APPENDIX A

A PROGRAMMED TEXT

on

T H E R M O M E T E R S

*

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B A R O D A 2

ENTERING BEHAVIOUR TEST

Name_____Sex_____

School_____

(A) (1) Write whether the following are solids, liquids or gasses:

(a) Cotton .....

(b) Stone .....

(c) Milk .....

(d) Air .....

(e) Water .....

(f) Hydrogen .....

(g) Mercury .....

(B) Fill in the blanks using the correct answers given in the brackets:

(2) Keeping a water beaker on the fire is an example of _____(heating/cooling)

(3) Ram lost 10 Rupees. This can be written as _____(+10/-10).

(4) When milk is heated, its level_____ (increases/decreases).

(5) Is glass a transparent material? _____(Yes/No)

(6) Length of a cloth can be measured accurately by _____(instrument/hand).

(7) The unit of measuring length is _____ (gram/centimeter).

(8) When a substance is heated, it _____ (expands/contracts).

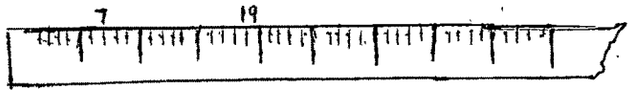
(9) The doctor knows the exact body temperature of a patient by _____(touching his body/using a clinical thermometer).

(10) When a substance is heated, its temperature _____ (rises/falls).

(11) Ordinarily, thermometers are made up of _____ (glass/wood/metal).

(12) On heating, water becomes_____(colder/hotter).

(13) Observe the figure carefully:



The lines drawn between 7 and 19 are called_____ (divisions/numbers).

(C) Complete the following:

(14) What is the instrument used to measure the temperature of water? Ans:_____

(15) Which is at a higher temperature, ice water or boiling water? Ans:_____

(16) Observe the following numbers: ;
32, 81, 15, 7, 69, 53, 48

(i) What is the maximum number in the above series? Ans:_____

(ii) What is the minimum number in the above series? Ans:_____

(17) What is the meaning of the letter C? Ans:_____

(18) What is the liquid used in common thermometers?
Ans:_____

LINEAR COVERT FORM

About This Programme . . .

On reading this programme, you will know many interesting things about thermometers. Thermometers are the instruments used to measure the heat levels. You have to know something about thermometers because we will be using them in hospitals, laboratories, houses and so on.

How to Read this Book

1 This book contains small sentences called frames. Read each frame carefully.

2 In some frames, there will be blank space(s). You have to fill in the blank with suitable word.

3 In some frames, there will be a blank followed by two alternatives in the brackets. You have to select the suitable answer.

4 Just you think about the answer in your mind.

5 The correct answers are given in the same frame on the left hand side of the margin. Keep the answer covered with a folded paper.

6 After thinking and deciding the answer, move the paper and check whether you are right.

7 If your answer is correct, then go to the next frame.

8 If your answer is not correct, do not worry. Read the frame and try it again.

COVER the correct answers

READ the frame

UNDERSTAND it

THINK about the answer in your mind

CHECK your answer

PROCEED FURTHER

1

A beaker filled with water is kept on fire.

a) Does the water get heated? ____ (Yes/No)

b) Its heat level _____ (rises/falls).

a) Yes

b) rises

2

A pot of milk is kept in ice.

a) It gets _____(heated/cooled).

b) Its heat level _____ (rises/falls)

a) cooled

b) falls

3

On heating, the heat level of water rises. On cooling, the heat level of milk falls.

Can the heat level be changed by heating or cooling? _____ (Yes/No)

Yes

4

Ice water and boiling water differ in their heat levels, Thus, ice water and boiling water differ in their temperatures.

