

**CERTIFICATE IN ENERGY TECHNOLOGY AND
MANAGEMENT (CETM)**

Term-End Examination 00192

December, 2011

**OEY-001 : ENERGY RESOURCES AND
CONVERSION PROCESSES**

Time : 3 hours

Maximum Marks : 70

Note : There are two sections in this question paper, Section A and Section B. Section A is compulsory. Attempt any eight questions from Section B. Use of scientific calculator is permitted.

SECTION - A

(All questions are compulsory)

1. Choose the correct answer from the given four alternatives. 7x1=7
- (a) The most important solid fuel is :
- (i) Wood
 - (ii) Car coal
 - (iii) Coal
 - (iv) None of the above

- (b) Zeroth Law of thermodynamics states that :
- (i) two thermodynamic systems are always in thermal equilibrium with each other.
 - (ii) if two systems are in thermal equilibrium, then the third system will also be in thermal equilibrium
 - (iii) two systems not in thermal equilibrium with a third system, they are in thermal equilibrium with each other.
 - (iv) when two systems are in thermal equilibrium with a third system, they are in thermal equilibrium with each other.
- (c) A man pushes a wall and fails to displace it. He does :
- (i) negative work
 - (ii) positive work but not maximum work
 - (iii) no work at all
 - (iv) maximum positive work
- (d) The unit of power in SI (watt) is equivalent to :
- (i) kg ms^{-2}
 - (ii) $\text{kg m}^2 \text{s}^{-2}$
 - (iii) $\text{kg m}^2 \text{s}^{-3}$
 - (iv) none of the above
- (e) A light and a heavy body have equal Kinetic energy. Which has greater momentum ?
- (i) The heavy body
 - (ii) The light body
 - (iii) Both have equal momentum
 - (iv) Data given is incomplete

(f) The mass of the body is halved and its speed is doubled. What happens to the Kinetic energy of the body ?

(i) doubled

(ii) four times

(iii) eight - times

(iv) Remains unchanged

(g) Which one of the following is the renewable energy ?

(i) Petroleum (ii) Natural gas

(iii) Wind (iv) Coal

2. Fill in the blanks :

7x1=7

(a) It takes 10 seconds to lift a 15 kg block to a vertical height of 2 m. The power out of the device is equal to _____.

(b) The energy form contained in a bullet fired from a pistol is _____.

(c) Living things need energy from _____.

(d) BTU stands for _____.

(e) Most biotic resources are _____.

(f) Common energy sources in Indian villages is _____.

(g) The global warming contributes to the rise in sea level due to thermal expansion of ocean and melting of _____.

SECTION - B

(Answer *any eight* questions)

3. Write down the details of direct conversion of solar energy. How it is useful for human beings ? 7
4. Explain in detail about wind power generation and its advantages. 7
5. What do you mean by tidal energy and geothermal energy ? How these are tapped ? 7
6. What are the advantages of liquid and gaseous fuels over solid fuels ? 7
7. What is meant by calorific value of fuel ? Differentiate between H.C.V. and L.C.V. 7
8. Explain why, though wood is a renewable source of energy but the use of wood as a fuel is not a wise decision. 7
9. Write down in brief about energy scenario in India. 7

10. The percentage composition of sample of liquid fuel by weight is, 7

C = 84.8 percent and H_2 = 15.2 percent :

Calculate the weight of air needed for the combustion of 1 kg of fuel, if 15 percent excess air is supplied.

11. Discuss the measures that required to be taken for sustainable energy use in future. 7

12. Define biomass. What are the resources of biomass ? Discuss in brief the advantages and limitations of biomass energy. 7
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