ADAMAS UNIVERSITY PURSUE EXCELLENCE	**ADAMAS UNIVERSITY** **END-SEMESTER EXAMINATION : MAY 2021** (Academic Session: 2021– 22)		
Name of the Program:	B.Tech in Electrical Engineering	**Semester:**	VI
Paper Title:	Thermal Power Engineering	**Paper Code:**	EME43110
Maximum Marks:	40	**Time duration:**	3:00 hours
Total No of questions:	8	**Total No of Pages:**	02
(Any other information for the student may be mentioned here)	Use the virtual Steamtable if you solve the Numerical problem of Q3, Q8(a), Q8(b), Q9(b)		

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. a) What is critical point for pure substance?
   b) A cycle consisting of two isothermal and two adiabatic processes is known as--- i) Carnot cycle ii) Rankine cycle iii) Brayton Cycle iv) None of these
   c) Dryness fraction can be expressed as a ratio of _____
   d) The major use of the Economizer is _____. i) Heat up the incoming water with exhaust steam. ii) Heat up the pulverized fuel by exhaust. iii) Heat up the incoming air by exhaust gases iv) Heat up the incoming water by exhaust gases.
   e) Difference between the fire tube and water tube boiler?

GROUP –B

Answer *any three* of the following $3 \times 5 = 15$

2 Describe the function of Boiler mounting and accessories (5)

3. Find the enthalpy, entropy and volume of steam at 1.4MPa 380ºC steam. (5)

4. Describe the Reheat cycle with Layout, P-V, T-S, H-S diagram (5)

5. Describe the velocity triangle of Tangential Flow Impulse Turbine. What is the difference between Impulse and Reaction Turbine (5)

GROUP –C

Answer *any two* of the following $2 \times 10 = 20$

6. a) Describe the working principle of any one fire tube boiler with proper sketch. (6)

b) Describe the Coal handling unit in a steam power plant. (4)

7. a) Dry saturated steam at 5bar with negligible velocity expands isentropically in a convergent nozzle to 1bar and dryness fraction 0.94. Determine the velocity of steam leaving the nozzle. (4)

b) Determine the condition of steam in the following-i) At a pressure of 10bar and temperature 200ºC, ii) At a pressure of 10bar and volume 0.175m^3/kg. (6)

8. a) In a De-level turbine the steam enters the wheel through a nozzle with a velocity of 500m/s and at an angle of 20º to the direction of motion of the blade. The blade speed is 200m/s and exit angle of the moving blade is 25º. Find the inlet angle of the moving blade, exit velocity of steam and its direction and work done per kg of steam if the relative velocity is constant in this turbine). (6)

b) The following observation were in a boiler trial, Coal used 250kg of calorific value 29800Kj/Kg, water evaporated 2000Kg, steam pressure11.5bar, dryness fraction of steam 0.95 and feed water temperature 34ºC. Calculate the equivalent evaporation from and at 100ºC per kg of coal and the efficiency of the boiler. (4)