Does the temperature indicate the heat level of a substance? _____ (Yes/No)

Yes

5

a) Temperature indicates the heat _____ of a substance.

b) When the heat level is high, we say that the temperature is _____ (high/low).

c) When the heat level is low, we say that the _____ is low.

a) level

b) high

c) temperature

6

The heat level of a substance is scientifically known as the temperature of that substance. A substance at low temperature is said to be cold.

a) A substance at high temperature is said to be _____ (cold/hot).

a) hot

7 a) If the temperature is_____(high/low) we say that it is hot.

a) high

b) If the_____is low, we say that it is cold.

b) temperature

---

8 What are the common words used to indicate the following?

a) cold

a) Low temperature: _____

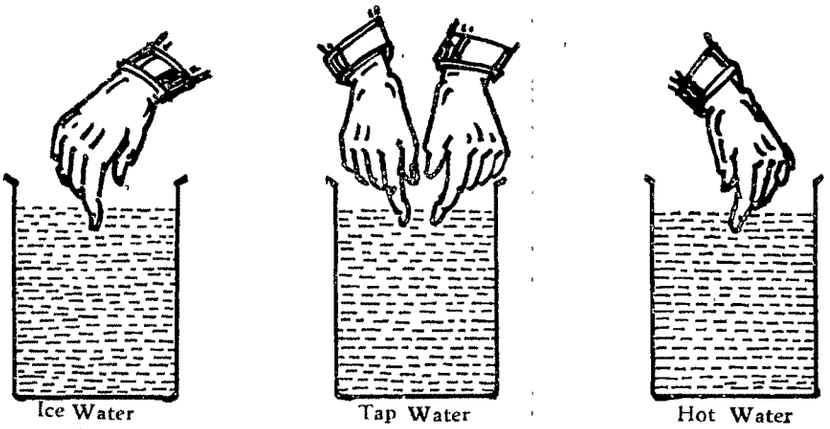
b) hot

b) High temperature: _____

---

9 The following is one way of FEELING whether a substance is cold or hot.

Observe the figure carefully and answer the following:



a) Ram dipped his right hand finger in the beaker A. It was felt_____(hot/cold).

a) cold

b) Ram dipped his left hand finger in the beaker C. It was felt_____(hot/cold).

b) hot

---

10 Then he dipped both the fingers in the beaker B. To the right hand, the water in B was felt hot and to the left hand it was felt cold.

Can the exact temperature of water be known by touching it? _____(Yes/No)

No

---

11 Ram's experience regarding the temperature of water in B . . . . . .

(Tickmark _/ the correct answer)

i) remained the same ( )

(ii) ii) differed from hand to hand ( )

---

12 By touching the tap water, Ram _____ could/could not) know its exact temperature.

could not

---

13 Heat level or temperature of a substance can be measured scientifically using a thermometer.

The instrument used to measure the _____ of a substance is called thermometer.

temperature

---

14 To measure the temperature of a substance we use an instrument called _____.

thermometer

---

15 Can Ram know the accurate temperature of a substance using a thermometer? ____ (Yes/No)

Yes

---

16 a) When a substance is heated, its temperature _____ (rises/falls).

a) rises

b) When a substance is cooled, its temperature _____.

