**SAMPLE QUESTION BANK**

**Program: BE (Mechanical Engineering)**

Curriculum Scheme: **Rev 2016**

**BE Semester VIII**

Course Code:MEDLOC8043 and Course Name: Renewable Energy Systems

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**MCQ- SAMPLE SET**

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| 1. | 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 |
|  |  |
| 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. | The Tidal Range is |
| Option A: | the vertical difference between high and low tide. |
| Option B: | the time duration between high and low tide. |
| Option C: | the length of the tidal coast. |
| Option D: | the height of the tidal dam. |
|  |  |
| 4. | The ocean thermal energy conversion(OTEC) uses \_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | Energy difference |
| Option B: | Kinetic difference |
| Option C: | Temperature difference |
| Option D: | Potential difference |
|  |  |
| 5. | Which types of biogas plant are fed and emptied |
| Option A: | Batch type plants |
| Option B: | Drum type plants |
| Option C: | Dome type plants |
| Option D: | Continuous type plants |
|  |  |
| 6. | What is Hour angle at 10.30 am ? |
| Option A: | -22.5° |
| Option B: | 22.5° |
| Option C: | -45° |
| Option D: | 45.° |
|  |  |
| 7. | What is Angle of Declination on June 22 ? |
| Option A: | -23.45° |
| Option B: | 23.45° |
| Option C: | 0° |
| Option D: | 90° |
|  |  |
| 8. | Which control is used to maintain the optimum blade angle to achieve certain rotor speeds or power output of wind turbines? |
| Option A: | Pitch control |
| Option B: | Yaw Control |
| Option C: | Tethering Control |
| Option D: | Power control |
|  |  |
| 9. | Betz coefficient is |
| Option A: | 5.39 |
| Option B: | 935 |
| Option C: | 39.5 |
| Option D: | 0.593 |
|  |  |
| 10. | The value of Solar Constant is |
| Option A: | 1347 W/m2 |
| Option B: | 1357 W/m2 |
| Option C: | 1367 W/m2 |
| Option D: | 1377 W/m2 |
|  |  |
| 11. | Which of the following has the lowest efficiency? |
| Option A: | Solar energy |
| Option B: | Wind energy |
| Option C: | Wave energy |
| Option D: | OTEC |
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| 12. | The ocean thermal energy conversion (OTEC) is uses \_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | Energy difference |
| Option B: | Potential difference |
| Option C: | Temperature difference |
| Option D: | Kinetic difference |
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| 13. | Biogas is a mixture of |
| Option A: | 55-65% methane,30-40 % carbon dioxide and the rest being hydrogen, hydrogen sulphide and nitrogen |
| Option B: | 30-40% methane,55-60 % carbon dioxide and the rest being hydrogen, hydrogen sulphide and nitrogen |
| Option C: | 55-65% methane,30-40 % mixture of hydrogen, hydrogen sulphide and nitrogen and the rest being carbon dioxide |
| Option D: | 30-40% methane,55-65 % mixture of hydrogen, hydrogen sulphide and nitrogen and the rest being carbon dioxide |
|  |  |
| 14. | In biogas plants minimum distance to prevent the seepage of slurry to wells is |
| Option A: | 2 m |
| Option B: | 5m |
| Option C: | 15m |
| Option D: | 6 m |
|  |  |
| 15. | What is the main source for the formation of wind? |
| Option A: | Uneven land |
| Option B: | Sun |
| Option C: | Vegetation |
| Option D: | Seasons |
|  |  |
| 16. | Which type of wind turbine has low RPM? |
| Option A: | Small wind turbine |
| Option B: | Medium wind turbine |
| Option C: | Remote wind turbine |
| Option D: | Remote wind turbine |
|  |  |
| 17. | Solar radiation which reaches the surface without scattering or absorbed is called \_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | Diffuse radiation |
| Option B: | Beam Radiation |
| Option C: | Infrared radiation |
| Option D: | Ultraviolet radiation |
|  |  |
| 18. | Natural gas is mainly composed of:- |
| Option A: | Carbon and hydrocarbons |
| Option B: | Methane with small amount of propane and ethane |
| Option C: | Nitrogen |
| Option D: | Hydrogen |
|  |  |
