

- Q.31 A Carnot engine working between 620K and 300 K gives 200KJ of work Calculate the thermal efficiency of engine and heat added during the process. (CO2)
- Q.32 Explain reversible process and give its two examples. (CO3)
- Q.33 Why multistage compression is preferred over single stage compression? (CO6)
- Q.34 Describe working of a single stage reciprocating air compressor. (CO6)
- Q.35 Explain the use of fusible plug. (CO5)

#### **SECTION-D**

- Note:** Long answer type questions. Attempt any two questions out of three questions. (2x10=20)
- Q.36 Define the following terms (CO4)
- (i) Total heat or enthalpy of water
  - (ii) Latent heat of steam. Total heat or enthalpy of steam
  - (iv) Dryness fraction
  - (v) Wetness fraction.
- Q.37 Explain construction and working of Nestler boiler with neat sketch. (CO5)
- Q.38 What is Carnot cycle? Describe processes of Carnot cycle with the help of P-V and T-S diagrams. (CO3)

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#### **4th Sem / Branch : Mechanical Engineering Sub.: Thermodynamics - I**

Time : 3Hrs.

M.M. : 100

#### **SECTION-A**

**Note:** Multiple choice questions. All questions are compulsory (10x1=10)

- Q.1 Bomb calorimeter is an example of (CO3)
- a) Closed system
  - b) Isolated system
  - c) Open system
  - d) Homogenous system
- Q.2 Enthalpy is the heat supplied to a system at (CO1)
- a) Constant volume
  - b) Constant pressure
  - c) Constant entropy
  - d) Constant temperature
- Q.3 The S.I. Unit of characteristic gas constant is (CO3)
- a) J/kg
  - b) kJ/kg
  - c) J/kg K
  - d) J/K
- Q.4 If a gas is heated at constant volume (CO2)
- a) Its pressure increases
  - b) Its temperature increases
  - c) Both A & B
  - d) Neither A & Nor B
- Q.5 The change of entropy when heat is rejected by gas (CO2)
- a) Negative
  - b) Positive
  - c) May be negative or positive
  - d) None of the above

- Q.6 A wet vapour can be completely specified by its (CO4)  
 a) Pressure  
 b) Pressure and dryness fraction  
 c) Pressure and Temperature  
 d) Temperature
- Q.7 Mollier diagram is a plot of (CO4)  
 a) Temperature and entropy  
 b) Entropy  
 c) Temperature and enthalpy  
 d) Enthalpy and entropy
- Q.8 The device which supply feed water to the boiler is called (CO5)  
 a) Economiser                  b) Feed pump  
 c) Water level indicator    d) None of the above
- Q.9 Which of the following is a water tube boiler? (CO5)  
 a) Babcock and Wilcox boiler  
 b) Locomotive boiler  
 c) Cochran boiler  
 d) Lancashire boiler
- Q.10 With the increase in clearance volume ideal work of compressing 1kg of air (CO6)  
 a) Increases                  b) Does not change  
 c) Decreases                d) None of the above

### SECTION-B

**Note:** Objective type questions. All questions are compulsory. (10x1=10)

- Q.11 Define surroundings. (CO2)

- Q.12 State Boyle's law. (CO1)
- Q.13 What is the other name of constant pressure process? (CO2)
- Q.14 Give Kelvin Planck's statement. (CO1)
- Q.15 Define heat sink. (CO3)
- Q.16 During which process, solid changes directly to the gaseous form without ever being a liquid? (CO4)
- Q.17 Give any two examples of externally fired boilers. (CO5)
- Q.18 Define horizontal boiler. (CO5)
- Q.19 What is the other name of Otto cycle? (CO2)
- Q.20 Define capacity in connection with air compressor. (CO6)

### SECTION-C

**Note:** Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

- Q.21 Explain types of thermodynamic systems. (CO1)
- Q.22 Define internal energy. (CO2)
- Q.23 Define Regnault's law. (CO1)
- Q.24 Explain specific heat and its types. (CO3)
- Q.25 Explain constant temperature process. (CO3)
- Q.26 Explain the law of conservation of energy with suitable example. (CO1)
- Q.27 What are the limitations of first law first law of thermodynamics? (CO1)
- Q.28 Give concept of enthalpy of an ideal gas. (CO2)
- Q.29 Explain the common types of steams. (CO4)
- Q.30 Classify the steam boilers according to the contents in the tubes. (CO5)