

Enrollment No:-\_\_\_\_\_

Exam Seat No:-\_\_\_\_\_

# C.U.SHAH UNIVERSITY

Summer-2015

Subject Code: 4CS03PHC1 Subject Name: Heat & Thermodynamics

Course Name: B.Sc. (Pure)

Date: 7/5/2015

Semester:III

Marks: 70

Time:02:30 TO 05:30

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## Instructions:

- 1) Attempt all Questions of both sections in same answer book/Supplementary.
  - 2) Use of Programmable calculator & any other electronic instrument prohibited.
  - 3) Instructions written on main answer book are strictly to be obeyed.
  - 4) Draw neat diagrams & figures (if necessary) at right places.
  - 5) Assume suitable & perfect data if needed.
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## Section – I

- Q-1
- a) What is Temperature? (01)
  - b) Define atmosphere Lapse rate. (01)
  - c) What is Heat? (01)
  - d) Give the statement of Third law of thermodynamics. (01)
  - e) Define Zeroth law of thermodynamics. (01)
  - f) Explain Kelvin's statement of Second law of thermodynamics. (01)
  - g) Explain First law of thermodynamics. (01)

- Q-2
- a) Discuss application of the First law of thermodynamics. (05)
  - b) Write a short note on Carnot cycle. (05)
  - c) Write a short note on heat engine. (04)

OR

- Q-2
- a) Derive Differential form of First law of thermodynamics. (05)
  - b) Explain temperature-entropy diagram. (05)
  - c) Discuss conversion of work into heat and heat into work with suitable examples. (04)

OR

- Q-3
- a) Discuss 1<sup>st</sup> and 2<sup>nd</sup> order phase transition. (07)
  - b) Explain Carnot engine and its efficiency. (07)

OR

- Q-3
- a) What is specific heat? Derive the relation  $C_p - C_v = R$ . (07)
  - b) Calculate the formula of work done during an adiabatic process. (07)



## Section – II

Marks

- Q-4 a) Define transmitting power. (01)  
b) Write expression of Clausius-Clapeyron relation. (01)  
c) Explain Wien's law. (01)  
d) Explain radiant heat. (01)  
e) What is black body material? (01)  
f) Explain reflecting power. (01)  
g) Explain absorbing power. (01)

- Q-5 a) Derive Maxwell's thermodynamic relation. (05)  
b) Explain Joule-Kelvin coefficient for ideal and Van der wall gases. (05)  
c) Explain in detail Stefan's law. (04)

OR

- Q-5 a) Derive 1<sup>st</sup> and 2<sup>nd</sup> order energy equations. (05)  
b) Find value of  $C_P - C_V$  using TdS equations. (05)  
c) Discuss the energy distribution of black body. (04)

- Q-6 a) Explain derivation of Maxwell's relation. (07)  
b) Write short notes on (1) Rayleigh-Jeans law and (2) Plank's law. (07)

OR

- Q-6 a) Define TdS equations. Derive 1<sup>st</sup> and 2<sup>nd</sup> TdS equations. (07)  
b) Discuss the main properties of radiant heat in detail. (07)

