

Practice HVAC Licensing Exam

1. A tracer wire buried with plastic gas piping shall be minimum ____AWG
 - a) 16
 - b) 14
 - c) 18
 - d) 20

2. The minimum ventilation rate for living area of a residence is the greater of 15 cfm per person or ____ air changes per hour
 - a) .5
 - b) .35
 - c) .40
 - d) 1

3. When using a test pressure of 10 psig, the test gauge shall not be capable of reading pressures greater than____PSIG
 - a) 100
 - b) 80
 - c) 50
 - d) 75

4. The use of gypsum boards to for plenums shall be limited to systems where the temperature does not exceed _____ degrees F and the temperature of the conveyed air is kept above the dew point
 - a) 125
 - b) 110
 - c) 250
 - d) 95

5. A sauna room shall have a vent opening above the door at least 4 inches by ____ inches
 - a) 6
 - b) 12
 - c) 10
 - d) 8

6. Gas piping shall be labeled at intervals not exceeding _____ feet
 - a) 8
 - b) 5
 - c) 4
 - d) 3

7. A JOINT OBTAINED BY THE JOINING OF METAL PARTS WITH METALLIC MIXTURES OF ALLOYS WHICH MELT AT 1050 DEGREES F, IS CALLED A _____ JOINT.
 - a) WELDED

- b) MECHANICAL
- c) BRAZED
- d) SOLDERED

8. If an 6" X 10" duct is terminated with a metal louver (75% free area), the louver must be a minimum _____ square inches

- a) 90
- b) 60
- c) 120
- d) 80

9. A gas regulator that reduces incoming pressure between .5 and 5 psig to a lower pressure is called a _____.

- a) service entrance regulator
- b) low pressure regulator
- c) high pressure regulator
- d) medium pressure regulator

10. Unless otherwise specified by the manufacturer, vents shall terminate not less than _____ feet above the highest connected appliance

- a) 12
- b) 10
- c) 8
- d) 5

11. When obtaining combustion air from a crawl space, the free area of the crawl space vent to the outside must be a minimum _____ the size of the combustion air opening

- a) 4 times
- b) 2.5 times
- c) 3 times
- d) 2 times

12. A type I hood, 5 foot long, wall mounted canopy, serving medium-duty appliances shall have a minimum capacity of _____ CFM

- a) 1000
- b) 2500
- c) 500
- d) 1500

13. Downdraft kitchen exhaust ducts may be constructed of _____.

- a) all of the above
- b) sheet metal
- c) aluminum
- d) PVC

14. When combustion air is mechanically forced into a room, a minimum rate of _____ cfm per 1000 btu/h of combined input rating of all installed appliances

must be supplied

- a) .35
- b) 1.0
- c) .25
- d) .40

15. The maximum cfm of duct leakage allowed with a air handler in place for a 1500 square foot home with .1 inch w.c. is_____.

- a) 75
- b) 150
- c) 60
- d) 80

16. Plastic pipe shall not be operated at pressures greater than _____ psig for LP gas

- a) 100
- b) 15
- c) 30
- d) 10

17. Semi-rigid metallic tubing used as appliance connectors shall not exceed ___ feet

- a) 8
- b) 3
- c) 6
- d) 5

18. For other than appliances installed in fireplaces, a gas shutoff valve shall be located within ___feet of the appliance

- a) 3
- b) 4
- c) 10
- d) 6

19. Appliance pits greater than 12 inches deep shall be lined with masonry extending ___inches above the adjoining grade

- a) 4
- b) 2
- c) 3
- d) 6

20. Gas piping may be joined in concealed locations using which of the following methods?

- a) brazing
- b) compression fittings
- c) unions

d) swing joints

21. 1/2" copper tubing must be supported a minimum of _____ feet when installed horizontally

- a) 4
- b) 10
- c) 8
- d) 6

22. Equipment, appliances or material included in a list published by a nationally recognized testing laboratory concerned with product evaluation and states that the above item meets recognized standards is said to be _____

- a) approved
- b) listed
- c) certified
- d) tested

23. A type I hood is not required for _____ >

- a) griddles
- b) hot dog cookers
- c) fryers
- d) broilers

24. REFRIGERANTS REMOVED FROM A SYSTEM IN ANY CONDITION WITHOUT NECESSARILY TESTING OR PROCESSING THEM ARE CALLED _____.

- a) RECYCLED REFRIGERANTS
- b) RECIEVED REFRIGERANTS
- c) RECOVERED REFRIGERANTS
- d) RECLAIMED REFRIGERANTS

25. THE MAXIMUM ALLOWABLE HORIZONTAL LENGTH OF A CATEGORY I APPLIANCE SINGLE WALL VENT CONNECTOR IS _____% OF THE HEIGHT OF THE VENT

- a) 50
- b) 25
- c) 75
- d) 100

26. A commercial stainless steel duct must be constructed of _____ gage thickness

- a) 20
- b) 14
- c) 18
- d) 16

27. A NON LOAD BEARING STUD MAY BE NOTCHED _____% OF ITS

DEPTH.

