Code No: 07A42202 **R07** **Set No. 2**

II B.Tech II Semester Examinations,April/May 2012
PRIME MOVERS AND MECHANICAL COMPONENTS
Instrumentation And Control Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Define and explain the following terms of a gas turbine plant:
   (a) Compressor efficiency,
   (b) Turbine efficiency,
   (c) Isentropic efficiency, and
   (d) Thermal efficiency. [16]
2. (a) Describe the working of evaporative type steam condenser.
   (b) Explain how a steam condenser works? How it improves the performance of steam power plant. [8+8]
3. Sketch and explain various inversions of a double slider crank chain. [16]
4. (a) A 5cm jet of water having a velocity of 15m/s strikes at the centre of a hemispherical vane. Determine the force exerted on the vane if it moves with a linear velocity of 5m/s.If a series of such vanes are mounted on the periphery of a wheel and jet strikes each vane in succession, what would be the force exerted by the jet?
   (b) A stationary vane having an inlet angle of zero degree and an outlet angle of 25^o receives water at a velocity of 50m/s. Determine the components of force acting on it in the direction of jet and normal to it. Also find the resultant force in magnitude and direction. [8+8]
5. (a) What are different fluid parameters to be controlled by the valves of an hydraulic system?
   (b) What are the applications of hydraulic control valves? [8+8]
6. (a) Water tube boilers are preferred for steam power generation-Substantiate the statement.
   (b) Bring out the differences between simple vertical boiler and Cochran boiler. [8+8]
7. Compare the 'optimum blade-speed ratio', work-output, maximum work-output, 'blade- diagram efficiency' and maximum 'blade-diagram efficiency' of an 'impulse' and 'impulse-reaction'turbines. [16]
8. (a) How does the specific speed of centrifugal pump gives us valuable information regarding the selection of pump under the given set of conditions.

(b) Explain the characteristic curves of a typical centrifugal pump. [8+8]

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Code No: 07A42202 **R07** **Set No. 4**

II B.Tech II Semester Examinations,April/May 2012
PRIME MOVERS AND MECHANICAL COMPONENTS
Instrumentation And Control Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What are different fluid parameters to be controlled by the valves of an hydraulic system?
   (b) What are the applications of hydraulic control valves? [8+8]

2. (a) A 5cm jet of water having a velocity of 15m/s strikes at the centre of a hemispherical vane. Determine the force exerted on the vane if it moves with a linear velocity of 5m/s.If a series of such vanes are mounted on the periphery of a wheel and jet strikes each vane in succession, what would be the force exerted by the jet?
   (b) A stationary vane having an inlet angle of zero degree and an outlet angle of 25^o receives water at a velocity of 50m/s. Determine the components of force acting on it in the direction of jet and normal to it. Also find the resultant force in magnitude and direction. [8+8]

3. Sketch and explain various inversions of a double slider crank chain. [16]

4. Define and explain the following terms of a gas turbine plant:
   (a) Compressor efficiency,
   (b) Turbine efficiency,
   (c) Isentropic efficiency, and
   (d) Thermal efficiency. [16]

5. Compare the 'optimum blade-speed ratio', work-output, maximum work-output, 'blade- diagram efficiency' and maximum 'blade-diagram efficiency' of an 'impulse' and 'impulse-reaction'turbines. [16]

6. (a) Describe the working of evaporative type steam condenser.
   (b) Explain how a steam condenser works? How it improves the performance of steam power plant. [8+8]

7. (a) Water tube boilers are preferred for steam power generation-Substantiate the statement.
   (b) Bring out the differences between simple vertical boiler and Cochran boiler. [8+8]

8. (a) How does the specific speed of centrifugal pump gives us valuable information regarding the selection of pump under the given set of conditions.

(b) Explain the characteristic curves of a typical centrifugal pump. [8+8]

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Code No: 07A42202 **R07** **Set No. 1**

II B.Tech II Semester Examinations,April/May 2012
PRIME MOVERS AND MECHANICAL COMPONENTS
Instrumentation And Control Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Define and explain the following terms of a gas turbine plant:
   (a) Compressor efficiency,
   (b) Turbine efficiency,
   (c) Isentropic efficiency, and
   (d) Thermal efficiency. [16]

2. Compare the 'optimum blade-speed ratio', work-output, maximum work-output, 'blade- diagram efficiency' and maximum 'blade-diagram efficiency' of an 'impulse' and 'impulse-reaction'turbines. [16]

3. (a) A 5cm jet of water having a velocity of 15m/s strikes at the centre of a hemispherical vane. Determine the force exerted on the vane if it moves with a linear velocity of 5m/s.If a series of such vanes are mounted on the periphery of a wheel and jet strikes each vane in succession, what would be the force exerted by the jet?
   (b) A stationary vane having an inlet angle of zero degree and an outlet angle of 25^o receives water at a velocity of 50m/s. Determine the components of force acting on it in the direction of jet and normal to it. Also find the resultant force in magnitude and direction. [8+8]

4. (a) Describe the working of evaporative type steam condenser.
   (b) Explain how a steam condenser works? How it improves the performance of steam power plant. [8+8]

5. Sketch and explain various inversions of a double slider crank chain. [16]

6. (a) Water tube boilers are preferred for steam power generation-Substantiate the statement.
   (b) Bring out the differences between simple vertical boiler and Cochran boiler. [8+8]

7. (a) How does the specific speed of centrifugal pump gives us valuable information regarding the selection of pump under the given set of conditions.
   (b) Explain the characteristic curves of a typical centrifugal pump. [8+8]

8. (a) What are different fluid parameters to be controlled by the valves of an hydraulic system?

(b) What are the applications of hydraulic control valves? [8+8]

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Code No: 07A42202 **R07** **Set No. 3**

II B.Tech II Semester Examinations,April/May 2012
PRIME MOVERS AND MECHANICAL COMPONENTS
Instrumentation And Control Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Sketch and explain various inversions of a double slider crank chain. [16]

2. (a) Describe the working of evaporative type steam condenser.
   (b) Explain how a steam condenser works? How it improves the performance of steam power plant. [8+8]

3. (a) What are different fluid parameters to be controlled by the valves of an hydraulic system?
   (b) What are the applications of hydraulic control valves? [8+8]

4. (a) Water tube boilers are preferred for steam power generation-Substantiate the statement.
   (b) Bring out the differences between simple vertical boiler and Cochran boiler. [8+8]

5. Compare the 'optimum blade-speed ratio', work-output, maximum work-output, 'blade- diagram efficiency' and maximum 'blade-diagram efficiency' of an 'impulse' and 'impulse-reaction'turbines. [16]

6. (a) A 5cm jet of water having a velocity of 15m/s strikes at the centre of a hemispherical vane. Determine the force exerted on the vane if it moves with a linear velocity of 5m/s.If a series of such vanes are mounted on the periphery of a wheel and jet strikes each vane in succession, what would be the force exerted by the jet?
   (b) A stationary vane having an inlet angle of zero degree and an outlet angle of 25^o receives water at a velocity of 50m/s. Determine the components of force acting on it in the direction of jet and normal to it. Also find the resultant force in magnitude and direction. [8+8]

7. (a) How does the specific speed of centrifugal pump gives us valuable information regarding the selection of pump under the given set of conditions.
   (b) Explain the characteristic curves of a typical centrifugal pump. [8+8]

8. Define and explain the following terms of a gas turbine plant:
   (a) Compressor efficiency,
   (b) Turbine efficiency,
   (c) Isentropic efficiency, and

(d) Thermal efficiency. [16]

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