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18ARC33

Third Semester B.Arch. Degree Examination, July/August 2021 Climatology

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions.

2. Draw neat labeled sketches wherever necessary mandatorily.

- 1
 - a. List the major and subzones of tropical climate. (05 Marks)
 - b. Explain with sketches the various instruments and measuring units of different elements of climate. (15 Marks)
- 2
 - a. Explain Thermal comfort scale. (05 Marks)
 - b. Describe the following with relevant sketches
 - i) Kata thermometer ii) Bio climatic chart iii) Globe thermometer. (15 Marks)
- 3
 - a. Explain with sun path diagram, its components and methods of computing solar altitude and azimuth for given date and time. (10 Marks)
 - b. Explain the concept of Sol-Air temperature and solar gain factor. (10 Marks)
- 4

Explain the heat exchange processes of a building with the outside environment. (20 Marks)
- 5

Explain steady state, periodic heat flow, time lag and decrement factor. (20 Marks)
- 6

Calculate 'U' value of a given composite wall. Assume a wall of a westerly, normal exposure, consisting of the following :

114mm Engineering brickwork	K	=	1.150W/mdeg C
50mm Cavity	R _c	=	0.076m ² deg C/W
100mm Dense concert block	K	=	1.440W/m deg C
25mm Wood wool slab	K	=	0.093 W/m deg C
12mm plastering	K	=	0.461 W/m deg C
1/f ₁ = 0.123 m ² deg C/W			
surface resistance	1/f ₀	=	0.176m ² deg C/W
	1/f ₁	=	0.123m ² deg C/W

(20 Marks)
- 7
 - a. What are the shading devices? Explain the different types of shading devices used in buildings. (10 Marks)
 - b. What are the functions of natural ventilation and air movement? (10 Marks)
- 8
 - a. What is stack effect? (10 Marks)
 - b. Discuss internal airflow pattern with respect to location of opening, external features and wind direction. (10 Marks)
- 9
 - a. What is "Day light Factor"? (05 Marks)
 - b. Describe how "Day light Factor" can be useful in functional architectural spaces. (15 Marks)
- 10

Illustrate with sketches 'design principle' for building in hot dry as compared with warm humid climate. (20 Marks)