

Five-Year Integrated M.Sc. Examination 2021-22

Sem-V

Earth and Environmental Science

Paper: EES-3-5-1

Subject: Climatology and Climate Change

Time: Four Hours

Full Marks: 80

Questions are of value as indicated in the margin.

Answer **question No. 1** and **any four** from the rest.

1. Write short notes on **any four** of the following:

- a) Synoptic Scale Meteorology
- b) Solar Constant
- c) Ferrell cell
- d) Thermohaline Circulation
- e) Vertical Clouds
- f) Western Disturbance

4x4 = 16

2. a) Discuss the factors (with examples) that influence the temperature of a particular place on the earth's surface.

b) What do you mean by 'range of temperature'?

12+4 = 16

3. Explain the conditions necessary for precipitation. What are the three major types of precipitation?

8+8 = 16

4. a) Explain the general atmospheric circulation pattern with the help of three cell model.

b) What are jet streams? How are they developed?

10+6 = 16

5. What is lapse rate? What are the types of lapse rate? Discuss different stability class one can find in the atmosphere on the basis of lapse rate.

2+4+10 = 16

6. Discuss the phenomenon of greenhouse effect in the atmosphere. How man-made contributions of greenhouse gases have affected the role and nature of natural greenhouse gases? What are the steps taken for controlling greenhouse gas emissions?

4+4+8 = 16

7. a) Describe the different sources of proxy data for climate.

b) Explain the Milankovitch cycles and their significance in global climate variation.

8+8 = 16