

Code No: 07A3EC02

R07**Set No. 2****II B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010****FLUID MECHANICS AND HYDRAULIC MACHINERY**

Common to Production Engineering, Electrical And Electronics Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions**All Questions carry equal marks**

1. (a) What do you mean by specific speed of a centrifugal pump? Derive the expression for the same.
(b) Write about the performance characteristic curves of a centrifugal pump. [8+8]
2. (a) Write about the units and scales of pressure measurement.
(b) An inverted U-tube manometer is connected to two horizontal pipes A and B through which water is flowing. The vertical distance between the axes of these pipes is 20cm. When an oil of specific gravity 0.8 is used as a gauge fluid, the vertical heights of water columns in the two limbs of the inverted manometer (when measured from the respective centre lines of the pipes) are found to be same and equal to 20cm. Sketch the configuration. Determine the difference of pressure between the pipes. [6+10]
3. A square plate weighing 110N and of uniform thickness and 30cm edge is hung so that horizontal jet 3cm diameter and having a velocity of 12m/s impinges on the plate. The center line of the jet is 15cm below the upper edge of the plate, and when the plate is vertical, the jet strikes the plate normally and at its center. Find what force must be applied at the lower edge of the plate in order to keep plate vertical. If the plate is allowed to swing freely, find the inclination to vertical which the plate will assume under the action of jet. [16]
4. (a) What do you understand by hydroelectric power station? What are its types? Discuss the type where water is recycled.
(b) Write short notes on
 - i. Mass curve
 - ii. Heads and efficiencies related to hydropower plant. [8+8]
5. (a) Write the classification of turbines based on various aspects.
(b) Explain the working and operation of a Pelton wheel with the help of neat sketch. [8+8]
6. Determine the diameter of the throat of a venturimeter to be introduced in a horizontal section of a 0.10m diameter main so that reading of the differential U-tube manometer is 0.60m of mercury when the discharge is 15litres per second. Assume the coefficient of discharge of the meter as 0.95. The fluid flowing through the main is water. [16]

Code No: 07A3EC02

R07**Set No. 2**

7. A pipeline, 40cm diameter, conveying oil (specific gravity =0.85) at the flow rate of 1500lit/sec has a 90° bend in the horizontal plane. The pressure at the entrance to the bend is 1340bar and the loss of head in the bend is 2.5m of oil. Find the magnitude and direction of the force exerted by the oil on the bend and show the direction of the force on a sketch of the bend. [16]
8. (a) What are unit quantities? Define the unit quantities for a turbine. Why are they important?
- (b) Write short notes on
- i. Cavitation
 - ii. Governing of turbines. [8+8]

Code No: 07A3EC02

R07**Set No. 4****II B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010****FLUID MECHANICS AND HYDRAULIC MACHINERY**

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Time: 3 hours

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(b) Write short notes on
 - i. Cavitation
 - ii. Governing of turbines. [8+8]
2. A pipeline, 40cm diameter, conveying oil (specific gravity = 0.85) at the flow rate of 1500lit/sec has a 90° bend in the horizontal plane. The pressure at the entrance to the bend is 1340bar and the loss of head in the bend is 2.5m of oil. Find the magnitude and direction of the force exerted by the oil on the bend and show the direction of the force on a sketch of the bend. [16]
3. (a) Write about the units and scales of pressure measurement.
(b) An inverted U-tube manometer is connected to two horizontal pipes A and B through which water is flowing. The vertical distance between the axes of these pipes is 20cm. When an oil of specific gravity 0.8 is used as a gauge fluid, the vertical heights of water columns in the two limbs of the inverted manometer (when measured from the respective centre lines of the pipes) are found to be same and equal to 20cm. Sketch the configuration. Determine the difference of pressure between the pipes. [6+10]
4. (a) What do you mean by specific speed of a centrifugal pump? Derive the expression for the same.
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6. A square plate weighing 110N and of uniform thickness and 30cm edge is hung so that horizontal jet 3cm diameter and having a velocity of 12m/s impinges on the plate. The center line of the jet is 15cm below the upper edge of the plate, and when the plate is vertical, the jet strikes the plate normally and at its center. Find what force must be applied at the lower edge of the plate in order to keep plate vertical. If the plate is allowed to swing freely, find the inclination to vertical which the plate will assume under the action of jet. [16]

Code No: 07A3EC02

R07

Set No. 4

7. (a) What do you understand by hydroelectric power station? What are its types? Discuss the type where water is recycled.
- (b) Write short notes on
- i. Mass curve
 - ii. Heads and efficiencies related to hydropower plant. [8+8]
8. (a) Write the classification of turbines based on various aspects.
- (b) Explain the working and operation of a Pelton wheel with the help of neat sketch. [8+8]

FIRSTRANKER

Code No: 07A3EC02

R07**Set No. 1****II B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010****FLUID MECHANICS AND HYDRAULIC MACHINERY**

Common to Production Engineering, Electrical And Electronics Engineering

Time: 3 hours

Max Marks: 80

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(b) Write short notes on
 - i. Cavitation
 - ii. Governing of turbines. [8+8]
2. (a) Write about the units and scales of pressure measurement.
(b) An inverted U-tube manometer is connected to two horizontal pipes A and B through which water is flowing. The vertical distance between the axes of these pipes is 20cm. When an oil of specific gravity 0.8 is used as a gauge fluid, the vertical heights of water columns in the two limbs of the inverted manometer (when measured from the respective centre lines of the pipes) are found to be same and equal to 20cm. Sketch the configuration. Determine the difference of pressure between the pipes. [6+10]
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Code No: 07A3EC02

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Set No. 1

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- (b) Write short notes on
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 - ii. Heads and efficiencies related to hydropower plant. [8+8]
8. (a) Write the classification of turbines based on various aspects.
- (b) Explain the working and operation of a Pelton wheel with the help of neat sketch. [8+8]

FIRSTRANKER

Code No: 07A3EC02

R07**Set No. 3****II B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010****FLUID MECHANICS AND HYDRAULIC MACHINERY**

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Answer any FIVE Questions

All Questions carry equal marks

1. (a) What are unit quantities? Define the unit quantities for a turbine. Why are they important?
(b) Write short notes on
 - i. Cavitation
 - ii. Governing of turbines. [8+8]
2. (a) What do you understand by hydroelectric power station? What are its types? Discuss the type where water is recycled.
(b) Write short notes on
 - i. Mass curve
 - ii. Heads and efficiencies related to hydropower plant. [8+8]
3. (a) What do you mean by specific speed of a centrifugal pump? Derive the expression for the same.
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7. (a) Write the classification of turbines based on various aspects.

Code No: 07A3EC02

R07**Set No. 3**

- (b) Explain the working and operation of a Pelton wheel with the help of neat sketch. [8+8]
8. (a) Write about the units and scales of pressure measurement.
- (b) An inverted U-tube manometer is connected to two horizontal pipes A and B through which water is flowing. The vertical distance between the axes of these pipes is 20cm. When an oil of specific gravity 0.8 is used as a gauge fluid, the vertical heights of water columns in the two limbs of the inverted manometer (when measured from the respective centre lines of the pipes) are found to be same and equal to 20cm. Sketch the configuration. Determine the difference of pressure between the pipes. [6+10]

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