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B.E (full time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2012

MECHANICAL ENGINEERING BRANCH

7th SEMESTER

ME 517 NEW AND RENEWABLE SOURCES OF ENERGY

REGULATIONS : 2004

76

Time : 3 h

Max Marks : 100

Assume relevant data, if information provided is insufficient

Answer ALL Questions

Part A

10 x 2 = 20

1. What is energy gap?
2. Give any 2 examples for non conventional sources of energy and renewable sources of energy
3. Mention any 2 options adopted for increasing the efficiency in solar flat plate collectors
4. Comment on the statement: "Amorphous SPV cells possess higher efficiency compared to polycrystalline SPV cells"
5. What does the term 'wind rose' mean?
6. Mention 4 environmental impacts of windmills
7. What do B0 and B25 mean?
8. List any 2 technologies for thermo chemical conversion of biomass
9. Brief on the principle causing formation of waves
10. Gist on the probable causes of geothermal energy

Part B

5 x 16 = 80

11. (a) (i) Compare the merits and demerits of the following renewable energy conversion technologies:
SPV, OTEC, Aero generators, Geothermal energy based binary cycle
12. (a) (i) Compare the merits and demerits of solar concentrating collectors over solar flat plate collectors
(ii) With a neat sketch explain the working of a solar pond
(or)
(b) (i) With relevant schematic explain the working of a SPV cell and present their typical I-V characteristics
(ii) How MPP is maintained in SPV power plants? (4)

13. (a) (i) Mention any 10 classifications of wind energy conversion systems
(ii) Compare the pros and cons of horizontal and vertical axis wind mills

(or)

- (b) With suitable block diagram/schematic, explain the working of a typical horizontal axis wind mill and its control system

14. (a) (i) Comment on the composition of coal and biomass with respect to their moisture content, volatile matter, ash, fixed carbon, calorific value and hydrogen to carbon ratio

- (ii) Why biomass is termed as carbon neutral? (4)

(or)

- (b) Compare the working, merits and demerits of

- (i) Updraught and downdraught gasification system

- (ii) Floating drum and fixed dome biomethanation plants

15. (a) (i) Compare with relevant schematic, the flood and ebb mode of power generation in tidal power plants

(or)

- (b) (i) Explain the principle, construction, working, advantages and drawbacks of phosphoric acid fuel cells