- a) 30
- b) 40
- c) 25
- d) 15

28. CATEGORY I GAS EQUIPMENT MAY BE VENTED WITH WHICH OF THE FOLLOWING TYPES OF VENTS?

- a) ALL THE ABOVE
- b) CHIMNEY WITH CLAY LINER
- c) TYPE B
- d) SINGLE WALL METAL

29. RECLAIMED REFRIGERANTS SHALL NOT BE REUSED IN A DIFFERENT OWNERS EQUIPMENT UNLESS TESTED AND FOUND TO MEET THE PURITY REQUIREMENTS OF

- a) ARI 700
- b) ASTM A53
- c) NFPA 54
- d) ASHRAE 34

30. IF A GALLON OF OIL CONTAINING 140,000 BTU'S SELLS FOR \$1.25, HOW MUCH WILL 1,000,000 BTU'S COST WHEN USED IN AN 80% AFUE OIL FURNACE

- a) \$8.93
- b) \$11.16
- c) \$14.00
- d) \$12.78

31. For 3/4 inch steel gas pipe hangers or supports shall be spaced not farther than _____ feet apart

- a) 10
- b) 4
- c) 8
- d) 6

32. An auxiliary drain pan must have a minimum depth of _____ inches

- a) 1.5
- b) 1
- c) 1.25
- d) 2

33. A 12" ROUND DUCT HAS A RECTANGULAR EQUIVALENT OF

- a) 16 X 8
- b) 15 X 8
- c) 14 X 8
- d) 17 X 8

34. GAS APPLIANCE CONNECTORS SHALL NOT PASS THROUGH ANY OF THE FOLLOWING EXCEPT

- a) WALLS
- b) APPLIANCE HOUSINGS
- c) FACTORY BUILT FIREPLACES
- d) FLOORS

35. Sauna heaters shall have a thermostat that limits the room temperature to _____ degrees F

- a) 194
- b) 144
- c) 114
- d) 120

36. The minimum R value of duct insulation installed in areas other than the conditioned space or attics is _____

- a) R 5
- b) R 6
- c) R 8
- d) R 4

37. _____ piping may only be used for gas piping outside and underground.

- a) Aluminum
- b) Copper
- c) Steel
- d) Plastic

38. The maximum length allowed for a 4 inch dryer duct with two 90 degree bends is _____ feet

- a) 25
- b) 35
- c) 30
- d) 40

39. The minimum return opening to an 80,000 btuh (output rating) forced air furnace shall be _____ square inches.

- a) 160
- b) 80
- c) 140
- d) 100

40. A location that cannot be accessed without damaging permanent parts of a building is called a/an _____ location

- a) inaccessible
- b) assessible

- c) concealed
- d) ready access

41. AN APPLIANCE RATED AT 75,000 BTUH INPUT MUST BE PLACED IN A ROOM CONTAINING A MINIMUM _____ CUBIC FEET IN ORDER TO BE IN AN UNCONFINED SPACE.

- a) 3750
- b) 7500
- c) 1500
- d) 75000

42. A FUEL FIRED FURNACE, MEASURING 22 CUBIC FEET MUST BE PLACED IN A ROOM GREATER THAN _____ CUBIC FEET IF IT IS NOT APPROVED FOR CLOSET INSTALATION

- a) 264
- b) 352
- c) 220
- d) 564

43. The ignition source of an appliance shall be elevated not less than _____ unless it is listed as flammable ignition resistant

- a) 6 feet
- b) 18 inches
- c) 4 feet
- d) 24 inches

44. Transition ducts used to connect commercial dryers to exhaust duct shall be limited to ____ feet in length

- a) 4
- b) 3
- c) 6
- d) 8

45. A label shall be affixed to a gas appliance with all the following information except _____

- a) BTUH rating
- b) manufacture date
- c) type of fuel used
- d) minimum clearances

46. The miminum size supply line to an oil furnace shall be _____ inch.

- a) 1/8
- b) 1/16
- c) 3/8
- d) 1/4

47. A BLOWER WITH AN EXTERNAL STATIC PRESSURE OF .55" WC IS

CONNECTED TO A 70 FT. LONG DUCT. THE SYSTEM INCLUDES REGISTERS AND GRILLS (.03" WC EACH), A COOLING COIL (.15" WC) AND FILTER (.10" WC). WHAT IS THE TOTAL AVAILABLE STATIC PRESSURE REMAINING FOR SIZING THE DUCT?