| 19. | How do fuel cells generate electricity? |
| Option A: | Electrochemical reaction |
| Option B: | combustion |
| Option C: | fusion |
| Option D: | organic reaction |
|  |  |
| 20. | For which of these devices does negative charge carriers flow from anode to cathode in the external circuit? |
| Option A: | MHD |
| Option B: | Thermoelectric generator |
| Option C: | Fuel cells |
| Option D: | Thermionic generator |
|  |  |
| 21. | Steam reforming is currently the least expensive method of producing \_\_\_\_\_\_\_\_\_\_\_. |
| Option A: | Natural gas |
| Option B: | Biogas |
| Option C: | Hydrogen |
| Option D: | Coal |
|  |  |
| 22. | The main composition of biogas is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| Option A: | Hydrogen |
| Option B: | Carbon dioxide |
| Option C: | Nitrogen |
| Option D: | Methane |
|  |  |
| 23. | Solar radiation received at any point of earth is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| Option A: | Infrared rays |
| Option B: | Insolation |
| Option C: | Beam Radiation |
| Option D: | Diffuse Radiation |
|  |  |
| 24. | Diffuse radiation in the extraterrestrial region is \_\_\_\_\_\_\_\_\_. |
| Option A: | zero |
| Option B: | minimum |
| Option C: | maximum |
| Option D: | medium |
|  |  |
| 25. | In which type of absorber plate is the overall flow direction is along the absorber glass plate? |
| Option A: | Finned absorber |
| Option B: | Non-porous absorber plate |
| Option C: | Overlapped glass absorber |
| Option D: | Porous absorber plate |
|  |  |
| 26. | What happens when the land near the earth’s equator is heated? |
| Option A: | All the oceanic water gets heated up |
| Option B: | Low tides |
| Option C: | High tides |
| Option D: | Large atmospheric winds are created |
|  |  |
| 27. | A device for showing direction of wind as well used as a decorative purpose? |
| Option A: | Anemometers |
| Option B: | Weather vane |
| Option C: | Pin wheels |
| Option D: | Wind socks |
|  |  |
| 28. | Gasification, steam gasification and hydrogenation are \_\_\_\_\_\_\_. |
| Option A: | Are one and the same |
| Option B: | biochemical conversion |
| Option C: | types of fermentation |
| Option D: | types of pyrolysis |
|  |  |
| 29. | The hole on earth’s surface from where the steam from the earth comes out is called as \_\_\_\_\_\_\_\_\_. |
| Option A: | Gash |
| Option B: | Mud pot |
| Option C: | Fumarole |
| Option D: | Void |
|  |  |
| 30. | The electrolytic solution used in a hydrogen-oxygen fuel cell is \_\_\_\_\_\_\_\_\_\_\_\_. |
| Option A: | 75% KOH solution |
| Option B: | 25% KOH solution |
| Option C: | 25% NaOH solution |
| Option D: | 75% NaOH solution |
|  |  |
| 31. | For meeting the future energy requirements India is planning to have |
| Option A: | More use of fossil fuels |
| Option B: | Less energy consumption |
| Option C: | More use of Renewable energy |
| Option D: | Complete ban on fossil fuel |
|  |  |
| 32. | Based on traditional use energy sources are classified as |
| Option A: | Conventional & Non-conventional |
| Option B: | Non-renewable & Renewable |
| Option C: | Commercial & Non commercial |
| Option D: | Primary & secondary sources |
|  |  |
| 33. | Which of the renewable energy has maximum potential in India |
| Option A: | wind |
| Option B: | Geothermal |
| Option C: | Hydrogen |
| Option D: | Solar |
|  |  |
| 34. | The efficiency of various types of collectors \_\_\_\_\_\_ with \_\_\_\_\_\_\_ temperature. |
| Option A: | increases, decreasing |
| Option B: | decreases, increasing |
| Option C: | remains same, increasing |
| Option D: | depends upon type of collector |
|  |  |
| 35. | The global radiation reaching a horizontal surface on the earth is given by |
| Option A: | Hourly beam radiation + Hourly diffuse radiation |
| Option B: | Hourly beam radiation – Hourly diffuse radiation |
| Option C: | Hourly beam radiation / Hourly diffuse radiation |
| Option D: | Hourly diffuse radiation / Hourly beam radiation |
|  |  |
