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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, December – 2020

(Fifth Semester)

BELPE 5041 / BEEPE 5041 – SOLAR, WIND & HYBRID ENERGY SYSTEMS

(EE & EEE)

Time: 2 hrs

Maximum: 50 Marks

The figures in the right hand margin indicate marks.**PART – A: (Multiple Choice Questions)****(1 x 10 = 10 Marks)**Q.1. Answer ALL questions

- a. Which of the following is categorized as Non- renewable energy?
- | | |
|-----------------------------------|-----------------------------------|
| (i) Electricity from fossil fuels | (i) Electricity from fossil fuels |
| (iii) Firewood | (iii) Firewood |
- b. The world's first 100% solar powered airport located at
- | | |
|---------------------------|---------------------------|
| (i) Cochin, Kerala | (i) Cochin, Kerala |
| (iii) Chennai, Tamil Nadu | (iii) Chennai, Tamil Nadu |
- c. In extraterrestrial radiation, what is the approximate percentage content of infrared component?
- | | |
|-----------|------------|
| (i) 45.5% | (ii) 55.5% |
| (iii) 90% | (iv) 80% |
- d. For 1 degree change in longitude, the change in solar time is
- | | |
|----------------|---------------|
| (i) 4minutes | (ii) 4seconds |
| (iii) 1minutes | (iv) 1hour |
- e. A cylindrical parabolic concentrator requires
- | | |
|---------------------|-------------------------------|
| (i) 2-axis tracking | (ii) 1-axis tracking |
| (iii) no tracking | (iv) seasonal adjustment only |
- f. An MPPT is basically
- | | |
|-------------------------------|-------------------------|
| (i) a dc –dc switch regulator | (ii) an ac-dc converter |
| (iii) a dc-ac inverter | (iv) an amplifier |
- g. There is a little wind in the
- | | |
|-------------------------|-----------------------------------|
| (i) North pole region | (ii) tropical region |
| (iii) south pole region | (iv) $\pm 5^0$ around the equator |
- h. Bio gas is predominantly
- | | |
|----------------------|----------------------|
| (i) hydrogen | (ii) carbon monoxide |
| (iii) carbon dioxide | (iv) methane |
- i. Full form of ICV is _____
- | | |
|------------------------------------|------------------------------------|
| (i) Internal combustion vehicles | (i) Internal combustion vehicles |
| (iii) Internally combined vehicles | (iii) Internally combined vehicles |
- j. Electric Vehicles are generally powered by
- | | |
|-------------------------|-------------------------|
| (i) Aluminium batteries | (i) Aluminium batteries |
| (iii) Sodium batteries | (iii) Sodium batteries |

PART – B: (Short Answer Questions)

(2 x 5 = 10 Marks)

Q.2. Answer ALL questions

- a. What are primary and secondary energy sources?
- b. What are the indirect forms of solar energy?
- c. What are the advantages of solar PV system?
- d. Which types of energy-storage systems are suited for peak shaving in electrical utility?
- e. Differentiate between wind-diesel hybrid system and wind –PV system

PART – C: (Long Answer Questions)

(6 x 5 = 30 Marks)

Answer ANY FIVE questions

Marks

3. Discuss main features of non conventional energy sources? (6)
4. Discuss different renewable sources of energy with special reference to the Indian context. (6)
5. Describe flat plate collector with the help of a suitable diagram. (6)
6. Determine the local apparent time (local solar time) corresponding to 13:30 IST on July 1, at Delhi ($28^{\circ}35'N$, $77^{\circ}12'E$). The equation of time correction on July 1 is - 4 minutes. In India, the standard time is based on $82^{\circ}30'E$. (6)
7. Draw and explain an equivalent circuit of a practical solar PV cell. (6)
8. With the help of block diagram, explain the functions of various blocks of a Wind Energy Conversion System. (6)
9. Write short notes on advantages and disadvantages of wind energy system. (6)
10. What are the advantages of Hybrid electric vehicles over electric cars? (6)

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