- a) .15" WC
- b) .17" WC
- c) .30" WC
- d) .24" WC

48. WHAT IS THE VELOCITY OF 1400 CFM OF AIR IN A DUCT MEASURING 12" X 30"?

- a) 467 FPM
- b) 560 FPM
- c) 3.8 FPM
- d) 360 FPM

49. A system designed to shut off the gas supply to the burners if the oxygen in the surrounding atmosphere is reduced to a predetermined level is called a

-
- a) carbon dioxide detector
 - b) oxygen depletion shutoff system
 - c) automatic shut of valve
 - d) air regulator system

50. A 75,000 BTUH (INPUT RATING) 80% AFUE FURNACE HAS A TEMPERATURE RISE OF 45-DEGREES. WHAT IS THE CFM?

- a) 1667
- b) 1212
- c) 1515
- d) 1175

51. Appliances installed on roofs greater than _____ feet high must have a permanent means of access.

- a) 18
- b) 20
- c) 16
- d) 24

52. A fire damper install at a 2 hour fire rated wall shall have a minimum rating of _____ hours

- a) 2
- b) 1.5
- c) 3
- d) 1

53. Shield plates placed on studs to protect gas piping shall extend _____ inches to each side of the stud.

- a) 1.5
- b) 3
- c) 4
- d) 2

54. The minimum diameter of a close dryer duct shall be _____ inches

- a) 6
- b) 5
- c) 3
- d) 4

55. A location that cannot be accessed without damaging permanent parts of a building is called a/an _____ location

- a) concealed
- b) assessable
- c) inaccessible
- d) ready access

56. Screens used to protect intake openings for ventilation may not have a mesh less than _____ inch.

- a) 1/16
- b) 1/2
- c) 1/8
- d) 1/4

57. THE MINIMUM INSULATION R-VALUE FOR REFRIGERANT LINES FOR A RESIDENCE IS _____.

- a) R-3
- b) R-2
- c) 5-5
- d) R-4

58. Close dryers exhausting more than _____ cfm must be provided with make up air

- a) 150
- b) 100
- c) 200
- d) 75

59. Which of the follow shall not share a type I hood

- a) charcoal grille
- b) griddle
- c) deep fat fryer
- d) pizza oven

60. Underfloor accesses must be a minimum 22 inches high by _____ inches wide

- a) 30
- b) 24
- c) 28
- d) 36

61. Closets containing close dryers must have a make up air opening not less than _____ square inches

- a) 75
- b) 100
- c) 150
- d) 50

62. Grease ducts in enclosures shall have a clearance of _____ inches to construction of non combustible gypsum attached to non combustible structures

- a) 18
- b) 12
- c) 6
- d) 3

63. Which of the following heating systems must have its efficiency posted on a certificate placed on or inside the electrical distribution panel of new residential construction

- a) Electric baseboard
- b) unvented room heater
- c) gas furnace
- d) electric furnace

64. A ventilation system in a 10,000 square foot enclosed parking garage shall be capable of producing a minimum of _____ cfm

- a) 10,000
- b) 20,000
- c) 5000
- d) 15,000

65. IN ORDER TO SUPPLY OUTDOOR COMBUSTION AIR USING THE TWO OPENING METHOD WITH HORIZONTAL DUCTS, WHAT DUCT SIZE BELOW WOULD BE THE MINIMUM NEEDED TO HANDLE A 140,000 BTUH FURNACE

- a) 3.5" X 10"
- b) 8.5" X 10"
- c) 7" X 10"
- d) 14' X 10"

66. Factory built fireplaces must be listed and labeled according to _____.

- a) UL 348
- b) UL127
- c) UL 187
- d) UL 124

67. A single wall oil heat chimney connector shall have _____ clearance from combustibles

- a) 9
- b) 18
- c) 36
- d) 12

68. A plastic condensate pan must have a minimum thickness of _____ inch

- a) .0250
- b) .0625
- c) .0375
- d) .0276

69. If natural ventilation is used, a building, measuring 3000 square feet, must have a minimum openable area of _____ square feet.

- a) 120
- b) 150
- c) 300
- d) 450

70. Duct smoke detectors shall comply with_____.

- a) UL 268
- b) UL 181
- c) ASTM 34
- d) NFPA 72

71. A 2 inch diameter gas pipe must be purged with an inert gas before opening if it is greater than _____ feet long.

- a) all of the above
- b) 30
- c) 50
- d) 40

72. Unless protected by approved area smoke detectors, smoke detectors are required in the return air duct or plenum on any system with a design capacity greater than _____cfm.

