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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

MAKE UP EXAMINATION – JAN-2023

Course Code: CHE1008

Course Name: Energy and Sustainability

Program: BTech

Date: 30 – JAN - 2023

Time: 09:30AM – 12:30PM

Max Marks: 100

Weightage: 50%

Instructions:

(i) Read the all questions carefully and answer accordingly.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries 2 marks.

(15Qx 2M= 30M)

1. Which of these Energy resources is/are widely used in industries?

- a) Coal and Gasoline b) Wood c) Biogas d) Crop Residue

(C.O.No.1) [Knowledge]

2. Water flows through the dam's turbines to produce electricity, known as,

- a) Solar energy b) Pumped-storage hydropower
c) Tidel energy d) Wind energy

(C.O.No.1) [Knowledge]

3. Equitable use of energy means

- (a) Equal distribution and sharing of resources (b) Excess of energy
(c) Minimal usage of energy (d) Unequal distribution of energy

(C.O.No.1) [Knowledge]

4. Which government body is giving star rating system for electrical appliances?

- a) BEE b) ISI c) MNRE d) SECI

(C.O.No.1) [Knowledge]

5. Which among following is not a primary type of fuel

- a) coal b) wood c) biogas d) Natural gas

(C.O.No.1) [Knowledge]

6. Electricity produced from force of water is

- a) Hydroelectric energy b) Hydrothermal energy
c) Nuclear electricity d) Current electricity

(C.O.No.2) [Knowledge]

7. Which among the following power plants are coming under the type of geothermal power plants?

- a) Binary cycle b) Flash steam c) Dry steam d) All the above

(C.O.No.2) [Knowledge]

8. The wind is a by-product of _____ energy.
 a) Geo-thermal energy b) Solar energy c) Biomass energy d) Nuclear energy
 (C.O.No.1) [Knowledge]
9. Silicon can be doped with _____
 a) Only with divalent atoms b) trivalent or pentavalent atoms
 c) Only with Trivalent atoms d) Only with Pentavalent atoms
 (C.O.No.2) [Knowledge]
10. The scientist who discovered photovoltaic effect
 a) Albert Einstien b) Rutherford c) Edmond Becquerel d) Mary Curie
 (C.O.No.1) [Knowledge]
11. Charge transport in the electrodes occurs via the motion of _____
 a) the motion of ions b) the motion of electrons
 c) motion of ions and electrons d) half-cell reactions
 (C.O.No.1) [Knowledge]
12. A quantitative relationship between electrode potential and concentration of substance involved is called _____
 a) Standard electrode potential b) Nernst equation
 c) Reduction potential d) Ideal gas law constant
 (C.O.No.1) [Knowledge]
13. Which of the following component of battery take part in the oxidation reactions?
 a) Anode b) Cathode c) Electrolyte d) Separator
 (C.O.No.1) [Knowledge]
14. Find the suitable anti-reflective coating materials for photovoltaic cell.
 a) Si b) POCl_3 c) Silicon nitride and TiO_2 d) B_2H_6
 (C.O.No.2) [Knowledge]
15. Basis for solar cells is
 a) photoelectric effect b) Electrochemical effect
 c) Photovoltaic effect d) Photochemical effect
 (C.O.No.1) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries 8 marks. (5Qx8M=40M)

16. We can convert energy available from the sources like sun, air, water, fossils, heat trapped beneath the earth's crust, biodegradable wastes and radioactive elements to useable form such as heat or electricity. Name each type of energy and identify whether it is renewable or non-renewable form.
 (C.O.No.1) [Comprehension]
17. Fuel is a combustible substance which produces large amount of energy in the form of heat and light. These fuels can be classified in different ways. Mention the classification of fuels with examples.
 (C.O.No.1) [Comprehension]

18. How wind mills convert wind energy into electricity? Explain the parameters which influence power generated in wind mills using the mathematical expression.
(C.O.No.2) [Comprehension]
19. Explain the principle involved in Zn-MnO₂ dry cell.
(C.O.No.2) [Comprehension]
20. What are fuel cells? List out the differences between fuel cells and batteries.
(C.O.No.2) [Comprehension]

Part C [Problem Solving Questions]

Answer all the Questions. Each question carries 15 marks. (2Qx15M=30M)

21. (a) Batteries are made up of different components with specific role to play. Name each component and their function. [6 M]
(b) Explain the cell reaction and construction with characteristics associated with Li-MnO₂ battery. [9 M] (C.O.No. 1) [Application]
22. Name the type of fuel with examples which are obtained from buried dead plants and animals in the limited availability of oxygen over the period of millions of years. Discuss the importance and consequences of the same. (C.O.No. 1) [Application]