



R18 Regulation

Subject code:2E6CB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Supplementary Examinations, November 2025

THERMAL ENGINEERING - II (ME)

Maximum Marks: 70

Date: 19.11.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

STEAM TABLES ARE ALLOWED

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	What are the methods used to improve cycle performance of a Rankine cycle	2M	1	L1
2	What are the essential features of good steam boiler	2M	1	L1
3	What is the function of a steam nozzle	2M	2	L1
4	What is the stagnation temperature of steam nozzle	2M	2	L1
5	Draw the velocity triangle diagram for an Impulse turbine blades.	2M	3	L1
6	What is the pressure- velocity compounding	2M	3	L1
7	Write the function of a Steam Condenser	2M	4	L1
8	Write the classification of Gas Turbines	2M	4	L1
9	What is the working principle of Jet propulsion	2M	5	L1
10	Write the difference between a propeller engine and jet engine	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Difference between Carnot vapor power cycle and Rankine cycle?	10M	1	L2
	OR			
12	What is a reheating? What are the advantages of the heat re-heat Rankine cycle?	10M	1	L2
13	Derive an expression for the mass of steam discharged through a Nozzle.	10M	2	L2
	OR			
14	A nozzle is to be designed to expand steam at the rate of 0.10 kg/s from 500kpa, 210 ⁰ C to 100kpa. Neglect inlet velocity of steam. For a nozzle efficiency of 0.9 DE.	10M	2	L2
15	Why are steam turbines compounded? Explain.	10M	3	L2
	OR			

16	In a single stage impulse turbine, the steam jet leaves the nozzle at 20° to the plane of the wheel at a speed of 670m/s and it enters the moving blades at an angle of 35° to the drum axis. The moving blades are symmetrical in shape. Determine the blade velocity and diagram efficiency.	10M	3	L2
17	Define isothermal efficiency of the compressor and turbine.	10M	4	L2
OR				
18	A surface condenser is designed to handle 12000 kg of steam per hour. The steam enters at 8kpa, 0.9 dry. The condensate leaves the condenser at the corresponding saturation temperature. Calculate the rate of cooling water, if cooling water temperature rise is limited to 12°C .	10M	4	L2
19	State the difference between air breathing and non-air breathing propulsion systems.	10M	5	L2
OR				
20	The effective jet velocity from a rocket engine is 3000m/s. The forward velocity is 1500m/s and propellant consumption is 80kg/s. Calculate the thrust, thrust power, and propulsive efficiency.	10M	5	L2