- a) 1500
- b) 2000
- c) 4000
- d) 3000

73. IF A CONTRACTOR WORKS ON 15% PROFIT, WHAT WOULD HIS SALES HAVE TO BE TO MAKE \$75,000?

- a) \$600,000
- b) \$112,000
- c) \$500,000

d) \$862,500

74. A single wall low heat 6 inch diameter chimney connector shall have a minimum thickness of _____

- a) 22
- b) 16
- c) 26
- d) 24

75. The vertical distance between the front lower lip of a type I or II hood and the surface of the appliance shall not extend more than _____ feet

- a) 3.6
- b) 4
- c) 2
- d) 3

76. Vented wall furnaces shall be located so that a door cannot swing within _____ inches of the air inlets or outlets of such furnace measures at right angles to the openings

- a) 12
- b) 18
- c) 36
- d) 24

77. FUEL FIRED APPLIANCES SHALL NOT BE LOCATED IN _____.

- a) BASEMENTS
- b) BEDROOMS
- c) LIVING ROOMS
- d) KITCHENS

78. THE VELOCITY OF 250 CFM OF AIR IN A FLEXIBLE, SPIRAL WIRE HELIX CORE DUCT SIZED AT .08" WC STATIC PRESSURE IS _____.

- a) 500 FPM
- b) 900 FPM
- c) 400 FPM
- d) 750 FPM

79. Which of the following is not required for a heat pump installation

- a) load calculation
- b) programmable thermostat
- c) a permit
- d) a means of controlling electric resistance heat from operating when the heat pump can handle the load

80. Type I exhaust outlets that terminate above a roof shall have a discharge outlet not less than ____ inches above the roof surface

- a) 36

- b) 30
- c) 48
- d) 40

81. A CUSTOMER MOVES UP FROM AN 8 SEER TO A 13 SEER AIR CONDITIONER. WHAT WOULD HIS YEARLY SAVING BE IF HE WAS PAYING \$650 PER YEAR FOR AIR CONDITIONING

- a) \$197
- b) \$325
- c) \$250
- d) \$260

82. A CEILING HAS A TOTAL U-VALUE OF .07. WHAT IS THE NEW R-VALUE IF R-19 IS ADDED?

- a) 33.28
- b) 32.28
- c) 30.28
- d) 31.28

83. The control side of a floor furnace must have a minimum _____ inches clearance

- a) 24
- b) 18
- c) 20
- d) 12

84. Which of the following must have a flame spread rating no greater than 5 feet when installed in plenums.

- a) pneumatic tubing
- b) wiring
- c) all the above
- d) fire sprinkler piping

85. The maximum size unvented gas heater that may be installed in a residential bathroom measuring 1600 cubic feet is _____ btuh

- a) 8000
- b) 4000
- c) 3000
- d) 6000

86. The slope of a 24 foot horizontal grease duct must be at least ____ inch.

- a) 1/8
- b) 1/4
- c) 3/4
- d) 1/2

87. If a water level detection device is used in an auxiliary drain pan it must conform to _____.

- a) ASTM 243
- b) UL 508
- c) UL 181
- d) ASI 84

88. The vent cap of an oil tank must have a screen mesh no finer than No.

- a) 10
- b) 4
- c) 6
- d) 8

89. WHAT IS THE DESIGN FRICTION RATE WHEN THE AVAILABLE STATIC PRESSURE FOR THE DUCT SYSTEM IS .36" WC AND THE RUN WITH THE LONGEST EFFECTIVE LENGTH IS 375 FEET?

- a) .05" WC
- b) .08" WC
- c) .15" WC
- d) .10" WC

90. Passageways in attics shall not be less than _____ inches wide

- a) 24
- b) 20
- c) 30
- d) 22

91. IN A ROOM THAT IS LARGE IN COMPARISON WITH THE SIZE OF THE EQUIPMENT, AN APPLIANCE THAT REQUIRES 18" CLEARANCE ON ITS SIDES, MAY HAVE ITS CLEARANCE REDUCED TO _____ IF .024" SHEETMETAL WITH A VENTILATED AIR SPACE IS USED TO PROTECT THE COMBUSTIBLE SURFACE.

- a) 6
- b) MAY NOT HAVE CLEARANCE REDUCED
- c) 12
- d) 9

92. A vertical pipe supplying gas is a _____

- a) riser
- b) leader
- c) upright
- d) standpipe

93. Copper piping shall not be used if the gas contains more than ___ grains of hydrogen sulfide per 100 standard cubic feet.

- a) .3

- b) 3
- c) .5
- d) 6

94. Brazing alloys used on gas piping shall not contain more than _____ percent phosphorus

- a) .005
- b) .5
- c) 5
- d) .05

95. Duct insulation installed within _____ inches of a type I hood shall be noncombustible or be listed for the application

- a) 18
- b) 6
- c) 12
- d) 24

96. The minimum distance between the cooking surface and a grease filter serving burners with flames is _____ feet

- a) 1
- b) 3.5
- c) .5
- d) 2

97. The minimum gage for a 14 inch round galvanized air duct is _____.

- a) 30
- b) 28
- c) 26
- d) 24

98. FOR A BUILDING TO BE MAINTAINED AT 70 F, HOW MANY BTUH ARE REQUIRED TO OFFSET 300 CFM OF 20 F OUTDOOR VENTILATION?

- a) 16,500
- b) 6,600
- c) 6,000
- d) 1,400

99. The maximum operating pressure of LP gas systems shall not exceed _____ unless the building or area is constructed according to NFPA 58, Chapter 10

