



B. Tech.
(SEM. VII) (ODD SEM.) EXAMINATION, 2009-10
NON CONVENTIONAL ENERGY RESOURCES
(ELECTIVE - I)

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt **all** questions.
 - (2) Use of **calculator** is permitted.

1 Attempt any **four** parts of the following : **5×4=20**

- (a) What is the present installed power generation capacity in India? Discuss contribution of various types of power plants.
- (b) What are primary and secondary energy sources? Explain with example.
- (c) Write short notes on classification of energy sources.
- (d) What is GPD and how it is related to economics of any country?
- (e) Discuss the merits and demerits of the various renewable technologies.
- (f) Which type of renewable energy source is best suitable for rural and agricultural applications and why? Explain in brief.

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1

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2 Attempt any **four** questions of the following : **5×4=20**

- (a) Explain the following :
 - (i) Solar constant
 - (ii) Solar declination
 - (iii) Day length
 - (iv) Hour angle
 - (v) Solar time.
- (b) What are direct and indirect applications of solar energy?
- (c) Discuss various types of solar collectors.
- (d) What are the method of solar radiation measurement? Discuss each in brief.
- (e) Determine the local solar time and declination at a location latitude $23^{\circ}15'$ N longitude $77^{\circ}30'$ E at 12.30 IST on June 19. Equation of time correction is $= -(1'01'')$
- (f) Explain principle and working of solar pond.

3 Attempt any **two** parts of the following : **10×2=20**

- (a) Explain the principle of wind energy conversion. Derive expression for power developed due to wind.
- (b) Discuss various designs of rotors with their relative merits and demerits.
- (c) Explain the working of geothermal power plants. What are the applications of geothermal energy?

4 Attempt any **two** parts of the following : **10×2=20**

- (a) What are tidal waves? How can power be developed in single basin tidal system?
- (b) Discuss working of Hydrogen-Oxygen fuel cell. Discuss various methods used for hydrogen storage.
- (c) Write a brief note on hydrogen transportation. Write main applications of hydrogen gas.

5 Attempt any **two** parts of the following : **10×2=20**

- (a) What are disadvantages of low power factor and how p.f. can be improved in a power system?
- (b) What is Energy Audit? What are steps used for energy conservation?
- (c) Write short notes on the following :
 - (i) Waste heat utilization
 - (ii) Cogeneration techniques.