

Semester: VIII

Programme: B.tech. – Electrical

Time: 03 hrs.

Instructions: All questions are compulsory

Max. Marks: 100

SECTION A (MCQ)

S. No.		Marks	CO
Q 1	<p>HVDC systems are mainly used with large power rating for</p> <ul style="list-style-type: none">(a) Interconnection of the two systems with different frequencies(b) Bulk power transmission over long distances(c) Underwater or submarine cable transmission(d) For connecting nonconventional power sources like wind power etc. to the grid	5	CO1
Q.2	<p>In a bipolar system</p> <ul style="list-style-type: none">(a) Both conductors are positive(b) Both conductors are negative(c) One conductor is positive and the other negative(d) One conductor is positive or negative and other is at ground potential	5	CO2
Q.3	<p>The main advantage of HVDC-VSC schemes is</p> <ul style="list-style-type: none">(a) Both active and reactive powers can be controlled(b) Does not require DC filters(c) Can be used for very high power more than 1500 MW(d) All of the above	5	CO2
Q.4	<p>12-pulse converters are used in modern converters because of</p> <ul style="list-style-type: none">(a) Reduced current(b) Reduced ripple(c) Increased voltage and reduced harmonics(d) Both (b) and (c)	5	CO3
Q.5	<p>In HVDC converter ratio reactive power needed for proportional active power transmission at full -load</p> <ul style="list-style-type: none">(a) 1.0(b) 0.9(c) 0.6	5	CO4

	(d) 0.25		
Q.6	<p>Peak to peak ripple in a 12-pulse converter is</p> <p>(a) $0.5236 \cdot V_d$ (b) $0.114 \cdot V_d$ (c) $0.3206 \cdot V_d$ (d) $0.0345 \cdot V_d$</p>	5	CO3
SECTION B			
Q.7	<p>What do you understand by the terms (a) Commutating voltage (b) Commutation reactance Discuss the effect of the later term on the output voltage of the converter.</p>	10	CO4
Q.8	<p>Define the following terms (i) Peak Inverse Voltage (ii) HVDC coupling system (iii) Peak to peak ripple (iv) Volt-ampere rating of a valve</p>	10	CO3
Q.9	<p>A transformer secondary line voltage to a 3-phase bridge rectifier is 345 kV. Calculate the DC voltage output with $\mu = 15^\circ$, when $\alpha = 0^\circ, 15^\circ$ and 30°.</p>	10	CO2
Q.10	<p>Present comparative characteristic of CSC (classical HVDC) and HVDC-VSC systems</p>	10	CO4
Q.11	<p>What are the advantages and disadvantages of homopolar HVDC links over other types of links.</p>	10	CO1
SECTION-C			
Q.12	<p>An existing 400kV 3-phase AC line transmitting a power of 100 MW is converted into bipolar DC line. Estimate the DC voltage/pole and DC line losses, if the resistance of each conductor is 0.01 ohm. Assume power factor =0.90.</p> <p style="text-align: center;">OR</p> <p>Define the terms 'transient reliability' and 'short circuit ratio' as applied to transmission lines. Discuss the effect of these factors on the performance of a DC link.</p>	20	CO1,2