Standard Questions

Heat and Thermodynamic

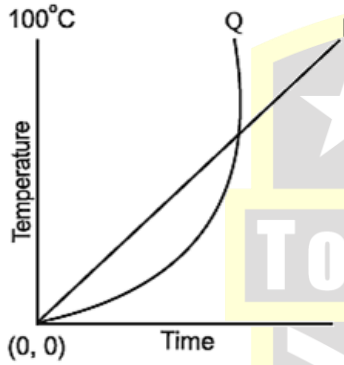
1. Transfer of heat by convection can take place in
   (a) Solids and liquids
   (b) Solids and vacuum
   (c) Gases and liquids
   (d) Vacuum and gases
2. A liquid remains hot or cold for a long time in thermos flask because there is no loss or gain of heat by
   (a) Conduction
   (b) Convection and radiation
   (c) Both (a) and (b)
   (d) None of the above
3. Steam at 100°C causes more severe burns than the water at the same temperature, because:
   (a) Steam is a gas
   (b) Steam provides more heat
   (c) Steam is highly combustible
   (d) Steam exerts more pressure
4. The hand burns more by steam comparatively to boiling water, because –
   (a) The steam has latent heat
   (b) Steam sneaked into the body
   (c) The steam has more power
   (d) Steam is gig
5. The heat required in calories to convert one gram of ice at 0°C to steam at 100°C is approximately
   (a) 80 (b) 336
   (c) 720 (d) 620
6. At what temperature are the reading of a Centigrade and Fahrenheit thermometer the same?
   (a) – 40 (b) 212
   (c) 40 (d) 100
7. At what degree are the Centigrade and Fahrenheit temperatures the same?
   (a) 100° (b) 80°
   (c) –32° (d) – 40°
8. At which temperature, the celsius and Fahrenheit scales coincides?
   (a) 0° (b) 10°
   (c) – 40° (d) 40°
9. At what point the Fahrenheit temperature is double of centigrade temperature?
   (a) – 6.7° C (b) –12.3° C
   (c) 12.3° C (d) 160° C
10. The body temperature of a healthy man is –
    (a) 37° Celsius (b) 37° Fahrenheit
    (c) 98.4° Celsius (d) 98.4° Kelvin
11. The normal temperature of human body on the Kelvin scale is –
    (a) 280 (b) 290
    (c) 300 (d) 310
12. The normal temperature of human body is 98.4 °F. It's equivalent temperature in °C is –
    (a) 40.16 (b) 36.89
    (c) 35.72 (d) 32.36
13. Normal temperature of human body on Celsius scale will be –
    (a) 310 degree (b) 98.4 degree
    (c) 36.9 degree (d) 31.5 degree
14. Which one of the following scales of temperature does not have a negative value?
    (a) Celsius (b) Fahrenheit
    (c) Kelvin (d) Reaumur
15. A measured temperature in Fahrenheit scale is 200°F. What will be its value in Celsius scale?
    (a) 93.3°C (b) 40°C
    (c) 99°C (d) 30°C
16. Let the average temperatures in Centigrade (C) and Fahrenheit (F) be $\bar{C}$ and $\bar{F}$. If $\bar{C}$ and $\bar{F}$ are related to, $F = \frac{9}{5}C + 32$, then $\bar{F}$ and $\bar{C}$ have the relation:
    (a) $\bar{F} = \frac{9}{5}\bar{C} + 32$ (b) $\bar{F} = \bar{C} + 32$
    (c) $\bar{F} = \frac{9}{5}\bar{C}$ (d) $\bar{F} = \frac{9}{5}\bar{C} - 32$
17. The value of 40 degrees Celsius in Fahrenheit scale is
    (a) 104° F (b) 100° F
    (c) 102° F (d) 75° F
18. The value of 50°C in Fahrenheit scale is
    (a) 104°F (b) 122°F
    (c) 100°F (d) 75°F
19. In cold countries, alcohol is preferred to mercury as a thermometric liquid because:
    (a) Alcohol has a lower freezing point
    (b) Alcohol is a better conductor of heat
    (c) Alcohol is cheaper than mercury
    (d) The world production of alcohol is greater than that of mercury
20. Which one of the following is used as an antifreeze for the automobile engines?
    (a) Ethanol (b) Ethylene glycol
    (c) Methanol (d) Propyl alcohol
21. What is absolute zero temperature?
    (a) The starting point of any temperature scale
    (b) Theoretically the lowest possible temperature.

(c) The temperature at which the vapour of any liquid substance is condensed.
(d) The temperature at which all material are in vapour form.

22. Expansion during heating –
(a) Occurs only in solid
(b) Increases the weight of the material
(c) Decreases the density of the material
(d) Occurs at the same rate for all liquids and solids

23. When ice melts, then-
(a) Volume increases
(b) Volume decreases
(c) Mass increases
(d) Mass decreases

24. The variations in temperature from 0°C to 100°C with respect to time of two liquids P, Q are shown in the graph given below:



Which of the following statement is correct?
(a) During heating, liquid P has always warmer than Q.
(b) At no point of time during heating did the two liquids have the same temperature.
(c) (c) P attained the temperature of 100oC faster than Q.
(d) Q attained the temperature of 100oC faster than P.

25. What is the use of thermostat?
(a) To measure the temperature
(b) To increase the temperature
(c) To maintain the temperature
(d) To convert heat into electricity

26. Thermostat is related to:
(a) Humidity (b) Temperature
(c) Air (d) Clouds

27. Thermostat is a device which:
(a) Measures heat
(b) Measures temperature
(c) Automatically regulates the temperature of a system
(d) Automatically regulates pressure of a system

28. Thermostat ..... is a mean of keeping stable?
(a) Current (b) Temperature
(c) Pressure (d) Heat Radiation

29. What is the function of the thermostat of a refrigerator?
(a) To lower the temperature
(b) To increase the freezin g point
(c) To maintain constant t emperature
(d) To decrease the meltin g point

30. The safest temperature for keeping food fresh in a refrigerator is
(a) 4°C (b) 8°C
(c) 0°C (d) 10°C

31. When soggy biscuits are kept inside the fridge for some time, they become crisp because:
(a) Cooling releases extra moisture
(b) Humidity inside the fridge is low and extra moisture is absorbed.
(c) Humidity inside the fridge is high and extra moisture is absorbed.
(d) Pressure inside the fridge is high and help in releasing extra moisture.

32. Assertion (A): A piece of ice added to the drink, cools it.
Reason (R): Ice takes latent heat from the drink for melting resulting in the cooling of the drink.
Select the correct answer using the codes given below:
(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

33. Assertion (A): Large cold storage plants use ammonia as refrigerant while domestic refrigerators use chlorofluorocarbons.
Reason (R): Ammonia can be liquefied at ambient temperatures at low pressures.
Code:
(a) Both (A) and (R) are true, and (R) is the correct explanation of (A)
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

34. Consider the following statements -
Assertion (A): If Ice collects in the freezer, the cooling in the refrigerator is affected adversely.
Reason (R): Ice is a poor conductor.
Select the correct answer using the codes given below:

Code:
(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

35. When a glass rod is placed in steam, its length increases but its width:
(a) Remains unchanged
(b) Decreases
(c) Increases
(d) Becomes irregular

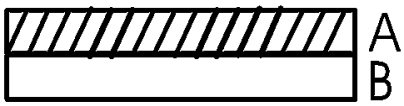
36. Consider the figures of a metal ball and a metal ring given below:



Ball Annulus

The metal ball can just pass through the hole of a metal ring formed out of a strip. When the ball is heated it gets stuck. But when the metal is heated-
(a) The ball can still pass through the ring as diameter expands on heating.
(b) The ball gets stuck because of the diameter of the hole decrease on expansion.
(c) The ball will still pass through because the hole diameter does not change.
(d) The ball will pass through because there is no change in the ring.

37. Strips of two metals A and B are firmly jointed together as shown in the figure.

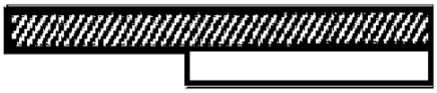


On heating, A expands more than B does. If this jointed strip is heated, then it will appear as:

(a) 

(b) 

(c) 

(d) 

38. Assertion (A): A piece of copper and a piece of glass are heated to the same temperature. When touched, thereafter, the copper piece appears hotter than the glass piece.
Reason (R): The density of copper is more than that of glass.
Code:
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not a correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

39. In winter you touch a log of wood and a rod of iron, you will feel rod of iron is colder because –
(a) The heat of rod of iron is less than the heat of log of wood
(b) In comparison to wood, iron is good conductor of heat
(c) In comparison to wood, iron is bad conductor of heat
(d) The rod of iron is heavier than the log of wood

40. If the temperature of air increases, how would it affect its ability to assume water vapour-
(a) Decrease
(b) Increase
(c) Firstly decrease, then again increase
(d) Remains constant

41. In the night of strong wind, dew is not formed because
(a) Rate of evaporation is fast
(b) Moisture in air is low
(c) Temperature is high
(d) Sky is not clear

42. Which of the following statements is not true?
(a) Air-Conditioner and Air-Cooler both maintain temperature.
(b) Air-Conditioner and Air-Cooler both maintain humidity
(c) Air-Conditioner maintains humidity but Air-Cooler does not maintain humidity
(d) Both control motion of air

43. What does an air conditioner install in a room control?
(a) Temperature only
(b) Humidity and temperature only
(c) Pressure and temperature only
(d) Humidity, pressure, and temperature

44. The cooling by a desert cooler is based on –

(a) Hot air replacement
(b) Air dehydration
(c) Evaporative cooling
(d) Air rehydration

45. Cooling is done by –
(a) Flow of water
(b) Release of compressed gas
(c) Cooking gas
(d) Melting the solid

46. In which of the following conditions wet clothes will dry earliest?
(a) 100% RH, 60°C temperature
(b) 100% RH, 20°C temperature
(c) 20% RH, 20°C temperature
(d) 20% RH, 60°C temperature

47. Which one of the following changes occurs when salt is added into the water?
(a) Boiling point is increased and freezing point decreased
(b) Boiling point is decreased and freezing point is increased
(c) Both boiling point and freezing point are decreased
(d) Both boiling point and freezing point are increased

