

45073 (A)

M.Sc. DEGREE EXAMINATION, MARCH/APRIL 2020.

FOURTH SEMESTER

Physics

Paper III — ATMOSPHERIC PHYSICS

Time : Three hours

Maximum : 75 marks

(No additional sheet will be supplied)

PART A — (5 × 3 = 15 marks)

Answer any FIVE questions.

Each question carries 3 marks.

Each answer should not exceed 1 page.

1. Briefly explain the composition of the atmosphere.
2. What is Green house effect ? Explain.
3. Explain how the atmosphere humidity will be measured using an automatic weather station.
4. What is Rawinsonde ? How it will work?
5. Explain the effects of primary gaseous pollutants on human health.
6. What are Aerosols ? How they effect the climate?
7. Derive the basic Radar equation.
8. Explain how a parabolic antenna works.

PART B — (4 × 15 = 60 marks)

Answer ALL questions.

Each question carries 15 marks.

Each answer should not exceed 6 pages.

9. (a) Explain the variation of temperature with height. Give detailed note on the energy balance on earth and atmosphere.

Or

- (b) Explain the block body radiation. Write about the significance of Plank's Law, Stefan Bottzmann Law and Wien's displacement Law in the atmospheric physics.

10. (a) Explain the estimation of Convective boundary layer height using GPS. Sonde. Write about space borne systems for measurement of meteorological parameters.

Or

- (b) Explain the working of a radiosonde for upper air observations.
11. (a) What is the importance of Ozone in the different regions of the atmosphere? Discuss the Ozone hole phenomenon and explain the chemistry of the formation and destruction of Ozone in the atmosphere.

Or

- (b) Discuss the advantages of laser remote sensing methods used for studies in the atmosphere. Discuss the lidar system and methodology used for the measurement of pollutants in the atmosphere.
12. (a) Explain the working principle of Doppler Weather Radar, with neat illustrations. Derive the radar equation.

- (b) What is Pulse compression technique? How radar is affected by pulse compression? What is the advantage of using phased array in weather radar?

