PHY3FV108:Renewable Energy Sources	
Section-A-Mark-2	
1.	Explain the utilization aspects of wind energy
2.	Discuss the advantages of wind energy
3.	Discuss the disadvantages of wind energy
4.	How does wind speed vary with height above the ground?
5.	Define the relationship between wind speed and height.
6.	Define wind energy and its basic principle.
7.	List any two advantages of wind energy.
8.	Why is wind energy considered environmentally friendly?
9.	State any two reasons that make wind energy a suitable option for rural and isolated regions.
10.	List any two environmental impacts of wind energy.
11.	What are the two main sources of wind?
12.	What causes local winds?
13.	Why is wind speed higher at greater heights?
14.	How is wind power related to wind velocity?
15.	Give the expression for the kinetic energy of air flowing through an area A with wind velocity Uw.
16.	Define Gilbert's limit.
17.	Explain wind energy pattern factor (EPF).
18.	List the basic components of a wind energy conversion systems.
19.	Name the main components of a wind-electric generating power plant.
20.	Mention any two applications of wind power plants.
21.	Explain any two problems faced in the operation of large wind power

22.	What does the term "Geothermal" mean?
23.	Why is geothermal energy classified as a renewable energy source?
24.	**Name any two methods through which heat is transferred from the Earth's interior.**
25.	**What forms of energy are present in geothermal energy?**
26.	**What are geothermal fields?**
27.	Mention two types of geothermal fluids.
28.	How is geothermal energy extracted from geothermal fields?
29.	Name the two types of geothermal energy deposits.
30.	Name the three main layers of the Earth's interior.
31.	What is the lithosphere composed of?
32.	What is the asthenosphere and where is it located?
33.	**Define magma.**
34.	Name any two substances found in the Earth's crust.
35.	What are commercial energy sources
36.	Differentiate between primary and secondary energy sources.
37.	Define non-conventional energy sources with examples
38.	How do non-conventional energy sources differ from conventional ones?
39.	Explain why non-conventional energy is considered the future of sustainable energy.
40.	Describe the major types of non-conventional energy sources available in India.
41.	What is meant by renewable energy? Give suitable examples.
42.	Explain why solar energy is called a renewable resource.
43.	How is wind energy harnessed for power generation?
44.	Describe the significance of biomass as a renewable energy source

45.	Compare hydropower and geothermal energy as renewable sources
46.	Define non-renewable energy sources and give examples.
47.	Why are fossil fuels classified as non-renewable?
48.	What is meant by primary energy sources. Give examples.
49.	What is meant by secondary energy sources. Give examples.
50.	List five examples of commercial or conventional energy sources.
51.	Differentiate between commercial energy sources and non-commercial energy sources with examples
52.	Summarize the importance of oil and natural gas as conventional energy sources.
53.	Explain how hydroelectric power fits into the category of conventional energy.
54.	Explain the role of solar photovoltaic systems in energy production.
55.	How does wind energy qualify as a renewable source?
56.	Describe how hydrogen fuel cells work as a renewable energy source
57.	Compare solar and wind energy in terms of availability and application.
58.	What are the most prominent new sources of energy identified by the UN?
59.	Explain how OTEC (Ocean Thermal Energy Conversion) generates energy.
60.	Describe how geothermal energy is obtained and used
61.	Why are draught animals and agricultural residues considered new energy sources?
62.	List the energy sources that are classified as commercial or conventional.
63.	Why are firewood, animal dung, and agricultural waste considered non-commercial?
64.	List any two fossil fuels and their uses
65.	Define solar photovoltaic energy.
66.	Why is natural gas considered a clean fuel?

67.	Mention any two environmental impacts of coal combustion.
68.	List two applications of wind energy.
69.	State one advantage and one disadvantage of using hydrogen as fuel.
70.	What is meant by geothermal energy?
71.	Explain the classification of energy sources with examples.
72.	Mention any two rock types involved in the geothermal hot spring structure.
73.	What role do permeable rocks play in the formation of hot springs?
74.	Why is water able to circulate in a geothermal system?
75.	What is the primary heat source for hot springs in a geothermal system?
76.	What are the different types of hydrothermal resources?
77.	List any two types of geothermal resources.
78.	What are the three sub-types of hydrothermal resources?
79.	What is the main characteristic of vapour-dominated geothermal fields?
80.	Mention two non-condensable gases commonly present in hydrothermal steam.
81.	What causes surface subsidence in geothermal fields?
82.	What causes surface subsidence in geothermal fields?
83.	Name two methods used in high-temperature liquid-dominated systems.
84.	Discuss the applications of low-temperature geothermal systems and how they are used.
85.	Name the three forms of energy available from geopressured reservoirs.
86.	What are the methods used to fracture hot dry rocks to create artificial reservoirs?
87.	Mention any two advantages of geothermal energy over fossil fuels
88.	Name any two industrial applications of geothermal energy.
89.	List any two disadvantages of geothermal energy.

