Vivekananda College of Engineering & Technology, Puttur [A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®] Affiliated to VTU, Belagavi & Approved by AICTE New Delhi			
CRM08	Rev 1.11	ME	27/07/2022

CONTINUOUS INTERNAL EVALUATION - 2

Dept:ME	Sem / Div:4th A	Sub:ATD	S Code:18ME42
Date:04/08/22	Time: 9:30-11:00	Max Marks: 50	Elective:N

Note: Answer any 2 full questions, choosing one full question from each part.

QN		Questions	Marks	RBT	CO's
		PART A			
1	a	In a single heater regenerative cycle the steam enters the turbine at 30bar and 400°C & the condensor pressure is 0.1 bar. The feed water heater is direct type which operates at 5 bar. Find the Net Turbine Work, Net Pump Work, Cycle efficiency & Steam flow rate.	13	L3	CO3
	b	In a Rankine cycle the steam at the inlet to the turbuine is saturated at a pressure of 35bar & exhaust pressure is 0.2 bar. Find : The Pump work, Turbine work, Heat Supplied, Heat Rejected & cycle efficiency. Steam flow rate of 9.5kg/sec.	12	L3	CO3
		OR			
2	a	A steam power plant operates on a theoretical reheat cycle. Steam at boiler with 150 bar and 550°C expands through the high pressure turbine. It is reheated at constant pressure of 40 bar to 550°C and expands through the low pressure turbine to a condenser at 0.1 bar. Find the Net Turbine Work, Net Pump Work, Cycle efficiency and Steam flow rate.	13	L3	CO3
	b	In a steam power cycle, the steam supply is at 15 bar and dry saturated The condenser pressure is 0.4 bar. Find: The Pump work, turbine work, Heat Supplied, Heat Rejected & Cycle efficiency. Steam flow rate of 8.5kg/sec.	12	L3	CO3

		PART B			
3	a	The air enters the compressor of an open cycle constant pressure gas turbine at a pressure of 1 bar & temperature of 20°C. The pressure of the air after the compression is 4bar. The isentropic efficincies of the compressor and turbine are 80% and 85% respectively. The air fuel ratio is 90:1. If the flow rate of air is 3kg/sec & CV of fuel is 41,800kJ/kg. Find: Cycle efficiency and Net work output.	9	L3	CO2
	b	A Simple gas turbine operating on a brayton cycle has air enetring the compressor at 100kPa & 27°C. The pressure ratio is 9.0 and the maximum cycle temperature is 727°C. The expansion in the turbine is devided into two stages each of pressure ratio 3.0 with intermediate reheating to 727°C. Find: Cycle efficiency & Net work output.	9	L3	CO2
	c	Discuss the effect of Condenser & Boiler pressure on Thermal efficiency of Rankine cycle using T-S diagram.	7	L2	CO3
		OR			
4	a	In an open cycle gas turbine plant, air enters the compressor at 1bar and 27°C. The pressure after compression is 4 bar. The isentropic efficiencies of the turbine & the compressor are 85% & 80% respectively. Air fuel ratio is 80:1. CV of the fuel is 42,000kJ/kg. Mass flow rate of air is 2.5kg/sec. Find: Cycle efficiency and Net work output.	10	L3	CO2
	b	In a regernative gas turbine cycle air enters the compressor at 1bar & 15°C. The pressure ratio is 6. Isentropic efficiencies of compressor &turbine are 0.8 and 0.85 respectively. The maximum tempertaure of the cycle is 800°C. The regernerator efficiency is 0.78. Find: Cycle efficiency and Net work output.	8	L3	CO2
	c	Explain the Types of feed water heater using flow and T-S diagram.	7	L2	CO3

Prepared by 24/11/22

HOD