Code No: RR220801 | RR | SET-1

**B.Tech II Year II Semester Examinations, April/May-2012**
**MECHANICAL ENGINEERING**
**(CHEMICAL ENGINEERING)**

**Time: 3 hours** **Max. Marks: 80**

**Answer any five questions**
**All questions carry equal marks**

\- - -

1.a) Define a thermodynamic system. Differentiate among open system, closed system and an isolated system.
b) Briefly explain the First law of thermodynamics for closed system. [16]

2.a) State the limitations of First law of thermodynamics.
b) What do you mean by Clausis Inequality?
c) Prove that Entropy is a property of a system. [16]

3.a) What is a cycle? How do you differentiate between ideal cycle and actual cycle?
b) Define the term Relative efficiency and derive expression for efficiency of Otto cycle.
c) Differentiate between the Otto and Diesel cycle. [16]

4.a) Explain the following terms relating to steam formation
i) Latent heat of steam ii) Dryness fraction
b) Explain with neat sketch the working principle of Babcock Wilcox boiler.
c) Define the following terms:
i) Brake power ii) Indicated power iii) Brake thermal efficiency. [16]

5.a) Explain the difference between an impulse turbine and a reaction turbine.
b) What do you mean by compounding of steam turbines? Discuss the method of velocity compounding of steam turbine.
c) What are the advantages of Gas turbines over Steam turbines? [16]

6.a) Describe with a neat sketch the construction and working of a multi stage reciprocating air compressor.
b) Enumerate the applications of compressed air.
c) What are the advantages and limitations of multi stage air compressor over single stage air compressor? [16]

7.a) Discuss the various important parameters necessary for the selection of belt drives.
b) Prove that the ratio of the driving tensions on the two sides of a pulley is

$T_1/T_2 = e^{\mu\theta}$

Where $T_1$ = tension in the tight side of the belt
$T_2$ = tension in the slack side of the belt
$\mu$ = coefficient of friction between the belt and the pulley
$\theta$ = angle of contact in radians. [16]

8.a) With the help of neat sketches explain the construction and working of different types of gears.
b) Explain the hydrodynamic theory of bearings.
c) Distinguish between the roller and thrust bearing. [16]

********

Code No: RR220801 | RR | SET-2

**B.Tech II Year II Semester Examinations, April/May-2012**
**MECHANICAL ENGINEERING**
**(CHEMICAL ENGINEERING)**

**Time: 3 hours** **Max. Marks: 80**

**Answer any five questions**
**All questions carry equal marks**

\- - -

1.a) What is a cycle? How do you differentiate between ideal cycle and actual cycle?
b) Define the term Relative efficiency and derive expression for efficiency of Otto cycle.
c) Differentiate between the Otto and Diesel cycle. [16]

2.a) Explain the following terms relating to steam formation
i) Latent heat of steam ii) Dryness fraction
b) Explain with neat sketch the working principle of Babcock Wilcox boiler.
c) Define the following terms:
i) Brake power ii) Indicated power iii) Brake thermal efficiency. [16]

3.a) Explain the difference between an impulse turbine and a reaction turbine.
b) What do you mean by compounding of steam turbines? Discuss the method of velocity compounding of steam turbine.
c) What are the advantages of Gas turbines over Steam turbines? [16]

4.a) Describe with a neat sketch the construction and working of a multi stage reciprocating air compressor.
b) Enumerate the applications of compressed air.
c) What are the advantages and limitations of multi stage air compressor over single stage air compressor? [16]

5.a) Discuss the various important parameters necessary for the selection of belt drives.
b) Prove that the ratio of the driving tensions on the two sides of a pulley is

$T_1/T_2 = e^{\mu\theta}$

Where $T_1$ = tension in the tight side of the belt
$T_2$ = tension in the slack side of the belt
$\mu$ = coefficient of friction between the belt and the pulley
$\theta$ = angle of contact in radians. [16]

6.a) With the help of neat sketches explain the construction and working of different types of gears.
b) Explain the hydrodynamic theory of bearings.
c) Distinguish between the roller and thrust bearing. [16]

7.a) Define a thermodynamic system. Differentiate among open system, closed system and an isolated system.
b) Briefly explain the First law of thermodynamics for closed system. [16]

8.a) State the limitations of First law of thermodynamics.
b) What do you mean by Clausis Inequality?
c) Prove that Entropy is a property of a system. [16]