48. On adding common salt to water, the boiling point and freezing point of water will:
(a) Increase
(b) Decrease
(c) Decrease and increase respectively
(d) Increase and decrease respectively

49. An assertion and its reason is given below -
Assertion (A): Salt is used for cooking the food at places on higher from sea level.
Reason (R): Temperature is low in higher places.
Which one among these is right answer?
(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

50. To keep drinks at the same temperature for quite some time, the walls of thermos bottle are coated with:
(a) Aluminium paint (b) Lead Powder
(c) Silver layer (d) Mercury Layer

51. It is more comfortable to wear white cloth in summer because
(a) They reflect all the heat falling on them
(b) They radiate heat transferred from the body
(c) They absorb perspiration
(d) They are soothing to the eye

52. White clothes are cooler than black clothes because:
(a) They absorb whole of light
(b) They inhibit penetration of light
(c) They make sunlight completely cool
(d) They reflect the whole light

53. Assertion and Reason are given below –
Assertion (A): We prefer the white dress in winters.
Reason (R): White dresses are good reflectors of heat.
Which one among these is the right answer.
(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

54. Consider the following statements:
Assertion (A): Light coloured clothes are preferred in summer.
Reason (R): Light colours are poor absorbers of heat.
Select correct answer from the code given below:
(a) Both (A) and (R) are correct and (R) correctly explains (A).
(b) Both (A) and (R) are correct, but (R) does not correctly explain (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

55. Loss of water from the body through perspiration depends on:
(a) Atmospheric temperature only
(b) Atmospheric humidity only
(c) Both (a) and (b)
(d) None of (a) and (b)s

56. The most important function of perspiration is to:
(a) Regulate body temperature
(b) Regulate body water supply
(c) Get rid of body poison.
(d) Keep the skin pores clear of dirt.

57. A fan produces feeling of comfort during hot weather, because –
(a) Fan supplies cold air
(b) Our perspiration evaporates rapidly
(c) Our body radiates more heat
(d) Conductivity of air increase

58. In an earthen pitcher, the water remains cold due to the process of
(a) Condensation
(b) Evaporation
(c) Sublimation
(d) None of the above

59. On a specific day and time, the temperature was 48ºC in Churu and 24ºC in Shimla. Two metallic cups identical in all respects contained water at 95ºC in Churu and 71ºC in Shimla. Which one of these two cups reached room temperature first?
(a) Cup in Churu
(b) Cup in Shimla
(c) Both cups reached room temperature at the same time
(d) Data are not enough to find out result

60. A hot body cools from 90º C to 75º C in 25 seconds. The same body in further cooling from 75º C to 60º C will take how much time?
(a) 25 seconds
(b) Less than 25 seconds
(c) More than 25 seconds
(d) Nothing can be said

61. In the season of summer, we experience a humid heat when weather:
(a) Start of summer
(b) Middle of summer
(c) Scorching weather
(d) Humid weather

62. Xeric condition refers to –
(a) low temperature
(b) low humidity
(c) high evaporation
(d) extreme temperature

63. The atmosphere exerts enormous pressure on us. But we do not feel it because
(a) Our blood exerts a pressure slightly more than that of the atmosphere.
(b) We are used to it.
(c) Our bones are very strong and can withstand the pressure.
(d) The surface area of our head is very small.

64. Which of the following statement is not true:
(a) Boiling point of any water solution is higher than pure water.
(b) Addition of solute to a solution increases its water potential.
(c) Water vapour pressure of any solution is lower than vapour pressure of pure water.
(d) When a solution is separated with the help of semipermeable membrane then water flow can be stopped by giving pressure to the solution.

65. Why does water boil at a temperature below 100^0C at higher altitudes?
(a) The atmospheric pressure decreases and hence boiling point is lowered.
(b) The gravitational attraction is less.
(c) Because of heavy winds in mountains.
(d) None of the above is correct.

66. Assertion (A): The boiling point of water decreases as the altitude increases.
Reason (R): The atmospheric pressure increases with altitude.
Code:
(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

67. Food gets cooked faster in a pressure cooker because –
(a) Water starts boiling at a lower temperature due to high pressure
(b) Water starts boiling at a higher temperature due to high pressure
(c) Water boils only at 100º C but the heat content is higher at high pressure
(d) Convection currents are set inside the cooker

68. Pressure-cooker cooks' food in lesser time because
(a) The temperature of boiling water decreases due to high pressure
(b) Air has no effect as it is closed from all sides
(c) Temperature of boiling water increases due to high pressure
(d) Evaporation of the water used is very small

69. Why does food cook faster in a pressure cooker?
(a) The increased pressure increases the boiling point.
(b) Does not waste steam.
(c) The food is cooked quickly by steam.
(d) The water boils at constant temperature.

70. Food is cooked faster in a pressure cooker because
(a) Heat cannot escape from the cooker.
(b) Steam is colder than the boiling water.
(c) Due to high pressure, the boiling point of water is raised.
(d) Water starts boiling at a lower temperature.

71. In a pressure cooker food is cooked in shorter time because –
(a) The boiling point of water increases
(b) The boiling point of water decreases
(c) The food takes less heat
(d) None of the above.

72. Assertion (A): The handle of pressure cooker is made up of Ebonite.
Reason (R): Ebonite is a hard material.

Code:
(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

73. In a pressure cooker, the temperature at which the food is cooked depends mainly upon which of the following?
1. Area of the hole in the lid
2. Temperature of the flame
3. Weight of the lid
Select the correct answer using the code given below.
(a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3

74. Maximum temperature inside pressure cooker depends on:
(a) Area of hole on the top and weight kept on it
(b) Area of hole on the top and food being cooked
(c) Weight kept on hole at top and food being cooked
(d) Area of hole on the top only

75. When water is heated from 0^0C to 10^0C. It's volume:
(a) Increases
(b) Decreases
(c) Does not change
(d) First decreases and then increases

76. What changes will the volume of water show if the temperature is lowered from 9°C to 3°C:
(a) The volume will not change
(b) The volume will first increase and then decrease
(c) The volume will first decrease and then increase
(d) Water will freeze

77. Consider the following statements:
1. Steam at 100^0C and boiling water at 100^0C contain same amount of heat.
2. Latent heat of fusion of ice is equal to the latent heat of vaporization of water.
3. In an air-conditioner, heat is extracted from the room air at the evaporator coils and is ejected out at the condenser coils.
Which of these statements is/are correct?
(a) 1 and 2 (b) 2 and 3
(c) Only 2 (d) Only 3

78. When a bottle is filled with water and it is freezing the bottle breaks down, because-
(a) Water expands upon freezing.
(b) Bottle shrinks at freezing point.
(c) The temperature outside the bottle is higher than inside.
(d) Water expands on heating.

79. A glass bottle containing water tightly corked breaks when it is kept in freezer, because –
(a) Bottle shrinks on freezing.
(b) The volume of water decreases on freezing
(c) The volume of water increases on freezing.
(d) Glass is the bad conductor of heat

80. When a piece of ice floating in a glass of water melts, the level of water will:
(a) Fall
(b) Rise
(c) Remain same
(d) Fall or rise depends on the temperature of water

81. Cloudy nights are warmer compared to clear cloudless nights, because clouds-
(a) Prevent cold waves from the sky from descending on earth.
(b) Reflect back the heat given off by earth.
(c) Produce heat and radiate it towards earth.
(d) Absorb heat from the atmosphere and send it toward earth.

82. The cloudy nights are warmer than clear nights because–
(a) The clouds prevent radiation of heat from the ground and the air
(b) Clouds absorb sunlight during the day and radiate the same in night
(c) Clouds make the atmosphere damp and generate heat
(d) The clouds obstruct the movement of air which creates heat

83. Fruit stored in a cold chamber exhibit longer storage life because
(a) Exposure to sunlight is prevented
(b) Concentration of carbon dioxide in environment increases
(c) Rate of respiration is decreased
(d) There is increase in humidity

84. Assertion (A): Woollen clothes keep us warm.
Reason (R): Woollen fibres are made from a special type of protein, which is a bad conductor of heat.
Select the correct answer from the codes given below:
(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

85. Which one of the following statements is not correct?
(a) The velocity of sound in air increases with the increase of temperature
(b) The velocity of sound in air is independent of pressure
(c) The velocity of sound in air decreases as the humidity increases
(d) The velocity of sound in air is not affected by the change in amplitude and frequency

86. Opening the door of refrigerator kept in the room
(a) You can cool the room to some degree
(b) You can cool the room to the temperature of refrigerator
(c) You can warm the room a little
(d) You can neither cool nor warm the room

87. If a gas is compressed to half of its original volume at 27°C, to what temperature should it be heated to make it occupy its original volume?
(a) 327^0C (b) 600^0C
(c) 54^0C (d) 300^0C

88. Heat energy of an object is
(a) The average energy of the molecules of the object
(b) The total energy of the molecules of the object
(c) The average velocity of the molecules of the object
(d) The average P. E. of the molecules of the object

89. Which of the following statements are true regarding heat?
1. heat is a of energy
2. Heat can be reflected by mirror
3. Heat is an electromagnetic radiation
4. Heat can not pass through vacuum.
Select the correct answer from the codes given below:
(a) 1, 2 & 3 (b) 2, 3 & 4
(c) 1, 2 & 4 (d) 1, 3 & 4

90. Heat is associated with
(a) K.E of random motion of molecules
(b) K.E. of orderly motion of molecules
(c) Total K.E of random and orderly motion of molecules
(d) None of these

91. Earliest thermometer was developed by
(a) Celsius (b) Fahrenheit
(c) Kelvin (d) Galileo

92. The SI unit of temperature is
(a) Kelvin (b) Celsius
(c) Fahrenheit (d) Joule

93. The correct value of 0°C on the kelvin scale is
(a) 273 K (b) 273.15 K
(c) 275.15 K (d) 270 K

94. The temperature at which both the Fahrenheit and Centigrade scales have the same value is
(a) – 60° deg (b) - 40° deg
(c) - 20 ° deg (d) 0 ° deg

