

FOURTH SEMESTER DIPLOMA EXAMINATION IN ARCHITECTURE—
OCTOBER, 2013

CLIMATOLOGY

[Time : 3 hours

(Maximum marks : 100)

Marks

PART—A
(Maximum marks : 10)

I Answer the following questions in one or two sentences.

1. What is tropical climate ?
2. What is urban climate ?
3. What is thermal comfort indice ?
4. What is heat absorbing glass ?
5. What is the form of the best shelter in warm-humid climate ? (5×2=10)

PART—B

(Maximum marks : 30)

II Answer *any five* of the following questions. Each question carries 6 marks.

1. Explain the climatic element 'air movement' in detail.
2. Explain the influence of hills on rainfall pattern of an area.
3. Write the equation for thermal balance of human body.
4. What is meant by periodic heat flow ?
5. Suggest the best air-conditioning system for a mobile shop. Explain its working.
6. Suggest any six structural ways by which we can create thermally comfortable interior when hot discomfort prevails.
7. Give any six features of the best shelter for hot-dry climate. (5×6=30)

PART—C
(Maximum marks : 60)

(Answer one full question from each unit. Each question carries 15 marks.)

UNIT—I

- III (a) Write the characteristics of warm-humid climate. 8
 (b) How do topography influence air movement pattern of an area ? 4
 (c) Write the importance of ITCZ in air movement pattern. 3

OR

- IV (a) Explain global factors related to quality and quantity of solar radiation. 6
 (b) How earth-sun relationship affect the amount of radiation received at a particular point on the surface of the earth ? 6
 (c) What is meant by equinox day ? 3

UNIT—II

- V (a) Define k-value of a substance. 3
 (b) Define air to air resistance. Write the relevance of it in thermal design of buildings. 6
 (c) What is meant by diurnal variation ? How it is used in thermal design of buildings ? 6

OR

- VI (a) Explain the heat exchange process of the human body. 10
 (b) What is meant by time lag ? 3
 (c) Define decrement factor. 2

UNIT—III

- VII (a) Suggest a mechanical thermal control system which can be used in a toilet. Explain how it works ? 5
 (b) What is dehumidification ? Why it becomes necessary in an air-conditioning system ? 7
 (c) What are the functions of servo mechanisms in an air-conditioner ? 3

OR

- VIII (a) What is stack effect in air movement ? 4
 (b) What is cross ventilation ? Suggest any two ways by which we can ensure cross ventilation. 6
 (c) Explain how orientation affect indoor air flow. 5

UNIT—IV

- IX (a) Derive the physiological objectives for the thermal design of suitable shelter for warm-humid climate. 8
- (b) Write down the best solution for the thermal design of roof and wall in shelter for warm-humid climate. 7.

OR

- X (a) Derive the suitable form and orientation for the shelter for tropical upland climate. 7
- (b) Derive solution for thermal design of following parts of shelter for tropical upland climate :
- (i) Roof and walls.
- (ii) Surface finishing. 8
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