1. The minimum slope for thermoset single-ply roofing is _________
   A  1/2:12  
   B  1/3:12  
   C  1/4:12  
   D  1:12

2. Flashing must be primed on both sides when the roof slope is less than ____________
   A  1:12  
   B  2:12  
   C  3:12  
   D  6:12

3. A reglet may be installed in all of the following manners except ____________
   A  Inset into a raggle  
   B  Embedded behind cladding  
   C  Surface mounted  
   D  Formed as part of an outside wall flashing

4. Type IV asphalt softens at how many degrees?
   A  210  
   B  225  
   C  158  
   D  135

5. Which is not a type of downspout?
   A  Plain rectangular  
   B  Corrugated rectangular  
   C  Plain round  
   D  Ogee

6. When fastening to concrete and not using reglets, the fasteners must be how many inches apart?
   A  8  
   B  10  
   C  12  
   D  18
7. Moderate testing compliance metal roofing has a fire rating of class __________

   A   A  
   B   B  
   C   C  
   D   D

8. The difference between gravel stop and eave drip is ____________

   A  There is no difference  
   B  Eave drip is usually a heavier gage  
   C  Gravel stop has a more pronounced lip  
   D  Gravel stop is usually a heavier gage

9. Tapered rigid insulation usually comes in widths of ____________

   A  18 inches  
   B  24 inches  
   C  36 inches  
   D  4 feet

10. Two layers of underlayment are required when installing shingles on roofs with a slope less than __________

     A  3:12  
     B  5:12  
     C  6:12  
     D  9:12

11. Which of the following is especially vulnerable to leakage?

     A  Chimneys  
     B  Eaves  
     C  Valleys  
     D  Counterflashing

12. On a wood roof, all may have a sheet metal patch except?

     A  Knots  
     B  Large cracks  
     C  Rotted wood  
     D  Resinous areas

13. Who is responsible for fire equipment at the kettle?

     A  Employer  
     B  Fire marshal  
     C  Kettle worker  
     D  Home owner
14. In HVHZ wind areas, 3-tab shingles must have a minimum of how many fasteners?

A 2
B 4
C 6
D 8

15. Polyvinyl chloride roofing material should not be exposed to __________

A Ozone
B Hydrogen
C Carbon products
D Ultraviolet light

16. In open valleys, flashing must be a minimum of what gage galvanized metal?

A 24
B 26
C 22
D 29

17. Metal roof shingles require valley flashing end laps of at least how many inches?

A 2
B 4
C 6
D 8

18. The minimum thickness aluminum to be used for valley lining is __________

A 26
B .024
C .032
D 24

19. Plywood with a panel span rating of 32/16 may be used as roof sheathing to a maximum of how many inches without edge support?

A 32
B 28
C 16
D 12

20. Where a sloping roof meets a vertical wall, flashing must be at least how many inches high?

A 8
B 10
C 12
D 5
21. The percentage of roofing injuries attributable to hot bitumen work is ________

A 10  
B 23  
C 44  
D 51

22. Roll roofing is to be installed over existing roofing materials. The insulation is damp. The roofer should ________

A Remove the damp insulation  
B Install a roof vent every 100 square feet  
C Run a fan over the wet areas for 24 hours  
D Cut 2 foot by 2 foot squares in the roof

2.3 In damp areas where good ventilation is important clay tile roofs should have ________

A Double selvage  
B A hot mop application  
C A ballast system  
D A counter batten system

24. For slate tile installed over copper crickets, the slate should lap the copper at least how many inches?

A 2  
B 4  
C 6  
D 8

25. Which should not be soldered according to Roofing and Construction Estimating?

A Aluminum  
B Copper  
C Lead  
D Nickel alloys

26. Wood shingles will be used to cover 1,000 square feet. The area covered by one shingle is 18 square inches. The pounds of nails required are ________

