



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech(EE-NEW)/SEM-7/EE-704-E/2009-10**2009****NON-CONVENTIONAL ENERGY SOURCES**

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 any *ten* of the following : $10 \times 1 = 10$

- i) The standard value for solar constant as per NASA standard is

a) 1150 W/m ²	b) 1353 W/m ²
c) 2100 W/m ²	d) 1825 W/m ²
- ii) A geothermal field may yield

a) dry steam	b) wet steam
c) hot air	d) all of these.
- iii) Tidal energy utilises

a) kinetic energy of water
b) potential energy of water
c) both kinetic and potential energies of water
d) none of these.

CS/B.Tech(EE-NEW)/SEM-7/EE-704-E/2009-10

- iv) The greenhouse gas is
a) carbon dioxide b) methane
c) nitrous oxide d) all of these.
- v) An illuminated solar cell is
a) constant voltage device
b) constant current device
c) constant power output device
d) none of these.
- vi) Which is not renewable energy source ?
a) hydropower b) tidal power
c) geothermal d) fuel cell.
- vii) Bio-gas consists of
a) only methane
b) methane and carbon dioxide
c) only ethane
d) none of these
e) all of these.
- viii) Fill factor indicates the
a) solar radiation b) energy of a solar cell
c) quality of solar cell d) none of these.
- ix) The output of a solar cell is of the order of
a) 0.5 W b) 1.5 W
c) 5.0 W d) 7.5 W.
- x) Dolphin mechanism is a method of extracting
a) solar energy b) wind energy
c) ocean energy d) geothermal energy.
- xi) Tidal power plants are built on
a) seashore b) cricks
c) plates d) mountain range.

CS/B.Tech(EE-NEW)/SEM-7/EE-704-E/2009-10

GROUP - B

(Short Answer Type Questions)

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

2. How is geothermal energy generated inside the earth crust ?
In India where is geothermal energy available ?
3. Explain the types of generators used with wind turbines for producing electricity.
4. List the advantages and disadvantages of a tidal barrage scheme as a source of electrical power.
5. a) Give the list of materials used for bio-gas generation.
b) Write the main applications of bio-gas.
6. What are the main advantages and disadvantages of bio-mass energy ? Explain the process of photosynthesis.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Discuss on spectral energy distribution of solar radiation with the help of a suitable diagram. Discuss on depletion of solar radiation. How is electrical power produced by distributed collector solar thermal electrical power plant ? Discuss how solar energy is transferred into electrical energy in solar PV cell ? What do you mean by CR of collector ? Discuss on fixed mirror solar collector.

$2 + 2 + 3 + 4 + 2 + 2$

CS/B.Tech(EE-NEW)/SEM-7/EE-704-E/2009-10

8. a) Briefly describe a silicon solar cell along with its constructional features.
- b) How can you get the maximum power output from a solar cell ?
- c) What is a photovoltaic system ?
- d) Compare monocrystalline, polycrystalline and amorphous silicon as materials for solar cell.

5 + 2 + 3 + 5

9. a) What are the different types of geothermal resources ?
- b) What are the major applications of geothermal energy ?
- c) What principles guide in the location of a geothermal power station ?
- d) What is the prospect of geothermal energy ?

3 + 2 + 5 + 5

10. What is fuel cell ? Discuss different types of fuel cell. What are the advantages of fuel cell energy ? Discuss on alkaline fuel cell and hydrogen fuel cell.

2 + 3 + 3 + 3 + 4

11. Write short notes on any *three* of the following :
- a) Magnetohydrodynamic energy conversion
- b) Microhydel generation
- c) Advantages of non-conventional sources over conventional sources.
- d) Biodiesel
- e) Wave energy.

3 × 5