| 36. | The angle made in the horizontal plane between the horizontal line due south and the projection of the normal to the surface on the horizontal plane is |
| Option A: | Hour angle |
| Option B: | Declination |
| Option C: | Surface azimuth angle |
| Option D: | Solar altitude angle |
|  |  |
| 37. | The hour angle is equivalent to |
| Option A: | 10° per hour |
| Option B: | 15° per hour |
| Option C: | 25° per hour |
| Option D: | 45° per houR |
|  |  |
| 38. | What does Heating and cooling of the atmosphere generates? |
| Option A: | Thermo line circulation |
| Option B: | Radiation currents |
| Option C: | Convection currents |
| Option D: | Conduction currents |
|  |  |
| 39. | How much wind power does India hold? |
| Option A: | 20,000 MW |
| Option B: | 12,000 MW |
| Option C: | 140,000 MW |
| Option D: | 5000 MW |
|  |  |
| 40. | What is the main source for the formation of wind? |
| Option A: | Uneven land |
| Option B: | Sun |
| Option C: | Vegetation |
| Option D: | Seasons |
|  |  |
| 41. | Which type of windmill has better performance? |
| Option A: | Vertical type wind mills |
| Option B: | Darrieus type machines |
| Option C: | Magnus effect rotor |
| Option D: | Horizontal type windmills |
|  |  |
| 42. | Biomass is produced by which substances. |
| Option A: | Stones |
| Option B: | Water |
| Option C: | Plants and aquatic derivatives |
| Option D: | Soil |
|  |  |
| 43. | Which parameter is not effecting the biomass conversion process |
| Option A: | Temperature |
| Option B: | Pressure |
| Option C: | Culture condition |
| Option D: | Volume |
|  |  |
| 44. | Which one is the types of gasifiers |
| Option A: | Criss-cross gasifiers |
| Option B: | Linedraft gasifiers |
| Option C: | Updraft gasifiers |
| Option D: | Mis-match gasifiers |
|  |  |
| 45. | Closed cycle systems use the fluid having \_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | High boiling points |
| Option B: | Low boiling points |
| Option C: | High viscosity |
| Option D: | Low viscosity |
|  |  |
| 46. | The open cycle system produces \_\_\_\_\_\_\_\_ water |
| Option A: | Desalinated |
| Option B: | Impure |
| Option C: | Contaminated |
| Option D: | Chlorinated |
|  |  |
| 47. | Vapour dominated geothermal systems are called as |
| Option A: | Petro thermal systems |
| Option B: | Geopressure systems |
| Option C: | Dry steam fields |
| Option D: | Hot dry rock systems |
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| 48. | A fuel cell is used to convert chemical energy into \_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | Mechanical energy |
| Option B: | Solar energy |
| Option C: | Electrical energy |
| Option D: | Potential energy |
|  |  |
| 49. | Which state has maximum installed capacity of wind energy as on date |
| Option A: | Maharashtra |
| Option B: | MP |
| Option C: | UP |
| Option D: | Tamilnadu |
|  |  |
| 50. | Which of the following energy source is used most widely as primary energy consumption in the world |
| Option A: | Coal |
| Option B: | Natural gas |
| Option C: | Oil |
| Option D: | Hydro |
|  |  |
| 51. | Considering current known reserves, Fossil fuels are going to get depleted in |
| Option A: | 1000-1500 years |
| Option B: | 36800 years |
| Option C: | 368 years |
| Option D: | 70-100 years |
|  |  |
| 52. | The power from the sun intercepted by the earth is approximately |
| Option A: | 1.8 x 108 MW |
| Option B: | 1.8 x 1011 MW |
| Option C: | 1.8 x 1014 MW |
| Option D: | 1.8 x 1017 MW |
|  |  |
| 53. | The ratio of the beam radiation flux falling on a tilted surface to that falling on a horizontal surface is called the |
| Option A: | Radiation shape factor |
| Option B: | Tilt factor |
| Option C: | Slope |
| Option D: | sun factor |
|  |  |
| 54. | The angle made by the plane surface with the horizontal is known as |
| Option A: | Latitude |
| Option B: | Slope |
| Option C: | Surface azimuth angle |
| Option D: | Declination |
|  |  |
| 55. | In the paraboloid dish concept, the concentrator tracks the sun by rotating about |
| Option A: | One axes |
| Option B: | TWO axes |
| Option C: | THREE axes |