A Less than 10  
B Between 10 and 15  
C Between 15 and 20  
D More than 20

27. Coal tar is not recommended for roof slopes greater than ________

A 1:12  
B 2:12  
C 3:12  
D 4:12
28. Toeboards are required on scaffolding above how many feet?
   A 6  
   B 8  
   C 10  
   D 3

29. Each portable ladder not self-supporting shall be capable of supporting at least how many times the intended load?
   A 2  
   B 4  
   C 5  
   D 8

30. To limit the effects of thermal expansion in gutters, the maximum practical gutter length to be served by a downspout is how many feet?
   A 12  
   B 32  
   C 42  
   D 50

31. The least expensive nail suitable for attaching asphalt shingles to wood decking is ________
   A Copper  
   B Galvanized  
   C Stainless steel  
   D Common

32. When checking for leaks on a tile roof, look for ________
   A Broken or missing tiles  
   B Improper valley installation  
   C Excessively high ridge caps  
   D Worn downspouts

33. The flange under the tile course should extend immediately ________
   A Above the pipe  
   B Below the pipe  
   C Around the pipe  
   D Adjacent to the pipe
34. A ladder must extend above a roof deck how many feet?

A  2  
B  3  
C  4  
D  5

Use the following Diagram for Questions 35-37

Rob's House has a rise and run of 9/12. Standard 3-tab shingles are to be applied over double layer 15 pound felt. All eave metal and flashings are 26 gage galvanized sheet metal.

35. Shingles cost $42.00 per square roof-top delivery. Labor costs $65.00 per square. The total cost to purchase and install the shingles for Rob's House is _________. Do not allow for ridge caps, starters or waste.

A Less than $4,000 
B Between $4,000 and $5,000 
C Between $5,000 and $6,000 
D More than $6,000
36. The total rolls of 15 pound felt required for Rob's House is ___________. Do not allow for waste or overlap.
A. Less than 10
B. Between 10 and 13
C. Between 13 and 16
D. More than 16

37. The total length of eave required for Rob's House is ___________. Do not allow for waste or overlap.
A. Less than 322 feet
B. Between 322 and 332 feet
C. Between 332 and 342 feet
D. More than 342 feet

**Use the diagram on last page for questions 38 and 39**

38. The contractor can purchase 36 inch by 120 inch 16 ounce copper sheets for $180.00 each. The total cost for the 16 ounce copper only for the air conditioning curbs and parapet walls only on the high roof of the Town Hall is ____________
A. Less than $9,500
B. Between $9,500 and $10,000
C. Between $10,000 and $10,500
D. More than $10,500

39. The squares of shingles to shingle the Town Hall steep roof are ____________
A. 34
B. 35
C. 36
D. 37
All air conditioning penetrations are curb style with 16 ounce copper sheathing coping caps. All parapet walls are covered with 16 ounce copper sheathing coping caps. All air conditioning penetrations are 10 feet by 14 feet inside measurement.
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# X L X W X Flat Area Factor + 100 X Cost = Total
1. 1 X 58 + 20 + 14 X 32 M+
2. 1 X 20 X 14 M+
3. 2 X 14 X 12 M+
   MR X 1.25 + 100 X 107 = $4,761.50

# X L X W X Flat Area Factor + 400 = Rolls
1. 1 X 58 + 20 + 14 X 32 M+
2. 1 X 20 X 14 M+
3. 2 X 14 X 12 M+
   MR X 1.25 + 400 = 11.12

Flat Lengths: 32 + 58 + 20 + 14 X 2 — 20 -12 — 12 + (6 X 14) = 288

Gable: # X Span X Flat Area Factor
2 X 12 + 20 X 1.25 = 55

Parapet: Centerline X W ÷ Coverage X Cost = Total
188 +105 X 2+4 X 2 M+

A/C Curbs:
14 + 10 X 2+2 X 5 X 2 M+
   MR + 30 X 180 = $10,080

# X L X W X Flat Area Factor ÷ 100 = Squares
4 X 30 X 28 X 1.083 ÷ 100 = 36.38