b) falls

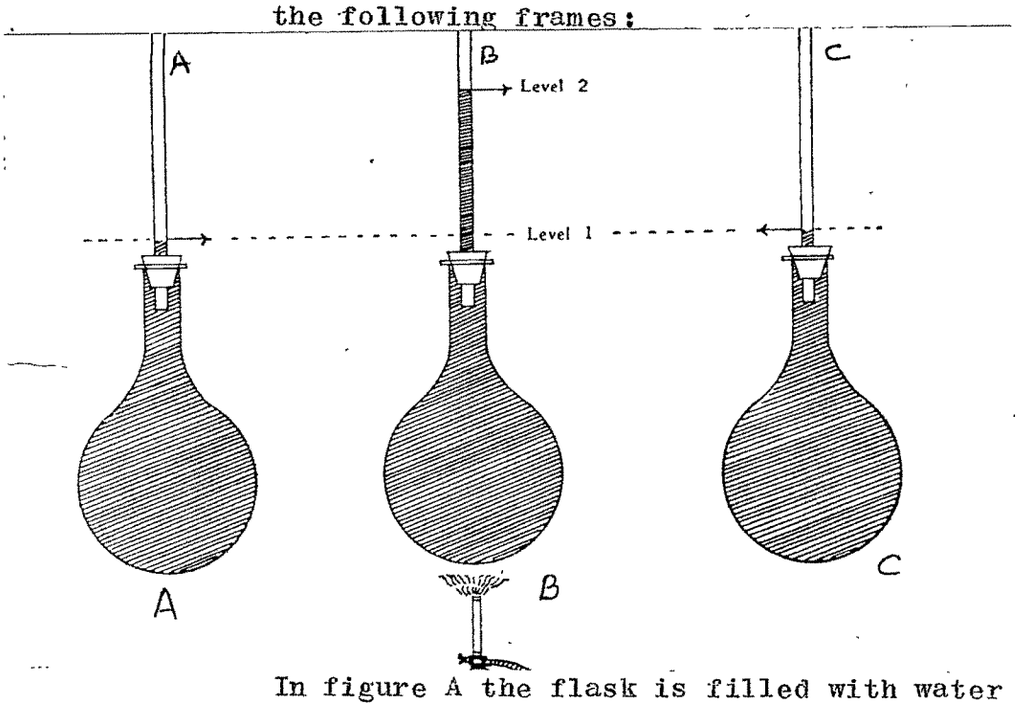
---

17 On heating or cooling a substance, its _____ changes.

temperature

---

18 Observe the figure carefully and answer the following frames:



In figure A the flask is filled with water upto Level 1.

a) The flask is heated with a burner as shown in the figure B.

a) rises Due to heating, the level of water _____ (rises/falls) from Level 1 to Level 2.

---

19 Burner is removed and the flask is cooled. On cooling, the level _____ (rises/falls)

falls as shownin figure C.

---

20 Rise in the level of water in figure B is due to _____,
(Tickmark _/ the correct answer):

a) cooling ( )
b) adding some more water ( )

(c) _/ c) heating ( )

---

falls

21 The level of milk rises when it is heated. But on cooling, its level _____ (rises/falls).

---

more

22 When any liquid (milk or water) is heated, its level rises and it occupies _____ (more/less) space.

---

heating

23 Occupying more space on _____ (heating/cooling) is called expansion.

---

less

24 When water is cooled, its level falls and it occupies _____ space.

---

contraction

25 Occupying less space on cooling is called _____ (expansion/contraction).

(iii) _/

26 Expansion means _____

(Tickmark _/ the correct answer):

i) occupying more space on cooling ( )
ii) occupying less space on cooling ( )
iii) occupying more space on heating ( )
iv) occupying less space on heating ( )

---

contracts

27 When the temperature of a substance falls, it _____ (contracts/expands).

---

i) _/
iii) _/
iv) _/
vii) _/

28 Below are given some words related to expansion and contraction. Tickmark (_/) only those related to contraction.

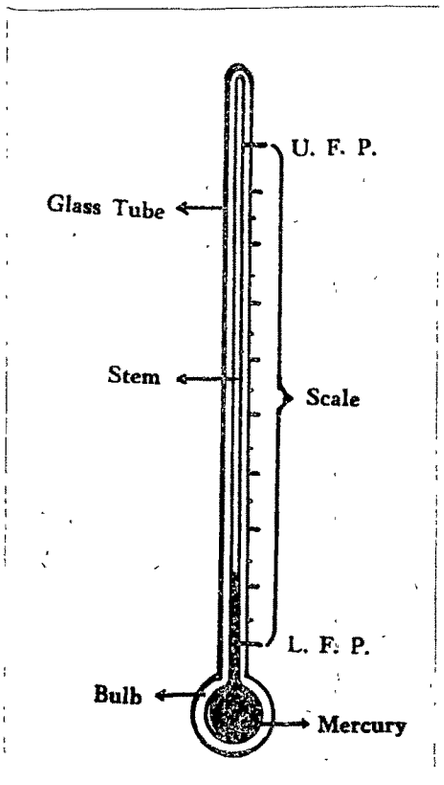
i) Cooling ( )
ii) Rise in the level ( )
iii) Fall in the temperature ( )
iv) Occupying less space ( )
v) Rise in the temperature ( )
vi) Occupying more space ( )
vii) Fall in the level ( )
viii) Heating ( )

29 Thermometer is constructed on the principle that liquids expand with _____(rise/fall) in temperature and contract with fall in _____.

rise
temperature

---

30 Below is given the figure of a thermometer. Study the figure carefully and recognize its parts.



(a) The lower end of the thermometer which is filled with mercury is called the _____.