90.	List the five major oceans of the world.
91.	What are the four major categories of ocean energy sources?
92.	What causes ocean tides?
93.	What is a tide?
94.	What causes the daily variation in tidal levels?
95.	Name the three main components of a tidal power plant.
96.	What is the function of sluice ways in a tidal power plant?
97.	Mention any two fringe benefits of tidal power plants
98.	What causes ocean wave energy?
99.	Mention any two advantages of wave energy.
100.	Mention the factors affecting wave energy.
101.	What is the basic principle of Ocean Thermal Energy Conversion (OTEC)?
102.	What is the efficiency of an OTEC plant?
103.	Name the two basic types of OTEC systems.
104.	Mention any two advantages of Ocean Thermal Energy Conversion (OTEC).
105.	State any two major limitations of OTEC systems.
106.	**Explain** the difference between *extraterrestrial* and *terrestrial* solar radiation.
107.	**Describe** the concept of the *solar constant* and its significance in solar energy studies.
108.	**Summarize** how *beam radiation* and *diffuse radiation* contribute to total solar radiation
109.	**Classify** the solar spectrum into its three basic wavelength bands.
110.	**Interpret** the role of *air mass (ma)* in determining the intensity of solar radiation received on Earth
111.	**Compare** *pyranometer* and *pyrheliometer* based on the type of radiation they measure

112.	Define pyranometer and its primary function.
113.	What type of radiation is measured by a pyrheliometer?
114.	Name the three instruments used to measure solar radiation
115.	What is the working principle of a sunshine recorder?
116.	List any two components of a pyranometer.
117.	Explain how a pyrheliometer determines solar radiation using electrical energy balance.
118.	List the advantages of a wind energy conversion system.
119.	List the disadvantages of a wind energy conversion system.
120.	Define a flat plate collector
121.	Describe one advantage and one disadvantage of flat plate collectors.
122.	Why is orientation important in concentrating collectors
123.	Explain why concentrating collectors require a tracking system.
124.	What is a parabolic trough collector?
125.	Write a note on the absorber plate in a flat plate collector
126.	Write a note on solar air heaters
127.	Discuss any three advantages of solar air heater.
128.	Discuss any three disadvantages of solar air heater.
129.	Explain any three applications of solar air heater.
130.	Explain the working of a solar dryer
131.	What are the advantages of solar drying
132.	Describe any two disadvantages of solar drying
133.	What are the different types of solar cookers available.
134.	Write a note on dish solar cooker
135.	

136.	Write a short description on community solar cooker for indoor cooking.
137.	What are solar photovoltaic cells.
138.	Describe the various types of solar cell materials available in the market
Section-B-Mark-6	
1.	Explain in detail the environmental impacts caused by wind energy systems.
2.	List and explain any six disadvantages of wind energy.
3.	What are the major environmental impacts of wind energy? Explain.
4.	Write three advantages and three disadvantages of wind energy.
5.	Explain the sources of wind and how wind is generated.
6.	Explain basic components of a wind energy conversion system with a neat diagram.
7.	Describe the major components of a wind-electric generating power plant and explain the function of the wind mill head.
8.	Explain in detail the problems encountered in operating large wind power generators. What are the possible solutions or considerations for these challenges?
9.	Explain the major problems faced in the operation of large wind power generators.
10.	Explain why geothermal energy is considered renewable and inexhaustible.
11.	Describe how geothermal energy can be tapped and used for power generation.
12.	Discuss the methods by which heat is transferred from Earth’s interior to its surface.
13.	Explain the availability and method of extraction of geothermal energy.
14.	Write a short note on the different types of geothermal fluids and their significance.
15.	Describe the structure of the Earth's interior with the help of a diagram or layers.

16.	Write a short note on the Earth's core and its properties.
17.	Explain the classification of energy sources with examples.
18.	Describe conventional energy sources and their role in development.
19.	Discuss the characteristics of renewable energy sources.
20.	Explain the working and benefits of solar photovoltaic systems.
21.	What are the main uses and environmental effects of coal?
22.	Compare and contrast primary and secondary energy sources.
23.	Discuss the advantages of non-conventional energy sources.
24.	Explain the term "non-commercial energy sources" with examples.
25.	Describe the potential and uses of wind energy
26.	What are the limitations of natural gas utilization in India
27.	Discuss the environmental hazards of fossil fuel usage.
28.	Write a short note on biomass and biogas as energy sources.
29.	Explain Ocean Thermal Energy Conversion (OTEC) and its significance
30.	Discuss the importance of hydrogen energy and its future scope.
31.	What are the merits and demerits of using coal in industries?
32.	Describe the different types of non-conventional energy sources and their applications.
33.	Explain the structure and working of a geothermal hot spring system.
34.	Explain the different types of geothermal energy resources.
35.	Write a short note on hydrothermal resources and their sub-types.
36.	Explain the working of a vapour-dominated (dry steam) geothermal system with a diagram.
37.	Describe the process of electricity generation in a flash steam open system.
38.	Compare vapour-dominated and flash steam systems.