95. Gas thermometers are more sensitive than the liquid thermometers because the gases
(a) have low specific heat
(b) have high specific heat
(c) have large coefficient of expansion
(d) are lighter

96. A temperature difference of 25°C is equivalent to a temperature difference of
(a) 13° F (b) 45° F
(c) 67°F (d) 77°F

97. The absolute zero on Celsius scale is
(a) - 200°C (b) - 273.15°C
(c) - 373.15°C (d) none these

98. On thermometer, the freezing point of water is marked as 20° and the boiling point of water is marked as 150°. A temperature of 60°C will be read on this thermometer as
(a) 110° (b) 98°
(c) 75° (d) 40°

99. The absolute zero is a temperature at which .....
(a) Molecular motion in a gas would cease
(b) Water freezes
(c) All gases become liquid
(d) All gases become solid

100. Who invented the Centigrade scale?
(a) Anders Celsius
(b) Daniel G. Fahrenheit
(c) William Thomson
(d) Wright Brothers

101. The temperature of a place on one sunny day is 113 in Fahrenheit scale. The Kelvin scal reading of this temperature will be
(a) 318 K (b) 45 K
(c) 62.8 K (d) 335.8 K

102. The range of platinum resistance thermometer is

(a) from- 200° C to 1600°C
(b) from - 200°C to 1200°C
(c) from - 200°C to 800°C
(d) from - 0°C to 1200°C

103. Which one of the following is the correct relation between the Kelvin temp. (T) and the Celsius temp. (t_c)?
(a) These are two independent temperature scales
(b) $T = t_c$
(c) $T = t_c - 273.15$
(d) $T = t_c + 273.15$

104. Mercury thermometers can be used to measure temperature up to
(a) 260°C (b) 100°C
(c) 360°C (d) 500°C

105. Who among the following scientist invented the mercury thermometer?
(a) D.G. Fahrenheit
(b) Kelvin
(c) S. Celsius
(d) James Hargreaves

106. The temperature of a gas is measured with a
(a) platinum resistance thermometer
(b) pyrometer
(c) gas thermometer
(d) vapour pressure thermometer

107. A Kelvin thermometer and a Fahrenheit thermometer both give the same reading for a certain sample. What would be the corresponding reading in a Celsius thermometer?
(a) 574 (b) 301
(c) 273 (d) 232

108. The temperature of the sun is measured with
(a) platinum thermometer
(b) pyrometer
(c) gas thermometer
(d) vapour pressure thermometer

109. The value of 40 degrees Celsius in Fahrenheit scale is
(a) $104^{\circ}F$
(b) $100^{\circ}F$
(c) $102^{\circ}F$
(d) $75^{\circ}F$
(e) None of the above/More than one of the above

110. The normal temperature of human body is
(a) $37^{\circ}C$ (b) $37^{\circ}F$
(c) $104^{\circ}F$ (d) $36.8^{\circ}C$

111. A non-volatile solid is added to water. Its boiling point will....
(a) decrease (b) Increase
(c) no change (d) No option is correct

112. In which mode of transmission, the heat waves travel along straight line with the speed of light
(a) natural convection
(b) thermal radiation
(c) forced convection
(d) thermal conduction

113. When an object is heated, the molecules of that object
(a) began to move faster
(b) lose energy
(c) become heavier
(d) become lighter

114. Two blocks of lead, one twice as heavy as the other, are at $50^{\circ}C$ The ratio of heat content of the heavier block to that of the lighter block is
(a) 0.5 (b) 1
(c) 2 (d) 4

115. The quantity of heat required to change the temperature of 1 kg of substance by $1^{\circ}C$ is called its
(a) Specific heat (b) the total energy
(c) the latent-heat (d) heat of fusion

116. A change of $10^{\circ}C$ in Centigrade scale corresponds to what change in Fahrenheit scale?
(a) $18^{\circ}F$ (b) $21^{\circ}F$
(c) $10^{\circ}F$ (d) $15^{\circ}F$

117. At OK the velocity of the molecules is
(a) zero (b) infinity
(c) very large (d) of any value

118. The unit of the coefficient of linear expansion is
(a) m (b) $/^{\circ}C$
(c) $m/^{\circ}C$ (d) °C

119. Coefficient of linear expansion always..... with the increase in temperature
(a) increase (b) decrease
(c) remains (d) double itself

120. Choose the correct statement
(α) α : β : γ : : 1 : 3 : 2
(b) α : β : γ : : 3 : 2 : 1
(c) α : β : γ : : 2 : 3 : 1
(d) α : β : γ : : 1 : 2 : 3

121. A graph is plotted taking ℃ along the Y-axis and of along the X - axis. It is a/an
(a) parabola (b) straight line
(c) ellipse (d) circle

122. A circular disc of copper has a symmetrical hole at its centre. The disc is uniformly heated. The diameter of the hole will
(a) increase
(b) decrease
(c) remain the some
(d) none of these

123. If the temperature scale is changed from °C to °F the numerical value of specific heat will
(a) increase
(b) decrease
(c) remain unchanged
(d) nothing can be said

124. Which of the following substances has greatest specific heat?
(a) Iron (b) Water
(c) Copper (d) Mercury

125. When temperature is gradually decreased the specific heat of substance is
(a) decreased
(b) increased
(c) remain unchanged
(d) none of these

126. When lake starts breezing the formation of the ice will start first at the
(a) bottom (b) middle
(c) top (d) none of these

127. Glaciers always melt at the ..... first.
(a) top surface (b) sides
(c) bottom (d) middle surface

128. The unit of latent heat is
(a) cal-g (b) cal/°C
(c) cal/g (d) none of these

129. If the termal capacity of a body is infinity, then
(a) heat can never be added to it
(b) heat can never be extracted from it
(c) the temperature of the body cannot be altered by adding or extracting any amount of heat
(d) it has in finite amount of heat

130. Calorimeters are generally made of
(a) copper (b) brass
(c) aluminum (d) zinc

131. One Joule is approximately equal to
(a) 0.28 cal (b) 0.32 cal
(c) 0.24 cal (d) 4.2 cal

132. What is an endothermic reaction?
(a) Reaction in which heat is released
(b) Reaction in which heat is absorbed
(c) Reaction in which neither heat is released nor absorbed
(d) None of these

133. What is the process of conversion of solid state directly to gaseous state called?
(a) Evaporation (b) Condensation
(c) Sublimation (d) Distillation

134. The unit of RH are
(a) kg – m^3 (b) kg
(c) kg - m^2 (d) none of these

135. At dew point RH is
(a) 100% (b) 50%
(c) 25% (d) 0%

136. The most comfortable value for RH is
(a) 10% (b) 30%
(c) 50% (d) 100%

137. When air is saturated, it cannot hold
(a) more water vapour
(b) more air
(c) more CO_2
(d) more O_2

138. If RH is high-
(a) we feel sultry
(b) we perspire less
(c) clothes do not dry easily
(d) all of above are correct

139. A fan produces a feeling of comfort during hot weather because
(a) fan supplies cold air
(b) our perspiration evaporates rapidly
(c) our body radiates more heat in air
(d) conductivity of air increases.

140. Device used to measure very high temperature is
(a) pyrometer (b) thermometer

(c) bolometer (d) calorimeter

141. A solid metal ball has aspherical cavity. If the ball is heated, the volume of the cavity will
(a) increase
(b) decrease
(c) remain unaffected
(d) none of these

142. A metal sheet with circular hole is heated. The hole will
(a) contract
(b) expand
(c) remain unaffected
(d) none of these

143. During summer, water kept in an earthen pot becomes cool because of the phenomenon of …….....
(a) Osmosis (b) Evaporation
(c) Diffusion (d) Transpiration

144. A liquid initially contracts when cooled down to 4℃ but on further cooling down to 0℃, it expands. The liquid is:
(a) Alcohol (b) Water
(c) Molten iron (d) Mercury

145. The rate of evaporation of liquid does not depend upon
(a) Temperature
(b) Its surface area exposed to the atmosphere
(c) Its mass
(d) Humidity

146. Which one of the following can extinguish fire more quickly?
(a) Cold water (b) Boiling water
(c) Hot water (d) Ice

147. ..... expansion makes the Eiffel Tower taller during summers.
(a) Gradient (b) Thermal
(c) Chemical (d) Gravitational

148. Rate of evaporation increases with
(a) An increase of surface area
(b) An increase in humidity
(c) A decrease in wind speed
(d) A decrease of temperature

149. A gas is enclosed in a container which is then placed on a fast-moving train. The temperature of the gas
(a) rises
(b) falls
(c) remain unchanged
(d) becomes unsteady

150. What is an exothermic reaction?
(a) Reaction in which heat is released
(b) Reaction in which heat is absorbed
(c) Reaction in which neither heat is released nor absorbed
(d) None of these

151. The pressure exerted on the walls of the container by a gas is due to the fact that the gas molecules
(a) lose their kinetic energy
(b) stick to the walls
(c) are accelerated towards the walls
(d) change their momenta due to collision with the walls

152. Pressure exerted by gas is
(a) independent of the density of the gas
(b) inversely proportional to the density of the gas
(c) directly proportional to the density of the gas
(d) directly proportional to the square of the density of the gas

153. A gas behaves as an ideal gas more closely at-
(a) low pressure and high temp
(b) high pressure and low temp
(c) low pressure and low temp
(d) high pressure and high temp

154. Temperature can be expressed as a derived quantity in terms of
(a) length and mass
(b) mass and time
(c) length, mass and time
(d) none of these

155. Why is it difficult to measure the coefficient of expansion of a liquid than solid?
(a) Liquids tend to evaporate at all temperatures
(b) Liquids conduct more heat
(c) Liquids expand too much when heated
(d) Their containers also expand when heated

156. The product of the pressure and volume of an ideal gas is
(a) a constant

(b) approximately equal to the universal gas constant
(c) directly proportional to its temp
(d) inversely proportional to its temp

157. For an ideal gas the inter particle interaction is
(a) attractive (b) repulsive
(c) very large (d) zero

158. The first law of thermodynamics is concerned with the conservation of
(a) number of molecules
(b) energy
(c) numbers of moles
(d) temperature

159. Heat given to an ideal gas under isothermal conditions is used
(a) increasing the temp
(b) in doing external work
(c) in increasing the internal energy
(d) none of these

