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3 (Sem-5/CBCS) GLG HE 2

2024

GEOLOGY

(Honours Elective)

Paper : GLG-HE-5026

(Earth and Climate)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct option : $1 \times 7 = 7$

(A) Which of the following statements about the Coriolis force is correct ?

(i) It deflects the wind to the right direction in the northern hemisphere

(ii) It is absent at the Equator

(iii) It is maximum at the poles

(iv) All of the above

Contd.

- (B) Noctilucent clouds are seen in
- Troposphere
 - Ionosphere
 - Stratosphere
 - Mesosphere
- (C) The 'Hadley Cell' refers to a pattern of atmospheric circulation in which
- Air rises at the equator and sinks at the poles
 - Air rises at the equator and sinks at about 30° north and south
 - Air rises at 60° north and south and sinks at the poles
 - All of the above
- (D) Which part of India receives rainfall from both the South-West and North-West monsoons ?
- Gujarat
 - West Bengal
 - Lakshadweep Island
 - Andaman and Nicobar Island
- (E) Which of the following climate archives have annually deposited layers that can be used to date the climate records they contain
- Varved lake sediments
 - Ice layers
 - Coral bands
 - All of the above

- (F) The largest reservoir of carbon on Earth lies in which of the following ?

- Its rocks
- Its atmosphere
- Its vegetation
- Its ocean

- (G) Aurora borealis occurs in

- Alaska
- South pole
- Equator
- All of the above

2. Answer the following questions : $2 \times 4 = 8$

- How does climate forcing differ from climate response ?
- What do you understand by thermohaline flow ?
- What do you understand by positive and negative feedback in the climate system ?
- What is orographic precipitation ?

3. Write briefly on the following : **(any three)**

- Climate forcing $5 \times 3 = 15$
- Interactions among various sources of Earth's heat
- Atmosphere and ocean interaction and its effect on climate

(d) Younger Dryas

(e) Marine isotope stages

4. Answer the following questions : **(any three)**

10×3=30

(a) Discuss briefly on Glacial and Interglacial stages. Add a note on Pleistocene glacial-interglacial cycles.

5+5=10

(b) Write a note on climate system response. Elaborate briefly on response rates and interaction within the climate system.

4+6=10

(c) What do you understand by archives of climate change ? Discuss briefly on archive based climate change data from the Indian continent.

3+7=10

(d) Discuss elaborately on Heat transfer in ocean. Add a note on surface and deep circulation.

6+4=10

(e) Write a note on mechanism of monsoon. Discuss briefly on effects of monsoon,

5+5=10

(f) Write short notes on the following :

5+5=10

(i) Sea ice and glacier ice

(ii) Future perspective of climate change