

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- March-April 2017

M.Tech 4th Semester

COURSE CODE: 10M13CE334

MAX. MARKS: 25

COURSE NAME: Principles of Affordable Housing

COURSE CREDITS: 03

MAX. TIME: 1.5 Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. (Assume any other necessary data suitably)

1. Define "thermal indices". Discuss different types of thermal index scales in brief. (4)
2. Explain following: (a) Mean radiant temperature (b) Index of thermal scale (c) density of heat flow rate in a building (d) Conductance (6)
3. A 5 m X 5 m and 2.5 m high office is located on an intermediate floor of a building, only exposed wall facing south, all other walls adjoin rooms kept at the same temperature: $T_i = 20^\circ\text{C}$. Outside temperature $T_o = 0^\circ\text{C}$. Ventilation rate is three air changes per hour, three 100 W bulbs are in continuous use to light the rear part of building used by four persons. The exposed 5 m X 2.5 m wall consists of two single glazed window, 1.5 m X 1.5 m. $U = 1.35 \text{ W/m}^2/\text{C}$. Calculate the total heat loss. (6)
4. Discuss the effect of cavity over heat flow or building insulation. (3)
5. What are the key objectives of thermal control in a building? (3)
6. The outside air temperature of a building is 30°C , absorptance of the wall surface, $a = 0.4$, surface conductance $f_o = 10 \text{ W/m}^2/\text{C}$. Consider the incident radiation $I = 6000 \text{ W/m}^2$, calculate sol-air temperature T_s . (3)