

Prince of Songkla University
Faculty of Engineering

Mid-Term Examination

7 August 2011

215-663 ENERGY MANAGEMENT IN BUILDINGS

Semester 1/2554

Time 9:00-12:00

Room: Robot

Directions

- A4 paper is allowed and can be written **only one side of the A4 paper**.
- All types of calculator and dictionary are permitted.
- Attempt all 4 questions.
- The exam paper has 8 pages.

Juntakan Taweekun
Instructor

Problem	Marks	
1	15	
2	15	
3	15	
4	30	
Total	75	

Name _____

ID _____

Name _____ ID _____

Question 1 (15 points)

For a person weighting 70 kg and possessing a height of 1.80 m., calculate the body surface area. Fill in the values of Wm^{-2} and $W(\text{average})$ for the following table using the calculated body surface area in each activity. Also show the calculation of each activity.

Table 1 Metabolic rates of different activities

Activity	met	Wm^{-2}	W (average)
Sleeping	0.7		
Reclining	0.8		
Seated and quiet	1.0		
Sedentary activity (office, dwelling, lab, school)	1.2		
Standing, relaxed	1.2		
Light activity, standing (shopping, laboratory experiment, light industry)	1.6		
Medium activity, standing (shop assistant, domestic work, machine work)	2.0		
High activity (heavy machine work, garage work, if sustained)*	3.0		

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Name _____ ID _____

Question 2 (15 points)

Calculate sunrise and sunset times on 14 June for a location at latitude 35° .

Name _____ ID _____

Question 3 (15 points)

Explain all the factors affect thermal comfort in details. In your opinion, what additional factors should be considered for thermal comfort and Why?

Question 4 (30 points)

Calculate the position of the shade for point “P” and draw the shade of an overhang 1.5 m long and extend 0.75 m) as shown in the following figure. The window (1.2 m x 1.2 m) faces to North at 9.00 am on 14 June in Bangkok. The shade device is perpendicular to the plane of the window and 0.2 m above the window.

Given: Latitude of Bangkok = 13.7°
 Longitude of Bangkok = 100.5°E

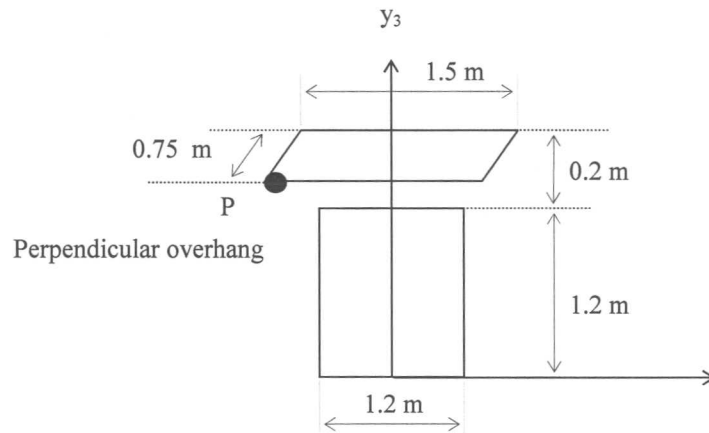


Figure 1 The configuration of a window with perpendicular overhang.
 The window faces to North.

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