- a) 10
- b) .5
- c) 5
- d) 20

100. THE AMERICANS WITH DISABILITIES ACT APPLIES TO ALL EMPLOYERS WHO HAVE _____ OR MORE EMPLOYEES

- a) 25
- b) 15
- c) 50
- d) 10

101. Flexible air ducts_____.

- a) shall not be limited in length
- b) shall be limited to 14 feet in length
- c) shall be labeled 181-B
- d) May convey air at up to 275 degrees

102. The minimum allowable HSPF rating of an air cooled residential heat pump is _____

- a) 7.0
- b) 8.2
- c) 6.8
- d) 7.7

103. A 500 SQUARE FOOT CONFERENCE ROOM REQUIRES _____CFM OF OUTDOOR VENTILATION

- a) 500
- b) 250
- c) 750
- d) 150

104. When mechanically ventilating a 1500 square foot conference room in an office building, how many CFM of outdoor air are required?

- a) 1500
- b) 1000
- c) 50
- d) 3000

105. Access points for inspecting and servicing fire dampers shall be labeled FIRE DAMPER with letter no less than _____ inch/s high

- a) .5
- b) .75
- c) 2
- d) 1

106. Unless protected from vehicle impact, appliances shall be installed a minimum _____ feet above the floor of a private garage

- a) 6
- b) 5
- c) 8
- d) 9

107. Cleanouts located on horizontal grease ducts shall be placed not more than

_____ feet apart

- a) 100
- b) 15
- c) 20
- d) 10

108. Unless otherwise approved, ducts shall not be installed within _____ inches of earth.

- a) 4
- b) 3
- c) 5
- d) 6

109. THE DISTANCE FROM A METER TO A NATURAL GAS WATER HEATER (40,000 BTUH) IS 30 FEET. 20 FEET FURTHER DOWN THE LINE IS A FURNACE (120,000 BTUH). WHAT IS THE MINIMUM PIPE SIZE THAT MUST BE USED BETWEEN THE WATER HEATER AND FURNACE? (PRESSURE LESS THAN 2 LBS, PRESSURE DROP = .05)?

- a) 1/2"
- b) 3/4"
- c) 1"
- d) 3/8"

110. A gas regulator that reduces incoming pressure between .5 and 5 psig to a lower pressure is called a _____.

- a) low pressure regulator
- b) service entrance regulator
- c) high pressure regulator
- d) medium pressure regulator

111. A HEAT PUMP IN A RESIDENCE MUST BE CONTROLLED BY WHICH OF THE FOLLOWING?

- a) A PROGRAMMABLE THERMOSTAT
- b) A DEVICE TO PREVENT SUPPLEMENTARY HEAT FROM COMING ON IF HEAT PUMP CAN HANDLE THE LOAD ALONE
- c) A DEVICE THAT ALLOWS SUPPLEMENTARY HEAT OPERATION DURING DEFROST CYCLES EXCEEDING 15 MINUTES
- d) A FOSSIL FUEL KIT

112. When bending metallic gas pipe, the inside radius shall not be less than _____ times the diameter

- a) 6
- b) 10
- c) 5
- d) 25

113. THE LARGEST A BORED HOLE MAY BE IN A 2' x 9.5" joist is

- a) 3.4"
- b) 3.31"
- c) 3"
- d) 2.85"

114. When aluminum foil is used as a vapor retarder for duct insulation it must be minimum

_____ mils thick

- a) 4
- b) 2
- c) 1
- d) 6

115. A label shall be affixed to the gas appliance with all the following information except _____

- a) BTUH rating
- b) type of fuel used
- c) manufacture date
- d) minimum clearances

116. Exhausted environmental air must be _____ feet from mechanical intakes

- a) 12
- b) 8
- c) 3
- d) 10

117. THE MAXIMUM BTUH RATING OF AN UNVENTED GAS HEATER INSTALLED IN A 15 X 20 ROOM WITH 8 FOOT CEILINGS IS (infiltration rate is greater than .40 ACH)?

- a) 48,000
- b) 40,000
- c) 24,000
- d) 6,000

118. Liquid adhesive used on air filters shall have a flash point no lower than _____ degrees F

- a) 230
- b) 275
- c) 250
- d) 325

119. Unless welded or placed in a ventilated shaft, the maximum operating pressure of gas piping in a residence shall not exceed _____ psig

- a) .5
- b) 10
- c) 2
- d) 5

120. Duct lining shall be interrupted _____ inches downstream of a duct heater

- a) 6
- b) 12
- c) 10
- d) 4

121. TWO NATURALLY VENTILATED APPLIANCES WITH A COMBINED CAPACITY OF 130,000 BTUH ARE CONNECTED TO A COMMON B-VENT, 18' HIGH WITH TWO 90-DEGREE ELBOWS. WHAT SIZE COMMON VENT SHOULD BE USED?

