

**2012**

**M.Sc. Part-II Examination**

**ENVIRONMENTAL SCIENCE**

**PAPER—VIII**

Full Marks : 100

Time : 4 Hours

*The figures in the right-hand margin indicate full marks.*

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

*Illustrate the answers wherever necessary.*

Answer Q. No. 1 and any five questions from the rest.

1. Answer any ten questions of the following :  $2 \times 10$

- (i) What do you mean by the capture efficiency of the solar collector?
- (ii) What are the important factors which affect the efficiency of PV-Collector?
- (iii) To produce 30 watt electricity from solar thermal energy  $1\text{m}^2$  area of mirror is required. Find the total area of mirrors needed for producing 1686 GW of electricity in such process.

(Turn Over)

- (iv) What do you mean by 'space disposal' of radioactive waste?
  - (v) What is 'sievert ( $S_v$ )'?
  - (vi) Write D-D type fusion nuclear reaction.
  - (vii) Write two advantages of thermal pollution.
  - (viii) Write two energy related environmental effects.
  - (ix) How is biomass related to solar energy?
  - (x) What is 'gasification'?
  - (xi) What is 'chain reaction' in nuclear fission process?
  - (xii) What is 'langley'?
  - (xiii) Define 'solar constant'.
  - (xiv) What is 'solar pond'?
  - (xv) Give two direct uses of geothermal energy.
  - (xvi) Write the principle of MHD-generator.
2. Give a brief out line of Sun's life. Write notes on chemical composition of the sun and photosphere of the Sun.  
8+8
3. Write the general characteristics of the fossil fuels. Give the composition of natural gas and its uses.  
8+8

4. Write the principle of generation of hydroelectricity and give a sketch of hydroelectric power plant. What are the advantages of hydropower plant over thermal power plant.  
10+6
5. Write the principle of wind-mill. What is wind generator? Write the merits and limitations of wind energy.  
5+3+8
6. Write notes on : 8+8  
(a) Tidal energy ;  
(b) Liquid flat plate collector.
7. Explain briefly the principle of operation of a nuclear reactor. What are the advantages and disadvantages of nuclear energy ?  
10+6
8. What is biomass? Define time constant related to renewability of biomass. Write advantages and disadvantages of biomass energy.  
2+4+10
9. (a) Give a brief outline of environmental implications of energy.  
(b) What is radioactive wastes ? Classify them and write briefly about radioactive waste management.  
6+10

10. (a) Give a brief outline of large scale exploitation of solar energy with demerits.
- (b) Write different types of ocean energy resources and their characteristics of interest.

8+8

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