INTD 356
FALL 2014

Name _____

Final Exam

This exam is open book and open notes.

Section 1: Vocabulary
Match the following terms with their definitions.

_____1. Building permit
_____2. Setbacks
_____3. Prescriptive code
_____4. Performance code
_____5. Fire walls
_____6. Types of construction
_____7. Heavy Timber
_____8. Means of egress
_____9. CALGreen
_____10. LEED
_____11. R-value
_____12. U-value
_____13. Altitude
_____14. Azimuth
_____15. Passive solar heating
_____16. Light shelves
_____17. Historic character
_____18. Historic Integrity
_____19. National Register of Historic Places
_____20. Preservation Management Plan

A. A building code which sets out a precise requirement, explaining exactly what must be done to meet the code
B. A document that records a resource's history and why it is significant
C. A horizontal surface that reflects daylight into a building
D. A measure of thermal resistance
E. A building code which stipulates how a component or system must function without giving the means required
F. A measure of thermal transmittance
G. The angular elevation of the sun above the horizon
H. A set of rating systems for buildings developed by the USGBC
I. Assembly to prevent the spread of fire from one part of a building to another
J. IBC classification of a building according to the fire resistance of its major elements
K. Identifies cultural resources, such as buildings, objects, and historic districts
L. Provides safe access from any point in a building to protected exits
M. Whether a building retains character-defining features and has not been changed over time
N. The angle of horizontal deviation of a bearing from a standard south direction
O. The distance a structure must be from the edge of a lot
P. The way cities enforce their building codes
Q. 2013 California Green Building Standards Code
R. Type of construction: exterior walls are noncombustible materials, interior supports are large wooden timbers
S. Uses solar energy to heat the interior spaces of a building
T. Visually distinctive features, materials, and spaces

21. Circle the projects which need a building permit:
    a. New construction and additions
    b. Repairs
    c. Demolition
    d. Finish work: painting, carpets
    e. Add/remove walls
    f. Roofing

22. What is the purpose of building codes? (only 3 words!)

23. Give the occupancy classification for the following buildings.

a. Clothing store	
b. Elementary school	
c. Hotel	
d. Concert hall	

24. A building has noncombustible masonry exterior walls, and wood-framed interior walls. What Type of Construction is it?

25. In which direction do exit doors swing?

26. What is the FIRST priority for Readily Achievable Barrier Removal?

Accessibility: list the following requirements

27. Size of minimum clear floor space	
28. Size of minimum turning circle	
29. Minimum clear width for passage (for example, a corridor)	
30. Maximum vertical change of level, no bevel	

31. What are the two criteria for roofing products to meet Cool Roof requirements in the California Energy Code?

32. What is the largest consumer of energy in a commercial building? What is the second largest?

33. List the 5 LEED rating systems for different project types.

34. Complete this sentence: Thermal insulation is required between _____ and _____ spaces.

35. List four common types of insulating materials.

36. At what time of year is the sun highest in the sky at noon? Lowest?

37. List the three essential elements in every passive solar system.

38. What is the difference between a direct gain and an indirect gain passive solar heating system?

39. What is the most effective shading device for a south-facing window?

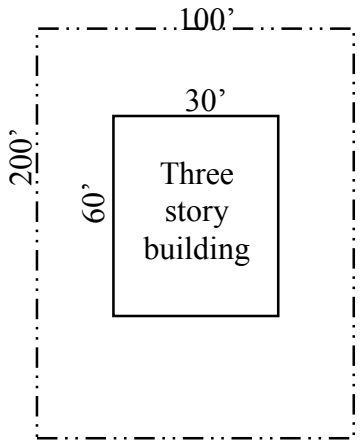
40. A window is 8' tall. How far will daylighting penetrate into the room, effective for task illumination?

41. How do light shelves work?

42. You are working on an adaptive reuse project, turning a historic federal building into a high-end hotel. Under the Standards for the Treatment of Historic Properties, which treatment approach should guide your design?

43. Are historic buildings required to be accessible? Explain.

44. For this site plan, calculate the following:



a. Floor Area Ratio	
b. Lot Coverage	

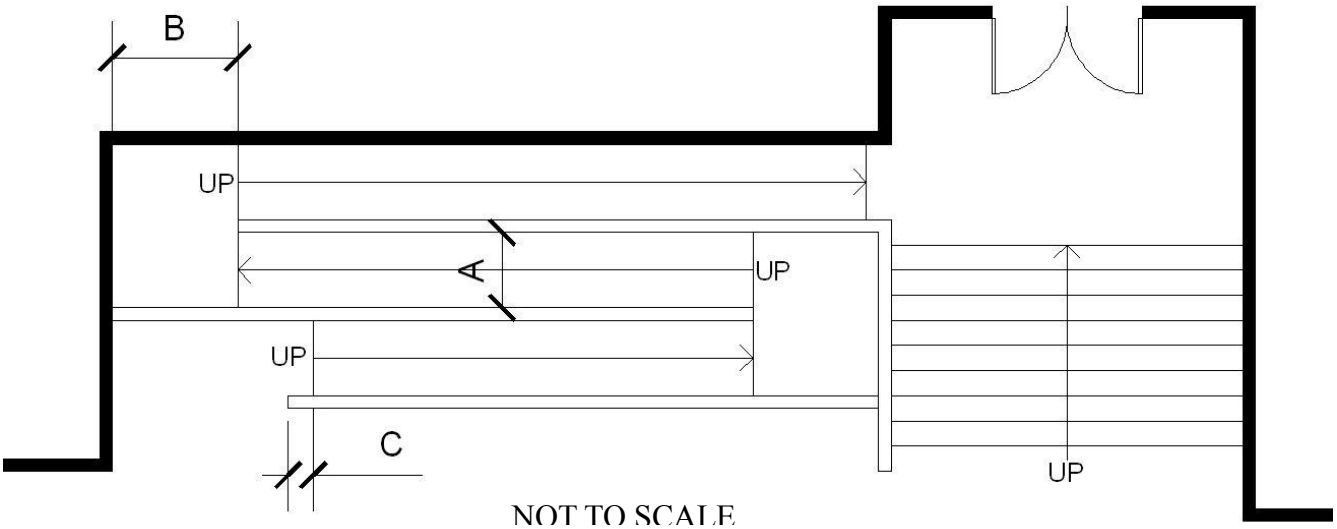
For an elementary school building that is 2 stories tall, 20,000 sf per story:

45. What is the least expensive type of construction that is allowable? Do not use Type IV HT.	
46. How tall may the building be?	_____ feet, _____ stories
47. What level of fire protection is required for the structural frame?	

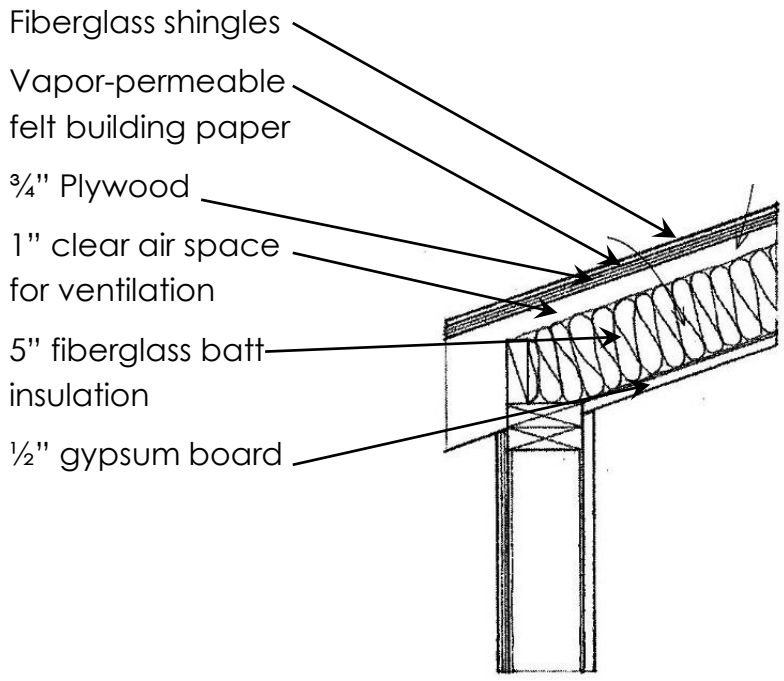
Note: code tables are located on the last page of the exam.

The total elevation change for the ramp below is 5’-3”. Find the following:

48. Dimension A	_____ minimum
49. Dimension B	_____ minimum
50. Dimension C	_____ minimum
51. Total ramp length (excludes landings)	



52. Calculate the total thermal resistance for this roof assembly.



Total Thermal Resistance R_t:	

What are the altitude and azimuth of the sun at the following dates and times here in the Bay Area (38° latitude)? Use the Sun Path diagram from class #13, or see professor if you need one.

	Date	Time	Altitude	Azimuth
53.	December 21	10 AM		
54.	February 20	3 PM		
55.	June 21	5 PM		
56.	October 20	12 noon		

57. Draw a **west**-facing window with an appropriate shading device in the box below.

58. Essay question, 3 points: Think of a historic building you have visited at some point in your life. Local examples might include Alcatraz, Coit Tower, the Golden Gate Park Conservatory, Filoli, Pigeon Point Lighthouse, Villa Montalvo, the Winchester House, or any California mission. Describe this property's historic character (1 pt) and historic integrity (1 pt). Under which National Register criteria do you think this property was nominated (1 pt)? Use the back of this exam or another page.

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a, b]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

GROUP		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HEIGHT (feet)	UL	160	65	55	65	55	65	50	40
		STORIES(S) AREA (A)								
A-1	S A	UL UL	5 UL	3 15,500	2 8,500	3 14,000	2 8,500	3 15,000	2 11,500	1 5,500
A-2	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-3	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-4	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-5	S A	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL
B	S A	UL UL	11 UL	5 37,500	3 23,000	5 28,500	3 19,000	5 36,000	3 18,000	2 9,000
E	S A	UL UL	5 UL	3 26,500	2 14,500	3 23,500	2 14,500	3 25,500	1 18,500	1 9,500
F-1	S A	UL UL	11 UL	4 25,000	2 15,500	3 19,000	2 12,000	4 33,500	2 14,000	1 8,500
F-2	S A	UL UL	11 UL	5 37,500	3 23,000	4 28,500	3 18,000	5 50,500	3 21,000	2 13,000

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A[d]	B	A[d]	B	HT	A[d]	B
Primary structural frame[g] (see Section 202)	3[a]	2[a]	1	0	1	0	HT	1	0
Bearing walls Exterior[f, g] Interior	 3 3[a]	 2 2[a]	 1 1	 0 0	 2 1	 2 0	 2 1/HT	 1 1	 0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[e]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	$1^{1}/_{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0