- a) 5"
- b) 7"
- c) 4"
- d) 6"

122. Shield plates on studs must be a minimum _____ - inch thick

- a) .087
- b) .025
- c) .075
- d) .062

123. A floor furnace shall be placed such that a drapery can be no nearer than _____ to the register of the furnace

- a) 18
- b) 12
- c) 6
- d) 8

124. Corridors are generally not permitted to be used as return ducts, however the hallway of a tenant space _____ square feet or less may be used for return air.

- a) 1200
- b) 500
- c) 750
- d) 1000

125. Where holes or notches for gas tubing are less than 1.5 inches from the nearest edge of a wood stud, they must be protected by metal shields not less than _____ inch thick.

- a) 1/8
- b) 1/32
- c) 1/16
- d) 1/4

126. The minimum cross-sectional dimension of a combustion air duct shall be _____ inches

- a) 3
- b) 8
- c) 4
- d) 6

127. The highest point of an attic must be at least ____ inches in order to be used as a source for combustion air

- a) 28
- b) 30
- c) 24
- d) 36

128. A gas line serving a grill may be installed a minimum _____ inches as long as it is approved and not susceptible to physical damage

- a) 8
- b) 12
- c) 6
- d) 16

129. Which rooftop appliance does not require guardrail protection?

- a) one located 3 feet from roof edge
- b) one located 6 feet from roof edge
- c) one located 4 feet from roof edge
- d) one located 8 feet from roof edge

130. When obtaining combustion air from an attic, a minimum 26 gage galvanized sheet metal sleeve must be used and extended _____ inches above the joists and insulation

- a) 6
- b) 2
- c) 8
- d) 4

131. A HOUSE HAS A HEAT LOSS OF 48,000 BTUH AT 20-DEGREE OUTDOOR TEMPERATURE. WHAT IS THE HEAT LOSS AT 40-DEGREE OUTDOOR TEMPERATURE?

- a) 18,000 BTUH
- b) 124,000 BTUH
- c) 19,200 BTUH
- d) 28,800 BTUH

132. Duct insulation shall have the R value printed every _____ inches

- a) 60
- b) 36
- c) 48
- d) 24

133. A CONTRACTOR PAYS \$750 FOR A FURNACE PLUS 7% TAX. WHAT WOULD HIS SALES PRICE BE IF HE WISHED TO MAKE 30% GROSS PROFIT?

- a) \$1028
- b) \$1146
- c) \$1043
- d) \$975

134. A 30' X 8' PARTITION (2 X 4 STUDS, GYPSUM ON BOTH SIDES, NO INSULATION) SEPARATES TWO ROOMS HAVING A TEMPERATURE DIFFERENCE OF 20 DEGREES. WHAT IS THE WINTER HEAT LOSS THROUGH THE PARTITION?

- a) 3,535 BTUH
- b) 15,360 BTUH
- c) 1,500 BTUH
- d) 2,609 BTUH

135. Which of the following gas piping materials shall not be used in exterior locations or underground

- a) steel
- b) plastic
- c) brass
- d) aluminum

136. This question eliminated

- a) ?
- b) ?

137. Gas piping installed underground beneath buiding may not be incased in

_____.

- a) cement
- b) steel pipe
- c) plastic pipe
- d) wrought iron conduit

138. Floor registers must support _____ lbs consentrated load on a 2 inch disk applied at its most critical area

- a) 100
- b) 250
- c) 150
- d) 200

139. AN AIR CONDITIONER HAS HIGH SUCTION AND A LOW HEAD PRESSURES. WHAT WOULD BE A LIKELY CAUSE?

- a) DIRTY CONDENSER COIL
- b) DIRTY FILTERS
- c) CLOGGED METERING DEVICE

d) BAD OR WEAK COMPRESSOR VALVES

140. When cutting threads, a 3/4 inch pipe shall have approximately _____ treads cut

- a) 12
- b) 11
- c) 10
- d) 13

141. Type I grease ducts shall have a clearance of _____ inches to combustible construction

- a) 18
- b) 3
- c) 6
- d) 12

142. Grease ducts shall provide an air velocity not less than _____ feet per minute

- a) 400
- b) 750
- c) 250
- d) 500

143. IF PROTECTION FROM VEHICLE IMPACT IS NOT PROVIDED, APPLIANCES INSTALLED IN PRIVATE GARAGES MUST BE INSTALLED _____ FEET ABOVE THE FLOOR.

