Q.1. a) Fill in the blanks with the options given in the brackets (5)

(Steam boiler, Insulator, N/m², Electrons, CFC)

1. The SI unit of stress is .......... 
3. A closed vessel made up of steel and used for the generation of steam is called .......... 
4. A material that has extremely high electrical resistance is known as .......... 
5. Majority of charge carrier in case of n-type semiconductor are .......... 

b) Match the column (5)

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Temperature</td>
<td>a. Renewable</td>
</tr>
<tr>
<td>2. Wind Energy</td>
<td>b. Contact ratio</td>
</tr>
<tr>
<td>3. Ohm’s Law</td>
<td>c. “OR” gate</td>
</tr>
<tr>
<td>4. Digital electronics</td>
<td>d. V=IR</td>
</tr>
<tr>
<td>5. Gear</td>
<td>e. Kelvin</td>
</tr>
</tbody>
</table>

c) State True or False and correct the true statement in case false statement (5)

1. Velocity is a vector quantity. 
2. Solar energy is a non-renewable energy source. 
3. A good steam boiler is one which produces maximum steam with given fuel. 
4. Transducer is a device which converts one form of energy into another form. 
5. An voltmeter is used to measure current in an electrical circuit. 

d) Define the following in one line (5)


Q.2. Write 4 points on: (Each question carries 4 marks) (16)


Q.3. Explain the following: Write 4 points in your answers (16)

1. Hooke’s Law
2. Energy and power
3. Sensors used in various applications
4. Ozone layer depletion

Q.4. Answer the following: (Write 4 points in your answers) (16)
1. Explain the working principle of Synchronous motor
2. Explain PIV drives
3. Write a short notes on Ecosystem
4. List different types of material handling equipments

Q.5. Answer the following: (Write 4 points in your answers) (16)
1. Explain ecological pyramid.
2. What are the effects of air pollution on environmental system?
3. A boat is travelling at a speed of 30 km/s, how much time is required to travel a distance of 90 kms.
4. If a circuit has a resistance of 18 Ω and current of 15 A, calculate the voltage required.

Q.6. Explain in brief: (Write 4 points in your answers) (16)
1. Explain different types of sensors used in textile industries
2. Differentiate between single phase and three phase induction motors.
3. Write a short note on conservation of natural resources
4. Explain captive power generation system

Q.7. Answer the following: (Write 4 points in your answers) (16)
1. Explain laws of friction
2. Give the broad classification of boilers and list the applications of it.
3. Differentiate between AC and DC motors
4. Write a short notes on energy audit

Q.8. Write about the following: (Write 4 points in your answers) (16)
1. Renewable and non-renewable energy resources
2. Applications of Tacho-generator
3. Various measures taken to reduce air pollution in environment
4. Simple and compound lever