

Unit 4 - Week 2:

Course outline

How to access the Portal?

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Week 1:

Week 2:

Lecture 6: Basic Principles, Analysis of Force and Power Generation Part - I

Lecture 7: Basic Principles, Analysis of Force and Power Generation Part - II

Lecture 8: Specific Speed Governing and Limitations of Impulse Turbine

Lecture 9: Tutorial - I

Lecture 10: Tutorial - II

Quiz : Assignment 2

Feedback for week 2

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Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-11, 23:59 IST.

- 1) The power obtainable from an impulse turbine is proportional to the number of nozzles used. A Pelton turbine with six nozzles has a specific speed of 8.1. The specific speed per nozzle is
- (a) 1.35
(b) 3.3
(c) 2
(d) 8.1
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
b
- 2) The number of buckets required to maintain optimum efficiency of a Pelton turbine is usually fixed by the empirical relation: number of buckets = $15 + \frac{1}{2} \times (\text{Jet ratio})$, where Jet ratio is the ratio of the mean bucket diameter or pitch diameter to the nozzle diameter. With this information answer the following problem:
- For the standard design of a desired Pelton wheel, it is observed that if the jet ratio is increased by five times, then the number of buckets on the runner has to be doubled. If the diameter of the jet is 0.15 m, then the pitch diameter of the desired Pelton wheel is:
- (a) 0.3 m
(b) 3 m
(c) 0.75 m
(d) 1.5 m
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
d
- 3) A Pelton wheel produces 44kW at the shaft when available water head across the turbine is 40 m. The energy head transferred from water to the runner is 35 m of water. If the mechanical efficiency is 92%, the overall efficiency of the turbine is
- (a) 75 %
(b) 89.2 %
(c) 80.5 %
(d) 56.5 %
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
c
- 4) In the previous problem, the discharge through the turbine is
- (a) $0.52 \text{ m}^3 / \text{s}$
(b) $0.40 \text{ m}^3 / \text{s}$
(c) $0.28 \text{ m}^3 / \text{s}$
(d) $0.14 \text{ m}^3 / \text{s}$
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
d
- 5) In order to have maximum power from a Pelton turbine, the bucket speed must be
- (a) equal to the jet speed
(b) equal to half of the jet speed
(c) equal to twice the jet speed
(d) independent of the jet speed
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
b
- 6) The mean bucket speed of a Pelton turbine is 15 m/s. The rate of flow of water supplied by the jet under a head of 42 m is $1 \text{ m}^3 / \text{s}$. The jet is deflected by the buckets at an angle of 165° . Neglecting frictional losses in the bucket, the velocity of whirl at the outlet is obtained as (take coefficient of velocity, $C_v = 0.985$)
- (a) 2.18 m/s
(b) 4.18 m/s
(c) 1.09 m/s
(d) 4.36 m/s
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
a
- 7) In the previous problem the hydraulic efficiency is obtained as
- (a) 85%
(b) 75%
(c) 65%
(d) 95%
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
d
- 8) A Pelton wheel has to develop 13230 kW under a net head of 800 m while running at a speed of 600 rpm. If the coefficient of the jet $C_v = 0.97$, speed ratio $\phi = 0.46$ and the ratio of jet to wheel diameter is 1/16, then the number of jets required for the Pelton wheel is:
- (a) 1
(b) 2
(c) 5
(d) 6
- (here speed ratio is defined as the ratio between the bucket speed U and theoretical velocity of the jet $\sqrt{2gH}$; assume an overall efficiency $\eta_0 = 85\%$)
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
b
- 9) Consider the following statements pertaining to Pelton wheel:
- (i) Pelton wheel is suitable only for low heads.
(ii) Pelton wheel is a tangential flow impulse turbine.
(iii) Pelton wheel is a radial flow impulse turbine.
(iv) The operation of a Pelton turbine requires a draft tube.
- Out of the above statements:
- (a) Only (i) and (ii) are correct
(b) (i), (ii) and (iv) are correct
(c) (i), (ii) and (iii) are correct
(d) Only (ii) is correct
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
d
- 10) The function(s) of casing used in Pelton turbine is/are:
- (a) to prevent splashing of water and to discharge water to the tail race.
(b) to maintain the flow velocity constant.
(c) to convert part of pressure energy into kinetic energy
(d) None of the above.
- a
 b
 c
 d
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
a