- a) 7
- b) 6
- c) 8
- d) 5

144. THE MAXIMUM HORIZONTAL LENGTH OF A SINGLE WALL CONNECTOR IS _____ % OF THE HIEGHT OF THE CHIMNEY OR VENT.

- a) 50
- b) 100
- c) 75
- d) 150

145. Condensate piping must no be less than _____ inch diameter

- a) 3/4
- b) 1/2
- c) 5/8
- d) 1

146. The unthreaded portion of a gas piping outlet shall not extend less then _____ through a slab floor

- a) 1.5

- b) 3
- c) 2
- d) 1

147. A DOUBLED UP STUD IN A LOAD BEARING WALL MAY HAVE A HOLE BORED UP TO _____% OF IT DEPTH

- a) 25
- b) 40
- c) 60
- d) 15

148. A vent is not _____

- a) site made
- b) a passage way for carrying combustion products
- c) factory made
- d) listed and labeled

149. A HOUSE HAS A HEATING LOAD OF 48,000 BTUH. HOW MANY CFM ARE REQUIRED FOR A ROOM WITH A HEAT LOAD OF 5200 BTUH, USING A FURNACE WITH A 1200 CFM BLOWER?

- a) 468
- b) 112
- c) 130
- d) 1112

150. A home must be provided with a space heating system capable of maintaining a minimum indoor temperature of _____ degree at a point 3 feet above the floor level on a design heating day

- a) 78
- b) 70
- c) 75
- d) 68

151. An appliance that causes a positive vent pressure and produces excessive condensation in the vent is a Category _____ appliance

- a) II
- b) IV
- c) I
- d) III

152. Pressure sensitive tapes used on flexible ducts shall be labeled as conforming to _____

- a) UL 181 A
- b) UL 181-FX
- c) UL 181 A-P
- d) UL 181 B

Answers

1. c 404.Tracer
2. b Table 403.3
3. c section 406 (5 x test pressure)
4. a section 601
5. d section 914
6. b section 401
7. c Chapter 2 Definitions
8. d section 709 ($6 \times 10 = 60$ sq. in., $60/.75 = 80$ sq. in.)
9. d Chapter 2 definitions of "regulator, medium pressure"
10. d section 802 imc
11. d section 701 imc (2006 and earlier, Not in 2009 or 2012 codes)
12. d section 507 (300 X 5 ft = 1500 cfm)
13. a section 505 (exception includes PVC in some cases)
14. a section 304.9 Gas code(This answer is not found in some codes)
15. c 403.2.2 Energy Code (2009 code only, answer not in 2012Code)

$$1500 \text{ sq. ft.} / 100 = 15$$

$$15 \times 6 = 90 \text{ cfm}$$

16. c 404.14 Limitations. IFGC
17. c 411.1 gas code
18. d 409 gas code IFGC
19. a section 303 IMC
20. a 404 gas code
21. d Table 305.4 IMC
22. b definitions-listed
23. b section 507 IMC
24. c Chapter 2 definition "recovered refrigerant" mech code
25. c SECTION 503 LENGTH OF VENT CONNECTOR, GAS CODE
26. c section 506 IMC
27. b 302 MECH CODE
- 28 a TABLE 503.4 gas code
29. a 1102. mech code
30. b $1,000,000/140,000 = 7.143 \text{ gals}$
 $7.143/.80 = 8.928 \text{ gals @ } 80\% \text{ efficiency}$
 $8.928 \times \$1.25 = \11.60
31. c Table 415.1 gas code
32. a section 307 IMC
33. a Manual D rectangular to round tables or use duct calculator.
34. c 411 gas code
35. a section 914 IMC

36. b section R403 energy code
37. d 403 gas code
38. a section 504 IMC (35 feet minus 5 feet for each 90 degree bend)
Note: some older code allow for a max of 45 feet with a penalty of 10 feet
for each 90 degree bend
39. a section 918 IMC($80000/1000 = 80$, $80 \times 2" = 160$ square inches)
40. c Chapter 2, definitions gas code
41. a See "confined space " definition, 2006 IFGC. Note: confined space is no
longer a defined term in the 2009 or later codes
42. a 303 gas code, room must be 12 times larger than the appliance. Note this
provision is not in all codes
43. b 305 gas code
44. d. section 504 IMC
45. b section 301
46. c section 1305 IMC
47. d $.55 - .03 - .03 - .15 - .10 = .24'$ wc
48. b vel - cfm/ area in sq. ft.
 $12" \times 30" = 360$ sq. in.
 360 sq. in / $144 = 2.5$ sq. ft.
49. b chapter 2 definitions, gas code
50. b $CFM = BTUH / (TR \times 1.1)$
 $bthu = 75,000 \times .80 = 60,000$
51. c 306 mech code
52. b Table 607

53. c 404 gas code
54. d section 504 IMC
55. a Chapter 2 mech code "concealed location" definition
56. d Table 404 IMC
57. a section 403 energy code
58. c section 504 IMC
59. a Section 507 IMC(charcoal grille is *extra heavy duty*, see definitions)
60. a section 306 IMC
61. b section 504 IMC
62. c section 506 Grease duct enclosure
63. c section R401 energy code
64. d section 404 IMC ($10,000 \times 1.5 = 15,000$)
65. c 304 IMC, $140,000/2000 = 70$ square inches, $7 \times 10 = 70$ square inches(Gas Code)
66. b section 903 IMC
67. b Table 803.10.6 IMC
68. b section 307
69. a section 402 IMC ($3000 \times .04 = 120$)
70. a section 606 IMC
71. a table 406.7.1 gas code
72. b section 606 IMC
73. c $\$75,000/.15 = \$500,000$
74. d Tabel 803.9(1) IMC
75. b section 507 IMC
76. a section 909 IMC