160. At what temp. the density of the water is maximum?
(a) 0°C (b) 1°C
(c) 2°C (d) 4°C

161. In an isothermal expansion of a gas
(a) a pressure remains constant
(b) temperature remains constant
(c) density remains constant
(d) none of these

162. If an ideal gas is isothermally expanded, its internal energy will
(a) increase
(b) decrease
(c) remain the same
(d) none of these

163. A gas is a metallic cylinder is suddenly compressed by a piston which is maintained at the same position with the passage of time the pressure of air
(a) increases
(b) decreases
(c) remains the same
(d) none of these

164. What is called the process of converging gas into liquid?
(a) Radiation (b) Condensation
(c) Rescission (d) Evaporation

165. A gas has
(a) one specific heat
(b) two specific heats
(c) three specific heats
(d) infinite specific heat

166. The heat transferred by the radiator of a refrigerator is
(a) more than that at the freezer
(b) less than that at the freezer
(c) the same as that at the freezer
(d) none of these

167. Melting point of ice
(a) increases with increase of pressure
(b) decreases with increase of pressure
(c) is independent of pressure
(d) none of these

168. Two blocks of ice when pressed together join to form one block because
(a) of heat produced during pressing
(b) of cold produced during pressing
(c) melting point of ice increases with increase of pressure
(d) melting point of ice decreases with increase of pressure

169. In a pressure cooker the cooking is fast because
(a) the boiling point of water is raised by the increased pressure inside the cooker
(b) the B.P. of water is lowered by the increased pressure
(c) more steam is available to cook the food at 1000°C
(d) none of these

170. Water boils at a lower temperature at high altitudes, because-
(a) the air pressure is less
(b) outside temperature is less
(c) latent heat is less
(d) None of the above

171. Cooking taken longest time
(a) at the sea level
(b) at Simla
(c) at Mount Everest
(d) none of these

172. Paraffin wax contracts on solidification the m.p. of wax
(a) increases with increase of pressure
(b) decreases with increase of pressure

(c) in independent of pressure
(d) none of these

173. A large iceberg melts at the base but not at the top because
(a) the base of iceberg remains in warmer conditions
(b) ice at the base contains impurities
(c) higher pressure at the base lowers the melting point of ice.
(d) ice at the top is different kind

174. During melting process, the beat given to a body is utilized in
(a) increasing the temperature
(b) increasing the density of the material
(c) increasing the potential energy of the molecules
(d) increasing the kinetic energy of the molecules

175. Some quantity of water at room temperature is placed in an open pan and allowed to evaporate. After sometime the temperature of water
(a) decreases slightly
(b) increases slightly
(c) remains unchanged
(d) none of these

176. The boiling point of a liquid is
(a) affected by addition of soluble solid
(b) increases with increase of pressure
(c) both (a) and (b)
(d) None of these

177. A closed bottle containing water at room temperature is taken to the moon and then the lid is opened. The water will
(a) freeze
(b) boil
(c) decompose into hydrogen and oxygen
(d) not change at all

178. The critical temperature of a gas is the temperature
(a) at which Boyle's law is strictly obeyed
(b) at which the gas liquefies at a pressure of one atmosphere
(c) above which the gas cannot be liquefied
(d) Below which the gas cannot be liquefied

179. The relative humidity of air can decrease in spite of an increase in the absolute humidity when the
(a) pressure rises
(b) pressure falls
(c) temperature rises
(d) temperature falls

180. Water evaporates at atmospheric pressure at a certain rate. If now some water is placed in vacuum, the rate of evaporation
(a) will increase
(b) will decrease
(c) will remain unchanged
(d) none of these

181. If the atmospheric temperature and the dew point are nearly equal then
(a) the relative humidity is 100%
(b) the relative humidity is zero
(c) the relative humidity is 50%
(d) none of these

182. If the temperature inside a room is increased, the relative humidity will
(a) increase
(b) decrease
(c) remain unchanged
(d) none of these

183. A liquid boils at a temperature at which its saturated vapor pressure becomes
(a) equal to the atmospheric pressure
(b) twice the atmospheric pressure
(c) half the atmospheric pressure
(d) none of the above

184. With rise of B.P. of a water the latent heat of steam.
(a) decreases
(b) increased
(c) does not change
(d) none of these

185. In an isothermal change an ideal gas obey's
(a) Boyle's law
(b) Charle's Law
(c) Gay-Lussac's Law
(d) None of these

186. A refrigerator, with its power on, is kept in closed room with its door open. The temperature of the room will
(a) rise
(b) fall

(c) remains the same
(d) none of these

187. When a gas expands adiabatically
(a) no energy is required for expansion
(b) energy is required and it comes from the wall of the container of the gas
(c) internal energy of the gas in used in doing work
(d) law of conservation of energy does not hold

188. Heat capacity of substance is infinite. It means:
(a) infinite heat is given out
(b) infinite heat is taken in
(c) no change in temperature whether heat is taken in or given out
(d) all of these

189. A sample of gas expands from volume V_1 to V_2. The amount of work done by the gas is greatest when the expansion is
(a) iso thermal
(b) isobaric
(c) adiabatic
(d) equal in all cases

190. Specific heat of a metal at very low temperatures varies as
(a) T (b) T^2
(c) $T^{3/2}$ (d) T^3

191. The SI unit of mechanical equivalent of heat in
(a) joules-calorie (b) joules/calorie
(c) calorie-ergs (d) ergs/calorie

192. During adiabatic compression of a gas its temperature
(a) remains constant
(b) becomes zero
(c) falls
(d) rises

193. A amount of heat required to raise the temperature of a body through 1 K is called its
(a) thermal capacity
(b) entropy
(c) specific heat
(d) water equivalent

194. The first operation involved in a Carnot cycle is
(a) isothermal expansion
(b) adiabatic expansion
(c) isothermal compression
(d) adiabatic compression

195. $\frac{PV}{T}$ = constant is true for
(a) Isothermal changes only
(b) Adiabatic changes only
(c) Both isothermal and adiabatic changes
(d) Neither isothermal nor adiabatic changes

196. In which of the following process the internal energy of a system remains constant?
(a) Adiabatic (b) Isothermal
(c) Isobaric (d) None of these

197. In a cyclic process the change in the internal energy of system is
(a) maximum but not zero
(b) maximum but not infinite
(c) zero
(d) infinite

198. The temperature at which the vapour pressure of a liquid becomes equal to the external (atmospheric) pressure is its
(a) melting point (b) boiling point
(c) inversion point (d) none of these

199. A cooking pot should have
(a) high specific heat and low conductivity
(b) high specific heat and high conductivity
(c) low specific heat and low conductivity
(d) low specific heat and high conductivity

200. The freezer in a refrigerator is located at the top section so that:
(a) the entire chamber of the refrigerator is cooled quickly due to convection
(b) the motor is not heated
(c) the heat gained from the environment is high
(d) the heat gained from the environment is low

201. A Refrigerator works on which of the following principles?
(a) Osmosis (b) Centrifugation
(c) Dispersion (d) Evaporation

202. The thermal conductivity of a plate depends on

(a) the temperature difference between the two sides
(b) the thickness of the plate
(c) the area of the plate
(d) none of these above

203. While measuring the thermal conductivity of a liquid, we keep the upper part hot and the lower part cool because
(a) heat conduction is easier downwards
(b) convection gets stopped in this way
(c) radiation gets stopped in this way
(d) it is easier and more convenient to do so

204. It is hotter for the same distance over the top of a flame than it is on one side of it because
(a) more heat is radiated upwards
(b) air conducts more heat upwards
(c) convection takes heat upward
(d) of some reason other than the above three

205. A hot body will radiate maximum energy if its surface is
(a) white and rough
(b) white and polished
(c) black and rough
(d) black and polished

206. A polished metal plate with rough black spot on it is heated to about 2000 k and quickly taken to a dark room. Then the spot
(a) will appear brighter than the plate
(b) will appear darker than the plate
(c) and the plate will appear equally bright
(d) none of these

207. A sphere, a cube, and thin circular plate, all having the same mass and made of the same material are heated to the same temperature and then allowed to cool, which of then cools fastest?
(a) sphere (b) cube
(c) circular plate (d) all at the same rate

208. If the absolute temperature of a perfectly black body is doubled, then its rate of radiation increases by a factor of
(a) 2 (b) 4
(c) 8 (d) 16

209. The absorptive power of a perfectly black body is
(a) 1 (b) ∞
(c) 0 (d) none

210. Which of the following represents a relation for 'heat lost heat gained'?
(a) Principle of thermal equilibrium
(b) Principle of colors
(c) Principle of calorimetry
(d) Principle of vaporization

211. Which one of the following statements is NOT correct?
(a) In the conduction mode of transference of heat, the molecules of solid pass heat from one molecule to another without moving from their positions
(b) The amount of heat required to raise the temperature of a substance is called its specific heat capacity
(c) The process of heat transfer in liquids and gases is through convection mode
(d) The process of heat transfer from a body at higher temperature to a body at lower temperature without heating the space between them is known as radiation

212. According to Newton's law of cooling, the rate of cooling of a body is proportional to the
(a) temperature of the body
(b) temperature of the surrounding
(c) difference of the temperature of the body and its surroundings
(d) none of these

213. A body cools from 85°C to 80°C in 5 minutes. The time taken to cool from 85°C to 80°C is
(a) less than 5 minutes
(b) more than 5 minutes
(c) 5 minutes
(d) none of these

214. Which of the following statements is wrong?
(a) Stefan's constant is the same for all black bodies

(b) thermal radiations travel with the speed of $3 \times 10^8 ms^{-1}$
(c) thermal radiations exhibit diffraction
(d) Stefan's law is applicable for all heated body

215. Heat is transmitted from higher to lower temperature through actual mass motion of the molecules in
(a) conduction (b) convection
(c) radiation (d) all of the above

216. Apiece of metal and a piece of wood are kept at temperature 45℃ on touching the two of them with hand
(a) the two will appear equally hot
(b) the piece of wood will appear hotter than the piece of metal
(c) the piece of metal will appear hotter than the piece of wood
(d) the distinction in the hotness will not be possible

