29. a.	Define biomass. List the advantages, disadvantages and environmental compacts of biomass.	10	2	4	1,7
	(OR)				
b.	What is a biogas plant? Explain any one type of biogas plant with the help of its schematic diagram.	10	3	4	1,7
30. a.	Describe the working principle of solid oxide fuel cells. Mention the characteristics and advantages of fuel cells.	10	3	5	1,7
	(OR)				
b.	Explain the working of open cycle MHD power generation.	10	3	5	1,7

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Reg. No.														

B.Tech. DEGREE EXAMINATION, NOVEMBER 2022
Sixth and Seventh Semester

18MEO102T – ALTERNATIVE SOURCES OF ENERGY
(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours Max. Marks: 75

	Marks	BL	CO	PO
PART – A (25 × 1 = 25 Marks)				
Answer **ALL** Questions				
1. Which of the following type of collector used for low temperature system? (A) Flat plate collector (B) Line focusing parabolic collector (C) Paraboloid dish collector (D) Concentrator parabolic collector	1	1	1	1
2. Efficiency of practically used solar cell is approximately (A) 25% (B) 15% (C) 40% (D) 60%	1	1	1	1
3. In which collector the efficiency is maximum (A) Flate plate (B) Line focusing (C) Evacuated tube (D) Paraboloid dish	1	1	1	1
4. Which of the following is a commonly used material in solar cells? (A) Aluminium (B) Germanium (C) Silicon (D) Copper	1	1	1	1
5. The scattered solar radiation is called _____. (A) Direct radiation (B) Beam radiation (C) Diffuse radiation (D) Infrared radiation				
6. On which of the following factor power output in the wind energy not depend upon? (A) Blade radius (B) Sunlight (C) Air density (D) Wind speed	1	1	2	1
7. The speed at which the turbine starts producing power is called as (A) The cut-in speed (B) The cut-off speed (C) Rated speed (D) Betz limit	1	1	2	1
8. What happens to speed of wind between cut-in speed and rated speed? (A) Increases (B) Decreases (C) Zero (D) Infinity	1	1	2	1

9. What are wind energy conversion systems designed for? 1 1 2 1
   (A) To convert wind energy to mechanical energy
   (B) To covert wind energy to potential energy
   (C) To convert wind energy to electrical energy
   (D) To convert mechanical energy to wind energy

10. How does the output power vary between cut – in speed and the rated speed? 1 1 2 1
   (A) Cubically
   (B) Linearly
   (C) Square
   (D) Exponential

11. Which of the following statements does not describe tidal energy? 1 1 3 1
   (A) It is the kinetic energy from natural rise and fall of tides
   (B) It is the form of renewable energy
   (C) It is the energy derived from heating the ocean surface waters
   (D) It is obtained due to alternative sea levels

12. How non-condensable gases escape from the geothermal plant? 1 1 3 1
   (A) Air vents
   (B) Trap holes
   (C) Condenser ejectors
   (D) Centrifugal filter

13. Which is not a type of geothermal power plant? 1 1 3 1
   (A) Geomoderator power plant
   (B) Flash steam power plant
   (C) Dry stem power plant
   (D) Binary power point

14. A tide whose difference between high and low tides is called as 1 1 3 1
   (A) Divernal tide
   (B) Neap tide
   (C) Spring tide
   (D) Ebb tide

15. The Ocean Thermal Energy Conversion (OTEC) is uses _____. 1 1 3 1
   (A) Energy difference
   (B) Potential difference
   (C) Temperature difference
   (D) Kinematic difference

16. Biomass is used in the production of 1 1 4 1
   (A) Fibers
   (B) Chemicals
   (C) Transportation fuels
   (D) Biochemical

17. In biomethane, the percentage of carbondioxide is 1 1 4 1
   (A) 55 – 60
   (B) 35 – 45
   (C) 32 – 43
   (D) 42 – 45

18. This is also called as a biogas 1 1 4 1
   (A) Biobytanol
   (B) Biodiesel
   (C) Bioethanol
   (D) Biomethane

19. Bioethanol is mixed with _____ to prepare transportation fuel. 1 1 4 1
   (A) Oil
   (B) Petrol
   (C) Kerosene
   (D) Diesel

20. The aerobic digestion of sewage is utilized in the production of 1 1 4 1
   (A) Metal articles
   (B) Biofuels
   (C) Biomass
   (D) Synthetic fuels

21. Which of the following is incorrect for fuel cells. 1 1 5 1
   (A) They are modular
   (B) They are highly efficient
   (C) The noise level is very high
   (D) The emission level is much below the permissible level

22. The standard emf is _____ for hydrogen- oxygen fuel cells.
   (A) 3.96 V
   (B) 1.23 V
   (C) 0.58 V
   (D) 2.54 V

23. Which of the following use hydrogen as fuel? 1 1 4 1
   (A) Fossil fuels
   (B) Anaerobic digestion
   (C) Fuel cells
   (D) Cooking

24. In MHD generator, the conductor is made of 1 1 5 1
   (A) Copper
   (B) Aluminum
   (C) Gas
   (D) Liquid metal

25. In closed cycle MHD – steam power plant, which of the following gas is seeded in the MHD duct"?
   (A) Helium
   (B) Xenon
   (C) Sdihm
   (D)

PART – B (5 × 10 = 50 Marks) Marks BL CO PO
Answer **ALL** Questions

26. a. Describe the solar pond power plant with neat diagram. 10 2 1 1,7

(OR)

   b. Explain the working of solar vapour absorption refrigeration system with neat diagram. 10 2 1 1,7

27. a. What is meant by Betz limit? Show that a wind turbine cannot extract more than 59.3% of the wind energy? 10 3 2 1,7

(OR)

   b. Draw the schematic diagram of horizontal axis wind turbine system and explain the function of various components. 10 2 2 1,7

28. a. Explain the operation of vapour dominated geothermal energy system with neat schematic diagram. 10 2 3 1,7

(OR)

   b. Explain the working of Anderson cycle ocean thermal energy conversion system with neat sketch. 10 2 3 1,7