Steam Boilers and Engines

1. The function of a steam boiler is to:

(A) Generate steam

(B) Compress air

(C) Pump water

(D) Store fuel

Answer: A) Generate steam

2. The fire tube boiler is also called:

(A) Internally fired boiler

(B) Externally fired boiler

(C) Water tube boiler

(D) High pressure boiler

Answer: A) Internally fired boiler

3. The water tube boiler as compared to fire tube boiler:

(A) Produces higher pressure steam

(B) Has less efficiency

(C) Has thick tubes

(D) Has horizontal drum

Answer: A) Produces higher pressure steam

4. Fusible plug in a boiler is used to:

(A) Extinguish fire when water is low

(B) Increase temperature

(C) Improve steam quality

(D) Reduce pressure

Answer: A) Extinguish fire when water is low

5. The pressure gauge in a boiler measures:

(A) Steam pressure

(B) Water pressure

(C) Air pressure

(D) Fuel pressure

Answer: A) Steam pressure

6. The manhole is provided in a boiler for:

(A) Cleaning and inspection

(B) Increasing pressure

(C) Safety

(D) None

Answer: A) Cleaning and inspection

7. Economizer in a boiler is used to:

(A) Heat feed water

(B) Increase steam pressure

(C) Increase draft

(D) Preheat air

Answer: A) Heat feed water

8. Blow-off cock is used to:

(A) Remove sludge and sediments

(B) Increase steam pressure

(C) Reduce temperature

(D) Supply water

Answer: A) Remove sludge and sediments

9. Function of superheater is:

(A) To increase temperature of steam

(B) Increase pressure of steam

(C) Reduce fuel use

(D) Remove impurities

Answer: A) To increase temperature of steam

10. Cochran boiler is:

(A) Vertical fire tube boiler

(B) Horizontal water tube boiler

(C) Horizontal fire tube boiler

(D) Vertical water tube boiler

Answer: A) Vertical fire tube boiler

11. Boiler mountings are:

(A) Essential for operation and safety

(B) Optional

(C) Decorative

(D) Cleaning devices

Answer: A) Essential for operation and safety

12. Hardness of boiler water causes:

(A) Scale and sludge formation

(B) Increase efficiency

(C) High pressure

(D) Clear steam

Answer: A) Scale and sludge formation

13. Feed check valve is placed:

(A) At water inlet to boiler

(B) At steam exit

(C) On fire side

(D) On drum top

Answer: A) At water inlet to boiler

14. The function of a chimney is to:

(A) Discharge flue gases

(B) Discharge steam

(C) Supply air

(D) Store fuel

Answer: A) Discharge flue gases

15. The draught in boilers may be produced by:

(A) Chimney

(B) Steam jet

(C) Induced fan

(D) All of these

Answer: D) All of these

16. Safety valve in boiler is used to:

(A) Release excess pressure

(B) Increase temperature

(C) Prevent water level drop

(D) Add chemicals

Answer: A) Release excess pressure

17. Boiler efficiency is usually in the range of:

(A) 60-90%

(B) 100%

(C) 30-40%

(D) 10-20%

Answer: A) 60-90%

18. The term “priming” in boilers refers to:

(A) Carry over of water droplets

(B) Water heating

(C) Fuel supply

(D) Blow off

Answer: A) Carry over of water droplets

19. A steam engine converts:

(A) Thermal energy to mechanical work

(B) Mechanical to thermal

(C) Electrical to heat

(D) Solar to mechanical

Answer: A) Thermal energy to mechanical work

20. The most common type of steam engine is:

(A) Simple reciprocating

(B) Rotary

(C) Gas

(D) Electric

Answer: A) Simple reciprocating

21. The function of a governor is to:

(A) Control engine speed

(B) Open safety valve

(C) Heat water

(D) Store steam

Answer: A) Control engine speed

22. Steam turbines convert energy by the principle of:

(A) Impulse and reaction

(B) Expansion alone

(C) Compression

(D) Combustion

Answer: A) Impulse and reaction

23. The wear of piston and cylinder is minimized by:

(A) Lubrication

(B) Cleaning

(C) High pressure

(D) High speed

Answer: A) Lubrication

24. The unit of boiler horsepower (BHP) is:

(A) 34.5 lbs/hr steam generation

(B) 10 lbs/hr

(C) 100 lbs/hr

(D) 1 lb/hr

Answer: A) 34.5 lbs/hr steam generation

25. Steam used in engines is generally:

(A) Saturated or slightly superheated

(B) Wet

(C) Dry

(D) Highly superheated

Answer: A) Saturated or slightly superheated

26. The efficiency of a steam engine is highest when:

(A) Expansion ratio is high

(B) Cut-off is at start

(C) Cylinder is cold

(D) Steam pressure is low

Answer: A) Expansion ratio is high

27. Indicator diagram shows:

(A) Pressure-volume relationship

(B) Temperature-pressure plot

(C) Speed-time graph

(D) Power-fuel graph

Answer: A) Pressure-volume relationship

28. A compound steam engine is used for:

(A) Reducing steam consumption

(B) Reducing lubrication

(C) Increasing weight

(D) Speed reduction

Answer: A) Reducing steam consumption

29. Steam chest pressure is:

(A) Same as boiler pressure

(B) Less than boiler pressure

(C) More than atmospheric

(D) Zero

Answer: B) Less than boiler pressure

30. Condenser in steam engine:

(A) Converts exhaust steam to water

(B) Increases steam pressure

(C) Supplies superheated steam

(D) Cleans water

Answer: A) Converts exhaust steam to water

31. The vacuum in condenser improves:

(A) Thermal efficiency

(B) Lubrication

(C) Water quality

(D) Air quality

Answer: A) Thermal efficiency

32. The connecting rod connects:

(A) Piston to crankshaft

(B) Cylinder to piston

(C) Piston to flywheel

(D) Valve to piston

Answer: A) Piston to crankshaft

33. Steam engine valve controls:

(A) Admission and exhaust of steam

(B) Water supply

(C) Oil flow

(D) Piston movement

Answer: A) Admission and exhaust of steam

34. The main disadvantage of steam engines is:

(A) Low efficiency

(B) Slow starting

(C) High starting torque

(D) Small size

Answer: A) Low efficiency

35. The speed of steam turbine is regulated by:

(A) Governor

(B) Lubricator

(C) Safety valve

(D) Superheater

Answer: A) Governor

36. Boiler foil is used for:

(A) Dampening noise

(B) Water movement

(C) Stopping heat loss

(D) None

Answer: C) Stopping heat loss

37. Superheater increases:

(A) Temperature of steam

(B) Pressure of steam

(C) Lubrication

(D) All

Answer: A) Temperature of steam

38. Feed water heater is used for:

(A) Preheating water

(B) Heating steam

(C) Reducing vapor

(D) Lowering pump power

Answer: A) Preheating water

39. The most common steam pressure in industries is about:

(A) 8-10 bar

(B) 100 bar

(C) 1 bar

(D) 50 bar

Answer: A) 8-10 bar

40. Fusible plug operates when water level:

(A) Falls below safe level

(B) Rises above level

(C) Stays constant

(D) No effect

Answer: A) Falls below safe level

41. Steam nozzle converts:

(A) Pressure into velocity

(B) Velocity into pressure

(C) Heat to work

(D) Water to vapor

Answer: A) Pressure into velocity

42. Boiler Explosion is caused by:

(A) Excessive pressure

(B) Low water level

(C) Poor maintenance

(D) Any of these

Answer: D) Any of these

43. Water tube boilers are safer because:

(A) Water is inside tubes

(B) Less capacity

(C) More thickness

(D) Higher drum

Answer: A) Water is inside tubes

44. Babcock & Wilcox is a type of:

(A) Water tube boiler

(B) Fire tube boiler

(C) Simple vertical boiler

(D) Shell boiler

Answer: A) Water tube boiler

45. The main purpose of using a steam trap is:

(A) Remove condensate

(B) Increase steam pressure

(C) Supply water

(D) Supply fuel

Answer: A) Remove condensate

46. A dry steam is better than wet because:

(A) It has more energy

(B) It has less energy

(C) It is cooler

(D) None

Answer: A) It has more energy

47. Steam engines operate on the:

(A) Rankine cycle

(B) Otto cycle

(C) Brayton cycle

(D) Diesel cycle

Answer: A) Rankine cycle

48. The expansion ratio is:

(A) Volume after expansion/volume before

(B) Pressure after/pressure before

(C) Steam after/water before

(D) Length after/length before

Answer: A) Volume after expansion/volume before

49. In a locomotive, boiler is mostly of:

(A) Fire tube type

(B) Water tube type

(C) Electric type

(D) Gas type

Answer: A) Fire tube type

50. A pressure gauge may not measure:

(A) Negative pressure

(B) Absolute pressure

(C) Gauge pressure

(D) Differential pressure

Answer: B) Absolute pressure

51. Boiler efficiency increases by:

(A) Preheating feed water

(B) Reducing firing rate

(C) Lower flue gas temp

(D) Both A and C

Answer: D) Both A and C

52. Venturi meter in boiler is for:

(A) Flow measurement

(B) Pressure measurement

(C) Level measurement

(D) Temperature measurement

Answer: A) Flow measurement

53. Pressure in water tube is:

(A) Higher than fire tube

(B) Lower

(C) Equal

(D) No relation

Answer: A) Higher than fire tube

54. Boiler blowdown is done to:

(A) Remove dissolved solids

(B) Add oxygen

(C) Clean fuel

(D) Cool drum

Answer: A) Remove dissolved solids

55. The maximum pressure in low-pressure boilers is:

(A) 1.7 bar

(B) 3.5 bar

(C) 7 bar

(D) 10 bar

Answer: C) 7 bar

56. For a dead weight safety valve, the pressure depends on:

(A) Dead weight

(B) Valve area

(C) Both

(D) Boiler size

Answer: C) Both

57. Flash point of a fuel is:

(A) Lowest temperature of vapor ignition

(B) Highest temperature reached

(C) Ambient temperature

(D) None

Answer: A) Lowest temperature of vapor ignition

58. In a fire tube boiler, hot gases pass:

(A) Through tubes

(B) Around tubes

(C) In drum

(D) In superheater

Answer: A) Through tubes

59. Boiler mountings include:

(A) Water level indicator, safety valve, pressure gauge

(B) Fusible plug

(C) Blow off cock

(D) All of these

Answer: D) All of these

60. The amount of steam produced per kg of fuel is called:

(A) Evaporation rate

(B) Steam absorption

(C) Steam dryness

(D) Fuel ratio

Answer: A) Evaporation rate

61. The main function of the damper is:

(A) Control air supply

(B) Control steam flow

(C) Control pressure

(D) Release water

Answer: A) Control air supply

62. The calorimeter in boilers is used to:

(A) Measure steam quality

(B) Measure temperature

(C) Measure pressure

(D) Measure volume

Answer: A) Measure steam quality

63. Underfeed stokers are used for:

(A) Small boilers

(B) Large capacity boilers

(C) Electric boilers

(D) Wall-fired boilers

Answer: B) Large capacity boilers

64. The length of fusible plug is found by:

(A) Empirical relation

(B) Design chart

(C) Fixed by code

(D) Not fixed

Answer: A) Empirical relation

65. A boiler with no drum is called:

(A) Once through boiler

(B) Electric boiler

(C) Waterwall boiler

(D) Firebox boiler

Answer: A) Once through boiler

66. Dryness fraction of steam is:

(A) Mass of dry steam/total mass

(B) Mass of water/total mass

(C) Mass of vapor/mass of water

(D) None

Answer: A) Mass of dry steam/total mass

67. The basic difference between steam engine and steam turbine:

(A) Engine is reciprocating

(B) Turbine is rotary

(C) Both A and B

(D) None

Answer: C) Both A and B

68. Boiler mountings do not include:

(A) Chimney

(B) Water gauge glass

(C) Safety valve

(D) Pressure gauge

Answer: A) Chimney

69. Heat loss in boilers is mainly due to:

(A) Stack gas

(B) Radiation

(C) Blowdown

(D) All of these

Answer: D) All of these

70. Fire brick lining is provided for:

(A) Reducing heat loss

(B) Withstanding high temperature

(C) Both A and B

(D) Noise control

Answer: C) Both A and B

71. The helical coil is used in boilers for:

(A) Increasing heat transfer area

(B) Reducing weight

(C) Increasing size

(D) Decreasing efficiency

Answer: A) Increasing heat transfer area

72. The flash drum in a boiler system is provided to:

(A) Separate steam and water

(B) Purify water

(C) Preheat air

(D) Reduce temperature

Answer: A) Separate steam and water

73. Purging in boilers is done to:

(A) Remove combustible gases

(B) Purify steam

(C) Reduce pressure

(D) Absorb noise

Answer: A) Remove combustible gases

74. The principal function of the steam separator is:

(A) Remove water particles

(B) Add heat

(C) Control pressure

(D) Remove gases

Answer: A) Remove water particles

75. The pressure at which water boils depends on:

(A) Atmospheric pressure

(B) Boiler pressure

(C) Both

(D) Drum height

Answer: C) Both

76. In Lancashire boiler, the number of flue tubes is:

(A) 2

(B) 3

(C) 4

(D) 5

Answer: A) 2

77. The main advantage of high pressure boilers is:

(A) More heat transfer rate

(B) Less space needed

(C) Higher efficiency

(D) All of these

Answer: D) All of these

78. Steam drying is achieved in:

(A) Superheater

(B) Boiler drum

(C) Economizer

(D) Chimney

Answer: A) Superheater

79. Stefan–Boltzmann law is used for:

(A) Radiation

(B) Convection

(C) Conduction

(D) None

Answer: A) Radiation

80. Draught in locomotive is produced by:

(A) Steam jet

(B) Electric fan

(C) Induced fan

(D) Chimney

Answer: A) Steam jet

81. Safety valve lifts as soon as:

(A) Pressure exceeds set limit

(B) Water level drops

(C) Fires go out

(D) Drum is full

Answer: A) Pressure exceeds set limit

82. Boiler scale is:

(A) Hard deposit

(B) Soft deposit

(C) No deposit

(D) Wet deposit

Answer: A) Hard deposit

83. The main problem caused by foaming in boilers is:

(A) Carryover

(B) Low temperature

(C) Scale formation

(D) Low pressure

Answer: A) Carryover

84. Boiler drum is located at:

(A) Top

(B) Bottom

(C) Side

(D) Not present

Answer: A) Top

85. Wet steam contains:

(A) Water particles

(B) Superheated steam

(C) Dry steam

(D) None

Answer: A) Water particles

86. Surging in boilers is:

(A) Sudden increase and decrease in steam output

(B) Continuous pressure rise

(C) Continuous pressure drop

(D) Water hammer

Answer: A) Sudden increase and decrease in steam output

87. The process of cleaning boiler water is called:

(A) Blowdown

(B) Flushing

(C) Backwashing

(D) Purging

Answer: A) Blowdown

88. Feed water temperature is increased using:

(A) Economizer

(B) Superheater

(C) Chimney

(D) Air preheater

Answer: A) Economizer

89. A pressure reducing valve is fitted:

(A) Before steam enters user equipment

(B) Before entering boiler

(C) In water line

(D) Only for safety

Answer: A) Before steam enters user equipment

90. Supercritical boilers operate at:

(A) Above critical pressure

(B) Below critical pressure

(C) At critical pressure

(D) At atmospheric pressure

Answer: A) Above critical pressure

91. The main difference between natural and forced circulation boilers is:

(A) Method of water circulation

(B) Fuel burned

(C) Drum number

(D) Type of mountings

Answer: A) Method of water circulation

92. Rankine cycle efficiency is improved by:

(A) Regeneration and reheating

(B) Lowering pressure

(C) Lowering temperature

(D) Decreasing flow

Answer: A) Regeneration and reheating

93. The continuous blowdown removes:

(A) Dissolved solids

(B) Suspended solids

(C) Scale

(D) All of these

Answer: A) Dissolved solids

94. Gauge glass is used for:

(A) Water level indication

(B) Steam quality

(C) Pressure indication

(D) Temperature

Answer: A) Water level indication

95. A shell type boiler is:

(A) Horizontal cylindrical

(B) Vertical cylindrical

(C) Spherical

(D) Both A and B

Answer: D) Both A and B

96. Large capacity power plants prefer:

(A) Water tube boilers

(B) Fire tube boilers

(C) Electric boilers

(D) None

Answer: A) Water tube boilers

97. The first process in steam boiler start up is:

(A) Filling water

(B) Lighting fire

(C) Firing furnace

(D) Opening blowdown

Answer: A) Filling water

98. The rate of evaporation in a boiler is measured in:

(A) kg/hr

(B) kg/min

(C) tonne/hr

(D) All of these

Answer: D) All of these

99. The draft loss in a boiler furnace is minimum in:

(A) Forced draft

(B) Induced draft

(C) Natural draft

(D) Balanced draft

Answer: C) Natural draft

100. Mean effective pressure of a steam engine is:

(A) Average pressure acting on piston during cycle

(B) Maximum gauge pressure

(C) Boiler pressure

(D) Back pressure

Answer: A) Average pressure acting on piston during cycle

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