

Total No. of Question : [4]

Registration No. :

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Programme Name : Bachelor of Chemical Engineering
Regular S.Y.B.Tech.Sem.IV ESE May / June 2023
IV SEMESTER (2021 BATCH)
201CHL 215-Chemical Engineering Thermodynamics-I

Duration : 2 Hours

Marks : 50

Instructions :

1.Read questions carefully.

(Q1) All Questions are compulsory [20.0]

CO :- 1, 2, 3

Blooms Taxonomy :- Understand, Apply

(a) Explain System, Surrounding and Boundary with example [6.0]

(b) Derive an expression for first law of thermodynamics for steady state flow process [7.0]

(c) Derive van der Waals equation of state. [7.0]

(Q2) All Questions are compulsory [10.0]

CO :- 4

Blooms Taxonomy :- Apply

(a) Explain Clausius and Kelvin plank statement of Second Law of Thermodynamics [4.0]

OR [a / b]

(b) Explain concept of Entropy. [4.0]

(c) An inventor claims that his engine has the following specifications: [6.0]

i)Power developed=70 Kw

ii)Fuel burnt=4 kg/h

iii)Heating value of fuel=75000KJ/kg

State whether this claim is valid

iv)Temperature limits=1000 K and 300 K

State whether this claim is valid

(Q3) All Questions are compulsory [10.0]

CO :- 5

Blooms Taxonomy :- Understand

(a) Derive various fundamental property relations. [4.0]

(b) Derive Maxwell's equation. [6.0]

OR [b / c]

(c) Derive mathematical relation among Entropy [6.0]

(Q4) Attempt any two out of three questions [10.0]

CO :- 6

Blooms Taxonomy :- Apply

- (a) Explain in brief steam power plant. [5.0]
- (b) Explain vapor compression refrigeration system. [5.0]
- (c) What is refrigerant? write down desirable properties of refrigerant [5.0]