(b) Thermometer has a scale to measure the _____ of a substance.

(c) The scale is marked on the stem. In the figure above, some divisions are marked on the stem of the thermometer. These divisions make a _____ which helps to measure temperature.

(a) bulb
(b) temperature
(c) scale

---

31 (a) The thermometer is filled with _____.

(b) Mercury is filled in the _____.
(Tickmark ✓ the correct answer):
(i) entire stem ( )
(ii) part of the stem ( )

(c) U.F.P. is at the _____(lower/upper) end of the temperature scale.

(a) mercury
(b) (ii) ✓
(c) upper

32 The upper fixed point of the scale is marked as U.F.P.

The lower fixedpoint of the scale is marked as_____.

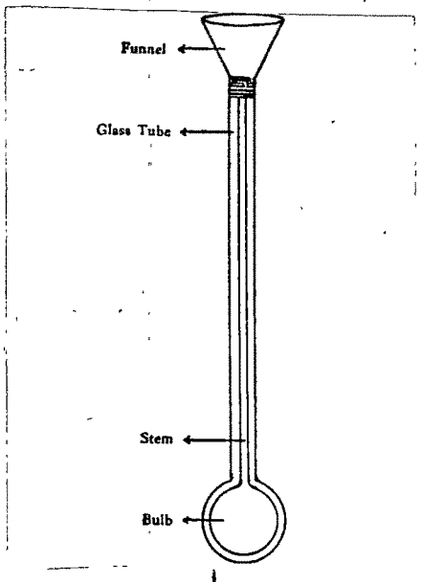
L.F.P.

---

33 Thermometer is constructed on the principle of expansion and contraction of liquids.

Let us see the material used in the construction of the common thermometer.

Study the figure carefully and answer the following frames:



A tube with narrow and uniformbore which is made up of _____(glass/metal) is taken.

glass

---

34 a) The lower end of the glass tube is blown into a _____.

b) The funnel is at the _____(lower/upper) end of the tube.

a) bulb
b) upper

---

35 The upper end is used to pour the _____ into the glass tube.

mercury

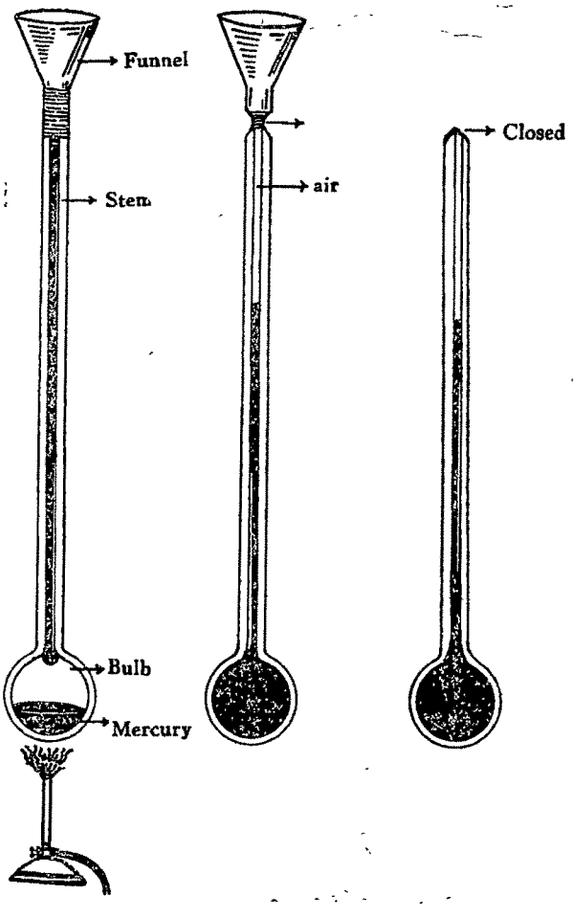
---

36 The upper end is in the shape of a _____ through which mercury can be poured.

funnel

---

37 The following frames describe the process of filling the bulb and the stem with mercury and sealing its upper end.



a) The mercury is poured through the _____ (bulb/funnel).

