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398, Ramkrishnapur Road, Barasat
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BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Tech.(ME)-2021
Course Name – Non-Conventional Energy Sources
Course Code - OEC-ME701C
(Semester VII)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Identify from the following, is an example of non-conventional energy.
a) Oil b) Coal
c) Biomass d) Natural gas

(ii) Select the percentage of global energy consumption is currently derived from fossil fuels.
a) 10% b) 30%
c) 60% d) Over 80%

(iii) Choose One major environmental impact of fossil fuel combustion is
a) Lowered energy costs b) Reduced water availability
c) Greenhouse gas emissions d) Increased soil fertility

(iv) Recall Non-conventional energy is primarily used because
a) It is cost-effective b) Fossil fuel supplies are abundant
c) It is more sustainable and eco-friendly d) It is easy to store

(v) Identify seasonal variation in solar energy availability affects which of the following energy resources.
a) Oil b) Hydroelectric power
c) Biomass d) Solar power

(vi) Recall from the following, is NOT a renewable energy source
a) Solar energy b) Wind energy
c) Coal d) Hydropower

(vii) Identify the use of fossil fuels primarily impacts the environment by contributing to
a) Soil erosion b) Air pollution
c) Water scarcity d) Earthquakes

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(viii) Choose from the following fossil fuels are formed from
a) Living animals
b) Plants and marine organisms from millions of years ago
c) Rocks and soil
d) Sunlight

(ix) Recall the energy source is most affected by geographical location
a) Natural gas
b) Wind energy
c) Coal
d) Oil

(x) Choose from the following is a direct consequence of burning fossil fuels.
a) Water pollution
b) Soil degradation
c) Global warming
d) Increased biodiversity

(xi) Relate the concept of a hybrid energy system is used to
a) Improve energy efficiency by combining multiple sources
b) Improve energy efficiency by combining multiple sources
c) Reduce the number of energy sources
d) Increase the use of fossil fuels

(xii) Identify One of the advantages of non-conventional energy resources is
a) High operating costs
b) High pollution levels
c) Less environmental impact
d) Short-term availability

(xiii) Choose from the following is a fossil fuel.
a) Solar energy
b) Wind energy
c) Natural gas
d) Geothermal energy

(xiv) Identify the role of a wind turbine's tower
a) It stores energy
b) It controls wind speed
c) It elevates the rotor and blades to capture wind
d) It supports solar panels

(xv) Choose the primary function of a wind turbine's rotor
a) To store wind energy
b) To capture wind and convert it into mechanical energy
c) To generate electricity directly
d) To stabilize the turbine

Group-B
(Short Answer Type Questions) 3 x 5=15

2. Identify one traditional water-lifting device and its energy source. (3)
3. Explain why site selection is important for wind energy projects. (3)
4. Identify one application of biodiesel and explain its benefit. (3)
5. List two applications of solar photovoltaic systems. (3)
6. Evaluate the factors influencing turbine selection in micro hydel power plants. (3)

OR

Predict a modification to improve the efficiency of an underperforming micro hydel turbine. (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. Define traditional energy sources and list three examples. (5)
8. Explain how animal-powered transport, such as bullock carts or camel caravans, contributed to trade and movement in ancient times. (5)
9. Compare horizontal-axis wind turbines (HAWT) and vertical-axis wind turbines (VAWT) in terms of efficiency and application. (5)

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10. Discuss about the important factors must be considered for selecting a turbine for a hydroelectric power plant. (5)
11. Illustrate how does the site selection for a micro hydel power plant affect its efficiency and energy output? (5)
12. Propose a hybrid energy system for a coastal area that experiences strong winds and sunny summers. (5)

OR

Propose a hybrid energy system for a rural household combining traditional biomass and solar energy for cooking and lighting. (5)

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