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E-Course 70 questions True-False test follows along with the PDF PowerPoint presentation

	A	B	C
1	License Number: Name:		
2	**Hydronic Heating Fundamentals (Page 1 of 1)**	**T**	**F**
3	The anticipated adoption date for the OBPVSC is October 1, 2024		
4	Heating boilers are constructed to operate up to 160 psi MAWP Maximum Allowable Working PSI		
5	Per NBIC Hot water heating boiler stop valves may be ferrous or nonferrous		
6	Pre-charge the hydro pheumatic expansion tank with air before filling the system with water		
7	Size and charge the expansion tank based upon the pressure relief device set pressure		
8	ASME CSD-1-2021 controls and safety devices comprise four sections		
9	The installing contractor shall test and report per CG-501(b) on the operation of control systems		
10	A hot water-supply boiler furnishes hot water at a pressure less than or equal to 200 psi		
11	Fuel pressure supervision is not required for ignition systems with pilots. Up to 2,500,000 Btu/Hr		
12	Pressure vessel Maximum Allowable Working Pressure MAWP is established by construction		
13	Static Load: Every foot of elevation exerts .433psi of pressure at the boiler. (2.31 feet = 1psi)		
14	Typically the higher the mass of the heat emitter the lower supply temperature required		
15	Hot water heating allows various generaters to be used and combined to heat the space		
16	Typically flue gas begins to condense with below 130F water return temperatures		
17	1 cubic foot of natural gas combustion produces 2 cubic foot of water vapor		
18	The typical condensing boiler condensate pH level is 3-5		
19	Air is soluable in water. Water cannot hold air when heated. It loses air when heated.		
20	Flow is energy in motion. Dead heading pumps raises the temperature. 1/12 hp motor 50F. per hour		
21	Where the expansion tank is installed determines the "point of no pressure change"		
22	Thermal equilibrium: System only cares about achieving a balance between heat input and output		
23	Series loop distribution systems are the simplest method to install. No zoning. 110ft baseboard max		
24	A series primary secondary distribution system does not incorporate closely spaced tees for zoning		
25	Closely spaced tees provides hydrolic isolation and enhance pump performance		
26	Differential pressure bypass valves are used in systems with multiple zone valves		
27	Thermostatic self operated temperature mixing valves can be used to control zone temperatures		
28	AHRI Ratings are based upon piping and pick up allowance of 1.15. 15% add to heat load calculation		
29	A typical condensing boiler can reach 98% efficiency with 105F. Return temperature water		
30	Pressure relief valves should be chosen based upon total static pressure calculations plus 10psi		
31	Use a pressure regulator set 3psi above the total system static pressure calculations		
32	The pressure relief device sent with the boiler may not be sufficient to handle actual static psi		
33	The greater the temperature of a liquid, the more pressure must be exerted to prevent boiling		
34	Thermal heat energy: 1 gpm delivers 10,000 btus per hour at 20F. Delta T (170F. To 150F.)		
35	Dedicate and size a pump for each hot water heating boiler		
36	The optimum velocity in hot water piping is minimum 2 fps to maximum 4 foot per second flow		
37	2-1/2" piping can flow the same as 11.4 total 1" pipes		
38	2" pipe has the equivalent flow of 3 total 1-1/2" pipes		
39	A Taco 1400-20 zone pump can deliver 8gpm at 37.22 ft.hd. From the pump curve shown		
40	1” Copper pipe (8 gpm) 3.11 fps 4.56 FT HD per 100 ft of pipe		
41	3.11 fps feet per second is within the optimum velocity for hot water heating pipe flow		
42	All piping components and fittings impose pressure loss and are used to calculate total head loss		
43	**Email completed test to Tim.radiantrealities@gmail.com**		
44	*8 CE hours will be submitted to the State of Oregon BCD accordingly*		
45	**Certificate of completion will be emailed to confirm receipt of successful test**		

Please write in any comments or questions. Thanks for your business!