

2013

**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) How does solar energy influence earth's climate?
- (ii) Draw the extra-terrestrial solar radiation graph to show the spectral characteristics.
- (iii) What is meant by 'bio-diesel'?
- (iv) Write difference between wet and dry natural gases.
- (v) Mention the difference between 'mini hydro' and 'micro hydro' plants.

(Turn Over)

- (vi) Why is Sun known as ultimate source of fossil fuels ?
  - (vii) What is meant by 'refining' of petroleum ?
  - (viii) Why is natural gas known as cleanest fuel ?
  - (ix) Mention the idea of 'a large dam' ?
  - (x) How does the tidal energy is converted to electrical energy ?
  - (xi) Give a schematic diagram of a 'solar air heater'.
  - (xii) What is 'plasma' ?
  - (xiii) What is 'pyrolysis' ?
  - (xiv) 'It has been common to use energy sources to generate electricity' — why ?
  - (xv) 'All energy directly or indirectly originates from nuclear energy' explain.
  - (xvi) Write the types of mirrors which are commonly used in a solar electric power station.
2. (a) Give an outline regarding impacts on environment due to large scale exploitation of wind energy.
- (b) Write briefly on large scale exploitation of hydro-energy and its impacts.

8+8

3. What is a nuclear reactor ? Mention the functions of materials used in a common nuclear reactor. Give a brief note on 'decommissioning of nuclear power reactors.'  
2+8+6
4. What is thermal pollution ? What are the sources of thermal pollution ? What are effects of thermal pollution ? Discuss about the control and prevention of thermal pollution.  
2+4+4+6
5. What are the environmental impacts (on atmosphere, hydrosphere, lithosphere and human society) of —
- (i) Oil;
  - (ii) Natural gas;
  - (iii) Coal and
  - (iv) Nuclear power.
- 4×4
6. What are the major types of bio-power system ? Mention the underlying principle of anaerobic digestion ? Write the merits of 'anaerobic digestion project'. Give a flow diagram of mesophilic process.  
3+2+8+3
7. Give a schematic diagram of a photovoltaic water pumping system. Write a briefly the concept of designing satellite solar power station. How can solar energy storage be achieved ?  
4+4+8

8. (a) Write common advantages and disadvantages for

- (i) renewable energy;
- (ii) non-renewable energy and
- (iii) sustainable energy.

(b) What are the merits and limitations of OTEC ?

12+4

9. What are the basic requirements for hydro power generation? Write the scheme for transformation of energy in the hydel power project. What is the average life span of a hydroelectric power project? Write the advantages of hydro power plants over thermal power plant.

3+3+2+8

10. (a) Why is solar energy is called 'environment friendly and independent' ?

(b) Write notes on :

- (i) radiative zone of the sun;
- (ii) convective zone of the sun.

8+8