| Option D: | FOUR axes |
|  |  |
| 56. | What are used to turn wind energy into electrical energy? |
| Option A: | Turbine |
| Option B: | Generators |
| Option C: | Yaw motor |
| Option D: | Blades |
|  |  |
| 57. | At what range of speed is the electricity from the wind turbine is generated |
| Option A: | 5 – 25m/s |
| Option B: | 10 – 35m/s |
| Option C: | 20 – 45m/s |
| Option D: | 30 – 55m/s |
|  |  |
| 58. | A wind turbine designed to come into operation at a minimum wind speed is called \_\_\_\_\_\_\_\_\_ |
| Option A: | Cut in velocity |
| Option B: | Windward |
| Option C: | Cut out velocity |
| Option D: | Upwind location |
|  |  |
| 59. | Algae is responsible to produce |
| Option A: | Biomass energy |
| Option B: | Wind energy |
| Option C: | Ocean energy |
| Option D: | Geo-thermal energy |
|  |  |
| 60 | The Fermentation is a process of decomposition of organic matter by |
| Option A: | Yeasts only |
| Option B: | Bacteria and Yeasts |
| Option C: | Mosquitoes and bacteria |
| Option D: | Larvas and yeasts |
|  |  |
| 61. | In the Pyrolysis process |
| Option A: | Charcoal and Lignin breakdowns |
| Option B: | Coal and Magnise breakdowns |
| Option C: | Charcoal and Lignin fusions |
| Option D: | coal and Magnin fusion |
|  |  |
| 62. | Which is related to wet process |
| Option A: | Aerobic Digestion |
| Option B: | Anaerobic Digestion |
| Option C: | Oxidation |
| Option D: | Liquefaction |
|  |  |
| 63. | Warm surface sea water is pumped through a \_\_\_\_\_\_\_\_ to vaporise the fluid. |
| Option A: | Heat exchanger |
| Option B: | Generator |
| Option C: | Evaporator |
| Option D: | Condenser |
|  |  |
| 64. | In \_\_\_\_\_\_ method the sea water enters a vacuum chamber and flash evaporated |
| Option A: | Closed cycle system |
| Option B: | Open cycle system |
| Option C: | Hybrid OTEC |
| Option D: | Neither closed nor open system |
|  |  |
| 65. | Waves are caused indirectly by \_\_\_\_\_ |
| Option A: | Wind energy |
| Option B: | Solar energy |
| Option C: | Geo-thermal energy |
| Option D: | Wave energy |
|  |  |
| 66. | The electrolytic solution used in alkaline fuel cell is \_\_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | 40% KOH solution |
| Option B: | 25% KOH solution |
| Option C: | 75% NaOH solution |
| Option D: | 25% NaOH solution |
|  |  |
| 67. | Which method is best for small plants for H2 production? |
| Option A: | Electrolysis |
| Option B: | Thermal decomposition |
| Option C: | Partial oxidation |
| Option D: | None of the mentioned |
|  |  |
| 68. | Which Indian enterprise has the Motto “ENERGY FOREVER”? |
| Option A: | Indian Renewable Energy Development Agency |
| Option B: | Indian Non-Renewable Energy Development |
| Option C: | Indian Agricultural Development |
| Option D: | Indian Biotechnology Development |
|  |  |
| 69. | A hydrogen fuel cell bus was launched in 2019 in India by? |
| Option A: | Tata Motors |
| Option B: | Ford Motors |
| Option C: | Tesla |
| Option D: | Mahindra & Mahindra |
|  |  |
| 70. | The natural gas industry in India began in which of the following year? |
| Option A: | 1970s |
| Option B: | 1960s |
| Option C: | 1980s |
| Option D: | 1990s |
|  |  |
| 71. | How much would be the angle of declination on DECEMBER 21 at 09:00 h (LAT). The collector s located in New Delhi (28˚35’N, 77o12’E) and is tilted at an angle of 36˚ with the horizontal and is pointing south? |
| Option A: | -44.28˚ |
| Option B: | -28.92˚ |
| Option C: | -23.45˚ |
| Option D: | -42.22˚ |
|  |  |
| 72. | The angle between the sun’s rays and a line perpendicular to the horizontal plane through angle the beam of the sun and vertical is called \_\_\_\_\_\_\_\_\_\_ |
| Option A: | Solar Azimuth angle |
| Option B: | Zenith angle |
| Option C: | Altitude angle |
| Option D: | Declination |
|  |  |
| 73. | In which collector does airflow without any obstruction? |
| Option A: | Porous absorber plate |
| Option B: | Non-porous absorber plate |
| Option C: | Over lapped glass absorber |
| Option D: | Finned absorber |
