

NIMAM INSTITUTE OF TECHNOLOGY, NITTE
Off-Campus Centre of Nitte (Deemed to be University)
I Sem B.Tech. (CBCS) Mid Semester Examinations - I, September 2022

ME1003-1 – ELEMENTS OF MECHANICAL ENGINEERING

Duration: 1 Hour

Max. Marks: 20

Note: Answer any **One** full question from **each Unit**.

Unit – I

1. a) Find the specific volume and enthalpy of 1 kg of steam at 8 bars (a) when the dryness is 0.9 and (b) when the steam is superheated to a temperature of 300 °C. Consider $C_{ps} = 2.25 \text{ kJ/kg}^\circ\text{C}$. Consider $T_{sat} = 170.4^\circ\text{C}$, $h_f = 720.94 \text{ kJ/kg}$, $h_{fg} = 2046.5 \text{ kJ/kg}$, $h_g = 2767.5 \text{ kJ/kg}$, $V_f = 0.001115 \frac{\text{m}^3}{\text{kg}}$, $V_g = 0.2403 \frac{\text{m}^3}{\text{kg}}$
- b) Sketch and explain the working of a Cochran boiler.

Marks	BT*	CO*	PO*
04	L*3	1	2
06	L2	1	1
04	L2	1	1
06	L1	1	1

2. a) What is open cycle gas turbine? Explain with neat diagram.
- b) What are the functions of the following in boilers?
 - i) Feed check valve
 - ii) Steam trap
 - iii) Air preheater

Unit – II

3. a) Explain the working of single stage air-compressor with neat diagram.
- b) Illustrate working principle of centrifugal pump with neat diagram.
4. a) List out the differences of impulse and reaction steam turbines
- b) Explain the working of Pelton turbine with neat diagram.

04	L2	2	1
06	L2	2	1
04	L1	2	1
06	L2	2	1

BT* Bloom's Taxonomy, L* Level; CO* Course Outcome; PO* Program Outcome
