

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR**

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**QUESTION BANK (DESCRIPTIVE)**

Subject with Code : **Non Conventional Energy Resources**  
 Year & Sem: III-B.Tech & I-Sem

Course & Branch: B.Tech - ME  
 Regulation: R16

**UNIT-I**

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|----|---|---|----|
| 1  | a | What are the types of solar radiation measuring Instruments?  | 6M |
|    | b | Explain the working of Sunshine recorder with a neat sketch   | 6M |
| 2  | a | Explain in brief about 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**

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| 1  | Enumerate the different types of concentrating type collectors.  | 12M |
| 2  | a Mention the thermal analysis of flat plate collector   | 6M  |
|    | b Write the working principle of flat plate collector with a neat sketch   | 6M  |
| 3  | Describe with a neat sketch working of a solar water heating system and state its advantages and disadvantages       | 12M |
| 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  | Explain the process of generation of power in solar pond with a neat sketch and also mention its merits and demerits | 12M |
| 6  | a Explain the working principle of concentrating collector   | 6M  |
|    | b How steam will be generated with parabolic dish collector. Explain   | 6M  |
| 7  | Explain the working of water heating system and desalination system with a neat sketch                               | 12M |
| 8  | Mention the functioning of various components in solar power generation  | 12M |
| 9  | 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  |
| 10 | a Write the applications of solar energy   | 6M  |
|    | b Explain the working principle of solar PV cells  | 6M  |

**UNIT-III**

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| 1 | a What is wind power? Explain 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 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 Explain the working of biomass Cogeneration system with a neat sketch and also mention its applications 12M
- 9 a Explain the function of KVIC biogas plant with a neat sketch 6M
- b Mention the characteristics of biodiesel 6M
- 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 method and mention any one in detail	6M
	b Mention the applications of hydrogen	6M
9	a What is the geothermal energy and explain its extraction process	6M
	b Explain Geothermal binary cycle power plant with neat diagram	6M
10	Explain in detail about the hybrid systems	12M

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