Total No. of printed pages = 6

END SEMESTER EXAMINATION – 2021

Semester : 5th

Subject Code : El/Me/Au/IP-505

NON CONVENTIONAL ENERGY SOURCES

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Instructions :

1. *All* questions of PART – A are compulsory.
2. Answer any *five* questions from PART – B.

PART – A

Marks – 25

1. Fill in the blanks : 1×10=10

   (a) Solar power on earth surface is ———.

   (b) Solar constant is ——— kW/m^2.

   (c) Wind energy is a form of ——— energy.

[Turn over

(d) Solar cell makes use of semi-conductor material based on single crystal ———.

(e) The best site for wind energy is found in ———.

(f) Lift forces act ——— to the air flow, while drag forces act ——— of air flow.

(g) Biomass is useful to produce ———.

(h) Biochemical conversion is one form —— conversion.

(i) Hot molten rock is generally called as ——.

(j) Fuel cell has very ——— conversion efficiency.

2. Write true or false : 1×10=10

(a) The savonius rotor is a horizontal axis machine.

(b) In Biogas, percentage of methane is in between 55-65%.

(c) By means of concentrating collectors, lower temperature is achieved in concentrating collector than the temperature in non-concentrating collector.

(d) In the non-concentrating type collector, the collector area is same as absorber area.

(e) Photo voltaic cells are made of semi conductor.

(f) The output voltage of a solar cell is AC.

(g) Biogas is produced by thermochemical conversion of Biomass.

(h) Winds having 5-25m/sec speed are suitable to operate wind turbine.

(i) In OTEC, closed cycle system is also known as claude cycle.

(j) The fuel cell is similar to other electric cell.

3. Choose the correct answer : $1 \times 5 = 5$

(a) Which type of coal has highest carbon content ?

(i) Anthracite (ii) Bituminus

(iii) Lignite (iv) Peat

(b) In the double basin system, turbines are located

(i) at the top of the upper basin

(ii) between the upper basin and lower basin

(iii) near the sluice gate

(iv) at the bottom of the lower basin

(c) Photovoltaic is conversion of sunlight into

(i) Chemical energy

(ii) Electricity

(iii) Biogas

(iv) Geo-thermal energy

(d) In case of tidal power plant how water is trapped from coastal water ?

(i) By building cannal

(ii) By digging walls

(iii) By building dams

(iv) By storing in tanks

(e) In which of the following heat is trapped inside earth surface ?

(i) Ocean-thermal energy conversion

(ii) Geo-thermal energy conversion

(iii) Solar energy conversion

(iv) None of these.

PART – B

Marks – 45

4. Answer the following :

(a) Write the three examples of conventional and non-conventional energy sources. 3

(b) What is solar insolation ? 2

(c) What are the reasons for variation in solar radiation reaching the earth than received at the outside of the atmosphere ? 4

5. (a) What do you mean by greenhouse effect ? 2

(b) What is meant by anaerobic digestion ? 2

(c) What is the principle of solar photovoltaic power generation ? 5

6. (a) Describe with neat sketch the working of WECS with main components. 6

(b) Why yaw control is needed in horizontal axis machine ? 3

7. (a) What are the forms of Biomass conversion ? 3

(b) Explain the constructional detail and working of Deenabandhu Biogas plant. 6

8. (a) Describe the closed cycle OTEC system. 6

(b) What are the main components of Tidal power plant ? 3

9. (a) What are the advantages of fuel cell ? 3

(b) Describe one closed cycle system MHD. 6