

FACULTY OF ENGINEERING**B.E. 4/4 (M / P) I – Semester (Main) Examination, December 2010****Subject: Non-Conventional Energy Sources (Elective – I)**

Time: 3 Hours

Max. Marks : 75

Note: Answer all questions from Part A. Answer any **Five** questions from Part B.**PART – A (25 Marks)**

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| 1. What are different non conventional energy resources? | 3 |
| 2. Write limitations of Renewable energy sources. | 2 |
| 3. Define solar constant. | 3 |
| 4. Write the basis of wind energy conversion? | 2 |
| 5. Explain the torque coefficient of windmill. | 3 |
| 6. Define and explain angle of attack. | 2 |
| 7. Explain the thermal storage system for hot water. | 2 |
| 8. Explain the merits and demerits of biomass fuels. | 3 |
| 9. Differentiate between tidal and wave power generation. | 2 |
| 10. What are the effects of OTEC on environmental pollution? | 3 |

PART – B (50 Marks)

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| 11.(a) Differentiate between non-conventional energy sources with conventional energy sources. | 6 |
| (b) Discuss the economical feasibility of harnessing solar energy. | 4 |
| 12. Discuss the working principles of the following solar equipment with suitable diagrams | 10 |
| (a) Flat plate collectors | |
| (b) Paraboloidal collector | |
| (c) Concentric sphere collector. | |
| 13.(a) Define the terms (i) Hour angle, (ii) declination. | 4 |
| (b) Determine the intercept factor for a parabolic cylinder concentrator producing an image in the focal plane with $h = 60$, if the receiver is symmetrical with respect to the centre of the focus and the receiver has a width of 0.02 & 0.03 of the width of the concentration. | 6 |
| 14.(a) Explain the working principle vertical axis windmill with suitable diagram. | 5 |
| (b) What are different geothermal energy resources? Explain. | 5 |
| 15.(a) Draw the schematic diagram for gasification of biomass fuels and explain how its working. | 5 |
| (b) Explain the use of chulas in gasifiers. | 5 |
| 16.(a) Explain the working of OTEC with suitable diagram. | 5 |
| (b) Differentiate between tidal and wave power generation systems. | 5 |
| 17. Write short notes on: | |
| a) Effects of wind parameters on windmill. | 5 |
| b) Solar ponds. | 5 |