|  |  |
| 74. | Angular distance of sun’s rays north or south of the equator is called \_\_\_\_\_\_\_ |
| Option A: | Declination |
| Option B: | Hour angle |
| Option C: | Latitude |
| Option D: | Air mass |
|  |  |
| 75. | Anemometry is defined as the process of ascertaining the \_\_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | Nature, pattern, and direction of wind or an airflow |
| Option B: | Force, speed, and direction of weather or a monsoon |
| Option C: | Force, speed, and direction of wind or an airflow |
| Option D: | Nature, speed, and direction of tidal waves of ocean |
|  |  |
| 76. | The mechanisms for producing forces from wind are, |
| Option A: | Lift & draft force |
| Option B: | Lift & drag force |
| Option C: | Lift & axial force |
| Option D: | Airfoil & wing force |
|  |  |
| 77. | What does TSR stand for in design consideration of wind mills? |
| Option A: | Tip speed ratio |
| Option B: | Torque-synchronous ratio |
| Option C: | Tip suspension ratio |
| Option D: | Temporary speed restriction |

**Descriptive SAMPLE SET**

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| Q1. | Describe working of closed cycle OTEC system withsketch. |
| Q2. | What is wave energy? Explain any one wave energy conversion system. |
| Q3. | Classify wind mills in detail. |
| Q4. | Calculate the variation of day length over a year on 19 th of each month of 2020 for location of Delhi (28035’N,77042’E) and plot the same on graph. |
| Q5. | Explain the various factors in details which affect the production of biogas. |
| Q6. | Explain factors to be considered in Wind energy site selection. |
| Q7. | What is importance of renewable energy sources? What is the present energy scenario in India? |
| Q8. | Draw and explain working of KVIC design of biogas digester. |
| Q9. | Estimate the monthly average daily global radiation on a horizontal surface at Ratnagiri (16°59' N, 72°05' E) during the 16th march if the average sunshine hours per day is 9.5. Assume the value of a=0.31 and b=0.43. |
| Q10. | A tidal power plant of the simple single basin type has a basin area of 30×106 m2. The tide has a range of 12m. The turbine however stops operating when the head on it fall below 3 m. Calculate the energy generated in one filling (or emptying) process, in kWh if the turbine generator efficiency =73%. |
| Q11. | |  | | --- | | Explain Global and National energy scenarios. | |
| Q12. | Explain vertical axis wind turbine with neat sketch. |
| Q13. | Explain hybrid energy system. |
| Q14. | Data for flat plate collector used for heating abuilding is given below.  Location and latitude:- Baroda , 22ºN  Day and time :- Jan 01 , 11:30 – 12:30 (IST)  Annual average intensity of solar radiation :- 0.5 Langley / minute  Collector tilt:- +15º  Number of glass cover :- 02  Heat removal factor of the collector :- 0.810  Transmittance of the glass :- 0.88  Absorptance of the glass :- 0.90  Top loss coefficient for the collector :- 7.88 W/m2ºC  Collector fluid temperature :- 60ºC  Ambient temperature :- 15ºC  Diffusive reflectance for two covers :- 0.24  Calculate: - 1. Solar altitude angle  2. Incident angle  3. Collector efficiency. |
| Q15. | (i)The initial temperature and heat content per sq km above 40ºC of an aquifer of thickness 0.5 km, depth 3 km, porosity 5% under sediments of density 2700 kg/m3, specific heat capacity 840 J/KgK , Temperature gradient 30ºC/km.  (ii) Suggest and use for heat, if the average surface temperature is 10ºC  (iii) What is the time constant for useful heat extraction with a pumped water extraction of 100 l/s km2? What is the thermal power extracted initially and after 10 years? |
| Q16. | Explain social & economic effects of global energy crises in details |
| Q17. | Explain solar Liquid flat plate collector & it’s working |
| Q18. | Explain components of wind energy conversion system |
| Q19. | Discuss the factors which affect the production of biogas. |
| Q20. | What is geothermal Energy? State its applications with advantages and limitations. |