217. An electric heater, kept in vacuum, is heated continuously by-passing electric current. Its temperature
(a) will go on rising with time
(b) will stop rising after some time as it will lose heat to the surrounding by conduction
(c) will become constant after some time because of loss of heat due to radiation
(d) none of these

218. A body cools from 60℃ to 50℃ in 10 minutes when kept in air at 30°C. In the next 10 minutes its temperature will be
(a) below 40℃
(b) 40℃
(c) above 40℃
(d) Can not be predicted

219. The statement that 'heat cannot flow by itself from a body at a lower temperature to a body at a higher temperature, is known as-
(a) Zeroth law of thermodynamics
(b) First law of thermodynamics
(c) Second law of thermodynamics
(d) Third law of thermodynamics

220. Thermon flask prevents heat loss by
(a) radiation (b) conduction
(c) convection (d) all of the above

221. Wollen clothes keep the body warm because
(a) wool increases the temperature of the body
(b) wool is the bad conductor of the heat so it does not allow heat to flow out of the body
(c) wool absorbs radiant heat from outer objects
(d) wool rejects heat from outer objects

222. In which of the following phenomena do heat waves travel along a straight line with the speed of light?
(a) Thermal conduction
(b) Thermal convection
(c) Thermal radiation
(d) Both, thermal conduction and radiation

223. If the temp. of a hot body is increased by 50%, the amount of radiation emitted by it increases approximately by
(a) 225% (b) 250%
(c) 400% (d) 500%

224. Which is the fastest mode of heat loss?
(a) conduction (b) convection
(c) radiation (d) all are equally fast

225. If the work done on the system or by the system is zero, which one of the following statements for a gas kept at a certain temperature is correct?
(a) Change in internal energy of the system is equal to flow of heat in or out of the system.
(b) Change in internal energy of the system is less than heat transferred.
(c) Change in internal energy of the system is more than the heat flow.
(d) Cannot be determined.

226. The amount of heat required to change a liquid to gaseous state without any change in temperature is known as-
(a) Specific heat capacity
(b) Mechanical equivalent of heat
(c) Latent heat of vaporization
(d) quenching

227. Relation between the color and the temperature of a star is given by

(a) Wean's Displacement Law
(b) Planck's Law
(c) Hubble's Law
(d) Hipparcos Rule

228. 10 g of ice at −10°C is mixed with 10 g of water at 0°C The amount of required to raise the temperature of mixture to 10°C is:
(a) 400 cal (b) 550 cal
(c) 1050 cal (d) 1200 cal

229. The process in which no heat enters or leaves the system in termed as
(a) isochoric (b) isobaric
(c) isothermal (d) adiabatic

230. Mode of transmission of heat in which heat carried by a moving particle is
(a) conduction (b) radiation
(c) wave motion (d) convection

231. The mechanical equivalent of heat J is:
(a) a constant
(b) a physical quantity
(c) a conversion factor
(d) none of these

232. Rate of diffusion is
(a) faster in solids than in liquids and gases
(b) faster in liquids than in solids and gases
(c) faster in gases than in liquids and gases
(d) equal in solids, liquids and gases

233. Water is usual as coolant in the radiator of a car engine because it
(a) has low density
(b) has high specific heat
(c) has low boiling point
(d) is easily available

234. Internal energy of a perfect gas is independent of
(a) pressure (b) volume
(c) temperature (d) none of these

235. At absolute zero temp., the kinetic energy of the molecules
(a) becomes maximum
(b) becomes minimum
(c) remains constant
(d) becomes zero

236. Thermal radiations are to: electromagnetic wave belonging
(a) ultraviolet (b) visible region
(c) gamma region (d) infrared region

237. A white and smooth surface is-
(a) good absorber and bad reflector of heat
(b) bad absorber and bad reflector of heat
(c) good absorber and good reflector of heat
(d) bad absorber and good reflector of heat

238. The saturated vapor pressure of water at 100°C
(a) 750 mm of Hg (b) 760 mm of Hg
(c) 76 mm of Hg (d) 7.6 mm of Hg

239. The clouds float in the atmosphere because of their low
(a) temperature (b) velocity
(c) pressure (d) density

240. Low temperatures (cryogenines) find application in:
(a) space travel, surgery and magnetic levitation
(b) surgery, magnetic levitation and telemetry
(c) space travel, surgery and telemetry
(d) space travel, magnetic levitation and telemetry

241. When water is heated from 0°C to 10°C its volume
(a) increases
(b) decreases
(c) does not change
(d) first decreases and then increases

242. What will happen if a glass bottle is completely filled with water, sealed with a lid and put into a freezer?
(a) The glass bottle will be deformed due to atmospheric pressure on the bottle after the water freezes
(b) Eventually, the ice will burst the glass bottle
(c) Nothing will happen
(d) Weight of the glass bottle will increase after water freezes into ice

243. A hollow sphere of radius R, a hollow cube of side R and thin circular plate of radius R made up of some material, are all heated to 20°C above room temperature. When left to cool in the room, which of them will reach the room temperature first?

(a) circular plate
(b) cube
(c) sphere
(d) all of them will reach the room temperature at the same time

244. Consider the following statements:
(1) steam at 100°C and boiling water at 100° contain same amount of heat
(2) Latent heat of fusion of ice is equal to the latent heat of vaporization of water
(3) I am air-conditioner, heat is extracted from the room air at the evaporator coils and is rejected out at the con denser coils
Which of these statements is/are correct?
(a) 1 and 2 (b) 2 and 3
(c) only 2 (d) only 3

245. What is the principle by which a cooling system (Radiator) in a motor car works?
(a) conduction only
(b) convection
(c) Radiation only
(d) both conduction and radiation

246. Which of the following is the best conductor of the heat?
(a) mercury (b) silver
(c) leather (d) benzene

247. In the winter season if we touch two blocks one of iron and another of wood in the early morning then the block of iron appears to be colder because
(a) the temperature of the iron block is less than that of the wooden block
(b) iron is a bad conductor of heat in comparison of the wood
(c) iron is a bad conductor of heat in comparison of the wood
(d) the block of iron is heavier than the wooden block

248. The water from a hand-pump is warm in winter because
(a) our body is cold in winter and water appears to be warm
(b) the temperature inside the earth is higher than the atmospheric temperature
(c) the pumping process causes friction which warms up the water
(d) inside water comes out and absorbs heat from the environment

249. Which color of heat radiation represents the highest temperature?
(a) blood red (b) dark cherry
(c) salmon (d) white

250. Which one of the following statements is correct?
Transfer of heat energy from a heater coil to the cooking vessel takes place through the process of
(a) convection only
(b) conduction and convection only
(c) radiation and convection only
(d) convection, conduction and radiation

251. How can boiling point of a liquid be reduced?
(a) by adding a solid of lower melting point
(b) by dissolving a soluble solid in it
(c) by increasing the pressure on the liquid
(d) by decreasing the pressure on the liquid

252. The temperature of a body is an indicator of
(a) the total energy of the molecules of the body
(b) the average energy of the molecules of the body
(c) the total velocity of the molecules of the body
(d) the average kinetic energy of the molecules of the body

253. At normal temperature, due to a puncture, the compressed air inside the tube of a car wheel suddenly starts coming out. Then the air inside the tube
(a) starts becoming hotter
(b) starts becoming cooler
(c) remains at the same temperature
(d) may become hotter or cooler depending on the amount of water vapor present in the air.

254. Which one of the following is true for the flow of water from high level to low level (at constant temperature and pressure)?
(a) $\Delta G = 0$ (b) $\Delta G = 1$
(c) $\Delta G < 0$ (d) $\Delta G = \infty$

255. Two bodies A and B are of same mass and same amount of heat is given to both of them.
If the temperature of A increases more than that of B because of heat addition, then
(a) the specific heat capacity of A is more than that of B
(b) The specific heat capacity of A is less than that of B
(c) Both A and B have the same specific heat capacity but A has greater thermal conductivity
(d) Both A and B the same specific heat capacity but B has greater thermal conductivity.

256. A real gas can be liquefied by the application of pressure when its temperature is
(a) Above the room temperature
(b) Above the inversion temperature
(c) At the Boyle temperature
(d) At the critical temperature

257. Night are cooler in the deserts than in the plains because-
(a) sand radiates heat more quickly than the earth
(b) the sky remains clear most of the time
(c) sand absorbs heat more quickly than the earth
(d) of none of the above reasons

258. The unit of temperature adopted by the SI is the Celsius and kelvin scales. It is based on the
(a) melting point of ice
(b) boiling point of water
(c) triple point of water corresponding to - $-0.01℃$
(d) temperature at which solid, liquid and gaseous water are all in equilibrium, i.e., $-273℃$

259. Clear night is colder than cloudy nights because of
(a) conduction (b) condensation
(c) radiation (d) insolation

260. A gas thermometer is more sensitive than a liquid thermometer because a gas
(a) is lighter than liquid
(b) expands more than a liquid
(c) is easy of obtain
(d) does not change state easily

261. The speed of light with the rise in the temperature of the medium
(a) supply heat
(b) do not radiate heat
(c) prevent air from contacting the body
(d) prevent the heat of the body from escaping

262. Clothes keep us warm in winter because they
(a) increases
(c) Remains unaltered
(b) Drops suddenly
(d) decreases

263. The best conductor of heat among the following is-
(a) Alcohol (b) Mercury
(c) Ether (d) Water

264. Metal tea pots have wooden handles because
(a) wood is a bad conductor of heat
(b) it prevents electric shock
(c) its gives beauty to the pots
(d) it is hygienic

265. White clothes are cooler than black ones because they
(a) absorb all the light that reaches them
(b) reflect all the light that reaches them
(c) will not allow the light to penetrate
(d) cool the sun light completely

266. Water is used in hot water bags because
(a) it is easily obtained
(b) it is cheaper and is not harmful
(c) it has high specific heat
(d) it is easy to heat water

267. An instrument used to measure humidity is-
(a) anemometer (b) hygrometer
(c) thermometer (d) pyrheliometer

268. The sun heats the earth through-
(a) Convention (b) Radiation
(c) Conduction (d) Fission

269. At upper atmosphere, an astronaut feels
(a) extremely hot (b) slightly hotter
(c) extremely cool (d) slightly cooler

