|  |  |
| --- | --- |
| Question | Consider the following statements about Temperature Inversion.  1. It is the increase in temperature with increasing height temporarily or locally.  2. Short winter nights, cloudy sky, cold air and the presence of winds lead to temperature inversion.  3. During a temperature inversion, the temperature may fall below freezing point in the valleys leading even to the occurrence of frost.  Which of the above statements are correct? |
| Type | multiple-choice |
| Option | 1 and 2 |
| Option | 2 and 3 |
| Option | 1 and 3 |
| Option | 1, 2 and 3 |
| Answer | 3 |
| Solution | Long winter nights, clear skies, dry air, and the absence of winds are ideal for temperature inversion. These situations lead to rapid radiation of heat from the earth's surface and the lower layers of the atmosphere, resulting in the cooling of the air near the earth's surface. The upper layers, which lose their heat not so rapidly, are comparatively warm. Hence the normal condition in which temperature decreases with increasing height is reversed. The cooler air is nearer the earth, and the warmer air is aloft. In other words, temperature increases with increasing height temporarily or locally. This phenomenon is termed inversion of temperature. **So, Statement 1 is correct**  The presence of cloudy sky traps the terrestrial radiation near the earth surface because of which it prevents the earth surface from getting cooled.  Thus short winter nights and cloudy sky does not lead to Temperature Inversion. **So, Statement 2 is not correct.**  During winters, the mountain slopes cool very rapidly due to the quick heat radiation. The air resting above them also becomes cold, and its density increases. Hence, it moves down the slopes and settles down in the valleys. This air pushes the comparatively warmer air of valleys upwards and leads to the phenomenon of inversion of temperature. Sometimes the temperature falls below freezing point in the valleys leading even to the occurrence of frost. **So, Statement 3 is correct.** |
| Positive Marks | 1 |
| Negative Marks | 0.25 |