

M. Tech. Electrical Power System (CBCS Pattern) Sem-II  
**PEPS23 - Renewable Energy System**

P. Pages : 1

Time : Three Hours



**GUG/W/22/11023**

Max. Marks : 70

- Notes :
1. All questions carry equal marks.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.
  4. Illustrate your answers wherever necessary with the help of neat sketches.
  5. Use of non programmable calculator.
  6. Answer **any five** questions.

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| 1. | a) Write a short note on –<br>i) Conventional and non-conventional energy resources<br>ii) Kyoto protocol  | 7 |
|    | b) What do you understand by energy security and why its analysis required?  | 7 |
| 2. | a) Estimate the monthly average of daily global radiation on horizontal surface at Agra (27°10'N, 78°05'E) during the month of January, if the average sunshine hrs. per day is 7 hrs. | 7 |
|    | b) Calculate the solar radiation on an inclined plane surface?   | 7 |
| 3. | a) What is the effect of partial and complete shadowing of a cell in a module.   | 5 |
|    | b) Describe the principle of solar photovoltaic energy conversion.   | 5 |
|    | c) Draw and explain an equivalent circuit of a solar PV cell.  | 4 |
| 4. | a) Write a short note on lift and drag type mechanism?   | 7 |
|    | b) Write a short note on wind power application?   | 7 |
| 5. | a) What is the environmental impact of geothermal energy?  | 7 |
|    | b) Explain the process of gasification of solid bio-fuels? What is the common composition of gases produced and what is its heating value?   | 7 |
| 6. | a) State the main application of flywheel energy storage.  | 7 |
|    | b) Explain the construction of ultra-capacitor. What new additional features are inbuilt to increase the storage capacity.   | 7 |
| 7. | a) What are fuel cells, write a short note on its application and its merits and demerits.   | 7 |
|    | b) What is the present state of development in fuel cell technologies in India.  | 7 |
| 8. | a) Write a short note on standalone system and its application in various industries.  | 7 |
|    | b) Briefly describe about the various hybrid system available and its merits.  | 7 |

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