270. A barometer is used to measure which one of the following?
(a) current
(b) atmospheric pressure
(c) humidity
(d) altitude

271. The wavelength of the radiation emitted by a body depends upon
(a) the nature of the surface
(b) the area of the surface
(c) the temperature of the surface
(d) all of the above factors

272. Name the law in Physics which states that equal volume of all gases under the same conditions of temperature and pressure contain equal number of molecules-
(a) Ohm's Law
(b) Boyle's Law
(c) Avogadro's Law
(d) Charle's Law

273. The energy that can harness heat stored below the earth's surface is known as:
(a) thermal energy
(b) nuclear energy
(c) tidal energy
(d) geo-thermal energy

274. The temperature of boiling water in a steam engine may be high because:
(a) there are dissolved substances in water
(b) there is low pressure inside the boiler
(c) there is high pressure inside the boiler
(d) the fire is at very high temperature

275. A reversible and an irreversible engine are working between the same limits of temperature. The efficiency of
(a) the reversible engine is greater than the irreversible engine
(b) each engine is 100%
(c) the two engine are equal
(d) the irreversible engine is greater than the engine reversible

276. The first law of thermodynamics is simply the case of:
(a) Charle's law
(b) the law of conservation of energy
(c) the law of heat exchange
(d) Newton's law of cooling

277. Perspiration cools the body because
(a) Presence of water on the skin is cooling
(b) evaporation requires latent heat
(c) water has a high specific heat
(d) water is poor conductor of heat

278. The two specific heats of gases are related by.
(a) Cp – Cv = R/J (b) Cp + Cv = RJ
(c) Cp – Cv = RJ (d) Cp / Cv = R

279. Burns caused by steam are much more severe than those caused by boiling water because
(a) Steam has latent heat
(b) Steam is gas and engulfs the body quickly
(c) Steam pierces through the pores of body quickly
(d) Temperature of steam is higher

280. Ice is packed in saw dust because
(a) saw dust does not stick to the ice
(b) saw dust will not get melted easily
(c) saw dust is poor conductor of heat
(d) saw dust is a good conductor of heat

281. The lowest temperature is recorded by
(a) Mercurial thermometer
(b) Minimum reading thermometer
(c) Alcohol thermometer
(d) Maximum reading thermometer

282. A closed vessel containing some gas at atmospheric pressure and room temperature is placed in a fast-moving train. The temperature of the gas will
(a) Decrease
(b) Remain unchanged
(c) Increase or decrease depending on the chemical composition of the gas
(d) Increase

283. If the pressure in a closed vessel is reduced by drawing out some gas, the mean free path of the gas molecules will
(a) Increase
(b) Increase or decrease depending on the nature of the gas
(c) Remain unchanged
(d) Decrease

284. The temperature at which a solid melts to become a liquid at the atmospheric pressure is called its melting point. The melting point of a solid is an indication of

(a) Strength of the intermolecular force of attraction
(b) Strength of the intermolecular force of repulsion
(c) Molecular mass
(d) Molecular size

285. Which one of the following statements with regard to expansion of materials due to heating is not correct?
(a) As ice melts, it expands uniformly up to 4°C.
(b) Mercury thermometer works using the principle of expansion due to heating.
(c) Small gap is kept between two rails to allow for expansion due to heating.
(d) The length of metallic wire increases when its temperature is increased.

286. A glass vessel is filled with water to the rim and a lid is fixed to it tightly. Then it is left inside a freezer for hours. What is expected to happen?
(a) The water freezes to ice and the level of ice comes down
(b) The water in the glass vessel simply freezes to ice
(c) The glass vessel breaks due to expansion as water freezes to ice
(d) The water does not freeze at all

287. Which one of the following thermometers is known as pyrometer?
(a) Thermo-electric thermometers
(b) Radiation thermometers
(c) Gas thermometers
(d) Liquid thermometers

288. What is latent heat of vaporization?
(a) Heat energy required to convert ice into water completely without changing the temperature
(b) Heat absorbed when a substance changes phase from gas to liquid
(c) Heat energy required to convert water into steam completely without changing the temperature
(d) Heat released when a substance changes phase from solid to liquid

289. After a hot sunny day, people sprinkle water on the roof- top because:
(a) Water helps air around the roof-top to absorb the heat instantly
(b) Water has lower specific heat capacity
(c) Water is easily available
(d) Water has large latent heat of Vaporization

290. Two systems are said to be in thermal equilibrium if and only if:
(a) There can be a heat flow between them even if they are at different temperatures
(b) There cannot be a heat flow between them even if they are at different temperatures
(c) There is no heat flow between them
(d) Their temperatures are slightly different

291. A piece of ice, 100 g in mass is kept at 0°C. The amount of heat it requires to 0°C is (take latent heat of melting of ice to be 333.6j / g) :
(a) 750.6 J (b) 83.4 J
(c) 33360 J (d) 3.336

292. A Barometer kept in an elevator reads 760 mm when the elevator is at rest. When the elevator moves in the upward direction with increasing speed, the reading of the Barometer will be:
(a) 760 mm (b) <760 mm
(c) > 760mm (d) Zero

293. The pressure exerted by a 760 mm column of mercury at 0°C is known as
(a) 1 pascal (b) 1 atmosphere
(c) 1 bar (d) 1 poise

294. The temperature of water at the bottom of a waterfall is higher than that at the top because
(a) water at the bottom has greater potential energy
(b) falling water absorbs heat from the surroundings
(c) kinetic energy of falling water is converted into heat
(d) the surface at the bottom provides heat

295. Which of the following is the example of ideal black body?
(a) kajal (b) black board
(c) a pin hole box (d) none of these

296. 300 g of water at 25°C is added to 100 g of ice at 0°C. The final temperature of the mixture in
(a) 0°C (b) 1°C
(c) 2°C (d) 3°C

297. A solid sphere of radius R and a hollow sphere of inner radius R/2 and outer radius R, made of copper, are heated to the same temperature and are allowed to cool in the same environment. Then
(a) hollow sphere cools faster
(b) both the spheres attain room temperature at the same time
(c) solid sphere cools faster
(d) none of these.

ANSWER KEYS

1	**C**	11	**D**	21	**B**	31	**B**	41	**A**
2	**C**	12	**B**	22	**C**	32	**A**	42	**B**
3	**B**	13	**C**	23	**B**	33	**C**	43	**B**
4	**A**	14	**C**	24	**D**	34	**A**	44	**C**
5	**C**	15	**A**	25	**C**	35	**C**	45	**B**
6	**A**	16	**A**	26	**B**	36	**A**	46	**D**
7	**D**	17	**A**	27	**C**	37	**B**	47	**A**
8	**C**	18	**B**	28	**B**	38	**B**	48	**D**
9	**D**	19	**A**	29	**C**	39	**B**	49	**B**
10	**A**	20	**B**	30	**A**	40	**B**	50	**C**

51	**A**	61	**D**	71	**A**	81	**B**
52	**D**	62	**B**	72	**B**	82	**A**
53	**D**	63	**A**	73	**C**	83	**C**
54	**A**	64	**B**	74	**A**	84	**C**
55	**C**	65	**A**	75	**D**	85	**C**
56	**A**	66	**C**	76	**C**	86	**C**
57	**B**	67	**B**	77	**D**	87	**A**
58	**B**	68	**C**	78	**A**		
59	**C**	69	**A**	79	**C**		
60	**C**	70	**C**	80	**C**		

88	**B**	98	**B**	108	**B**	118	**B**	128	**C**
89	**D**	99	**A**	109	**A**	119	**C**	129	**C**
90	**A**	100	**A**	110	**A**	120	**D**	130	**A**
91	**D**	101	**A**	111	**B**	121	**B**	131	**C**
92	**A**	102	**B**	112	**B**	122	**A**	132	**B**
93	**B**	103	**D**	113	**A**	123	**A**	133	**C**
94	**B**	104	**C**	114	**C**	124	**B**	134	**D**
95	**A**	105	**A**	115	**A**	125	**A**	135	**A**
96	**A**	106	**B**	116	**A**	126	**C**	136	**C**
97	**B**	107	**B**	117	**A**	127	**C**	137	**A**

138	**D**	148	**A**	158	**B**	168	**D**	178	**C**
139	**B**	149	**C**	159	**B**	169	**A**	179	**C**
140	**A**	150	**A**	160	**D**	170	**A**	180	**A**
141	**A**	151	**D**	161	**B**	171	**C**	181	**A**
142	**B**	152	**C**	162	**C**	172	**A**	182	**B**
143	**B**	153	**C**	163	**B**	173	**C**	183	**A**
144	**B**	154	**D**	164	**B**	174	**C**	184	**A**
145	**C**	155	**D**	165	**D**	175	**A**	185	**A**
146	**B**	156	**C**	166	**A**	176	**C**	186	**A**
147	**B**	157	**D**	167	**B**	177	**B**	187	**C**

188	C	198	B	208	D	218	C	228	C
189	B	199	B	209	A	219	C	229	D
190	A	200	A	210	C	220	D	230	D
191	B	201	D	211	B	221	B	231	C
192	D	202	C	212	C	222	C	232	C
193	A	203	B	213	B	223	C	233	B
194	A	204	C	214	D	224	B	234	D
195	C	205	C	215	B	225	A	235	D
196	B	206	A	216	C	226	C	236	D
197	C	207	C	217	C	227	A	237	D

238	B	248	B	258	C	268	B	278	C
239	D	249	D	259	C	269	C	279	A
240	A	250	C	260	B	270	B	280	C
241	D	251	D	261	C	271	C	281	C
242	B	252	D	262	D	272	C	282	C
243	C	253	B	263	B	273	D	283	A
244	D	254	C	264	A	274	C	284	A
245	B	255	B	265	B	275	A	285	A
246	B	256	D	266	C	276	B	286	C
247	B	257	A	267	B	277	B	287	B

288	C
289	D
290	C
291	C
292	B
293	C
294	C
295	C
296	A
297	A

SOLUTIONS

1. Ans. (c)
Convection is a mode of heat transfer by actual motion of matter. It is possible only in fluids and gases. Convection can be natural and forced.

