

Mech

University of Mumbai

Examinations summer 2022

Program: BE (Mechanical Engineering)

Curriculum Scheme: Examination: BE (Sem.VIII)

Course Code: MEDLO8043

Course Name: Renewable Energy Sources

Time: 2hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Ocean thermal energy is produced due to
Option A:	Pressure difference at different levels in the ocean.
Option B:	Temperature difference at different levels in the ocean.
Option C:	Energy stored by waves in the ocean.
Option D:	Tides rising out of the ocean.
2.	KVIC model plants are
Option A:	Fixed Dome Biogas Plants
Option B:	Floating Drum Biogas Plants
Option C:	Balloon Biogas Plants
Option D:	Polyethylene Tube Digester Biogas Plants.
3.	Path length of radiation through the atmosphere to the length of path when the sun is at zenith is called
Option A:	Declination
Option B:	Air mass
Option C:	Azimuth
Option D:	Solar Constant
4.	The angle through which the earth must turn to bring the meridian of a point directly in sun's rays is called
Option A:	Declination
Option B:	Zenith angle
Option C:	Latitude
Option D:	Hour angle
5.	At wind speed exceeding the rated value, the rotor speed is held constant by automatic adjustment of _____ of blades.
Option A:	Pitch
Option B:	speed of rotor
Option C:	chord length of blades
Option D:	increasing load on blades
6.	The fraction of time during a given period that the turbine is actually on line is called?
Option A:	Cut out velocity
Option B:	Flat rating
Option C:	Availability factor
Option D:	Cut in velocity
7.	If retention period is r and volume of fluid in digester is V , the digester volume is given by
Option A:	V/r

Option B:	Vxr
Option C:	V+r
Option D:	V-r
8.	What is Hour angle at 10.30 a.m ?
Option A:	-22.5°
Option B:	22.5°
Option C:	-45°
Option D:	45.°
9.	What is duration between two high tide?
Option A:	29 days 44 min
Option B:	6 h 25 min
Option C:	12 h 50 min
Option D:	14 days
10.	The process of producing energy by utilizing heat trapped inside the earth surface is called
Option A:	hydrothermal energy
Option B:	solar energy
Option C:	geo-Thermal energy
Option D:	wave energy

Q2	Solve any Four out of Six	5 marks each
A	Explain any two solar radiation measurement devices.	
B	Calculate the variation of day length over a year on 19 th of each month of 2020 for location of Delhi (28°35'N, 77°42'E)	
C	Calculate the useful heat content per square km of dry rock granite to a depth of 7 km. Take the geothermal temperature gradient at 40°C/km, Take the minimum useful temperature as 140 K above the surface temperature, and rock density of 2700kg/m ³	
D	Write short note on OTEC plant.	
E	Explain any one wave energy conversion device.	
F	Differentiate between Horizontal axis and Vertical axis wind turbines.	

Q3	Solve any Two Questions out of Three 10 marks each
A	Estimate the monthly average global radiation on a horizontal surface at Ratnagiri (16°59'N, 72°05'E) during the month of march if the average sunshine hour per day is 9.5. Take a=0.31 and b=0.43
B	Explain the various factors in details which affect the production of biogas.
C	What is betz coefficient? Derive maximum power coefficient for horizontal axis wind mill.

Q4	Solve any Two Questions out of Three 10 marks each
A	Define and explain 1) latitude 2) Hour angle 3) Declination 4) Day length 5) Slope
B	Draw and explain working of KVIC design of biogas digester
C	Calculate the number of animals and volume of bio digester required to produce Power for a household which has power requirement of 0.8 kW for lighting and cooking purpose. Take calorific value of methane as 28 MJ/m ³ , Burner efficiency as 70%, Retention period as 25 days, Dry matter per animal per day per animal is 1.8 kg, density of dry matter in slurry in digester is 50 kg/m ³ , Biogas yield is 0.3m ³ per kg of dry input, Methane proportion in gas is 0.7.

Compose

Mail

Inbox

216

Starred

Snoozed

Chat



No conversations
Start a chat

Spaces



No spaces yet
Create or find a space

Meet

Correction in Q.P. Code:93673 External Inbox x

support@muapps.in via amazonsees.com
to me

12:04 PM (12 minutes ago)



University of Mumbai

1T01428 - B.E (Mechanical Engineering) (SEM-VIII)(Choice Base Credit Grading System) / 53356 - Renewable Energy Systems (DLOC)
Correction in Q.P. Code:93673

Additional data in
Question no 2 (c):
specific heat of rock = 820 J/kg K

University of Mumbai