

**Chapter 1 - Introduction**

| <b>Sr. No.</b> | <b>Questions</b>   | <b>Jan-19</b> |
|----------------|--|---------------|
| <b>Theory</b>  |  |               |
| 1.             | Explain in brief open system and closed and isolated system giving examples. | 3             |

**Chapter 2 - Energy**

| <b>Sr. No.</b>  | <b>Questions</b>   | <b>Jan-19</b> |
|-----------------|--|---------------|
| 1.              | What is solid fuel? Discuss different types of solid fuel. | 4             |
| <b>Examples</b> |  |               |
| Not asked       |  |               |

**Chapter 3 – Properties of Gases**

| <b>Sr. No.</b>   | <b>Questions</b>  | <b>Jan-19</b> |
|------------------|---|---------------|
| <b>Theory</b>    |   |               |
| 1.               | Define isothermal process. Derive the expression for work done, change in internal energy, change in enthalpy and heat transfer for this process. | 7             |
| <b>Examples</b>  |   |               |
| <b>Not asked</b> |   |               |

## Chapter 4 – Properties of Steam

| Sr. No.         | Questions   | Jan-19 |
|-----------------|---|--------|
| <b>Theory</b>   |   |        |
| 1.              | Explain water Temperature- Enthalpy Diagram for water.  | 4      |
| 2.              | Dryness fraction of steam cannot have the value more than unity: Justify  | 3      |
| <b>Examples</b> |   |        |
| 1.              | 1.5 kg of steam at a pressure of 10bar and temperature of 250°C is expanded until the pressure becomes 2.8bar. The dryness fraction of steam is then 0.9. Calculate change in Internal Energy | 7      |

## Chapter 5 – Heat Engines

| Sr. No.          | Questions   | Jan-19 |
|------------------|---|--------|
| <b>Theory</b>    |   |        |
| 1.               | Derive an equation for air standard efficiency of Otto cycle.<br>OR<br>The efficiency of Otto cycle is a function of compression ratio: Prove it. | 7      |
| 2.               | Discuss Rankine cycle in detail with flow diagram and P-V diagram.<br>OR<br>Discuss Rankine cycle with block diagram                              | 4      |
| 3.               | The heat transfer from a heat reservoir is proportional to its temperature: Justify by deriving equation.   | 7      |
| <b>Examples</b>  |   |        |
| <b>Not asked</b> |   |        |

## Chapter 6 – Steam boilers

| Sr. No.         | Questions  | Jan-19 |
|-----------------|--|--------|
| <b>Theory</b>   |  |        |
| 1.              | <p>Explain the difference between boiler mountings and accessories.</p> <p style="text-align: center;">OR</p> <p>What is boiler mountings and accessories? Also give the list of it. Explain any one in brief.</p> <p style="text-align: center;">OR</p> <p>Show the function, working and location of the following with neat sketch in the boiler plant:<br/>           (1) burden pressure gauge (2) Steam stop valve (3) Fusible plug (4) Feed check valve (5) Air preheater (6) Economiser (7) super heater</p> | 3      |
| 2.              | Explain smoke tube internally fired horizontal type stationary boiler. (Lancashire boiler)   | 4      |
| <b>Examples</b> |  |        |
| Not asked       |  |        |

## Chapter 7 – Internal combustion engines

| Sr. No.         | Questions  | Jan-19 |
|-----------------|--|--------|
| <b>Theory</b>   |  |        |
| 1.              | Define following terms:<br>(1) swept volume, (2) clearance volume, (3) stroke length, (4) compression ratio (5) Scavenging, (6) Compression ratio, (7) Indicated thermal efficiency.   | 3      |
| <b>Examples</b> |  |        |
| 1.              | The following readings were taken during the test on a single cylinder four stroke IC engine:<br>Cylinder diameter : 270mm<br>Stroke Length : 380mm<br>Mean Effective Pressure : 6bar<br>Engine speed : 250rpm<br>Net load on brake : 1000N<br>Effective mean diameter of brake : 1.5m<br>Fuel used : 10kg/hr<br>Calorific value of Fuel : 44400kJ/kg<br>Calculate:<br>(i) Brake Power<br>(ii) Indicated Power<br>(iii) Mechanical Efficiency<br>(iv) Indicated thermal efficiency | 7      |

## Chapter 8 – Pumps

| Sr. No.          | Questions  | Jan-19 |
|------------------|--|--------|
| <b>Theory</b>    |  |        |
| 1.               | Differentiate between reciprocating pump and centrifugal pump.<br>OR<br>Distinguish between Reciprocating and Rotary Compressor. | 7      |
| 2.               | Discuss with neat sketch Diaphragm pump.   | 4      |
| 3.               | Explain with neat sketch single acting Plunger type pump.  | 3      |
| <b>Examples</b>  |  |        |
| <b>Not asked</b> |  |        |



**Chapter 9 – Air Compressors**

| <b>Sr. No.</b>  | <b>Questions</b>  | <b>Jan-19</b> |
|-----------------|---|---------------|
| <b>Theory</b>   |   |               |
| 1.              | Why multi-stage compression is required? Write advantages of the multi-staging compression. | 4             |
| <b>Examples</b> |   |               |
| Not asked       |   |               |

**Chapter 10 - Refrigeration & Air Conditioning**

| <b>Sr. No.</b>  | <b>Questions</b>  | <b>Jan-19</b> |
|-----------------|---|---------------|
| <b>Theory</b>   |   |               |
| 1.              | With neat sketch explain construction and working of split air conditioner. | 7             |
| <b>Examples</b> |   |               |
| Not asked       |   |               |

**Chapter 11 - Couplings, clutches and brakes**

| <b>Sr. No.</b>  | <b>Questions</b> | <b>Jan-19</b> |
|-----------------|------------------|---------------|
| <b>Theory</b>   |                  |               |
| Not asked       |                  |               |
| <b>Examples</b> |                  |               |
| Not asked       |                  |               |

**Chapter 12 - Transmission of motion & power**

| <b>Sr. No.</b>  | <b>Questions</b> | <b>Jan-19</b> |
|-----------------|------------------|---------------|
| <b>Theory</b>   |                  |               |
| Not asked       |                  |               |
| <b>Examples</b> |                  |               |
| Not asked       |                  |               |

**Chapter 13 – Engineering Materials**

| <b>Sr. No.</b>  | <b>Questions</b>  | <b>Jan-19</b> |
|-----------------|---|---------------|
| <b>Theory</b>   |   |               |
| 1.              | Discuss the following with application and Properties:<br>(i) Glass<br>(ii) Ceramic<br>(iii) Plastics | 7             |
| <b>Examples</b> |   |               |
| Not asked       |   |               |