

Regn No: _____

Name: _____

(To be written by the candidate)

**EXAMINATION FOR COMPETENT PERSONS FOR INSPECTION
AND CERTIFICATION OF BOILERS – APRIL - 2011**

REGULATIONS, WELDING, HEAT TREATMENT AND SAFETY

Date : 24/4/2011

Time : 11:30 – 12:30 Hrs.

Marks : 100

1. Boiler means any closed vessel exceeding capacity which is used expressly for generating steam under pressure
 - (a) 2.275 liters
 - (b) 200 liters
 - (c) 25 liters
 - (d) 22.75 liters
2. Steam pipe means any pipe through which steam passes if,
 - (a) Pressure exceeds 2 kg/cm² and ID greater than 250 mm
 - (b) Pressure exceeds 2.5 kg/cm² and ID greater than 100 mm
 - (c) Pressure exceeds 5kg/cm² and ID greater than 50 mm
 - (d) Pressure exceeds 3 kg/cm² and ID greater than 75 mm
3. Certificate for use of boilers
 - (a) Form II
 - (b) Form III
 - (c) Form VI
 - (d) Form IIIC.
4. Inspecting authorities certificate of inspection during construction of boilers for which variations from standard conditions have been permitted
 - (a) Form II
 - (b) Form IIA
 - (c) Form IIB
 - (d) Form IIIC
5. A certificate authorizing the use of boiler shall cease to be in force
 - (a) Expiry of the period for which it was granted
 - (b) Whenever any accident occur to the boiler
 - (c) Whenever any structural alteration, addition or renewal is done in the boiler
 - (d) All the above

6. The minimum tensile strength of carbon steel plates _____ the maximum tensile strength of carbon steel plates _____ in Kgf / mm²
- (a) 37 , 52 (b) 42 , 62
(c) 45 , 62 (d) 37 , 62
7. What is the limit of carbon content for materials used in flame cutting or welding
- (a) 0.25% (b) 0.20 %
(c) 0.30% (d) 0.35 %
8. The specification for boiler quality plates in Indian Standards
- (a) IS 2062 (b) IS 266
(c) IS 2002 (d) IS 2066
9. The range of graduation on pressure gauge for working pressure over 35 kg/ cm² shall be
- (a) Zero to 1.25 times the working pressure
(b) Zero to 2 times the working pressure
(c) Zero to 1.5 times the working pressure
(d) Zero to 1.0 times the working pressure
10. The yield strength of plate at room temperature shall not be less than
- (a) 45% (b) 55%
(c) 50%
11. The angle of bend on a mandrel of diameter 3t
- (a) 120Deg (b) 90Deg.
(c) 180Deg. (d) 150 Deg
12. The maximum design temperature permitted for carbon steel tubes and pipes
- (a) 350 deg C (b) 404 deg C
(c) 454p deg C (d) 450 deg C
13. Seamless steel tubes made to other international standards for boilers are permitted for use in Boilers
- (a) True (b) False

14. The minimum hydraulic test pressure to which the boiler quality tubes is tested at tube manufacturers works
- (a) 40 kg /cm² (b) 70 kg /cm²
 (c) 60 kg /cm² (d) 100 kg /cm²
15. What is the minimum and maximum tensile strength in Kgf/ mm² of Forgings
- (a) 37 , 52 (b) 42 , 62
 (c) 45 , 62 (d) 37 , 62
16. The minimum percentage elongation is calculated for castings by using Formula
- (a) $93 - R_m / 2.2$ (b) $73 - R_m / 2.2$
 (c) $93 - R_m / 1.2$ (d) $93 - R_m / 3.2$
- Where R_m is Measured Tensile Strength in Kgf/mm² at room temperature
17. The minimum size and maximum tensile strength of mild steel electrodes are — (inch) and —Tons / sq.inch.
- (a) $3/32$, 33 (b) $3/8$, 35
 (c) $1/4$, 65 (d) $1/8$, 55
18. Electrodes intended for use for more than one type of current and polarity shall be tested using each type of current and polarity
- (a) Yes (b) No
 (c) No mention in IBR
19. Departure from circularity fusion welded drums permitted is — % of nominal Internal Diameter
- (a) 0.5. (b) 2
 (c) 1 (d) depends on Internal Diameter
20. The butt joints of boiler drum shall be tested by
- (a) 10%RT (b) 100% UT
 (c) 100 % RT (d) 100 % MT

