CLASS:    BTECH                                                  SEMESTER : IV/VI
BRANCH:   BT/CHEMICAL/EEE/ECE/MECH                       SESSION : SP/2023

**SUBJECT: PH320 ATMOSPHERIC PHYSICS**

TIME:     3 Hours                                                  FULL MARKS: 50

**INSTRUCTIONS:**
**1. The question paper contains 5 questions each of 10 marks and total 50 marks.**
**2. Attempt all questions.**
**3. The missing data, if any, may be assumed suitably.**
*4*. **Before attempting the question paper, be sure that you have got the correct question paper.**
**5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**
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|---|---|---|---|---|
| Q.1(a) | Describe are the different forces which influences the speed and direction of the horizontal wind. | [5] | 1 | 1 |
| Q.1(b) | Describe the Ionosphere and its role in communication. How its structure changes with day and nighttime. | [5] | 1 | 1 |
| Q.2(a) | Derive the continuity equation for atmosphere. | [5] | 2 | 1 |
| Q.2(b) | Why we need to add the apparent forces in the second law of motion when we are dealing with atmospheric motion? What are these forces? | [5] | 2 | 1 |
| Q.3(a) | Describe the scattering of light in the atmosphere in detail. | [5] | 3 | 1 |
| Q.3(b) | Calculate the equivalent blackbody temperature of the Earth, assuming a *planetary albedo* (i.e., the fraction of the incident solar radiation that is reflected back into space without absorption) of 0.30. Assume that the Earth is in *radiative equilibrium*; i.e., that it experiences no net energy gain or loss due to radiative transfer. | [5] | 3 | 1 |
| Q.4(a) | Derive the expression for power received by the Radar. | [5] | 4 | 1 |
| Q.4(b) | Describe the differential-absorption lidar | [5] | 4 | 3 |
| Q.5(a) | Define the Aerosol Effective Radius and Aerodynamic diameter of aerosols. | [5] | 5 | 1 |
| Q.5(b) | Describe the direct and indirect effects of aerosols. | [5] | 5 | 5 |

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