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1. In the fire tube boilers :
   - (A) The hot gases pass through tubes and water surrounds the tubes
   - (B) The water passes through the tubes and hot gases surround the tubes
   - (C) Fire surrounds the tubes and water passes in the tubes
   - (D) All of the above

2. Lancashire boiler is :
   - (A) Internally fired boiler
   - (B) Externally fired boiler
   - (C) Forced circulation boiler
   - (D) Water tube boiler

3. Which of the following is a fire tube boiler?
   - (A) Stirling boiler
   - (B) Babcox and Wilcox boiler
   - (C) Velox boiler
   - (D) Locomotive boiler

4. Natural circulation type boiler works on the principle of :
   - (A) Differential density of hot and cold water
   - (B) Differential density of hot and cold water at chimney
   - (C) Natural draught system with Chimney
   - (D) None

5. In locomotive boiler maximum pressure is the order of :
   - (A) 5 bar
   - (B) 10 bar
   - (C) 20 bar
   - (D) 100 bar

6. Which of the following are classified as high pressure steam boiler?
   - (A) Loeffler boiler
   - (B) Benson boiler
   - (C) La mont boiler
   - (D) All of the above

7. Stirling steam boiler has:
   - (A) One steam drum, two water drums
   - (B) Two steam drums, two water drums
   - (C) Three steam drums, two water drums
   - (D) No drums

A

3

8. Equivalent evaporation as referred to steam generators is :

   (A) Quantity of steam produced per kg of fuel

   (B) Quantity of steam produced from water at 100° C to dry saturated steam at 100°C

   (C) Quantity of steam produced from water at ambient conditions to dry saturated steam at rated pressure of boiler

   (D) None of the above

9. Which of the following boilers used LPG as fuel?

   (A) Manning boiler   (B) Integral furnace boiler

   (C) BENT tube boiler   (D) All of the above

10. Which of the these boilers works in the temperature range below 100°C :

   (A) Integral furnace boiler   (B) Stirling boiler

   (C) Waste heat boiler   (D) All of the above

11. The functions of the following fitting is to extinguish boiler furnace fire in case of water level falling below safe level :

   (A) Feed check valve   (B) Blow off cock

   (C) Safety valve   (D) Fusible plug

12. Which of these safety valves is used in locomotive and marine engines?

   (A) Dead weight safety valve   (B) Spring loaded safety valve

   (C) Lever safety valve   (D) All of the above

13. Which of these boiler fitting is used to control the supply of water to the boiler and to prevent the escaping of water from the boiler when the pump pressure is less?

   (A) Feed check valve   (B) Stop valve

   (C) Safety valve   (D) Blow off cock

14. The function of the following fitting in boiler is to regulate the flow of steam from one steam pipe to other :

   (A) Feed check valve   (B) Safety valve

   (C) Blow off cock   (D) Stop valve

15. The function of the following fitting in a boiler is to prevent the pressure exceeding the maximum limit :

   (A) Feed check valve   (B) Blow off cock

   (C) Safety valve   (D) Fusible plug

16. Which of these component on the boiler is used to recover the waste heat of the flue gases for heating feed water?

    (A) Super heater   (B) Economiser

    (C) Pre heater   (D) Fusible plug

17. Which of these component on the boiler is used to increase the temperature steam above saturation temperature?

    (A) Air pre heater   (B) Economiser

    (C) Super heater   (D) None

18. Function of a steam separator :

    (A) To remove the entrained water particles from the steam conveyed to steam engine

    (B) To increase the temperature of the steam above saturation point

    (C) To increase the temperature of air before it enters the furnace

    (D) All the above

19. Which of the following as referred to steam boiler are defined as mountings?

    (A) Safety valve   (B) Economiser

    (C) Water level indicator   (D) Stop valve

20. Which of these boiler fitting is used to inject feed water into the boiler?

    (A) Injector   (B) Feed pump

    (C) Both of them   (D) None of them

21. Draught produced by chimney is described as:

    (A) Induced draught   (B) Natural draught

    (C) Forced draught   (D) Balanced draught

22. Artificial draught is produced by :

    (A) Induced fan   (B) Forced fan

    (C) Induced fan and forced fan (D) All of the above

23. For locomotive boilers the draught is produced by :

    (A) Forced fan   (B) Chimney

    (C) Steam jet   (D) Only motion of locomotive

24. For the same draught produced the power of induced draught fan as compared to forced draught fan is :

    (A) More   (B) Less

    (C) Same   (D) Not predictable

25. The artificial draught is normally designed to produce :
   (A) More draught
   (B) Less smoke
   (C) Less chimney gas temperature
   (D) All of the above

26. The location of fan for induced draught is :
   (A) Near bottom of chimney
   (B) Near bottom of furnace
   (C) At the top of the chimney
   (D) Anywhere permissible

27. For maximum discharge of hot gases through the chimney, the height of the hot gas column producing draught is :
   (A) Twice the height of the chimney
   (B) Equal to the height of the chimney
   (C) Half the height of the chimney
   (D) None of the above

28. The pressure at the furnace is minimum in case of :
   (A) Forced draught system
   (B) Induced draught system
   (C) Balanced draught system
   (D) Natural draught system

29. Chimney efficiency is approximately :
   (A) 20%
   (B) 0.25%
   (C) 30%
   (D) 90%

30. Artificial draught is produced by :
   (A) Air fans
   (B) Steam jet
   (C) Fan jet
   (D) All the above

31. Equivalent evaporation as referred to steam generator mean :
   (A) Quantity of dry saturated steam generated per kg of fuel at rated pressure
   (B) Quantity of steam generated per hour at rated pressure
   (C) Quantity of dry saturated steam generated at 1 bar from water at 100°C
   (D) Quantity of dry saturated steam generated from water at S.T.P

32. Boiler efficiency is defined as :
   (A) Ratio of heat output to heat input
   (B) Ratio of heat input to heat output
   (C) Heat input
   (D) Heat output

33. Factor of evaporation as referred to boiler :
   (A) $\dfrac{\text{Actual evaporation in kg/hr}}{\text{Equivalent evaporation in kg/hr}}$
   (B) $\dfrac{\text{Equivalent evaporation in kg/hr}}{\text{Actual evaporation in kg/hr}}$
   (C) Dryness fraction of steam produced
   (D) (1-Dryness fraction) of steam produced

34. The main objectives of boiler trail is to :

    (A) Determine its dryness fraction

    (B) Determine its efficiency

    (C) Determine its capacity

    (D) Determine both efficiency and capacity

35. Evaporation ratio is defined as :

    (A) $\dfrac{\text{Quantity of steam generation}}{\text{Quantity of fuel consumption}}$

    (B) $\dfrac{\text{Quantity of fuel consumption}}{\text{Quantity of steam generation}}$

    (C) $\dfrac{1}{\text{Quantity of fuel consumption}}$

    (D) $\dfrac{1}{\text{Quantity of steam generation}}$

36. Boiler turn down is defined as :

    (A) Ratio between full boiler output and boiler output when operating at high fire

    (B) Full boiler output

    (C) Ratio between full boiler output and boiler output when operating at low fire

    (D) None of the above

37. When was Indian boiler regulations created?

    (A) 15th October 1931   (B) 15th September 1930

    (C) 23rd February 1923   (D) None of the above

38. Which steam boiler are regulated by Indian boiler regulation?

    (A) Any closed vessel exceeding 22.75 litres capacity which is used for generating steam

    (B) Any closed vessel exceeding 10.75 litres capacity which is for generating steam

    (C) Any closed vessel exceeding 15 litres capacity which is for generating steam

    (D) None of the above

39. Define the boiler terminology MCR :

    (A) Maximum concentration rating   (B) Maximum rating

    (C) Maximum continuous rating   (D) None of the above

40. What is combustion space in a boiler?
    (A) It is the furnace volume in cubic metres per kg of fuel
    (B) It is the furnace volume in cubic metres
    (C) It is the furnace volume in cubic metres per kg of fuel fired per hour
    (D) It is the furnace volume in meter square per kg of fuel fired per hour

41. The transformation from solid to gas phase is called :
    (A) Vapourisation   (B) Condensation
    (C) Boiling   (D) Sublimation

42. Which increase in pressure the boiling point of water?
    (A) Increases   (B) Decreases
    (C) Do not change   (D) None of the above

43. Super heated steam is :
    (A) Steam at a temperature below boiling point of water
    (B) Steam at a temperature above boiling point of water
    (C) Steam at boiling point of water
    (D) None of the above

44. At triple point :
    (A) Ice on heating becomes super heated vapour
    (B) Solid, liquid and vapour co-sent
    (C) Ice occupies maximum specific volume
    (D) Liquid water, dry saturated steam co-sent

45. Dryness fraction is defined as :
    (A) $\dfrac{\text{Mass of dry steam}}{\text{Mass of water vapour is suspension}}$

    (B) $\dfrac{\text{Mass of water vapour in suspension}}{\text{Mass of dry steam}}$

    (C) $\dfrac{\text{Mass of dry steam}}{\text{Man of dry steam of mass of water vapour in suspension}}$

    (D) $\dfrac{\text{Mass of water vapour in suspension}}{\text{Mass of water vapour in suspension + mass of dry steam}}$

46. Saturated steam 100% dry contains :
    (A) 0% latent heat   (B) 90% latent heat
    (C) Sensible heat   (D) 100% latent heat

47. If a steam water content is 5%, its dryness fraction is :

    (A) 95%   (B) 0%

    (C) 5%   (D) None of the above

48. The energy content of steam is called :

    (A) Entropy   (B) Density

    (C) Specific volume   (D) Enthalpy

49. The end point of the pressure–temperature curve that designates condition under which a liquid and its vapour can co-sent?

    (A) Triple point   (B) Ice point

    (C) Critical point   (D) None of the above

50. Only throttling calorimeter is used for measuring :

    (A) Very low dryness fraction up to 0.7

    (B) Very high dryness fraction up to 0.98

    (C) Dryness fraction of only low pressure steam

    (D) Dryness fraction of only high pressure steam

51. Air at 20°C and 101.325 kpa is called:

    (A) STP   (B) NTP

    (C) ISA   (D) SATP

52. Which of these is a solid fuel?

    (A) Anthroate   (B) Gasoline

    (C) Paraffin   (D) Town gas

53. Calorific valve of Anthroate is approximately:

    (A) 12000 KJ/kg   (B) 14000 KJ/kg

    (C) 1000 KJ/kg   (D) 35600 KJ/kg

54. Calorific value of determined at constant volume :

    (A) Is equal to calorific value of fuel at constant pressure

    (B) Is more than the calorific value of fuel at constant pressure

    (C) Is less than the calorific value of fuel at constant pressure

    (D) May be more or may be less depending upon molecular contraction or expansion of the products of combustion

55. The calorific valve of hydrogen/kg when burnt at constant pressure in atmosphere of air as compared to that burnt at constant volume is :

    (A) Less   (B) More

    (C) Equal   (D) May be more or less

56. Bomb calorimeter is used to determine the calorific value of :

    (A) Solid fuels only   (B) Liquid fuels only

    (C) Both solid and liquid fuels   (D) Gaseous fuel

57. Junker's calorimeter is used to determine the calorific value of :

    (A) Gaseous fuels only   (B) Solid fuels only

    (C) Liquid fuels only   (D) None of the above

58. Bomb calorimeter determines :

    (A) Higher calorific value of fuels at constant pressure

    (B) Lower calorific value of fuels at constant pressure

    (C) Higher calorific value of fuels at constant volume

    (D) Lower calorific value of fuels at constant volume

59. Ultimate analysis of fuel means determination of :

    (A) Higher calorific value of fuel

    (B) Lower calorific value of fuel

    (C) Percentage of carbon, hydrogen, nitrogen, sulphur and phosphorus

    (D) Percentage of fixed carbon, ash, volatile matter and moisture

60. The higher heating value of natural gas is:

    (A) 9350 Kcal/Nm^3 (B) 31900 Kcal/Nm^3

    (C) 21300 Kcal/Nm^3 (D) 5000 Kcal/Nm^3

61. The oxygen % by volume in air is :

    (A) 21%   (B) 23%

    (C) 30%   (D) 79%

62. The Nitrogen % by volume in air is:

    (A) 79%   (B) 21%

    (C) 30%   (D) 23%

63. The amount of air required for complete combustion of fuel is called :

    (A)   Excess air
    (B)   Free air

    (C)   Stoichiometric air
    (D)   None of the above

64. For ideal combustion process for burning 1kg of a typical fuel containing 86% carbon, 12% hydrogen and 2% sulphur, the theoretically required quantity of air :

    (A)   15 kg
    (B)   10 kg

    (C)   12.5 kg
    (D)   14.1 kg

65. Free oxygen in the products of combustion is an indication of :

    (A)   Stoichiometric air
    (B)   Minimum air

    (C)   Excess air
    (D)   None of the above

66. Orsat apparatus is used to determine :

    (A)   Products of all constituents of fuel combustion by weight

    (B)   Products of all constituents of combustion of fuel by volume

    (C)   Products of only dry constituents of combustion by weight

    (D)   Products of only dry constituents of combustion by volume

67. Which of these devices can be used to detect leaks in boilers :

    (A)   Ultrasonic transmitter
    (B)   Leak detector fluid

    (C)   Micromanometer
    (D)   None of the above

68. If gravimetric analysis of products of combustion is known, Air; fuel ratio is given by :

    (A) $\dfrac{C \times N_2}{0.23CO_2 + 0.33CO}$
    (B) $\dfrac{C \times N_2}{0.21CO_2 + 0.33CO}$

    (C) $\dfrac{C \times N_2}{0.33CO_2 + 0.21CO}$
    (D) $\dfrac{C \times N_2}{0.33CO_2 + 0.23CO}$

69. Volumetric analysis of sample of dry products of combustion are $CO_2 = 10\%$ CO $= 1\%$ $O_2 = 8\%$ $N_2 = 81\%$, The proportion by weight are given by :

    (A)   10 :1:8:81
    (B)   44:28:256:2268

    (C)   22 :14 :256 :2268
    (D)   22 :14 :128 :2268

70. $C + O_2 \rightarrow CO_2$ Therefore 1kg of carbon requires how much kg of oxygen?

    (A)   1.67
    (B)   2.67

    (C)   3.67
    (D)   4.67

71. The S.I unit of length is :
    - (A) Millimeter
    - (B) Centimeter
    - (C) Meter
    - (D) Inch

72. Which of these is the unit of power?
    - (A) Watts
    - (B) Joules/sec
    - (C) Both (A) and (B)
    - (D) None of them

73. 1 Pascal is how much N/m^2?
    - (A) $1 N/m^2$
    - (B) 1 bar
    - (C) $2 N/m^2$
    - (D) None of them

74. Which of these is used to measure temperature?
    - (A) Micrometer
    - (B) Pyrometer
    - (C) Infrared thermometer
    - (D) Both (B) and (C)

75. Mechanical equivalent of heat is related to :
    - (A) Conservation of mass
    - (B) Conservation of energy
    - (C) Conservation of momentum
    - (D) None of the above

76. The localised corrosion caused by oxygen in boilers is called :
    - (A) Scaling
    - (B) Pitting
    - (C) Erosion
    - (D) None of the above

77. Which of these equipment is used for boiler water treatment?
    - (A) Pyrometer
    - (B) Micrometer
    - (C) Dearator
    - (D) None of the above

78. What is the recommended hardness of boiler feed water?
    - (A) Less than 5 ppm
    - (B) Greater than 5 ppm
    - (C) Greater than 1 ppm
    - (D) Less than 1 ppm

79. When the total amount of sludge under a boiler is high, which of these methods is employed for the removal of sludge?
    - (A) Coagulation
    - (B) Dispersion
    - (C) Both (A) and (B)
    - (D) None of them

80. Which of these treatment is used for boilers which operate at low or moderate pressures?
    - (A) Evaporation
    - (B) Dearation
    - (C) Membrane contractors
    - (D) Internal treatment

81. Largest planet :
    (A) Mercury   (B) Jupiter
    (C) Venus   (D) Pluto

82. South west monsoon season in India is between :
    (A) June to August   (B) October to November
    (C) June to July   (D) April to May

83. The first annual session of SNDP yogam having been held at :
    (A) 1914   (B) 1908
    (C) 1903   (D) 1904

84. Crips Mission arrived in the year :
    (A) 1946   (B) 1944
    (C) 1942   (D) 1940

85. Present Lok Sabha speaker :
    (A) Sumitra Mahagan   (B) Meera Kumar
    (C) Venkayya Naidu   (D) Somanath Chattergi

86. Largest river island :
    (A) Kuruvadeep   (B) Mangalavanam
    (C) Gosrreethuruth   (D) Majuli

87. National flower of Russia :
    (A) Narssissas   (B) Rose
    (C) Sunflower   (D) Lotus

88. The year 1942 is marked with :
    (A) Wagon Tragedy   (B) Punnapra-Vayalar Incident
    (C) Symon commission   (D) Temple entry proclamation

89. Eagle is the National Emblem of :
    (A) Turkey   (B) Mangolia
    (C) Poland   (D) Spain

90. World Bookday is celebrated on :
    (A) March 23   (B) April 23
    (C) December 10   (D) January 26

91. Sahodara Sangham was founded by K.Ayyappan in :
    - (A) 1907
    - (B) 1908
    - (C) 1914
    - (D) 1917

92. Name of the discovery of Brazil :
    - (A) Pedro Alvarez Cabral
    - (B) Barthalomio Diaz
    - (C) Christopher Columbus
    - (D) John Cabot

93. Who wrote 'The last temptation of Christ' :
    - (A) Vergil
    - (B) Nikos Kazantzaks
    - (C) Ovid
    - (D) Giovanavi Boccaccio

94. Which is a Scandinavian country?
    - (A) Finland
    - (B) Greece
    - (C) Ecuador
    - (D) Medagaskar

95. Which district is the largest producer of Tobacco in Kerala?
    - (A) Idukki
    - (B) Warangal
    - (C) Kasargod
    - (D) Palakkad

96. Nobel prize of literature of 1913 given :
    - (A) Tolstoy
    - (B) J.K Rowling
    - (C) Oscar wilde
    - (D) Ravindranath Tagore

97. Playing time of National Anthem:
    - (A) 56 seconds
    - (B) 54 seconds
    - (C) 50 seconds
    - (D) 52 seconds

98. Worlds largest delta :
    - (A) Sunderbands
    - (B) Rann of Kutch
    - (C) Obeestuary
    - (D) Dead sea

99. Author of 'Freedom at MidNight' :
    - (A) Chethan Bhagath
    - (B) Larrycolins and Doming Lapiere
    - (C) Neeraj. C. Choudari
    - (D) Mulana Abdul Kalam Azed

100. Who directed The Film 'Schindlers List'?
    - (A) Francis Cappola
    - (B) Jeen Luke Godard
    - (C) Steven SpielBerg
    - (D) George Eastman