Steam Power & Jet Propulsion

QUESTION BANK

UNIT-1 STEAMPOWER PLANT

Part – A (Short Answer Questions)					
1		What is adiabatic process?	L1	CO1	PO1,PO2
2		Explain different methods to improve the efficiency of Rankine cycle	L1	CO1	PO1,PO2
3		Compare and contrast the boiler Mountings and Accessories.	L4	CO1	PO1,PO2
4		Explain regenerative cycle with neat sketch.	L1	CO1	PO1,PO2
5		Differences between external fired and internal fired boilers	L1	CO1	PO1,PO2
6		State differences between high-pressure and low pressure boilers?	L1	CO1	PO1,PO2
7		Name the methods adopted for improving the performance of the Rankine cycle	L1	CO1	PO1,PO2
8		State the essential differences between Carnot and Rankine cycles.	L2	CO1	PO1,PO2
9		What is the function of fusible plug?	L2	CO1	PO1,PO2
10		Differentiate the super heater and economizer	L3	CO1	PO1,PO2
11	a)	Explain the effect of operating variables on Rankine cycle performance.	L2	CO1	PO1,PO2
	b)	A steam power plant operates on ideal Rankine cycle. The steam enters the turbine at 3 MPa, 350 ^{0}C and is condensed in the condenser at 75 kPa, calculate thermal efficiency, back work ratio and work ratio of this cycle.	L3	CO1	PO1,PO2
12		Explain the working principle of a volex boiler with a neat sketch and indicate all mountings and accessories on it.	L2	CO1	PO1,PO2
13	a)	Calculate the height of a chimney required to produce a draught equivalent to 1.7cm of water if the flue gas temperature is 270^{0}C and ambient temperature is 22^{0}C and minimum amount of air per kg of fuel is 17kg.			
	b)	What are the advantages and disadvantages of regenerative cycle over simple Rankine cycle?.	L3	CO1	PO1,PO2

14		Steam at 15 bar and 300 ^{0}C expands isentropically in a steam turbine till the temperature falls to 80 ^{0}C. Find the condition of steam at the end of expansion process and the work done per kg of steam. If the steam flow rate is 10 kg/s, what power will be produced by the turbine	L3	CO1	PO1,PO2
15		A power generating plant uses steam as working fluid and operates at boiler pressure of 50 bar, dry saturated and condenser pressure of 0.5 bar. Calculate for these limits i) the cycle efficiency and ii) the work ratio and iii) specific steam consumption for Carnot cycle and Rankine cycle.	L3	CO1	PO1,PO2
16		In a steam turbine installation running on ideal Rankine cycle steam leaves the boiler at 10 MPa and 700^{0}C and leaves turbine at 0.005 MPa. For the 50 MW output of the plant and cooling water entering and leaving condenser at 15^{0}C and respectively determine. i) The mass flow rate of steam in kg/s ii) The mass flow rate of condenser cooling water in kg/s iii) The thermal efficiency of cycle iv) The ration of heat supplied and rejected (in boiler and condenser respectively). Neglet K.E. and P.E. changes.	L3	CO1	PO1,PO2