

GANPAT UNIVERSITY
B.TECH SEM.5th ELECTRICAL ENGINEERING
REGULAR EXAMINATION NOV-DEC 2013
2EE 506- NON CONVENTIONAL ENERGY SOURCES

TIME:-3 HOURS

TOTAL MARKS-70

- INSTRUCTIONS:-
1. Attempt all questions.
 2. Make suitable assumptions wherever necessary.
 3. Figures to the right indicate full marks.

Section-I

Que-1

- (a) What is solar distillation? Explain basin type of solar still with neat sketch. (06)
 (b) Describe the basic principle of operation of an MHD generator. Derive the expressions for maximum power generation per unit volume of a generator. (06)

OR

Que-1

- (a) Explain with a neat sketch the working of solar industrial heating system. (06)
 (b) Discuss the main features of various types of renewable and non-renewable energy sources and explain the importance of non-renewable energy sources in the context of global warming. (06)

Que-2

- (a) Draw a typical power-density-duration curve and explain the cut-in, design & cut-out speeds. (06)
 (b) Describe the factors affecting power available from wind turbine. (05)

OR

Que-2

- (a) Derive the equation for Energy Content of wind per unit area. (06)
 (b) Compare the horizontal axis and vertical axis wind turbines. (05)

Que-3

Attempt any two. (12)

- (a) What do you understand by solar collectors? What are its different types? Give the methods of its classification.
 (b) Which are the different methods of measurement of solar radiation? Explain Pyrometer in detail.
 (c) Calculate the open-circuit voltage and maximum power output for an MHD generator having following data:
 Plate area=0.25 m²
 Distance between the electrodes =0.50 m
 Flux density=1.98 Wb/m²
 Average gas velocity=1200 m/s
 Gaseous conductivity 10 mho/m

Section-II

Que-4

- (a) Describe the various solid biomass fuels. (06)
- (b) What are the advantages of anaerobic digestion? (06)

OR

Que-4

- (a) Draw the schematic diagrams of Fixed dome and Floating drum types of biogas plant. (07)
- (b) What is bio-diesel? Explain its generation. (05)

Que-5

- (a) Give an overview of Ocean Thermal Energy Conversion System (OTEC) with a typical temperature profile of ocean layers. (06)
- (b) What are the conditions to be satisfied for on shore OTEC power plant? (05)

OR

Que-5

- (a) Draw the process diagram of Alkaline Electrolysis to get Hydrogen from water. (06)
- (b) Draw and explain a typical vehicular hydrogen fuel cell system. (05)

Que-6

- (a) Describe the double basin arrangements of tidal energy system. (06)
- (b) What are the essential components of a Tidal Power Station? Discuss each of them briefly. (06)

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