

Unit 12 - Week 10

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Assignment 10

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

Due on 2019-10-09, 23:59 IST.

 1) What is the main objective of energy storage? 1 point

- a. Offset adverse effect of fluctuating demand
- b. Assure steady output from existing plants
- c. Meet peak demand on short notice
- d. All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

d. All of the above

 2) In pumped hydro system which is not a source of loss 1 point

- a. Leakage of fluid from pipes and equipment
- b. Water addition due to rain
- c. Evaporation during storage
- d. Turbine losses

No, the answer is incorrect.

Score: 0

Accepted Answers:

b. Water addition due to rain

 3) Why is the compressed air in a storage system cooled before storage? 1 point

- a. Prevent heat loss during storage
- b. Improve turn around efficiency
- c. Reduces storage volume
- d. Help in a hybrid system

No, the answer is incorrect.

Score: 0

Accepted Answers:

c. Reduces storage volume

 4) How much energy can be stored by 500 kg of water raised by 100-m in a pumped hydro installation? Assume no pumping losses, density of water to be 1000 kg/m^3 and $g = 9.81 \text{ m/s}^2$ 1 point

- a. 0.25 kW-h
- b. 0.15 kW-h
- c. 0.98 MJ
- d. 0.5 MJ

No, the answer is incorrect.

Score: 0

Accepted Answers:

b. 0.15 kW-h

d. 0.5 MJ

 5) In an SMES 1 point

- a. Magnetic energy is converted to electrical energy
- b. Magnetic Energy can be stored indefinitely
- c. Electrical resistance of the coil drops to zero
- d. All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

d. All of the above

 6) A flywheel's energy storage can be increased by 1 point

- a. Locating more mass at the circumference
- b. Reducing frictional losses
- c. Choosing material with high tensile strength
- d. All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

d. All of the above

 7) What is the primary reason for the Alabama CAES installation more energy efficient than Huntorf installation? 1 point

- a. Recuperator uses waste heat from turbine
- b. Newer plant with better equipment
- c. Hybrid system with adiabatic storage
- d. Uses intercooler between compression stages

No, the answer is incorrect.

Score: 0

Accepted Answers:

a. Recuperator uses waste heat from turbine

 8) A flywheel in the form of a disc 5-m in diameter and 2-m thick rotates at $N = 3000 \text{ rpm}$. It is made of a material with an uniform density of 2000 kg/m^3 . Calculate the energy stored in the flywheel. 1 point

- a. 12 MJ
- b. 12 GJ
- c. 12 kW-h
- d. 24 MJ

No, the answer is incorrect.

Score: 0

Accepted Answers:

b. 12 GJ

 9) If the flywheel in Q8 is slowed down to 1500 rpm, how much energy can be recovered? 1 point

- a. 12 MJ
- b. 3 GJ
- c. 6 MJ
- d. 9 GJ

No, the answer is incorrect.

Score: 0

Accepted Answers:

d. 9 GJ

 10) In a CAES plant, air is compressed from 1 bar, 25°C to 50 bar. Calculate the compressed air temperature. Assuming, C_p/C_v of air to be 1.4. 1 point

- a. 560°C
- b. 780°C
- c. 910°C
- d. 640°C

No, the answer is incorrect.

Score: 0

Accepted Answers:

 d. 640°C

 11) In problem 10, if the compressor efficiency is 85%, what should be the compressed air temperature? 1 point

- a. 800°C
- b. 750°C
- c. 650°C
- d. Insufficient data

No, the answer is incorrect.

Score: 0

Accepted Answers:

 b. 750°C