

USN

--	--	--	--	--	--	--	--	--	--

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)

\* \* \* \* \*