

**Scheme G**  
**Sample Question Paper**

**Course Name : Diploma in Automobile Engineering**

**Course Code : AE**

**Semester : Fourth**

**Subject Title : Heat Power Engineering**

**Marks : 100**

**17407**

**Time: 03 Hours**

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**Instructions:**

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

**Q1.A. Attempt any SIX**

**12 Marks**

- a. State different types of ideal gas processes
- b. Define dryness fraction and degree of superheat.
- c. Define volumetric efficiency and isothermal efficiency of air compressor.
- d. State the applications of compressed air.(Any Two)
- e. State classification of the gas turbine.
- f. State the classification of conventional and non conventional sources of energy.
- g. List the properties of fuel.(Any Four)
- h. Classify the fuels.

**Q1.B Attempt any TWO**

**8 Marks**

- a. Represent Isobaric and Isochoric, Isothermal and Adiabatic process on P-V and T-S diagram.
- b. Describe the different phases of formation of steam.
- c. Explain working principle of Turbojet engine.

**Q.2 Attempt any FOUR**

**16 Marks**

- a. Represent the Carnot and Otto cycle on P-V and T-S diagram and write equation for air standard efficiency of the same.
- b. Explain the different modes of heat transfer.
- c. Draw neat and labeled sketch of La-mont Boiler.
- d. Explain the construction and working of three pass packaged type boiler

- e. Define following;
  - i. Free air delivered      ii. compressor capacity
  - iii .piston displacement   iv. Indicated power.
- f. Identify and write the application of gas turbine in aviation industries

**Q.3 Attempt any FOUR**

**16 Marks**

- a. State the classification of air compressor
- b. Explain Brayton cycle with P-V and T-S diagram.
- c. Describe non conventional power generation system? Explain their importance in the present situation of power shortage throughout the world.
- d. Explain working of nuclear power plant with simple diagram
- e. Define Ultimate Analysis and Proximate Analysis of coal, Explain how sampling of coal is done in boiler trial
- f. A coal has the following composition by mass C=90%, H<sub>2</sub>=3%, S=1%, O<sub>2</sub>=2%, N<sub>2</sub>=2% and remaining is ash find the HCV and LCV of the fuel.

**Q.4 Attempt any TWO**

**16 Marks**

- a. Draw a neat line diagram of a thermal power plant component and explain there working with the help of cycle on which it works.
- b. Define calorific value of the fuel, Differentiate between HCV and LCV of the fuel and state which value is used in calculation and why.
- c. Attempt the following
  - I. Explain the working of Tidal plant with the help of neat sketch.
  - II. Explain the construction and working of Bomb Calorimeter.

**Q.5 Attempt any TWO**

**16 Marks**

- a. Derive the relation between P,V and T during adiabatic process
- b. Attempt the following
  - I. Write the construction and working of two pass down flow surface condenser.
  - II. Explain the function and location of condenser in steam power plant.
- c. Explain the construction and working of axial flow compressor. Differentiate between reciprocating and rotary air compressor. (Any Four)

**Q.6 Attempt any FOUR**

**16 Marks**

- a. State the air standard efficiency of diesel and dual combustion cycle.

- b. Explain the sources of air leakage in condenser
- c. State the need of multi-staging and inter-cooling in air compressor.
- d. Explain the construction and working of open cycle gas turbine.
- e. Discuss closed cycle gas turbine state its advantages over open cycle gas turbine.
- f. Explain the construction and working of two stage reciprocating air compressor

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**Scheme G**  
**Sample Test Paper-I**

**Course Name : Diploma in Automobile Engineering**

**Course Code : AE**

**Semester : Fourth**

**Subject Title : Heat Power Engineering**

**Marks : 25**

**17407**

**Time: 1 Hours**

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**Instructions:**

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2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

**Q1. Attempt any THREE**

**9 Marks**

- a. Represent isobaric and isochoric, isothermal and adiabatic process on P-V and T-S diagram.
- b. Define
  - i. Free air delivered
  - ii. Compressor capacity
  - iii. Piston displacement
  - iv. Indicated power.
- c. Write the construction and working of two pass down flow surface condenser.
- d. Explain the sources of air leakage in condenser
- e. Write the classification of air compressor

**Q2. Attempt any TWO**

**8 Marks**

- a. Describe the different phases of formation of steam.
- b. Explain the different modes of heat transfer.
- c. State the applications of compressed air.

**Q3. Attempt any TWO**

**8 Marks**

- a. State the need of multi-staging and inter-cooling in Air Compressors.
- b. Explain the construction and working of three pass packaged type boiler.
- c. Derive the relation between P,V and T during adiabatic process.

**Scheme G**  
**Sample Test Paper-II**

**Course Name : Diploma in Automobile Engineering**

**Course Code : AE**

**Semester : Fourth**

**Subject Title : Heat Power Engineering**

**Marks : 25**

**17407**

**Time: 1 Hours**

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**Instructions:**

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

**Q1. Attempt any THREE**

**9 Marks**

- a. List the properties of fuel.
- b. Give the classification of fuels.
- c. Explain Turbojet engine.
- d. Identify the application of gas turbine in aviation industries.
- e. Explain the working of Bio Gas Plant with the help of neat sketch.

**Q2. Attempt any TWO**

**8 Marks**

- a. Explain Brayton cycle with P-V and T-S diagram.
- b. Demonstrate the construction and working of open cycle gas turbine.
- c. Differentiate between open cycle and closed cycle gas turbine with its schematic Diagram

**Q3. Attempt any TWO**

**8 Marks**

- a. Write Parameters for the site selection of conventional power plant.
- b. Explain the working of Tidal plant with the help of neat sketch.
- c. Explain the construction and working of Bomb Calorimeter.