JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

Ph.D. - I Semester (Civil)

COURSE CODE (CREDITS): 10M11CE115 (3) MAX. MARKS: 35

COURSE NAME: Mechanical and Electrical System in Building

COURSE INSTRUCTORS: Dr. Saurabh Rawat MAX. TIME: 2 Hours

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***Note:*** *All questions are compulsory. Marks are indicated against each question in square brackets.*

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**Q1)** What is the relation between refrigeration and air conditioning? Discuss the important issues to be considered in the design of refrigeration systems. ***[3 + 4 = 7 marks]***

**Q2)** Stepwise explain the general procedure for computing residential cooling loads. ***[6 marks]***

**Q3)** A home in Delhi, India, has a 12 ft by 14 ft family room as shown in **Figure 1**. Temperature in the space is to be maintained at 70°F. It is exposed to the outside on two adjacent sides with three windows and a swing door on the south exterior wall, and a window on the east exterior wall. The room is above a finished (heated) basement. The space has the following characteristics: **(a)** Ceiling/roof is well insulated (R = 45.2 hr · ft$^{2}$° · F/Btu, U = 0.022 Btu/hr ·°F · ft$^2$) with 9 ft ceiling height. **(b)** Exterior walls are well insulated (R = 18.2 hr · ft$^2$ · °F/Btu, U = 0.055 Btu/hr · °F · ft$^2$). **(c)** South windows are 3 ft by 4 ft with low-e double glass (R = 3.1 hr · ft$^2$ · °F/Btu, U = 0.32 Btu/hr · °F · ft$^2$).

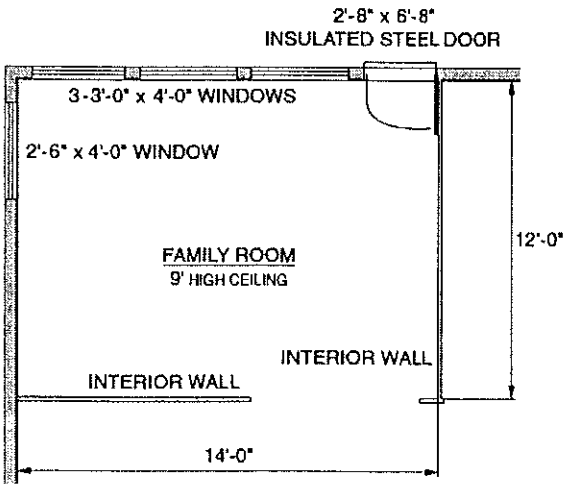


**Figure 1** Floor plan for the building