39.	Explain the working of a binary cycle geothermal system with a labeled diagram.
40.	Describe the Total Flow Concept in geothermal systems. What are the requirements of the mixed-phase expander?
41.	Write a short note on geopressured geothermal resources.
42.	Write a short note on Petro-thermal Systems
43.	Discuss the advantages and disadvantages of geothermal energy over other energy sources.
44.	Explain the working principle of ocean tidal energy conversion.
45.	Write a short note on ocean thermal energy conversion (OTEC).
46.	Explain the various sources of ocean energy
47.	Explain the main components of a tidal power plant with their functions and design considerations.
48.	Explain why tidal power plants are economically less attractive at present.
49.	Explain the advantages and disadvantages of wave energy.
50.	List and explain the three major factors influencing the generation of wave energy.
51.	Explain the working principle of a **closed cycle** OTEC system with a labeled diagram.
52.	List and explain the advantages and disadvantages of OTEC systems.
53.	**Describe** the working principle of a *pyranometer* using its main components.
54.	Write a note on the spectral distribution of solar radiation
55.	Describe the **reasons for variation in solar radiations reaching the earth than received on the outside of the atmosphere**
56.	Explain the concept of the solar constant.
57.	**Compare and contrast beam radiation, diffuse radiation, and total radiation.**

58.	Summarize the methods used for measuring solar radiation.
59.	**Describe the solar energy spectrum and classify it into different frequency bands.**
60.	Explain the working of a sunshine recorder and how it is used to determine the duration of bright sunshine.
61.	Explain the construction of a flat plate collector.
62.	Discuss any three advantages and three disadvantages of flat plate collectors
63.	List and explain any three advantages and three disadvantages of concentrating collectors.
64.	Describe the working of a parabolic trough collector briefly.
65.	Compare the single crystal and poly crystalline solar cells
66.	Write a note on silicon solar cells
67.	What are polycrystalline silicon solar cells. Discuss the various possible designs in which they can be fabricated.
68.	With a neat diagram,explain the working of a box type solar dryer
69.	Describe the basic working of any two concentrating collectors
70.	Differentiate between flat plate collectors and concentrating collectors
71.	Discuss the advantages and key characteristics of compound parabolic concentrator
72.	Describe the working of fresnel lens collector
Section-C-Mark-10	
1.	Discuss in detail the advantages , disadvantages and environmental impacts of wind energy.
2.	(a) Explain the basic components of a wind energy conversion system with a suitable diagram. (b)Explain the advantages and disadvantages of wind energy conversion systems.

3.	Explain the working, components, and applications of a wind-electric generating power plant.
4.	Discuss in detail the advantages and limitations of renewable energy sources.
5.	Explain the barriers to the implementation and diffusion of renewable energy technologies.
6.	How can renewable energy technologies be integrated into national energy planning?
7.	Explain how renewable energy can reduce dependency on fossil fuels and support long-term sustainability
8.	Discuss the main differences between renewable and non-renewable energy sources with examples.
9.	Write an essay on the importance of renewable energy in today's world.
10.	Explain the working principles, components, and environmental impacts of a vapour-dominated geothermal power plant. Support your answer with a neat labeled diagram.
11.	Describe in detail the structure and functioning of a geothermal hot spring system. How does the geological structure contribute to heat transfer? Explain with a labeled diagram.
12.	With the help of diagrams, describe the flash steam open system used in high-temperature liquid-dominated geothermal resources.
13.	Discuss the concept, components, working, and economic aspects of a tidal power plant.
14.	Explain the origin, nature, and potential of ocean wave energy. Also, discuss the advantages, disadvantages, and challenges associated with its utilization.
15.	Describe in detail the working of a closed cycle OTEC plant with a labeled diagram,
16.	Discuss the working principle of Ocean Thermal Energy Conversion (OTEC) power plants. Explain the major advantages and limitations of OTEC technology as a renewable energy source.

17.	What is Ocean Thermal Energy Conversion (OTEC)? Explain the working of the closed cycle OTEC system. Discuss its advantages and limitations.
18.	Describe the working principles and functions of various instruments used for the measurement of solar radiation.
19.	Discuss the concept of the solar constant and the factors that influence solar radiation reaching the Earth's surface.
20.	Describe in detail, the solar energy spectrum and its classification.
21.	Explain in detail the construction, working, advantages, disadvantages, and applications of a flat plate collector.
22.	With a neat diagram, Describe the construction and operation of a parabolic trough collector.
23.	Discuss the principle and working of Silicon photovoltaic cell
24.	Discuss the working of poly crystalline silicon solar cells
25.	Discuss the working, advantages and disadvantages of concentrating collectors.