

Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech (EEE)/SEM-8/EE-802D/2013

2013

ENERGY AUDIT AND CONSERVATION

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

10 × 1 = 10

i) Biomass provides of the global power usage.

- | | |
|---------|----------|
| a) ~14% | b) ~12% |
| c) ~18% | d) ~45%. |

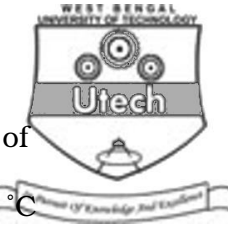
ii) The multiplication factor in the chain reaction is determined by

- | | |
|----------------------------|-------------------|
| a) $k = \epsilon p f \eta$ | b) $R_x = b_x F$ |
| c) $P_f = R_f E_f$ | d) none of these. |

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CS/B.Tech (EEE)/SEM-8/EE-802D/2013



- iii) Fusion requires plasma at temperature of
- a) $\sim 10^8 \text{ }^\circ\text{C}$ b) $\sim 10^2 \text{ }^\circ\text{C}$
 c) $\sim 10^5 \text{ }^\circ\text{C}$ d) $\sim 12^4 \text{ }^\circ\text{C}$.
- iv) Wind is potentially large source of
- a) no loss electricity
 b) carbon free electricity
 c) radiation free electricity
 d) none of these.
- v) The speed of a tidal wave in a sea of uniform depth h_0 is given by
- a) $c = \sqrt{gh_0}$
 b) $E = 1/2 \rho g a^2$
 c) $N = 1/4 \rho g a^2 \sqrt{g\lambda}/2\pi$
 d) none of these.
- vi) Global energy production is expected to increase by around between 1999 to 2020.
- a) 80% b) 75%
 c) 55% d) 60%.
- vii) The Reynolds number is
- a) $L = \rho u T$ b) $F/A = - \mu \cdot du/dy$
 c) $R_e = \rho v d / \mu$ d) none of these.

CS/B.Tech (EEE)/SEM-8/EE-802D/2013



- viii) The flywheel in a car provides
- Potential energy
 - Heat energy
 - Kinetic energy
 - none of these.
- ix) Lead-acid batteries are used as
- Back-up supply
 - Primary energy source
 - Secondary energy source
 - none of these.
- x) Mass flow is conserved along a steam-tube
- $\rho uA = \text{constant}$
 - $F/A = -\mu \cdot du/dy$
 - $L = \rho UT$
 - $L = \rho UT$

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- Discuss the energy sources (renewable & non-renewable) and significance of alternative resources and limitation of the sources.
- Discuss and compare various resources in view of capital and running cost.
- Discuss the significance of alternate resources and limitation of these resources.
- Discuss the electrical characteristics of photovoltaic cells and modules.
- What do you mean by Aggregate Technical and Commercial loss (A.T.C.) ? An organisation drawing 200 B.U. billed to 180 B.U. realized 90% at the billed amount. Find A.T.C. loss.

CS/B.Tech (EEE)/SEM-8/EE-802D/2013



GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following.

3 × 15 = 45

7. Discuss the importance of energy audit for any industry. What are the methods used for conducting energy audit ? Define the scope of preliminary energy audit.
8. What do you mean by energy conservation in generation, transmission and distribution ? What is the effective step to reduce transmission and distribution loss ?
9. What is the energy conservation in the following systems ?
 - a) Industrial
 - b) Agriculture
 - c) Domestic
 - d) Commercial
 - e) Municipal.
10. What are the concepts of supply side management, demand side management and load side management ? Describe the advantage of D.S.M. to consumer utility.
11. Define the simple pay-back period analysis. Also define the advantage and limitation of pay-back period.
12. What is the basic concept of energy management ? Why in electrical energy management, energy accounting management, management of power factor, voltage principle, power demand monitoring are required ?

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