



SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR

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QUESTION BANK (DESCRIPTIVE)

Subject with Code : Non - Conventional Energy Resources

Course &amp; Branch: B.Tech - ME

Year &amp; Sem: II-B.Tech &amp; II-Sem

Regulation: R18

UNIT –I

1. (a). What are the types of solar radiation measuring Instruments? 4M  
(b) Explain the working of Sunshine recorder with a neat sketch 8M
2. (a) Write short notes on solar radiation 6M  
(b) Derive an Expression for solar radiation on tilted surfaces. 6M
3. (a) Mention the importance of measuring wind speed and classify its measuring instruments 6M  
(b) Describe the working of hot wire anemometer with a neat sketch 6M
4. (a) What is conventional and non-conventional Energy? Write the merits and demerits of Conventional energy sources? 6M  
(b) Name the renewable energy sources and explain them in brief 6M
5. (a) What is the need of renewable energy? 6M  
(b) Describe Renewable Energy Scenario in Andhra Pradesh. 6M
6. (a) Explain the working of Pyrheliometer with a neat sketch 6M  
(b) Discuss about the environmental aspects of Energy Utilization? 6M
7. (a) Outline the challenges and remedies associated in the use of solar energy 6M  
(b) Generate a report on the usage of energy around the world 6M
8. (a) Illustrate the working of Eppley pyranometer with a neat sketch 6M  
(b) Define Extraterrestrial and Terrestrial solar radiation and solar flux? 6M
9. (a) Write a short note on the use of wind sock in aviation industry 6M  
(b) Explain briefly about the secondary sources of Energy 6M
10. (a) Mention the merits and demerits of solar energy 6M  
(b) What are energy resources available in India? 6M

UNIT –II

1. Enumerate the different types of concentrating type collectors. 12M
2. Describe with a neat sketch working of a solar water heating system and state its advantages and disadvantages 12M
3. (a) Mention the thermal analysis of flat plate collector 6M  
(b) Write the working principle of flat plate collector with a neat sketch 6M
4. (a) Illustrate the functions of various components in flat plate collectors 6M  
(b) How Flat plate collectors are different from Concentrating collectors 6M
5. (a) Explain the working principle of concentrating collector 6M  
(b) How steam will be generated with parabolic dish collector. Explain 6M
6. (a) Explain the construction and uses of evacuated tube collectors? 6M  
(b) What are the factors effected on performance of solar flat plate collector 6M
7. (a) Write the applications of solar energy 6M  
(b) Explain the working principle of solar PV cells 6M
8. Explain the working of water heating system and desalination system with a neat sketch 12M
9. Explain the process of generation of power in solar pond with a neat sketch and also mention its merits and demerits 12M
10. Mention the functioning of various components in solar power generation 12M

UNIT-III

1. (a) What is wind power? Explain it in detail. 6M  
(b) Mention the merits and demerits of wind energy 6M
2. Describe with a neat sketch the working of wind energy system with main components 12M
3. How the electricity will be generated from wind turbine generator 12M
4. Classify the wind turbines and explain their working in detail 12M
5. Illustrate the power generation process in HAWT with its merits and demerits 12M
6. Describe the working of VAWT with its merits and demerits 12M
7. (a) Differentiate HAWT and VAWT 6M  
(b) Explain briefly the functioning of Darrieus Wind Turbine 6M
8. What are the different types of vertical axis wind turbines? Write about Savonius and ducted wind turbines with neat sketches. 12M
9. Mention the factors to be considered in the selection of site for wind energy 12M
10. (a) Explain the performance and operational characteristics of wind machines 6M  
(b) What are the safety and environmental impact of wind energy 6M

