

H.V.P.Mandal's College of Engineering & Technology, Amravati
Department of Mechanical Engineering

Academic Session: 2020-2021

Semester: III

University Examination

Subject Name: Engg. Thermodynamics

Max Marks: 20

(Note-Solve any two question out of four)

Q1)

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|---|-----|
| a) Difference between closed system and open system? | 2mk |
| b) What is path function and point function? | 2mk |
| c) Derive the Steady flow energy equation for boiler. | 2mk |
| d) Difference between heat pump and refrigerator. | 2mk |
| e) Define Entropy | 1mk |
| f) Define Compression ratio and cut of ratio. | 1mk |

Q.2)

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|---|-----|
| a) Define Thermodynamic system. Classify them. | 2mk |
| b) Define Enthalpy, specific heat at constant pressure and temperature. | 2mk |
| c) Derive the Steady flow energy equation for nozzle. | 2mk |
| d) What is energy reservoir? | 1mk |
| e) Difference between available energy and unavailable energy. | 2mk |
| f) Explain Bore and stroke. | 1mk |

Q.3)

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| a) Difference between Macroscopic approach and Microscopic approach. | 2mk |
| b) A domestic refrigerator is loaded with the food and the door closed. During the certain period machine consumed 3.5 KWh of energy and internal energy of the system drop by 8 MJ. Find the net heat transfer for the system. | 2mk |
| c) Derive the Steady flow energy equation for Turbine. | 2mk |
| d) State and explain two statement of second law of thermodynamic. Show that both statements are equivalent. | 2mk |
| e) Prove entropy is property of the system. | 1mk |
| f) Explain Swept volume, clearance volume. | 1mk |

Q.4)

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| a) Define zeroth law of thermodynamic. | 2mk |
| b) One kg of air at pressure of 7 bar and temp. of 360 k undergoes reversible polytropic process which may represented by $PV^{1.1} = C$. If the final pressure is 1.4 bar find out 1) Final specific volume and temp. 2) work done and heat transfer.
How the work and heat interaction would be affected if the process is reversible and 15 KJ of work is lost due to internal friction? Take $R = 287 \text{ j/kgk}$ and $\alpha = 1.4$. | 2mk |
| c) Derive the Steady flow energy equation for compressor. | 2mk |
| d) State Carnot theorem. | 1mk |
| e) Define internal Energy | 1mk |
| f) Difference between otto cycle and diesel cycle | 2mk |