77. b 303 mechanical code
78. a use friction chart or ductulator
79. b section 403 energy code
80. d Section 506 IMC
81. c $8/13 = .615$
 $.615 \times 650 = 400$ op cost of new a/c
 $650 - 400 = \$250$ savings
82. a Only R values can be added or subtracted, therefore, convert the U value to R value $1/.07 = 14.28$
add R 19 + R 14.28 = R 33.28
83. b section 910 IMC
84. c section 602 IMC
85. d 303.3 exception 3, and 304.5.1 gas code
 $(6000/1000) \times 50 = 300$ cubic feet minimum bath size
86. d section 506 IMC ($24 / 12 = 2$, $2 \times 1/4" = 1/2"$)
87. b section 307 IMC
88. b section 1305 IMC
89. d $.36 \times 100/375 = .096$ (rounded to .10) manual d
90. d section 306 IMC
91. a Table 308.6
92. a Definitions, gas code
93. a section 403 IFGC
94. d section 403 IFGC
95. a section 506 IMC

96. d Table 507 IMC

97. b Table 603.4

98. a $70F-20F = 50F$ TD

$$BTUH = CFM \times 1.1 \times TD$$

$$= 300 \times 1.1 \times 50$$

99. d 402 gas code

100. b NASCLA business book or look up ADA

101. a section 603 IMC (flexible connectors must be limited to 14 feet, not ducts)

102. d Table C403.2.3 (2) energy code

103. a Table 403.3 mech code

table assumes 50 people /1000 sq ft

Therefore 25 people would occupy 500 sq ft

$$25 \text{ people} \times 20 \text{ cfm/person} = 500 \text{ cfm}$$

104. a Table 403.3 IMC ($1500/1000 = 1.5$, $1.5 \times 50 \text{ people} = 75 \text{ people}$, $75 \times$

$$20 \text{ cfm} = 1500 \text{ cfm})$$

105. a section 607 IMC

106. a section 304 IMC

107. c section 506 IMC

108. a Section 603 IMC

109. b See "longest length method" in gas code appendix

110. d section 202 IFGC

111. b 2012 energy code only

112. a 405 gas code

113. a 302 mech code

114. b section 604 IMC
115. c 301 gas code
116. d section 501 IMC
117. a 304.5.1 gas code
- $15 \times 20 \times 8 = 24,000$ cubic ft.
- $24,000 / 50 = 48$
118. d section 605 IMC
119. d section 402 IFGC
120. a section 604 IMC
121. d Use Table 504.3(1), IFGC, Remember to use the 15 ft. height not 20 ft.
122. d section 305 IMC (2009-2012 says .0575)
123. b section 910 IMC
124. d section 601 IMC
125. c 404.5 gas code
126. a section 708 IMC, also 304.6 IFGC
127. b section 701 IMC
128. a 404.9.1 gas code
129. d section 304 IMC, says "within" 6 feet
130. a section 701 IMC
131. d $48,000 \text{ btuh} / 50 \text{ degree TD} = 960 \text{ btuh heat loss per degree TD}$
- new TD $70\text{F} - 40\text{F} = 30$
- $30 \text{ DTD} \times 960 \text{ btuh} / \text{DTD} = 28,800 \text{ btuh}$
132. b section 604 IMC
133. b $\$750 \times .07 = \52.50

$$\$750.00 + 52.50 = \$802.50$$

$$100\% - 30\% = 70\% \text{ Or } .70$$

$$802.50 / .70 = \$1146.42$$

134. c still air surface = .68

$$\text{gypsum} = .45$$

$$\text{air space} = .91$$

$$\text{gypsum} = .45$$

$$\text{still air surface} = .68$$

$$\text{Total R} = 3.17$$

$$U = 1/3.17 = .315$$

wall is 240 square feet (30 x 8)

$$\text{BTUH} = \text{area} \times U \times \text{td}$$

$$240 \times .315 \times 20 = 1512 \text{ (close enough) still air surface} = .68$$

135. d 403 gas code

136. This question eliminated

137. a 404 gas code

138. d section 603 IMC

139. d see any service manual

140. c Table 403.9.2 gas code

141. a section 506 IMC

142. d section 506 IMC

143. b 305 gas code

144. c 503.10._ gas code

145. a section 307 IMC

146. c 404 gas code

147. c 302 mech code

148. a see definition "vent", gas code

149. c Room cfm = HF X room heat lose

HF factor = $1200/48,000$

HF= .025

Therefore: $.025 \times 5200 = 130$ cfm

150. d section 309 IMC

151. b Gas Code definitions "vented appliance categories"

152. a Section 603 IMC