University of Mumbai

Examination First Half 2022

Examinations Commencing from 17th May 2022 to4thJune 2022

Program: **Electrical Engineering**

Curriculum Scheme: Rev2019

Examination: TE SemesterV

Course Code: EEDO5011and Course Name: Renewable Energy Sources

Time: 2hour 30 minutes Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	What is connect across PV cell to protect photovoltaic cells from against the destructive effects of cell shading?
Option A:	Resistance
Option B:	Blocking diode
Option C:	Bypass diode
Option D:	capacitor
2.	Conventional source are called _____ sources of energy.
Option A:	Renewable
Option B:	Non-Renewable
Option C:	both Renewable and non-Renewable
Option D:	Geothermal energy
3.	For High head applications _____ turbines are used.
Option A:	Pelton
Option B:	Kaplan
Option C:	Fransis
Option D:	Propeller
4.	Solar cell works based on
Option A:	Laser technology
Option B:	Photo-conduction
Option C:	Thermal emission
Option D:	Tyndall effect
5.	Which renewable energy source contributes the power generation most in India ?
Option A:	Wind
Option B:	Solar
Option C:	Biomass
Option D:	Geothermal
6.	The Geothermal energy is obtained in the form of _____
Option A:	Light
Option B:	Protons
Option C:	Photons
Option D:	Heat
7.	In the open cycle OTEC, which working fluid is used?
Option A:	Ammonia
Option B:	water
Option C:	Propane

Option D:	Isobutane
8.	How is OTEC caused?
Option A:	By wind energy
Option B:	By geothermal energy
Option C:	By solar energy
Option D:	By gravitational force
9.	Which of the following converts energy from the combustion of fuel directly to the electrical energy?
Option A:	Ni-Cd cell
Option B:	Dynamo
Option C:	Fuel cell
Option D:	Electrolytic cell
10.	Which part of the wind turbines senses wind speed, wind direction, shaft speed and torque?
Option A:	Turbine blade
Option B:	Shaft
Option C:	Rotor
Option D:	Controller

Q2. **(20 Marks Each)**	**Solve any Four out of Six5 marks each**
A	Illustrate the phenomenon of hot spots in PV module.
B	Illustrate advantages and disadvantages of a horizontal axis wind turbine (HAWT)
C	Write a short note on: Solid oxide fuel cell
D	Describe the working principle of a tidal energy power generation
E	What are the different ways to use solar thermal energy? Describe any one of them in brief with the help of neat diagram
F	State and compare various renewable energy sources. What is the possibility of mitigating the problem faced due to fossil fuels with the integration of renewable energy?

Q3. **(20 Marks Each)**	**Solve any Two Questions out of Three 10 marks each**
A	Explain the following technologies: i) Wave energy ii) Pumped hydro storage system
B	Explain the working of a wind energy system (WES) with its various components. What are the different power converter topologies used for WES? Explain anyone in detail.
C	Draw I-V (current v/s voltage) and P-V (power v/s voltage) characteristics of a solarPV cell and clearly mark all essential parameters on it. What is the impact of change in solar radiation and temperature on solar PV characteristics?

Q4. (20 Marks Each)	
A	**Solve any two** **5 marks each**
i.	Explain the concept of mismatch in Solar PV module.
ii.	Write a short note on : Biomass energy
iii.	Explain the concept of aerofoils in wind energy system (WES).
B	**Solve any One** **10 marks each**
i.	Describe the principle of operation of Proton Exchange Membrane Fuel Cell (PEMFC) along with its electrical characteristics. Illustrate how PEMFC can fedpower to three phase AC standalone load.
ii.	What is MPPT in solar system? Explain any one MPPT algorithm.