

Reg.No. \_\_\_\_\_



# Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)  
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

## End Semester Examination – Nov/Dec – 2016

Code : **15PH3019**  
Sub. Name : **Principles of Renewable Energy**

Semester : **2016-17 ODD**  
Duration : **3hrs**  
Max. marks : **100**

### ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

| Q. No.                    | Sub Div. | Questions  | Course Outcome | Marks |
|---------------------------|----------|--|----------------|-------|
| 1.                        | a.       | What are the prospects of renewable energy sources in India? Mention the advantages of renewable energy sources                        | CO1            | 15    |
|                           | b.       | Explain the significance of energy consumption as a measure of prosperity  | CO1            | 5     |
| (OR)                      |          |  |                |       |
| 2.                        | a.       | Define the following with respect to solar radiation (i) Latitude angle (ii) Altitude angle (iii) Zenith angle with suitable diagrams. | CO1            | 15    |
|                           | b.       | Calculate the sunset hour angle and day length at location latitude of 35° N on February 20.   | CO1            | 5     |
| 3.                        | a.       | What are the main components of a flat plate solar collector? With a neat sketch, explain the function of each component.              | CO1            | 12    |
|                           | b.       | With a neat sketch, explain the working of a solar furnace.  | CO1            | 8     |
| (OR)                      |          |  |                |       |
| 4.                        | a.       | With a neat sketch, explain any one type of solar energy storage systems.  | CO1            | 10    |
|                           | b.       | Enumerate the different types of concentrating type collectors.  | CO1            | 10    |
| 5.                        | a.       | What is the basic principle of wind energy conversion?   | CO1            | 5     |
|                           | b.       | With the help of a neat schematic, explain the working of WECS for generation of electric energy                                       | CO1            | 15    |
| (OR)                      |          |  |                |       |
| 6.                        | a.       | Explain the working of Wind Energy Conversion System for generation of Electrical energy with a neat diagram                           | CO1            | 12    |
|                           | b.       | Derive an expression for the available power in the wind.  | CO1            | 8     |
| 7.                        | a.       | Define biomass. Give a descriptive classification of biomass resources.  | CO1            | 15    |
|                           | b.       | Explain any three factors which affect biodigestion  | CO1            | 5     |
| (OR)                      |          |  |                |       |
| 8.                        | a.       | With a neat diagram, explain the principle of biogas plant.  | CO1            | 10    |
|                           | b.       | Give an account of bio-mass conversion technologies.   | CO1            | 10    |
| <b><u>Compulsory:</u></b> |          |  |                |       |
| 9.                        | a.       | With a neat diagram, explain the principle of tidal power.   | CO1            | 10    |
|                           | b.       | With a neat diagram, explain the principle of ocean thermal energy conversion system.  | CO1            | 10    |

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