North American extreme rainfall events and Madden Julian Oscillation. What is an African Easterly Wave? 4+3+3

Unit III: Climatic Changes, Policies and Mitigation

5. What is climate cycle? Elucidate the concept of 'global bio-thermostat' in the context of climate change. 3+7

6. What is carbon trading? Explain the evidences of recent climate change. 3+7

Unit IV: Applied Climatology

7. If maximum and minimum temperatures on a day are 25°C and 15°C respectively, what will be the GDD for rice when its base temperature is 10°C? Explain how urban surface geometry influences air movement in cities. How is sky view factor measured? 2+5+3

8. Briefly describe IMD's Statistical Ensemble Forecasting System (SEFS) used in its monsoon forecast. Define GCM and enumerate its major components. Why is nowcasting important in trend forecasting? What is Lamb Weather Type Catalogue? 2+4+2+2

Internal Assessment **10**

M. Sc. Geography Examination, 2023

(1st Year, 2nd Semester)

Synoptic and Applied Climatology

Course Code: Sc/ GEOG/PG/CORE/TH/07

Paper: GEOG-C107T

Time : Two Hours Full Marks : 50

Answer *one* question from each unit

Unit I: Dynamics of Atmospheric Circulation

1. What is blackbody radiation? State the role of hydrostatic equilibrium in the stability of the atmosphere. Explain the mechanism of origin of geostrophic wind and state its characteristics. 3+3+4

2. State the reasons for the variability of Moist Adiabatic Lapse Rate from 5°C to 9°C. Explain the mechanism of formation of Rossby waves. 3+7

Unit II: Weather Disturbances and Hazards

3. Elucidate the major inter-annual ocean-atmospheric circulations and oscillations of the Indo-Pacific region that influence the extent and intensity of monsoonal rainfall in India. What do you mean by meso-scale convective system? 8+2

4. Explain the mechanism of formation of supercell thunderstorm. Elucidate the teleconnections between