2. Ans. (c)
Thermos flasks have a vacuum gap between the inner chamber and the outer wall, so there is no loss or gain of heat by conduction, convection and radiation. Thus, a liquid remains hot or cold for a long time in thermos flask.

3. Ans. (b)
Steam at 100ºC causes more severe burns than the water at the same temperature because steam provides more heat. The boiling point of water is 100 degree Celsius. At this temperature, the water will begin to change from the liquid state to the gaseous state. For this change to take place, additional energy is required. In fact, every gram of liquid water requires 540 calories of heat energy to convert it to steam. This is called the latent heat of vaporization or latent heat of steam. So, while they both would exist at the same temperature, the steam would have a lot more heat energy due to the addition of 540 calories per gram of heat energy that has been absorbed. This is why steam burns are worse than water burns.

4. Ans. (a)
See the explanation of above question.

5. Ans. (c)
Latent heat of Melting = 80 calorie/gram
The heat required for ice at 0°C to convert in water = 80 calorie
Required heat to enhance the temperature of water from 0°C to 100°C = 100 calorie
Latent heat of vaporization = 540 calorie/gram
Hence the energy required to convert water into vapour at 100°C = 540 calorie.
Total heat required = 80 + 100 + 540
= 720 calories.

6. Ans. (a)
-40° is the temperature, at which the readings are same in both degree Centigrade and in Fahrenheit scale. Relation between degree Centigrade & degree Fahrenheit is

$$\frac{C}{5} = \frac{F - 32}{9}$$

Placing F = -40 to verify

$$C = \frac{(-40-32)\times 5}{9} = \frac{-72\times 5}{9} = -40$$

7. Ans. (d)
See the explanation of above question.

8. Ans. (c)
See the explanation of above question.

9. Ans. (d)
According to formula
C/5 = (F–32) / 9 [placing F = 2C]
$\Longrightarrow$ 9C = 10C – 160
$\Longrightarrow$ C = 160
Hence at the temperature of 160ºC, the Fahrenheit temperature is double.

10. Ans. (a)
The normal core body temperature of a healthy, resting adult human being is stated to be at 98.6 degrees Fahrenheit or about 37.0 degrees Celsius. Though the body temperature measured on an individual can vary, a healthy body can maintain a fairly consistent body temperature that is around the mark of 37.0 degree Celsius. If we convert 37

degrees Celsius to Kelvin, it equals to 310 Kelvin.

11. Ans. (d)
See the explanation of the above question.

12. Ans. (b)
The formula to convert Fahrenheit (°F) to Celsius (°C) is

$$^{o}C = \frac{(^{o}F-32)\times 5}{9}$$

since the temperature in °F = 98.4°

$$\therefore {}^{o}C = \frac{(98.4-32)\times 5}{9} = 36.89^{o}C$$

13. Ans. (c)
See the explanation of the above question.

14. Ans. (c)
The Kelvin scale has no negative values. The Kelvin scale is the best representation of average kinetic molecular energy. When a substance has a temperature of 0K (–273.15°C) it is at 'absolute zero' and has no kinetic energy at all because its particles stop moving.

15. Ans. (a)
The formula to convert Fahrenheit (°F) to Celsius (°C) is

$$C = \frac{(F-32)\times 5}{9}$$

Since the temperature in °F = 200°F

$$\therefore \quad C = \frac{(200-32)\times 5}{9}$$

$$= \frac{168\times 5}{9} = \frac{840}{9} = 93.3$$

So, the value of 200°F is 93.3°C in Celsius scale.

16. Ans. (a)
The relationship between Centigrade (C) and Fahrenheit (F) is –

$$F = \frac{9}{5}C + 32$$

∵ Average temperature in Centigrade is $\bar{C}$ and Fahrenheit is $\bar{F}$

∴ Relationship between $\bar{C}$ and $\bar{F}$

$$\bar{F} = \frac{9}{5}\bar{C} + 32$$

17. Ans. (a)

$$F = \frac{9}{5}C + 32$$

where, C = Centigrade Temperature
F = Fahrenheit Temperature

$$F = \frac{9}{5}\times 40 + 32 \Rightarrow F = 72 + 32 \Rightarrow F = 104$$

So, the value of 40° C is 104°F at Fahrenheit scale.

18. Ans. (b)

$$F = \frac{9}{5}C + 32$$

$$\Rightarrow F = \frac{9}{5}\times 50 + 32$$

⇒ F = 90+32 ⇒ F = 122
So, the value of 50°C is 122°F at Fahrenheit scale.

19. Ans. (a)
There are lots of reasons for using alcohol than mercury as thermometric liquids. Some alcohol has a very low freezing point of about - 112°C and therefore is suitable to record very low temperature. Thus, in cold countries, alcohol is preferred to mercury as a thermometric liquid.

20. Ans. (b)
Ethylene glycol is an organic molecule most widely used as antifreeze in automobile engines and as an industrial solvent. When it is mixed with water, the freezing point of the mixture is depressed, specifically a mixture of 60% ethylene glycol and 40% water freezes at –45°C. That is why water is not frozen in the engine of cold countries.

21. Ans. (b)
Absolute zero is the lowest possible temperature at which point the atoms of a substance transmit no thermal energy. They are completely at rest. It is 0 on the Kelvin scale, which translates to -273.15 degree Celsius.

22. Ans. (c)
Density is defined as the ratio between mass and volume or mass per unit volume (Density = mass / volume). As the temperature increases, most materials expand or increase their volume. This results in a decrease in density.

23. Ans. (b)
Elements such as cast iron, ice, antimony, bismuth, and brass when melts, their volume decreases. These types of solids floats in their own melted fluid.

24. Ans. (d)
In above diagram, P denotes a straight line, while point Q denotes a curved line. It is clear that Q attained the temperature of 100°C quicker than P.

25. Ans. (c)
Thermostat is a device that automatically regulates temperature. It helps to save energy/power.

26. Ans. (b)
See the explanation of above question.

27. Ans. (c)

Thermostat is a device which automatically regulates temperature or provides a signal used by another device to regulate temperature.

28. Ans. (b)
See the explanation of above question.

29. Ans. (c)
See the explanation of above question.

30. Ans. (a)
Refrigerator temperatures do not destroy pathogenic or spoilage microorganisms. The lower temperature slows the growth of microorganisms already in the food. Some bacteria grow most rapidly in the range of temperature between 40° and 140ºF, the "Danger Zone". Thus, it is necessary to make sure that the refrigerator is maintaining the recommended temperature of 35 to 40-degree F or below. According to international standards, the recommended temperature of the refrigerator is 36ºF to 38ºF (1.7ºC to 3.3ºC). Thus option **(A)** is correct.

31. Ans. (b)
Most of the modern frost-free refrigerators use dehumidification process in which the moisture or water vapour or the humidity is removed from the air by keeping its dry bulb (DB) temperature constant. As water vapour or moisture condenses, it drips down into a drain, which removes water to the bottom of the refrigerator. This is the main reason for soggy biscuits turns into crisp in the refrigerator.

32. Ans. (a)
Heat transmits from hot body to cold body. Ice takes latent heat from the drink to melt and makes drink cooler.

33. Ans. (c)
Assertion (A) is correct but reason (R) is false because ammonia can be liquefied at ambient temperature at high pressure, not low pressure.

34. Ans. (a)
Ice collects in the freezer is the result of vapour and moisture which is expelled by the food and ice tray. It adversely affects the cooling of the refrigerator, as ice is a poor conductor.

35. Ans. (c)
When a glass rod is placed in steam, its length and width both will increase.

36. Ans. (a)
Most solids expand when heated and contract when cooled. The rate at which solids expand when heated depends on the substance. Metals tend to have higher rates of expansion than non-metal solids. When a metal ring is heated, there is an increase in outer diameter along with inner diameter. Thus, the ball can pass easily through it.

37. Ans. (b)
When two strips of different metals, say one of brass and the other of iron are welded or riveted together, the greater expansion of one metal results in the bending shown in option (b). Such a compound thin bar is called a bimetallic strip. When the strip is heated one side of the double strip bent into a curve.

38. Ans. (b)
Copper is a very good conductor of heat. So it allows the maximum amount of heat to pass through it from one point to other. But glass is a poor conductor of heat and hence it allows a very little amount of heat to pass through it. The density of copper is 8920-8960 kg/m^3 and the density of glass is equal to 2400-2800 kg/m^3. Thus, the density of copper is more than that of glass, but it is not the correct reason of the given assertion. Hence the correct answer is option (b).

39. Ans. (b)
In winter, if we touch a log of wood and a rod of iron, we feel that rod of iron is cold. It is because of the fact that in comparison to wood, iron is a good conductor of heat. When both the metal and the wood are at the same temperature, heat will flow from iron. Similarly, when we touch wood, a poor conductor, heat does not flow from it. Hence iron rod will feel colder as compared to wood.

40. Ans. (b)
There is a direct relation between the atmospheric humidity and temperature. The ability of air to assume water vapour depends on its temperature. Thus, if temperature of air is increased then automatically its ability to hold water vapour will also be increased.

41. Ans. (a)
Dew is not formed in the night of strong wind as due to strong wind the rate of evaporation is fast. Thus, the particles of the dew tend to evaporate.

42. Ans. (b)
Air conditioner and Air-cooler both maintains temperature and the motion of air. But the Air conditioner also having the ability to maintain humidity, while air cooler doesn't have the ability to maintain humidity. Thus, it is clear that option (b) is not true.

43. Ans. (b)

See the explanation of above question.

44. Ans. (c)

The cooling by a desert cooler is based on evaporative cooling. These coolers are also known as swamp coolers.

45. Ans. (b)

Most of the air conditioners use compressed gas, which can cool the room or other places.

46. Ans. (d)

The wet clothes will dry earliest at minimum humidity & maximum temperature. Thus, according to options given in the question, option (d) will dry the wet clothes earliest.

47. Ans. (a)

If salt is added to water, then the boiling point of water will increase. This happens as the boiling point is the temperature at which the vapor pressure of solvent becomes equal to the external atmospheric pressure. Similarly, it also decreases the freezing point, which in turn will interfere with the frozen solution's crystal structure. That means the temperature will have to be colder to overcome it and freeze the mixture.

