

**B.Sc. 3rd Semester (Honours) Examination, 2022 (CBCS)****Subject : Physics****Course : SEC-1****(Renewable Energy)****Time: 2 Hours****Full Marks: 40***The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**All symbols have their usually meaning.***Group-A**

1. Answer *any five* questions:  $2 \times 5 = 10$
- (a) What are the major components of biogas?
  - (b) Define ocean biomass.
  - (c) Why does salt gradient exist in solar pond?
  - (d) What are the causes that make the interior of the earth hot?
  - (e) State the principle of generation of ocean thermal energy.
  - (f) How electromagnetic energy can be harvested?
  - (g) What is anaerobic digestion?
  - (h) State the function of penstock.

**Group-B**Answer *any two* questions.  $5 \times 2 = 10$ 

2. (a) Define photovoltaic effect.
- (b) Describe the structure and function of a solar cell.  $1+4$
3. (a) Why is it necessary to store solar energy?
- (b) Draw a schematic diagram of a solar cooker and explain its function.  $1+4$
4. (a) What is piezoelectric effect?
- (b) Name two materials that exhibit piezoelectric property.
- (c) How does a piezoelectric generator work?  $1+1+3$
5. (a) Define osmosis and osmotic power.
- (b) Briefly discuss the principle of generating osmotic power.  $(1\frac{1}{2}+1\frac{1}{2})+2$

**Group-C**Answer *any two* questions. $10 \times 2 = 20$ 

6. (a) State the principle of generating hydroelectricity.  
 (b) What are the basic components of hydroelectric power plants?  
 (c) What are the quantities upon which the available power from a hydroelectric power plant depend?  
 (d) Water head of a reservoir is 20 metre and water is flowing at a rate of 20 litres/sec. Calculate how much power you will get from this hydroelectric power station if efficiency of the system is 70%.  
 (e) Discuss the effect of hydroelectric power plant on environment. 2+2+2+3+1
7. (a) Discuss the different kinds of geothermal resources. Give two natural examples of geothermal energy sources.  
 (b) Why heat extraction from geothermal sources is called heat mining?  
 (c) With a neat schematic diagram explain how electricity is generated from geothermal sources. 2+2+2+4
8. (a) What is solar greenhouse?  
 (b) Briefly discuss the construction of a solar greenhouse. How does it work? What are the uses of solar greenhouse?  
 (c) What do you mean by green energy? Why is green energy important? 2+(3+1+1)+1+(1+1)
9. (a) Discuss the difference between conventional and non-conventional energy.  
 (b) What do you mean by thermonuclear reaction?  
 (c) Nuclear fission and fusion— which is more effective and why?  
 (d) Describe different parts of nuclear reactor.  
 (e) Mention two nuclear power plants in India. 2+1+2+4+1
10. (a) What is the cause of wind? Define wind power.  
 (b) What is power curve of a wind turbine? On which factors does the power output of a wind turbine depend?  
 (c) How is electromagnetism used in wind turbines?  
 (d) Does windmill cause interference? 2+(2+2)+2+2



**B.Sc. 3rd Semester (Honours) Examination, 2022 (CBCS)**  
**Subject : Physics**  
**Course : SEC-1 (OR)**  
**(Weather Forecasting)**

**Time: 2 Hours****Full Marks: 40**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers  
in their own words as far as practicable.*

- 1.** Answer *any five* of the following questions:  $2 \times 5 = 10$
- (a) Draw a graph to show the variation of atmospheric temperature with the altitude.
  - (b) Write down two conditions for development of air mass.
  - (c) What causes the temperature to increase in the stratosphere?
  - (d) What is 'Aurora'?
  - (e) Write any two significance of Jet stream on climate control.
  - (f) Write down two conditions for the development of Tropical Cyclone.
  - (g) What are aerosols?
  - (h) What are the full forms of WMO and NOAA?
- 2.** Answer *any two* of the following questions:  $5 \times 2 = 10$
- (a) Clouds as an aid to weather forecasting— explain.
  - (b) Discuss the factors that affects the rate of evaporation.
  - (c) What is inversion of temperature in connection with the vertical distribution of atmospheric temperature? Explain the inversion of temperature due to the radiation from earth's surface.  $2+3$
  - (d) Differentiate between Tornado and Hurricane.
- 3.** Answer *any two* of the following questions:  $10 \times 2 = 20$
- (a) State the importance of weather forecasting. Write down the different methods used for weather forecasting and discuss any one method briefly. What are the problems of weather forecasting?  $2+2+4+2$
  - (b) Briefly discuss the role of human activities in Global Warming. Discuss how the greenhouse effect can be controlled. What is acid rain?  $5+3+2$
  - (c) What is the origin of wind? Write down the factors that affects the wind motion. What are tropical cyclones and how are they formed? Mention some of the major impacts of these cyclones.  $2+3+3+2$
  - (d) What do you mean by 'Air-mass' and 'Fronts'? Classify Fronts on the basis of the nature of Air-mass. Mention the meteorological features of any three fronts.  $2+2+6$