b) After pouring some mercury, the bulb is _____ (heated/cooled) with the burner.

a) funnel

b) heated

---

38 The glass tube contains air inside.it. On heating, the mercury expands and drives the _____ out.

air.

---

39 Burner is removed and the glass tube is allowed to cool down. The mercury in the glass tube becomes _____ (hot/cold).

cold

---

40 Heating and cooling are repeated till the entire bulb and a part of the stem are filled with _____ .

mercury

---

41 The mercury is heated in order to drive all the _____ out

air

---

42 After driving all the air out, the upper end is _____ (closed/kept open).

closed

---

43 Mercury is strongly heated in order to _____.

Tickmark _/ the correct answer):

i) seal the thermometer ( )
ii) drive the air out ( )
iii) make the mercury expand ( )

(ii) _/

---

44 The air above the mercury level is driverm out. Thus a vacuum is created. This vacuum is _____(above/below) the mercury level.

above

---

45 After sealing the upper end, there is _____ (air/vacuum) above the mercury level.

vacuum

---

46 After sealing the upper and there is no air (=vacuum) above the level of _____

mercury

---

47 There is _____ (air/vacuum) above the mercury level.

vacuum

---

48 The mercury expands when there is a _____ (rise/fall) in temperature.

rise

---

49 The thermometer would burst if there is no space for the _____ (mercury/ air) to expand.

mercury

---

50 The thermometer would burst at higher temperatures if there is no _____ (air/mercury/vacuum)

vacuum

---

51 Vacuum allows the mercury to _____ (expand/contract)

expand

---

52 The level of a shining liquid can be seen closely through the glass. So shining liquids are highly suitable to be used in the thermometers.

Mercury is used in the thermometers because it is a _____ liquid.

shining

---

53 Liquids which wet the glass do not show exact readings. Mercury shows the exact readings because it _____ (wets/does not wet) the glass.

does not wet

---

54 The liquid used in the thermometers should be a good conductor of heat (i.e. it should take up heat readily).

Mercury is used in the thermometers because it is a good _____ of heat.

conductor

---

55 Bad conductors do not take up heat readily. Can we find out small changes in temperature using a bad conductor of heat (i.e. one which does not take up heat readily)? _____ (Yes/No)

No.

56 Of the following, tickmark ✓ those statements which describe why mercury is used in the thermometers:

a) Mercury cannot be seen through the glass. ( )
b) Mercury is sensitive to even small changes in temperature. ( )
c) Mercury does not wet the glass. ( )
d) Mercury expands or contracts very slowly. ( )
e) Mercury can be seen through the glass. ( )
f) Mercury is a shining solid. ( )
g) Mercury is a shining liquid. ( )
h) Mercury sticks to the glass. ( )