48. Ans. (d)

See the explanation of above question.

49. Ans. (b)

At high altitudes the atmospheric pressure is low. So, water will boil at a lower temperature because the boiling point of water is lower at high altitude. It takes longer to cook at higher altitudes than at sea level. Adding a little salt to the water will cause the water to boil at a slightly higher temperature, which can be helpful while cooking especially at high altitudes. Lower pressure at higher altitudes causes the temperature to be colder.

50. Ans. (c)

The glass or steel which is used in thermos bottle is coated with a silver layer to keep drinks at the same temperature for some time.

51. Ans. (a)

We use white clothes in summer because white clothes are good reflectors of heat. Thus, we do not feel warm. In winter, gray or dull coloured clothes are used because gray or dull coloured clothes are good absorbers of heat.

52. Ans. (d)

See the explanation of above question.

53. Ans. (d)

See the explanation of above question.

54. Ans. (a)

White and light-coloured clothes are poor absorbers of heat, that is why such clothes are preferred in summer. So, both the options (A) and (R) are correct, and (R) correctly explains (A).

55. Ans. (c)

Loss of water from the body through perspiration depends on both atmospheric temperature and atmospheric humidity. Perspiration or sweating allows the body to regulate its temperature. The rate of sweating depends on many factors and is increased in proportion to the work rate and the environmental temperature and humidity.

56. Ans. (a)

Perspiration is often related to heat. When there is a rise in temperature of the surroundings, the body heats up and that can be dangerous. The temperature of the body has to be stable or else the cells will start to burst. The problem will occur with the running of the organs and even heat strokes can arise which can lead to death. It is the process of perspiration that cools the body down. The sweat released onto the body cools it down and when the watery substance evaporates from the skin, it takes the heat with it giving a cooling effect.

57. Ans. (b)

In summer, a ceiling fan in the counterclockwise direction can help to cool your home by pushing cool air down. During the hot summer months, though this wind chill effect can work to your advantage by providing a breeze that can help evaporate the skin's moisture quickly, creating a cool feeling.

58. Ans. (b)

The water remains cold in an earthen pitcher because of evaporation. When liquid changes to a gaseous (or vapour) state without boiling, it is known as evaporation. The earthen pitcher is made of mud and has many minute pores. It is through these pores that the water, placed inside the pitcher, oozes out. Now to evaporate, the water needs to absorb heat, which will change it to vapour. The only way the water oozing out of the pitchers can turn to vapour is by absorbing heat from the liquid within the pot. Due to this process of continuous absorption of heat from water inside the pot, in a few hours, this water becomes cool.

59. Ans. (c)

The rate of heat loss of an object is called cooling rate Rate of heat loss $(\Delta Q) \propto$ Temperature difference (ΔT)

∵ 95° - 48° = 47° and 71° - 24° = 47°
Because of the temperature difference (ΔT) is similar in both. Thus, both cups reach the room temperature at the same time.

60. Ans. (c)
Newton's law of cooling states that the rate of loss of heat by a body is directly proportional to the temperature difference between the body and its surroundings.
As the temperature difference between the body and its surroundings will be lesser in the second case, so the time taken in cooling from 75°C to 60°C will be more than 25 seconds.

61. Ans. (d)
In the season of summer, when the weather is humid, we experience humid heat.

62. Ans. (b)
Xeric condition refers to low humidity. Xeric condition is characterized by an inadequate supply of water. These conditions exist in arid habitats, extremely cold habitats, and in salt marshes.

63. Ans. (a)
The atmosphere exerts enormous pressure on us but we do not feel it, because our blood exerts pressure slightly more than that of the atmosphere. We feel this pressure in water because the pressure under water is greater than our normal blood pressure.

64. Ans. (b)
Water potential is the potential energy of water per unit volume relative to pure water in reference conditions. It quantifies the tendency of water to move from one area to another due to osmosis, gravity, mechanical pressure or matrix effects such as capillary action (which is caused by surface tension). The addition of solutes in water, lowers its water potential by which it becomes negatively charged. Adding solutes makes the water molecules less concentrated and this reduces the chemical potential of water in the system.

65. Ans. (a)
At higher altitudes of a mountain, the atmospheric pressure decreases due to lack of air. Therefore, the boiling water pressure decreases and water boils below 100°C due to lowering of boiling point. The boiling point of a liquid varies depending upon the surrounding environmental pressure. A liquid in a partial vacuum has a lower boiling point than that of liquid at atmospheric pressure. A liquid at high pressure has a higher boiling point than when that liquid is at atmospheric pressure.

66. Ans. (c)
The atmospheric pressure decreases as one climb higher in the atmosphere and increases closer to the earth's surface. The boiling point of water decreases as the altitude increases. Thus, (A) is true but (R) is false.

67. Ans. (b)
Food can be cooked faster in a pressure cooker since the boiling point of water increases with increase in pressure. As the water boils, the steam produced cannot evaporate so the pressure inside the cooker increases. The boiling point of water now becomes about 120°C. The load pin fixed on the heavy aluminium lid prevents any escape of steam. The rubber ring around the lid deals the liquid inside. Thus, food gets cooked faster in a pressure cooker. Pressure cookers are more common in the mountains where elevation is high. At higher elevations, atmospheric pressure is lower and therefore water boils at lower temperature. In order to make up for that difference, people use pressure cookers.

68. Ans. (c)
See the explanation of above question.

69. Ans. (a)
See the explanation of above question.

70. Ans. (c)
See the explanation of above question.

71. Ans. (a)
See the explanation of above question.

72. Ans. (b)
Handle of pressure cookers is made up of Ebonite because it is an insulator and prevents heat from reaching the handle and prevents burning of hands. Ebonite is a strong material. So assertion (A) and reason (R) both are correct but R is not the correct explanation of A.

73. Ans. (c)
In a pressure cooker the food is cooked with the boiling of water. Boiling point is increased inside a pressure cooker by increasing the pressure. This pressure can be adjusted by changing the weight placed on the top of the cooker lid. The pressure (and cooking temperature) also depends upon area of the hole in the lid. The principle of pressure cooking is to maintain a temperature of about 120°C inside the cooker as opposed to a temperature of 100°C attained in open vessels. The weight is designed in such a way that it will kick when the pressure inside just

exceeds about one atmospheric gauge thereby releasing the excess pressure. This is the pressure at which the boiling point is about 120°C. Once the requisite pressure and temperature is attained, more heat input (by increasing the temperature of the flame) results in more steam generated which is released through the lid and hence the cooking temperature remains the same, which is about 120°C. Thus, temperature at which the food is cooked does not depend upon temperature of the flame.

74. Ans. (a)
See the explanation of above question.

75. Ans. (d)
An increase in temperature (heating) increases the volume of most liquids slightly and consequently decreases the liquid density. But the behaviour of water from 0°C to 4°C is just opposite. When water is heated from 0°C to 4°C, then there is a decrease in volume and increase in density but when we cross the limit of 4°C then again it behaves like other ordinary liquids. Which means its volume increases and density decreases. Thus, when water is heated from 0°C to 10°C, it's volume first decreases and then increases.

76. Ans. (c)
If the temperature of water is lowered from 9°C to 4°C, then density is maximum at 4°C. Density is inversely proportional to volume, therefore till 4oC density increases which result in decrease in volume and later (4°C to 3°C) during the process of ice forming, reduction in density would cause an increase in volume.

77. Ans. (d)
Steam at 100°C contains 540 calories more than the boiling water at the same temperature due to the latent heat of vaporization. The latent heat of fusion of ice is 80cal/gm. Thus statement (1) and statement (2) are incorrect, while statement (3) is correct. In an air-conditioner, heat is extracted from the room air at the evaporator coil and is ejected out at the condenser coil.

78. Ans. (a)
A glass bottle containing water breaks when kept in a freezer because the frozen water will have more volume than the liquid water. So increased volume will put pressure on the walls of the bottle and it will break.

79. Ans (c)
See the explanation of above question.

80. Ans. (c)
We know that the mass of liquid displaced by the floating ice equals to the mass of the object. That's why the ice caps float on water. Similarly, when an ice cube melts in a glass of water, the water level does not change as the melted water will occupy exactly the same amount of space as the ice under the water level previously occupied.

81. Ans. (b)
When you have cloudy night, the clouds prevent heat from escaping through the atmosphere and into space. The clouds act like a blanket and trap the heat. That is why every time when there is a cloudy night, it is always warmer than a clear night.

82. Ans. (a)
The cloudy nights are warmer than clear nights because the clouds prevent radiation of heat from the ground and the air and they reflect back the heat.

83. Ans. (c)
It is well known that even after harvesting of the fruits the process of respiration continues and brings about ripening, change in colour, softening of flesh, increase in sugar content and development of flavour. These changes occur more rapidly at higher temperature. This means that the lower the temperature of storage the longer would be the storage life of the fruit. In cold chambers the rate of respiration of fruits is decreased.

84. Ans. (c)
Woollen clothes keep us warm in winter. It is just because woollen clothes have fibres and between those fibres, air is trapped which reduces heat loss. Air reduces heat loss because it is an insulator or poor conductor of heat. Thus, statement is correct but reason (R) is false.

85. Ans. (c)
Humidity is the percentage of water vapour present in air. As the humidity increases, the percentage of water vapour in air increase and this decreases the density of air. This results in the increase of velocity of sound. So, increase in the humidity of air increases the velocity of sound in air. Thus, statement (c) is not correct.

86. Ans. (c)
If the door of a refrigerator kept open in a room, the temperature will start to rise inside the refrigerator. The thermostat will kick in and try to cool it back down. This means the motor is running, which means heat is being added to the room resulting warmer room.

87. Ans. (a)

According to the law of gases

From formula $\frac{V_1}{V_2} = \frac{T_1}{T_2}$

$V_1 = \frac{V}{2}$ and $V_2 = V$ [given]

$T_1 = 273 + 27 = 300K$

$T_2 = ?$

$\frac{V/2}{V} = \frac{300}{T_2} \Longrightarrow T_2 = 600K$

$\therefore T_2 = 600 - 273 = 327^0C$

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