| Q21. | What is Fuel Cell? Classify it in brief. |
| Q22. | Explain various alternate sources to overcome these global energy crisis |
| Q23. | Explain in details the Pyranometer. |
| Q24. | Brief the different methods of obtaining energy from biogas? |
| Q25. | Describe limitation and scope of tidal power plant. |
| Q26. | Differentiate between fuel cell and battery. |
| Q27. | Explain briefly origin and type of geothermal energy regions. |
| Q28. | Write short note on tidal power generation system. |
| Q29. | Explain any two solar radiation measurement devices. |
| Q30. | What is betz coefficient? Derive maximum power coefficient for horizontal axis wind mill. |
| Q31. | Discuss in brief, what are the effects of various parameters on the performance of flat plate collector |
| Q32. | Explain with neat sketches, how energy from Geothermal source can be obtained in different ways. |
| Q33. | How can wave energy be utilized? |
| Q34. | Define and explain the following: i) latitude angle ii) Hour angle iii) Declination angle iv) Day length. |
| Q35. | Discuss working of flat plate collector using air as working medium. |
| Q36. | Explain solar water distillation with neat sketch. |
| Q37. | Explain geo-pressured hot dry rock as a source of geothermal source. |
| Q38. | Calculate the number of animals and volume of biodegster 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/m3, 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/m3, Biogas yield is 0.3m3 per kg of dry input, Methane proportion in gas is 0.7 . |
| Q39. | Define & explain the following terms:  i) Latitude  ii) Declination  iii) Surface Azimuth Angle  iv) Hour Angle  v) Day Length |
| Q40. | Describe with a neat sketch the working of wind energy system showing the main components. Discuss advantages and disadvantages of wind energy conversion systems. |
| Q41. | Calculate the useful heat content per square km of dry rock granite to a depth of 7 km. Take the geothermal temperature gradient at 400C/km, Take the minimum useful temperature as 140 K above the surface temperature, and rock density of 2700kg/m3 |
| Q42. | Write short note on energy planation. |
| Q43. | State various direct applications of solar energy. Explain solar heating and cooling of buildings. |
| Q44. | Derive an expression for average tidal power generation per unit area of basin in terms of tidal range. |
| Q45. | Explain earth-sun angles with neat sketch. |
| Q46. | Explain OTEC with neat sketch mention its merits and demerits. |
| Q47. | Explain analysis of aerodynamic forces acting on wind mill blade. |
| Q48. | Differentiate between Horizontal axis and Vertical axis wind turbines. |
| Q49. | Wind at 1 bar 20°C has a velocity of 12m/s. Calculate:  i)Total power density in wind stream ii) maximum power density iii) A reasonable obtainable power density iv) Total power produced if rotor diameter is 60m and its runs at 50rpm. v) The torque and the axial thrust produced at maximum efficiency. |
| Q50. | Estimate monthly average total daily radiation of FPC facing south, at Delhi (28°35’N,77°12’E) during the month of November if the average sunshine hours per day is 9.5. Assume the values of a=0.31 and b=0.43. |
| Q51. | What is the liquid dominated hydrothermal resources? |
| Q52. | Write short notes on “prospects of geothermal energy in India”. |
| Q53. | Write short notes on “Methods of Hydrogen Production”. |
| Q54. | Following data are given for a family biogas digester suitable for the output of eight cows. Given: Calorific value of methane: 28MJ/m3, Burner efficiency: 70%, Retention period: 20days, Temperature of fermentation: 30°C, dry matter (cow dung) collected per cow per day: 2 kg, Density of dry matter in fluids (slurry) in the digester: 50 kg/m3, Biogas yield: 0.2m3 per kg of dry input, Methane proportion in the biogas 0.7. Calculate: 1) The volume of biogas digester 2) The power available from the digester. |
| Q55. | State various parameters which affect performance of solar collectors. State limitations of flat plate collectors. |