21. The size of Transverse Tensile test specimen for weld joints for plate thickness above 30mm shall at least be
- (a) 25 mm (b) 30 mm
(c) equal to plate thickness (d) Discretion of Inspecting Authority
22. The minimum tensile strength & percentage elongation in All weld tensile tests on butt weld joints shall have a minimum of
- (a) 35 kgf/mm², 17 (b) 62 kgf/mm², 20
(c) 55 kgf/mm², 18 (d) that of the base material
23. The hydraulic test pressure that the drum shall be subjected to at works — Working Pressure
- (a) 1.5 times (b) 1.0 times
(c) 2.0 times (d) 1.25 times
24. The extent of thinning and departure from circularity permitted in tube bends are
- (a) 10%, 10% (b) $100 / 4 * R/D + 2$, 10 %
(c) $100 / 2 * R/D + 2$, 10 % (d) 10%, 15%
25. The least thickness of the tube permitted for use in coiled tubes for forced flow/circulation type boilers?
- (a) 2.9 mm (b) 2.03 mm
(c) 1.62 mm (d) 3.25 mm
26. The number of test plates required for fusion welded pipes are
- (a) one per 60M (b) Two per 60M
(c) Every pipe (d) One per 30 M
27. The minimum pipe thickness required for the pipe before bending shall be — times calculated pipe thickness
- (a) 1.0 (b) 1.125
(c) 1.25 (d) 2.0

28. The minimum angle of branch welded to the main pipe shall be
- (a) 60 deg (b) 45 deg
(c) 75 deg (d) 30 deg
29. The Hydro-test pressure of Waste Heat Boilers upto 50 Kg/cm² is — times Working Pressure
- (a) 1.5 (b) 1.25
(c) 1.5 (d) 1.125
30. Whether hydraulic test is mandatory on expiry of certificate for power utility boilers of working pressure less than 50kg/Cm²
- (a) Yes (b) No
(c) discretion of Inspecting Authority
31. The maximum percentage allowed for accumulation of pressure in steam test at site is
- (a) 5% (b) 3 %
(c) 10% (d) 8%
32. The maximum depth permitted in engraving of register number is
- (a) 1mm (b) 0.5mm
(c) 0.4mm (d) 0,2mm
33. The circularity deviation permitted in shells of shell type boilers is
- (a) 1% (b) 2%
(c) + or - 1%. (d) 0.5 %
34. The variation in Internal Diameter allowed in internal flues is
- (a) 1 % (b) 6mm or t of plate
(c) 6mm or ½ t of plate (d) 2%
35. The size of manhole of Shell Type boilers over 4ft prescribed in IBR is
- (a) 12" × 12" (b) 14" × 12"
(c) 16" × 12" (d) 18" × 12"

36. The Institution or Individual responsible for conducting and certifying welder's test
- (a) Inspecting Officer (b) Inspecting Authority
(c) Competent person (d) Competent Authority
37. The minimum thickness of the plate used for welders initial / requalification test is
- (a) 25mm (b) 13 mm
(c) 16mm (d) 19mm
38. The minimum diameter of the main pipe in welders initial qualification is
- (a) 102 mm (b) 127mm
(c) 89mm (d) 159mm
39. A welder is continuously engaged on production weld can be permitted to take the test as in actual Production.
- (a) Yes (b) No
(c) Not mentioned
40. Can any welder qualified for higher grade of steel may be permitted to weld lower grade?
- (a) Yes (b) No
(c) Not explicitly mentioned
41. The correct Form for certifying welder's qualification test is:
- (a) Form VI (b) Form XIII.
(c) Form II (d) Form IV(a)
42. The pipes are Certified by Well Known steel maker by the given below Form :
- (a) Form IIIA (b) Form IV
(c) Form IIIE (d) Form IIID
43. For Boilers operating at pressures higher than 60 kg /cm², the quality of feed water shall be as per the following Indian Standard:
- (a) 3025 (b) 3550
(c) 10496 (d) 2062

44. The categorization of Repairers of Boilers with Operating Pressure greater than 17.5 but less than 40 Kg/cm² falls into :
- (a) IIIrd Class (b) IInd Class
(c) Ist Class (d) Special Class
45. Every boiler shall be provided with atleast
- (a) one safety valve (b) two safety valves
(c) electromatic relief valve
46. The set pressure of one safety valve should be at least equal to
- (a) superheater outlet pressure (b) drum pressure
(c) feedwater pressure (d) 110% of superheater pressure
47. The safety valves used in water tube boilers in power plants normally of type
- (a) ordinary lift (b) high lift
(c) full lift (d) none of the above
48. The constant C used in calculating discharge capacity of safety valve may be more than 0.24 provided
- (a) discretion of inspecting authority (b) as detailed by Appendix L
(c) by actual demonstration
49. One of the two safety valves in boiler drum is having an isolation valve. Is it permissible?
- (a) Yes (b) No
50. The minimum distance between gauge cocks in water level indicators shall be
- (a) 175mm (b) 100mm
(c) 200mm

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