b.	The observed differencc bctwcen the high and low tide is 8.5 m for a proposed site. The basin area is about 0.5 km^2 which can generate power for 3 hours in each cycle. The average available head is assumed to be 8m, and overall efficiency to be 72%. Calculate the power at any instant and the yearly output. Average density of sea water is assumed to be 1025 kg/m^3.	10	2	3	1,7
29. a.i.	What do you mean by thermo-chemical conversion of biomers?	4	2	4	1,7
ii.	Draw the schematic sketch of fixed dome biogas plant.	6	2	4	1,7
	(OR)				
b.	Explain the working of gasifier. Also describe any two types of gasifeir with schematic diagram.	10	3	4	1,7
30. a.	Explain the process of opencycle magneto hydrodynamics. Write the comparison between opencycle MHD and closed cycle MHD.	10	3	5	1,7
	(OR)				
b.	Describe the working principle of solid oxide fuel cells. Mention the characteristics and advantages of fuel cells.	10	3	5	1,7

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Reg. No.															

B.Tech. DEGREE EXAMINATION, MAY 2022
Sixth 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

PART – A (25 × 1 = 25 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
1.	A solar cell is an electrical device that converts the energy of light directly into electricity by _____ (A) Photovoltaic effect (B) Chemical effect (C) Atmospheric effect (D) Physical effect	1	1	1	1
2.	The region where all the light from the source is blocked is called _____ (A) Antumbra (B) Shadow (C) Umbra (D) Penumbra	1	1	1	1
3.	Efficiency of solar cell is approximately_____ (A) 25% (B) 15% (C) 40% (D) 60%	1	1	1	1,7
4.	Which of the instrument measures the direct radiation? (A) Pyranometer (B) Pyroheliometer (C) Pyrogeometer (D) Sunglass recorder	1	1	1	1,7
5.	The angle between the direct radiation and vertical plane is _____ (A) Zenith angle (B) Incidence angle (C) Solar azimuth angle (D) Altitude angle	1	1	1	1
6.	The main source for the formation of wind is _____ (A) Sun (B) Uneven land (C) Season (D) Vegetation	1	1	2	1
7.	The amount of wind energy available at any instant will be proportional to_____ of wind speed. (A) Square root power of two (B) Square root power of three (C) Square power (D) Cube power	1	1	2	1,7
8.	The minimum speed of turbine at which the turbine start developing power is known as (A) Wind speed (B) Cut off speed (C) Furling speed (D) Cut in speed	1	1	2	1,7

9. Which of the following type is omni-directional? 1 1 2 1
(A) Horizontal axis wind turbine (B) Vertical axis wind turbine
(C) Hybrid type wind turbine (D) Vertex type wind turbine

10. Calculate tip speed ratio of turbine with speed of rotor 40 rpm, wind speed 20 m/s, radices of rotor 40 m. 1 1 2 1,7
(A) 10.254 (B) 8.378
(C) 6.548 (D) 5.265

11. Which components are used to convert mechanical energy into electrical energy? 1 1 3 1
(A) Turbine and generator (B) Penstock and turbine
(C) Tailstock and generator (D) Penstock and tail stock

12. Which type of turbine will have high head? 1 1 3 1,7
(A) Pelton turbine (B) Kaplan turbine
(C) Francis turbine (D) Reaction turbine

13. Geothermal power plant which pulls deep, high pressurized hot water is _____ 1 1 3 1,7
(A) Drysteam geothermal power plant (B) Vapour dominated geothermal plant
(C) Flash steam geothermal plant (D) Binary geothermal plant

14. Which one has least CO_2 emissions per unit of energy produced? 1 1 3 1,7
(A) Gas power plant (B) Geothermal power plant
(C) Biomass power plant (D) Coal power plant

15. When the water pressure become less than vapour pressure of water, bubbles of water vapour will form with in fluid. This process is called _____ 1 1 3 1,7
(A) Shear stress (B) Viscosity
(C) Cavitation (D) Deformation

16. Which of the following is not a stage in gasification process? 1 1 4 1
(A) Drying (B) Oxidation
(C) Fermentation (D) Reduction

17. Which of the following is generated in large quantity by the anaerobic fermentation of organic waste? 1 1 4 1
(A) Nitrogen (B) Hydrogen
(C) Methane (D) Carbondioxide

18. Which of the following is the major constituent of wood gasification? 1 1 4 1
(A) Nitrogen (B) Methane
(C) Carbon monoxide (D) Carbon dioxide

19. Pyrolysis yields _____ 1 1 4 1
(A) Solid fuel (B) Liquid fuel
(C) Gaseous fuel (D) Solid (or) liquid (or) gaseous fuel

20. Biodiesel is produced from oils (or) fats using _____ 1 1 4 1
(A) Fermentation (B) Trans esterification
(C) Distillation (D) Digestion

21. The energy required to extract an electron from the metal is known as _____ 1 1 5 1,7
(A) Work function (B) Puling energy
(C) Electrical energy (D) Path function

22. The conversion efficiency of a magneto hydro dynamic system is around _____ 1 1 5 1,7
(A) 50% (B) 70%
(C) 80% (D) 90%

23. Efficiency of thermo-electric generator depends up on _____ 1 1 5 1
(A) Voltage and current (B) Hot and cold junction temperature
(C) Resistance effect (D) High temperature function alone

24. In a thermionic generator, the space charge around the emitter can be greatly reduced by _____ 1 1 5 1
(A) Decreasing the gap between the electrodes (B) Increasing the gap between the electrodes
(C) Decreasing the temperature (D) Increasing the temperature

25. Metal hydride is used for the storage of _____ 1 1 5 1
(A) Hydrogen energy (B) Wind energy
(C) Biomass energy (D) Solar energy

PART – B (5 × 10 = 50 Marks)

Answer **ALL** Questions

		Marks	BL	CO	PO
26. a.	Explain the working of solar flat plate collector with a diagram. Also explain how solar efficiency varies with angular position.	10	3	1	1,7
	(OR)				
b.	Explain solar refrigeration system with neat diagram.	10	3	1	1,7
27. a.	Explain the factors to be considered for site selection for horizontal axis wind turbine.	10	2	2	1,7
	(OR)				
b.	The wind velocity at a wind site is available at 12m/s. The wind mill selected is 10 m diameter and 5 rps with maximum efficiency of 35%. Find the power output on the turbine.	10	3	2	1,7
28. a.	Draw the layout of open OTEC system. Also discuss the working of single and double basin tidal power plant.	10	2	3	1,7
	(OR)				