********

Code No: RR220801 | RR | SET-3

**B.Tech II Year II Semester Examinations, April/May-2012**
**MECHANICAL ENGINEERING**
**(CHEMICAL ENGINEERING)**

**Time: 3 hours** **Max. Marks: 80**

**Answer any five questions**
**All questions carry equal marks**

\- - -

1.a) Explain the difference between an impulse turbine and a reaction turbine.
b) What do you mean by compounding of steam turbines? Discuss the method of velocity compounding of steam turbine.
c) What are the advantages of Gas turbines over Steam turbines? [16]

2.a) Describe with a neat sketch the construction and working of a multi stage reciprocating air compressor.
b) Enumerate the applications of compressed air.
c) What are the advantages and limitations of multi stage air compressor over single stage air compressor? [16]

3.a) Discuss the various important parameters necessary for the selection of belt drives.
b) Prove that the ratio of the driving tensions on the two sides of a pulley is

$T_1/T_2 = e^{\mu\theta}$

Where $T_1$ = tension in the tight side of the belt
$T_2$ = tension in the slack side of the belt
$\mu$ = coefficient of friction between the belt and the pulley
$\theta$ = angle of contact in radians. [16]

4.a) With the help of neat sketches explain the construction and working of different types of gears.
b) Explain the hydrodynamic theory of bearings.
c) Distinguish between the roller and thrust bearing. [16]

5.a) Define a thermodynamic system. Differentiate among open system, closed system and an isolated system.
b) Briefly explain the First law of thermodynamics for closed system. [16]

6.a) State the limitations of First law of thermodynamics.
b) What do you mean by Clausis Inequality?
c) Prove that Entropy is a property of a system. [16]

7.a) What is a cycle? How do you differentiate between ideal cycle and actual cycle?
b) Define the term Relative efficiency and derive expression for efficiency of Otto cycle.
c) Differentiate between the Otto and Diesel cycle. [16]

8.a) Explain the following terms relating to steam formation
i) Latent heat of steam ii) Dryness fraction
b) Explain with neat sketch the working principle of Babcock Wilcox boiler.
c) Define the following terms:
i) Brake power ii) Indicated power iii) Brake thermal efficiency. [16]

********

Code No: RR220801 | RR | SET-4

**B.Tech II Year II Semester Examinations, April/May-2012**
**MECHANICAL ENGINEERING**
**(CHEMICAL ENGINEERING)**

**Time: 3 hours** **Max. Marks: 80**

**Answer any five questions**
**All questions carry equal marks**

\- - -

1.a) Discuss the various important parameters necessary for the selection of belt drives.
b) Prove that the ratio of the driving tensions on the two sides of a pulley is
$T_1/T_2 = e^{\mu\theta}$
Where $T_1$ = tension in the tight side of the belt
$T_2$ = tension in the slack side of the belt
$\mu$ = coefficient of friction between the belt and the pulley
$\theta$ = angle of contact in radians. [16]

2.a) With the help of neat sketches explain the construction and working of different types of gears.
b) Explain the hydrodynamic theory of bearings.
c) Distinguish between the roller and thrust bearing. [16]

3.a) Define a thermodynamic system. Differentiate among open system, closed system and an isolated system.
b) Briefly explain the First law of thermodynamics for closed system. [16]

4.a) State the limitations of First law of thermodynamics.
b) What do you mean by Clausis Inequality?
c) Prove that Entropy is a property of a system. [16]

5.a) What is a cycle? How do you differentiate between ideal cycle and actual cycle?
b) Define the term Relative efficiency and derive expression for efficiency of Otto cycle.
c) Differentiate between the Otto and Diesel cycle. [16]

6.a) Explain the following terms relating to steam formation
i) Latent heat of steam ii) Dryness fraction
b) Explain with neat sketch the working principle of Babcock Wilcox boiler.
c) Define the following terms:
i) Brake power ii) Indicated power iii) Brake thermal efficiency. [16]

7.a) Explain the difference between an impulse turbine and a reaction turbine.
b) What do you mean by compounding of steam turbines? Discuss the method of velocity compounding of steam turbine.
c) What are the advantages of Gas turbines over Steam turbines? [16]

8.a) Describe with a neat sketch the construction and working of a multi stage reciprocating air compressor.
b) Enumerate the applications of compressed air.
c) What are the advantages and limitations of multi stage air compressor over single stage air compressor? [16]

********