## UNIT-IV

1. (a) What is biomass and why it is called as renewable energy? 6M  
(b) What are the different forms of bio-energy? 6M
2. (a) What is biomass direct combustion? Explain in detail 6M  
(b) Name various stokers used for the combustion of biomass and explain anyone with a neat figure 6M
3. (a) Describe the working of Spreader stoker with a neat sketch 6M  
(b) Mention the need of Fluidized Bed Combustion and explain it with a neat diagram 6M
4. (a) What is biomass gasifier and write its gasification reactions 6M  
(b) How do you classify the gasifiers and explain anyone in detail. 6M
5. (a) With a neat sketch explain biomass gasification? 6M  
(b) What is meant by fermentation, aerobic, anaerobic digestion? Explain 6M
6. (a) Compare fixed dome and float drum type bio digesters. 6M  
(b) Explain the function of Deenbandhu biogas digester with a neat sketch 6M
7. (a) What are the factors affecting the generation of bio gas? 6M  
(b) Explicate various steps involve in the production of Ethanol 6M
- 8 (a) Write a short notes on various methods of biomass analysis 6M  
(b) Mention the characteristics of biodiesel 6M
9. Explain the working of biomass Cogeneration system with a neat sketch and also mention its applications 12M
10. (a) Write the merits and demerits of Biomass Energy 6M  
(b) Mention the applications of Biomass Energy along with its impact on environment 6M

## UNIT-V

1. What is tide? Explain tidal energy and its conversion with neat diagram. 12M
2. Explain the working of fuel cell and their applications 12M
3. Explain the basic components of a tidal power plant and state their merits and demerits 12M
4. What is the nature of tidal power extracted from single basin arrangement and double basin arrangement? 12M
5. Explain in detail the wave energy conversion by floats 12M
6. What is the basic principle of ocean thermal energy conversion ? What are the main types of OTEC power plants? Describe their working. 12M
7. (a) What are the different methods of hydrogen storage 6M  
(b) Differentiate wave and tidal energy. 6M
8. (a) How do you classify hydrogen production and mention any one method 6M  
(b) Mention the applications of hydrogen 6M

9. What are the geothermal power plants? Explain binary cycle power plant with neat diagram 12M
10. Explain in detail about the hybrid systems 12M

### Two marks Questions

#### UNIT- I

1. List the non –conventional energy sources?.
2. What are the fundamental sources of energy?
3. In world energy consumption what are the major energy consumptions?
4. What is the approximate amount of total power generation in India?
5. Write any two differences between renewable and non renewable sources.
6. List out secondary energy resources
7. Name the compounds present in the coal.
8. Name the products that can be obtained from crude oil.
9. Distinguish Extraterrestrial Radiation and Terrestrial Radiation
10. What is beam radiation and global radiation?

#### UNIT-II

1. What are the major functions of solar thermal applications?
2. List types of solar energy collectors.
3. Mention what factors affecting the performance of flat plate collector
4. Name solar direct thermal applications
5. Explain solar furnace?
6. Define solar pond.
7. What is photovoltaic cell function?
8. List main components of solar PV power generation
9. Distinguish solar array and solar module
10. List photovoltaic solar energy applications

#### UNIT-III

1. What are the causes to form wind?
2. Distinguish wind turbine and wind generator
3. Write and explain wind power equation.
4. List out types of wind turbines
5. List out types of VAWT?
6. What are the main parts of wind turbine?
7. In wind turbine site selection what are the technical considerations?
8. What are the advantages of wind power?
9. What are the disadvantages of wind power?
10. List out wind turbine site environmental considerations

**UNIT-IV**

1. List out major benefits of using bioenergy
2. Differentiate biofuel and bio power?
3. What are the Constituents of biomass material
4. What are the methods used to analysis of biomass?
5. What are the biomass converting processes?
6. Define biomass gasification?
7. What are the reactions involve producing biogas?
8. What is aerobic process
9. List out four factors which are affecting the performance of Bio gas production?
10. What is biodigester list two types of digesters?

**UNIT-V**

1. What is geothermal power?
2. Discuss the disadvantages of geothermal plant.
3. What is fuel cell?
4. What is meant by hybrid system?
5. Give the advantages of tidal power plant.
6. What is hydrogen fuel?
7. Explain principle of OTEC?
8. List out components of tidal power plant?
9. Differentiate tide and wave.
10. What are the hydrogen storage methods?