

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, April/May 2018**

**Course: Steam Turbine & its Auxiliaries (PSEG318)**  
**Program: B.Tech (PSE)**  
**Time: 03 hrs.**

**Semester: VI**  
**Max. Marks: 100**

**Instructions: Instructions: Attempt all Questions, Section-A, B & C have total marks distribution of 20, 40 & 40 respectively.**

**SECTION A**

S. No.		Marks	CO
Q 1	Explain 'Condenser Air Extraction System'. Describe along with figure the various types of Air Extraction equipment(s) used for the same.	4	CO2
Q 2	Explain the primary functions of the "Turbine Governing System?"	4	CO3
Q 3	Enumerate at least 5 most important functions of 'Condensate Extraction Pump (CEP)'.	4	CO2
Q 4	Enumerate four primary functions of the 'Turbine Oil System' along with the major equipment(s) used in the same.	4	CO3
Q 5	Explain the function of the 'De-aerator' in 'Feed Water Re-generation System'?	4	CO2

**SECTION B**

Q 6	Explain the following: a) Air Leakage inside the Condenser and the method of detection b) Cooling Water leakage inside the condenser and the method of detection	10	CO2, CO4
Q 7	Explain the functions of "HP Bypass System" & "LP Bypass System" used in a Steam Turbine along with its advantages.	10	CO3, CO4
Q 8	With the help of appropriate diagram, state the difference between 'Direct Contact Type' & 'Surface Type' condenser.	10	CO2
Q 9	With the help of appropriate chemical reaction, explain LP dosing system used in the Power cycle.	10	CO3

**SECTION-C**

Q 10	<p>Calculate the rate of flow of Cooling water and the cooling ratio for a surface condenser with the following data:</p> <p>a) Total amount of condensing steam = 17 Kg/ sec  b) Temperature of condensate = 25 Deg.C  c) Cooling Water temperature at condenser Inlet = 12 Deg.C  d) Cooling Water temperature at condenser Outlet = 20 Deg.C  e) Enthalpy of steam at inlet to condenser = 2400 KJ/ Kg  f) Consider, heat capacity of water = 4.19 KJ/ Kg/ Deg.C</p> <p>Explain why is it not preferable to save the Cooling Tower Blow down &amp; purify it to reuse back into the Cooling Tower repetitively.</p>	20	CO2, CO3
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Q11	The velocity of steam leaving the nozzle of an Impulse Turbine is 900 m/sec & the nozzle angle is 20 Deg. The blade velocity is 300 m/sec & the blade friction factor is 0.7. Calculate for a mass flow rate of 1 Kg/ sec & symmetric blading: (a) The blade inlet angle (b) The driving force on the wheel (c) The Axial Thrust (d) The Diagram Power (e) Diagram Efficiency	20	CO1, CO4
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Name:

Enrolment No:

