05. Which of the following variables affects the furnace capacity?
(A) Temperature of flue gas
(B) Thermal conductivity of stock
(C) Thickness of heating stock
(D) All (A), (B) and (C)
Answer: Option D

06. The purpose of controlling the furnace atmosphere is to prevent surface attack by
(A) Oxidation/scaling
(B) Decarburising
(C) Sulphur penetration
(D) Either of the above
Answer: Option D

07. Scaling of furnace stock is reduced by ________ in flue gas.
(A) CO
(B) H₂
(C) High CO/CO₂
(D) All (A), (B) & (C)
Answer: Option D

08. Which is not accomplished in an underfired furnace?
(A) Increase in heating capacity/m² of floor space
(B) Elimination of cold spot at the bottom of the charge
(C) Reduction in the temperature of furnace gases
(D) Protection of the periphery of the charge from excessive radiation
Answer: Option A

09. An improved and fuel efficient version of the pusher type reheating furnace is the ________ furnace.
(A) Walking beam
(B) Shaft
(C) Tunnel
(D) Rotary hearth
Answer: Option A

10. Circulation of gases in furnace is caused by the
(A) Change in volume during a change of temperature
(B) Difference in density between hot and cold gases
(C) Furnace pressure in conjunction with draft in flues
(D) All (A), (B) and (C)
Answer: Option D

11. Forced recirculation of furnace gases is practised
(A) To increase heat transfer by convection
(B) To ensure uniform temperature
(C) In furnaces, operating below 750°C
(D) All (A), (B) and (C)
Answer: Option D

12. Which of the following variables does not affect the furnace capacity?
(A) Size of the furnace
(B) Gas velocity in furnace
(C) Ratio of wall surface to surface of stock
(D) None of these
Answer: Option D

13. In a furnace, the heat taken by the charge/stock and the heat lost to the furnace structure & flue gases depends on the
(A) Rate of firing and emissivity of flame
(B) Thermal conductivity of the charge & structural materials of furnace
(C) Nature of process; whether batch, continuous or intermittent
(D) All (A), (B) and (C)
Answer: Option D
14. An example of a periodic furnace is the
(A) Blast furnace stoves
(B) Blast furnace
(C) Coke oven heating chamber
(D) Rotary kilns
Answer: Option A

15. Flue gas outlet temperature from the chimney of any furnace should be ideally about __________ °C.
(A) 50
(B) 100
(C) 150
(D) 250
Answer: Option C

16. Which of the following advantages is not associated with the use of preheated air for combustion of a fuel in the furnace?
(A) Increase in calorific value of the fuel
(B) Increase in flame temperature
(C) Reduction in scale losses
(D) Saving in fuel consumption
Answer: Option A

17. Which of the following is a batch furnace?
(A) Cupola
(B) Reheating furnace
(C) Glass tank furnace
(D) None of these
Answer: Option A

18. The thermal efficiency of an air/fuel gas preheating recuperator may be as high as __________ percent.
(A) 50
(B) 65
(C) 85
(D) 99
Answer: Option C

19. Which of the following is not a continuous waste heat recovery equipment from the flue gases going out of furnace?
(A) Economiser
(B) Regenerator
(C) Ceramic recuperator
(D) Waste heat boiler
Answer: Option B

20. Which of the following is not a recuperative furnace?
(A) Soaking pit
(B) Reheating furnace
(C) Steam boiler
(D) Coke oven
Answer: Option D

21. Waste heat from the outgoing flue gases in a thermal power plant is recovered by a/an
(A) Economiser
(B) Steam superheater
(C) Air preheater
(D) All (A), (B) and (C)
Answer: Option D

22. An example of shaft furnace is the
(A) L.D. converter
(B) Glass melting tank
(C) Blast furnace
(D) Soaking pit
23. Use of pulverised coal in boilers provides
   (A) Higher calorific value
   (B) Better combustion
   (C) Smokeless burning
   (D) Less erosion on furnace wall
   Answer: Option B

24. In salt bath furnace, heat is transferred to the charge mainly by
   (A) Conduction
   (B) Convection
   (C) Radiation
   (D) None of these
   Answer: Option A

25. Example of an indirectly heated furnace is
   (A) Hood annealing furnace
   (B) Muffle furnace
   (C) Both (A) and (B)
   (D) Neither (A) nor (B)
   Answer: Option C

26. The heating capacity of muffle furnace depends on the
    (A) Surface area & emissivity of the stock
    (B) Properties of the muffle wall (temperature, area, and emissivity)
    (C) Both (A) & (B)
    (D) Neither (A) nor (B)
    Answer: Option C

27. In case of pulverised coal fired steam boiler, the secondary air serves the main purpose of
    (A) Transportation of coal
    (B) Drying of coal
    (C) Combustion of coal by supplying it around the burner
    (D) Preheating the primary air
    Answer: Option C

28. Ceramic recuperators (made of SiC) is economical, only when used for preheating combustion air above ________ °C.
    (A) 250
    (B) 650
    (C) 850
    (D) 1000
    Answer: Option B

29. Which of the following is a directly fired intermittent furnace?
    (A) Walking beam reheating furnace
    (B) Reverberatory furnace
    (C) Tower furnace
    (D) Tunnel kiln
    Answer: Option B

30. Furnace aerodynamics is related to the ________ in the furnace.
    (A) Movement of gases
    (B) Measurement of flue gas volume
    (C) Temperature control
    (D) Pressure adjustment
    Answer: Option A

31. Temperature of a furnace fired with low calorific value fuel gas (i.e. lean gas) can be increased by
    (A) Preheating the combustion air
    (B) Oxygen enrichment of combustion air
    (C) Preheating the fuel gas
    (D) All (A), (B) & (C)
32. Which of the following is a periodic furnace?
   (A) Tunnel kiln
   (B) Rotary kiln
   (C) Soaking pit
   (D) Reheating furnace
   Answer: Option C

33. If fuel and air are mixed ahead of the burner, it is called a/an __________ burner.
   (A) Premix
   (B) Outside mixing type
   (C) Rotary
   (D) Diffusion
   Answer: Option A

34. Pulverised fuel fired furnaces employ _________ fuel firing.
   (A) Horizontal
   (B) Vertical
   (C) Tangential
   (D) All (A), (B) and (C)
   Answer: Option D

35. Heat balance of furnace provides means of determining the
   (A) Thermal efficiency of the process
   (B) Sources of heat losses
   (C) Scope of reduction of heat losses
   (D) All (A), (B) and (C)
   Answer: Option D

36. Main gas valve in a gaseous fuel burner is a __________ valve.
   (A) Gate
   (B) Butterfly
   (C) Globe
   (D) None of these
   Answer: Option A

37. Means for giving direction to the circulation of gases in furnaces are
   (A) Fans
   (B) Arrangement of heating stock in the furnaces
   (C) Location of outlet ports and heating & combustion devices
   (D) All (A), (B) and (C)
   Answer: Option D

38. Turn down ratio of a burner
   (A) Should be as low as possible i.e., 1 : 2
   (B) Should be 1:1 for a batch type furnace
   (C) Is the ratio of maximum to minimum permissible heat input rates
   (D) Is normally much more for a continuous furnace as compared to a batch furnace
   Answer: Option C

39. Oxygen percentage in the flue gas coming out of a gaseous fuel fired furnace should be ideally about _________ percent.
   (A) < 2
   (B) < 5
   (C) < 8
   (D) < 10
   Answer: Option A

40. Which is not a hearth furnace?
   (A) Glass tank furnace
   (B) Open hearth furnace
   (C) Cupola
   (D) Reheating furnace
   Answer: Option C
41. Which of the following accentuates clinkering troubles on furnace grate burning coal?
   (A) Low reactivity of carbonised residue containing high proportion of iron & sulphur
   (B) Low forced draft & fuel bed temperature
   (C) Thick firebed and preheated primary air
   (D) All (A), (B) and (C)
   Answer: Option D

42. Combustion of fuel in a furnace with oxygen enriched air results in higher
   (A) Flue gas volume
   (B) Flame temperature
   (C) Fuel consumption
   (D) Stack loss
   Answer: Option B

43. Cement Kiln is a
   (A) Rotary Kiln
   (B) Tunnel Kiln
   (C) Natural draft furnace
   (D) Batch furnace
   Answer: Option A

44. Regenerators compared to the recuperators for the same duty
   (A) Occupy more space
   (B) Are less costly
   (C) Are of smaller size
   (D) All (A), (B) and (C)
   Answer: Option A

45. Which furnace employs an I.D. fan for the removal of flue gases from the furnace?
   (A) Coke oven
   (B) Blast furnace stoves
   (C) Beehive coke oven
   (D) High pressure boiler
   Answer: Option D

46. Ceramic recuperators compared to metallic recuperators for the same duty
   (A) Are lighter
   (B) Occupy more space
   (C) Are less costly
   (D) Have higher pressure differential between flue gas & air side
   Answer: Option B

47. Reverbatory furnace is used for
   (A) Roasting/reduction of ores
   (B) Annealing steel coil
   (C) Heating air
   (D) Steel melting
   Answer: Option A

48. Rate of heat release in a furnace, which is the measure of heat intensity, is defined as
   (A) kcal/hr/m$^3$ combustion space
   (B) kcal/m$^3$ combustion space
   (C) kcal/hr
   (D) None of these
   Answer: Option A

49. Fuel used in B.F. stove is
   (A) Pulverised coal
   (B) Furnace oil
   (C) Blast furnace gas/mixed gas
   (D) Coke oven gas
   Answer: Option C

50. Design of waste heat boiler for recovery of waste heat from furnace gases depends upon the
51. In a furnace operation, which is not preheated?
(A) Solid fuels
(B) Hydrocarbon containing fuel gases (e.g. coke oven gas, refinery gas etc.)
(C) Both (A) and (B)
(D) Neither (A) nor (B)
Answer: Option C

52. Maximum heat transfer in high temperature furnaces is by
(A) Conduction
(B) Convection
(C) Radiation
(D) Either (A), (B) or (C); depends on the type of furnace
Answer: Option C

53. The main function of a muffle in the muffle furnace is to
(A) Protect the charge from the effects of the products of combustion
(B) Smooth out temperature inequalities on the combustion side of the muffle wall
(C) Both (A) & (B)
(D) Neither (A) nor (B)
Answer: Option C

54. Decarburisation of steel
(A) Is the removal of carbon from iron carbide (Fe₃C)
(B) Affects its crystalline structure
(C) Is favoured by CO₂
(D) All (A), (B) and (C)
Answer: Option D

55. Heat transfer rate to the stock/charge in the furnace does not depend upon the
(A) Emissivity of the refractory walls
(B) Size of the furnace
(C) Use of waste heat recovery equipments
(D) Thickness of the stock
Answer: Option C

56. Hearth furnaces are not used for
(A) Roasting
(B) Melting
(C) Reheating
(D) None of these
Answer: Option D

57. In order to maintain an oxidising atmosphere in a furnace, it should have
(A) More of excess air
(B) Less of excess air
(C) More of CO in flue gas
(D) More of CO₂ in flue gas
Answer: Option A

58. In a muffle furnace, the muffle
(A) Retards the heat transfer
(B) Assists in temperature equalisation in the charge
(C) Permits the use of controlled atmosphere for the protection of stock
(D) All (A), (B) and (C)
Answer: Option D

59. Which is a regenerative furnace?
(A) Coke oven heating chamber
(B) Open hearth furnace
60. Combustion of furnace oil in a furnace (soaking pit) with preheated combustion air at 400°C results in saving of about __________ percent furnace oil as compared to its combustion with atmospheric air, if the flue gas outlet temperature from the soaking pit is 1200°C.

(A) 5
(B) 60
(C) 20
(D) 40
Answer: Option C

61. In a furnace employing forced draught as compared to induced draught,
   (A) Air is sucked in, so air leaks are more and hence the furnace efficiency is reduced
   (B) The fan operates hot and hence blades are liable to corrosion and erosion
   (C) Positive pressure exists in the furnace
   (D) None of these
Answer: Option C

62. Regenerators are used for waste heat recovery in
   (A) By-product coke ovens
   (B) Beehive coke oven
   (C) Blast furnace stoves
   (D) Soaking pits
Answer: Option A

63. An example of recuperative furnace is the
   (A) Soaking pit
   (B) Open hearth furnace
   (C) Coke ovens
   (D) None of these
Answer: Option A

64. The heat recoverable from flue gases of furnaces depends on the
   (A) Thermal efficiency of furnace
   (B) Quantity of flue gases
   (C) Flue gas temperature drop through the furnace
   (D) All (A), (B) and (C)
Answer: Option D

65. Overall thermal efficiency of a lumpy coal fired suitably designed heating furnace, if operated & maintained properly may be about __________ percent.
   (A) 10-15
   (B) 25-30
   (C) 45-50
   (D) 65-70
Answer: Option B

66. Operation of blast furnace stove is based on the principles of a __________ furnace.
   (A) Regenerative
   (B) Recuperative
   (C) Both (A) and (B)
   (D) Neither (A) nor (B)
Answer: Option A

67. Higher furnace temperature cannot be achieved by use of a lean fuel gas in the furnace by
   (A) Increasing the draft in the furnace
   (B) Preheating the fuel gas
   (C) Oxygen enrichment of combustion air
   (D) Preheating the combustion air
Answer: Option A

68. Air filtration in a furnace
   (A) Reduces its thermal efficiency
69. Blast furnace stoves are meant for heating
   (A) Air
   (B) Blast furnace gas
   (C) Steam
   (D) None of these
   Answer: Option A

70. Which of the following is not a directly fired furnace?
   (A) By-product coke oven
   (B) Calcination kiln
   (C) Sintering furnace
   (D) Open hearth furnace
   Answer: Option A

71. Heat transfer rate to the charge/stock in a furnace does not depend upon the
   (A) Type of fuels viz. solid, liquid or gaseous
   (B) Flue gas temperature
   (C) Emissivity of refractory walls
   (D) Initial temperature of the charged stock
   Answer: Option A

72. Thermal efficiency of an open hearth furnace may be about _________ percent.
   (A) 5
   (B) 20
   (C) 50
   (D) 80
   Answer: Option B

73. The amount of combustible escaping unconsumed from the furnace, depends upon the
   (A) Air supplied and furnace temperature
   (B) Burner design (thoroughness of mixing versus stratification)
   (C) Air preheat and the flow of gases in the furnace (mixing by induction, by acceleration or by
   change of direction)
   (D) All (A), (B) and (C)
   Answer: Option D

74. The electric furnace in which heat is produced by a combination of induced current and skin
    effect is called _________ furnace.
   (A) Arc
   (B) Resistance
   (C) Low frequency induction
   (D) High frequency induction
   Answer: Option D

75. Reducing atmosphere is maintained in a
   (A) Calcination kiln
   (B) Blast furnace
   (C) Soaking pit
   (D) L.D. converter
   Answer: Option B

76. Which of the following is the most suitable for preheating combustion air above 650°C?
   (A) Regenerator
   (B) Metallic recuperator
   (C) Ceramic recuperator
   (D) None of these
   Answer: Option C

77. Heat transfer takes place through a liquid medium surrounding the submerged material
    under heating, in case of a/an
78. Artificial draught produced by a fan in the furnace can be controlled by the
(A) Speed of the fan
(B) Damper
(C) Variation in the pitch of fan blades
(D) All (A), (B) and (C)
Answer: Option D

79. Ceramic coating material for furnace refractory, which increases its emissivity and thus the radiation heat transfer rate in the furnace, comprises of
(A) Graphite powder
(B) Thoria
(C) Zircon powder
(D) Beryllium
Answer: Option C

80. Protective gas used in the annealing furnace for steel coil comprises of
(A) 95% N₂ + 5% H₂
(B) 5% H₂ + 9% N₂
(C) 100% CO
(D) 100% H₂
Answer: Option A

81. Which one is not an induced draught furnace?
(A) Blast furnace stove
(B) Sintering furnace
(C) High pressure boiler
(D) None of these
Answer: Option A

82. Acid dew point temperature (ADT) of a flue gas produced by the combustion of a fuel containing 1% sulphur may be about __________ °C.
(A) 80
(B) 130
(C) 180
(D) 250
Answer: Option B

83. Furnace pressure is normally controlled by regulating the
(A) Air pressure
(B) Fuel gas pressure
(C) Speed of I.D. fan
(D) Damper
Answer: Option D

84. Reheating furnace (pusher type) is used for heating
(A) Ingots
(B) Slabs
(C) Steel coils
(D) Steel sheets
Answer: Option B

85. __________ is an indirectly heated furnace.
(A) Open hearth furnace
(B) Muffle furnace
(C) Soaking pit
(D) Reheating furnace
Answer: Option B

86. Shaft furnaces are used for
87. Fuel economy in furnaces can be achieved by
   (A) Using oxygen enriched combustion air
   (B) Preheating the combustion air
   (C) Reducing the heat loss through furnace openings & doors
   (D) All (A), (B) and (C)
   Answer: Option D

88. Regenerators are installed in
   (A) Coke ovens
   (B) Open hearth furnace
   (C) Both (A) & (B)
   (D) Neither (A) nor (B)
   Answer: Option C

89. Ingress of cold air in the furnaces through cracks, charging doors, openings etc.
   (A) Reduces the flue gas temperature and makes the furnace atmosphere oxidising
   (B) Increases the load on the induced draft fan
   (C) Reduces the furnace draught
   (D) All (A), (B) and (C)
   Answer: Option D

90. Presence of SO\textsubscript{2} in furnace gases attacks the ferrous metal by way of
   (A) Accelerating the rate of scaling
   (B) Causing metal embrittlement
   (C) Attacking the grain boundaries; particularly severe on low carbon and nickel bearing steels at high temperature
   (D) All (A), (B) and (C)
   Answer: Option D

91. Which is the most thermally efficient furnace?
   (A) Reheating furnace
   (B) Reverberatory furnace
   (C) Rotary kilns
   (D) Boiler furnace
   Answer: Option D

92. In a heating process, a heat flow diagram in which the quantities of heat in the various items of a heat balance are represented by the width of a band is called the
   (A) Ostwald chart
   (B) Cox chart
   (C) Sankey diagram
   (D) None of these
   Answer: Option C

93. The advantages of firing pulverised coal in the furnace lies in the fact that, it
   (A) Permits the use of high ash content coal
   (B) Permits the use of low fusion point ash coal
   (C) Accelerates the burning rate and economises on fuel consumption
   (D) All (A), (B) and (C)
   Answer: Option C

94. In producer gas making furnace, steam is added along with air to mainly control the
   (A) Fusion of coal ash & clinker formation
   (B) C. V. of producer gas
   (C) Temperature of producer gas
   (D) Tar content in producer gas
   Answer: Option A

95. __________ furnace is not an electric furnace.
96. **Pick out the wrong statement.**

(A) Addition of methane to the furnace atmosphere reduces decarburising by hydrogen
(B) Nitrogen in presence of steam decor-burises high carbon steel, whereas hydrocarbon gases carburise the surface of steel at annealing temperatures
(C) Active nitrogen (formed by cracking ammonia at the metal surface) cause nitride formation with increase in surface hardness
(D) None of these
Answer: Option D

97. **To reduce the stack loss, heat recovery from flue gas can be done by**

(A) Preheating of cold stock
(B) Preheating of combustion air
(C) Steam generation in waste heat boilers
(D) All (A), (B) and (C)
Answer: Option D

98. **Thermal efficiency of furnaces can be improved by**

(A) Waste heat recovery from flue gas
(B) Minimising heat losses from furnace walls
(C) Maintaining proper draught
(D) All (A), (B) and (C)
Answer: Option D

99. **Size of the combustion chamber of a furnace depends upon the**

(A) Heat release rate of the fuel
(B) Preheat temperature of fuel & air
(C) Method of mixing the fuel & air
(D) All (A), (B) and (C)
Answer: Option D

100. **Power required in case of forced draught as compared to induced draught (for the same draught produced) is**

(A) Same
(B) Less
(C) More
(D) Either more or less; depends on the flue gas density
Answer: Option B

101. **An electric furnace producing heat by means of an electric arc struck between each of three electrodes and the charge is called _________ furnace.**

(A) Resistance
(B) Arc
(C) Low frequency induction
(D) None of these
Answer: Option B

102. **While the fuel fired furnace can be used upto a maximum temperature of about 1700°C, the electric furnace can be used upto a temperature of about _________ °C.**

(A) 2000
(B) 3000
(C) 4500
(D) 6000
Answer: Option C

103. **Which of the following is a heat treatment furnace?**

(A) Muffle furnace
(B) Annealing furnace
(C) Reheating furnace
(D) Rotary kiln
104. Rotary kilns are used in the
(A) Calcination of limestone & dolomite
(B) Cement manufacture
(C) Both (A) and (B)
(D) Neither (A) nor (B)
Answer: Option C

105. In practical operation of any furnace, zero oxygen percentage or theoretical CO₂ percentage in flue gas is rarely achieved, because of
(A) Use of non-preheated combustion air
(B) Use of pulverised solid fuels
(C) Imperfect mixing of fuel & air and infiltration of air
(D) Use of excessive positive draft in the furnace
Answer: Option C

106. Soaking pits are meant for heating steel
(A) Ingots
(B) Coils
(C) Sheets
(D) Slabs
Answer: Option A

107. Metallic recuperators are not used for waste heat recovery, if the hot flue gas temperature is above ________ °C, because corrosion prevails at higher temperatures.
(A) 350
(B) 750
(C) 1050
(D) 1250
Answer: Option B

108. Pot furnace which is either regenerative or recuperative, is used in the manufacture of
(A) Glass
(B) Stainless steel
(C) Potteries
(D) Refractory bricks
Answer: Option A

109. In reverberatory furnace, charge is heated mainly by
(A) Conduction
(B) Natural convection
(C) Radiation of heat from the roof of the combustion chamber
(D) None of these
Answer: Option C

110. Very high pressure boilers are usually ________ boilers.
(A) Fire tube
(B) Water tube
(C) Waste heat
(D) Natural circulation
Answer: Option D

111. Which one shows the diagrammatic heat balance in a furnace?
(A) Sankey diagram
(B) Cox chart
(C) Ostwald chart
(D) None of these
Answer: Option A

112. Thermal efficiency of blast furnace stoves used for heating blast (air) may be about ________ percent.
(A) 20
(B) 40
(C) 60

113. In which of the waste heat recovery equipment, the flow of flue gas and air is alternately reversed after a fixed interval of time?
   (A) Recuperator
   (B) Regenerator
   (C) Waste heat boiler
   (D) None of these
   Answer: Option B

114. Advantages of use of preheated combustion air are
   (A) Saving in fuel consumption
   (B) Reduction in scale losses
   (C) Increase in flame temperature
   (D) All (A), (B) and (C)
   Answer: Option D

115. ________ atmosphere is maintained inside an iron blast furnace.
   (A) Oxidising
   (B) Reducing
   (C) Inert
   (D) Decarburising
   Answer: Option B

116. Maximum thermal efficiency of boiler may be about ________ percent.
   (A) 10
   (B) 25
   (C) 65
   (D) 90
   Answer: Option D

117. If the flame is produced under the hearth and then sweeps up into the heating chamber, this is called a/an ________ furnace.
   (A) Sidefired
   (B) Underfired
   (C) Covered
   (D) Recirculating
   Answer: Option B

118. Thermal efficiency of a limestone calcination rotary kiln may be around ________ percent.
   (A) 20
   (B) 40
   (C) 65
   (D) 80
   Answer: Option B

119. Which of the following is the most important deterrents to an extended use of pulverised coal in boiler firing?
   (A) Ash disposal problem
   (B) Excessive fly ash discharge from the stack
   (C) Higher power consumption in its transportation
   (D) Erosion of induced draft fan blades
   Answer: Option A

120. Unit of furnace loading is
   (A) Ton stock/hr/m$^2$ hearth area
   (B) Ton stock/hr
   (C) Ton stock/m$^2$ hearth area
   (D) Both (B) and (C)
   Answer: Option A

121. Large tonnage of refractory bricks are dried in a
   (A) Shaft furnace
122. Specific heating capacity of a furnace is expressed as
   (A) Weight heated/hr
   (B) Weight heated/furnace volume
   (C) Weight heated/hr/furnace volume
   (D) None of these
   Answer: Option C

123. A refractory wall separating the stock and the source of heat is provided in a
   (A) Updraft kiln
   (B) Muffle furnace
   (C) Continuous furnace
   (D) None of these
   Answer: Option B

124. Coke ovens in steel plant are heated by
   (A) Electricity
   (B) Blast furnace gas/mixed gas
   (C) Coke oven gas
   (D) Both (B) and (C)
   Answer: Option D

125. Turndown ratio of a burner gives an idea of the ________ in the furnace.
   (A) Range of fuel firing rates
   (B) Volume of the combustion chamber
   (C) Maximum heat input rate only
   (D) Minimum heat input rate only
   Answer: Option A

126. Amount of coal lost in ash particle, which is carried through the boiler system, depends upon the
   (A) Physical nature, ash content and fineness of the coal
   (B) Amount of excess air supplied and load on the boiler
   (C) Type of burner and combustion chamber
   (D) All (A), (B) and (C)
   Answer: Option D

127. Which is a continuous furnace?
   (A) Coke ovens
   (B) Annealing furnace
   (C) Glass tank furnace
   (D) None of these
   Answer: Option C

128. In furnaces operating at very high temperature (say) 1250°C, e.g. soaking pit), the maximum heat transfer takes place by
   (A) Conduction
   (B) Convection
   (C) Radiation
   (D) Cannot be predicted
   Answer: Option C

129. Overfire burning in a furnace is a phenomenon characterised by
   (A) Supply of excess fuel
   (B) Supply of excess air
   (C) Burning carbon monoxide and other incombustible in upper zone of furnace by supplying more air
   (D) None of these
   Answer: Option C

130. The reason for excessive clinker formation in gas producers is the
(A) Use of coal/coke containing a high % of fines and ash
(B) Use of fuel having too low an ash fusion temperature
(C) Development of hot spots in the fuel bed and an abnormally high rate of gasification
(D) All (A), (B) and (C)
Answer: Option D

131. Regenerators are normally provided in the
   (A) Glass melting furnace
   (B) Open hearth furnace
   (C) By product coke ovens
   (D) All (A), (B) and (C)
   Answer: Option D

132. The rate of scaling of furnace stock depends upon the
   (A) Temperature
   (B) Time
   (C) Nature of atmosphere
   (D) All (A), (B) and (C)
   Answer: Option D

133. Which furnace employs preheating, heating and soaking zones?
   (A) Soaking pit
   (B) Reheating furnace
   (C) Open hearth furnace
   (D) Cupola
   Answer: Option B

134. In low or standard frequency induction furnace, heat is produced by the
   (A) Combination of induced current and skin effect
   (B) Induction and resistance
   (C) Current flow through a heating element
   (D) None of these
   Answer: Option B

135. Fuel economy in an industrial furnace operation cannot be achieved by the use of
   (A) Stoichiometric combustion air
   (B) Non-preheated combustion air
   (C) Combustion air not enriched with oxygen
   (D) Recuperators
   Answer: Option A

136. The thermal efficiency of a steel slab reheating furnace (walking beam type) may be about ________ percent.
   (A) 15
   (B) 40
   (C) 70
   (D) 85
   Answer: Option B

137. Out of the following fuels used in a furnace exhausting flue gas at a temperature of 600°C, the percentage stack loss will be maximum in case of complete combustion of
   (A) Furnace oil with air
   (B) Furnace oil with oxygen
   (C) Blast furnace gas with air
   (D) Blast furnace gas with oxygen
   Answer: Option C

138. Neutral atmosphere is maintained in a/an ________ furnace.
   (A) Cold rolled steel coil annealing
   (B) Open hearth
   (C) Soaking pit
   (D) Walking beam reheating
   Answer: Option A
139. Which of the following is not an additive for flue gases from furnace to reduce its dew-point?
   (A) Ammonia
   (B) Fine dolomite
   (C) Alkaline powders
   (D) None of these
   Answer: Option D

140. An example of indirectly heated furnace is the
   (A) Soaking pit
   (B) Muffle furnace
   (C) Reheating furnace
   (D) None of these
   Answer: Option B

141. The function of an economiser in a boiler is to preheat the
   (A) Feedwater
   (B) Combustion air
   (C) Pulverised coal
   (D) Furnace oil
   Answer: Option A

142. Thickness of stock does not affect the fuel economy of furnaces, if the material to be heated is of
   (A) Low emissivity
   (B) High thermal conductivity
   (C) Both (A) and (B)
   (D) Neither (A) nor (B)
   Answer: Option C

143. Which of the following furnaces will have maximum thermal efficiency?
   (A) Soaking pits
   (B) Walking beam reheating furnace
   (C) Boiler furnace
   (D) Rotary kilns
   Answer: Option C

144. The resistance furnace produces heat by the
   (A) Electric arc struck between electrodes and the charge
   (B) Flow of current through a heating element
   (C) Combination of induced current and skin effect
   (D) None of these
   Answer: Option B

145. Ostwald charts are meant for
   (A) Computing the excess/deficiency of combustion air
   (B) Calculation of flue gas temperature
   (C) Computation of flue gas analysis
   (D) None of these
   Answer: Option A

146. Dampers are located
   (A) Before the I.D fan
   (B) After the I.D. fan
   (C) Near the top of the chimney
   (D) Anywhere after the I.D. fan
   Answer: Option A

147. Regenerators as compared to recuperators for the same duty
   (A) Store smaller quantity of waste heat
   (B) Are lighter & compact
   (C) Involve higher initial cost
   (D) All (A), (B) & (C)
   Answer: Option C