Bachelor of Science Examination, 2024

(2nd Year, 1st Semester)

Geography

Paper : SC/GEOG/UG/CORE/TH/05

[Climatology (C-305T)]

Time : *Two Hours* *Full Marks* : 50

GROUP—A

Answer any two questions. **10×2=20**

1. Explain with suitable diagrams the theories regarding formation of precipitation in tropical and temperate regions. What is an 'Ekman spiral'? 8+2

2. What is jet stream? Discuss the modern theory regarding genesis of monsoon with reference to the upper air jet streams. What do you mean by 'Axis of Monsoon'? 2+6+2

3. Mention the major controlling factors of wind motion. Discuss the general pattern of global atmospheric circulation with special reference to meridional and zonal wind movements. 4+6

4. Describe the different types of temperature inversion occurring in the atmosphere. What is Isonomalus temperature? 7+3

GROUP—B

Answer any two questions. **5×2=10**

5. If at 40° N latitude, the pressure gradient is 20 mb (2000 Pa) per 1000 km, then estimate the geostrophic wind velocity. Consider air density as 1·25 kg m^{-3} and angular velocity of earth as $7{\cdot}3 \times 10^{-5}$ rad s^{-1}.

6. A weather balloon contains 8·80 moles of helium at a pressure of 0·992 atm and a temperature of 298 K at ground level. What is the volume of the balloon under these conditions? Consider R (gas constant) = 0·0821 atm-liter mol^{-1}.

7. Narrate the global surface pattern of average horizontal temperature distribution in July.

8. On a comfortable spring day, the relative humidity (RH) is only 60% and the outside (at ground level) temperature is 27° C. At what altitude might clouds start to form overhead if the air temperature is decreasing at a dry adiabatic lapse rate? Consider dew point temperature = Air temperature – ((100 – RH)/5).

GROUP—C

Answer any five questions. **2×5=10**

9. Define saturation vapour pressure.

10. What is absolute instability?

11. Why does the sky look red during sunset?

12. What is Mie scattering?

13. State the Stefan-Boltzmann law of radiation.

14. What is a 'SO-Index'?

15. What is gradient wind?

Internal Assessment **10**

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