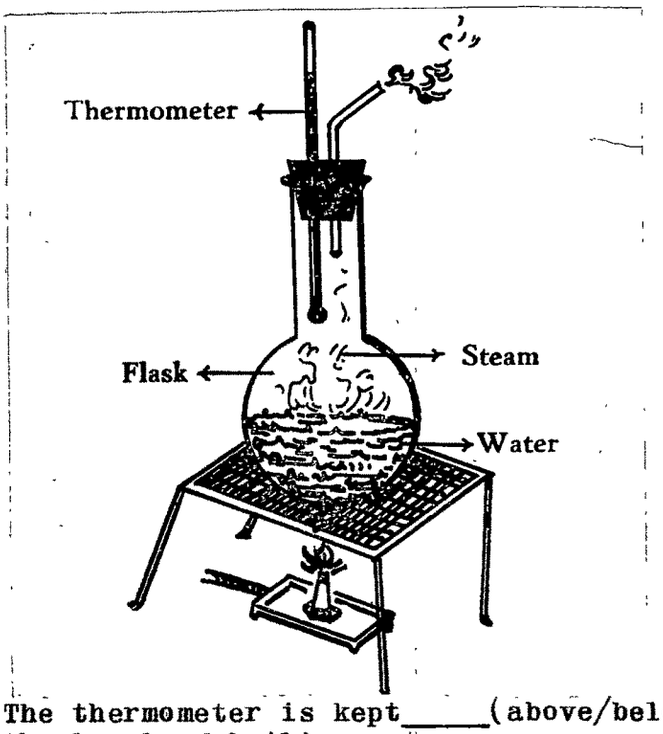
(b) ✓
(c) ✓
(e) ✓
(g) ✓

---

57 On the stem of the thermometer are marked the two important points of the temperature scale, namely, the U.F.P. and the L.F.P.

In the following frames the procedure of marking the U.F.P. is described.

Observe the figure carefully and answer the following:



a) The thermometer is kept_____(above/below) the level of boiling water.

a) above

b) Due to the high temperature of boiling water, the mercury level in the thermometer _____(rises/falls).

b) rises

58 a) After reaching a point (at the boiling point of water), the level of _____ in the thermometer does not rise further.

a) mercury

b) upper

b) This is marked as the _____(upper/lower) fixed point.

---

59 The temperature at which water boils and turns into steam is called the boiling point of _____(water/mercury).

water

---

60 The mercury remains steady at the _____ point of water

boiling

---

61 Upper fixed point (U.F.P.) of the temperature scale is marked at that point where the mercury level is _____ (steady/rising).

steady

---

62 The boiling point of water at which the mercury level is steady is marked as the _____ _____ _____ or _____ of the scale

Upper fixed point, U.F.P

---

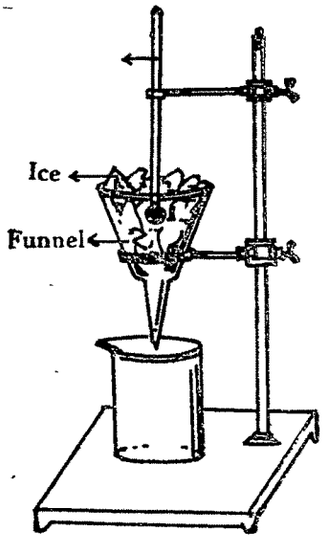
63 Does the U.F.P. indicatethe boiling point of water? _____ (Yes/No)

Yes

---

64 We have seen that the U.F.P is marked at the boiling point of water. In the following frames the process of marking the lower fixed point (L.F.P) of the temperature scale is described.

Observe the figure carefully and answer the following frames:



a) Bulb of the thermometer is put in a funnel filled with melting _____.

a) ice

---

65 Due to the low temperature of melting ice, the level of the mercury _____ (falls/rises).

falls

---

66 a) After reaching a point (at the melting point of ice) the level of _____ does not fall further.

a) mercury

b) This is marked as the _____ (upper/lower) fixed point.

b) lower

---

67 The temperature at which ice melts is called the melting point of _____ (ice/water/mercury

ice

---

68 Mercury remains steady at the _____ point of ice.

melting

---

69 Lower Fixed Point (L.F.P.) is marked at the point where mercury level is _____ (steady/falling).

steady

---

70 The mercury level remains steady at the melting point of ice. This is marked as the _____ _____ _____ or _____ of the scale.

Lower Fixed Point, L.F.P.

---

71 U.F.P. indicates the _____
(Tickmark _/ the correct answer):
i) melting point of ice ( )
ii) boiling point of water ( )

(ii) _/

---

72 The fixed point marked at the melting point of ice is the _____
Tickmark _/ the correct answer):
i) L.F.P. ( )
ii) U.F.P. ( )

(i) _/

---

73 There are many divisions between the L.F.P' and U.F.P. These divisions are marked with numbers. The process of marking the divisions and numbers between the U.F.P. and _____ is called graduating the thermometer.

L.F.P.

---

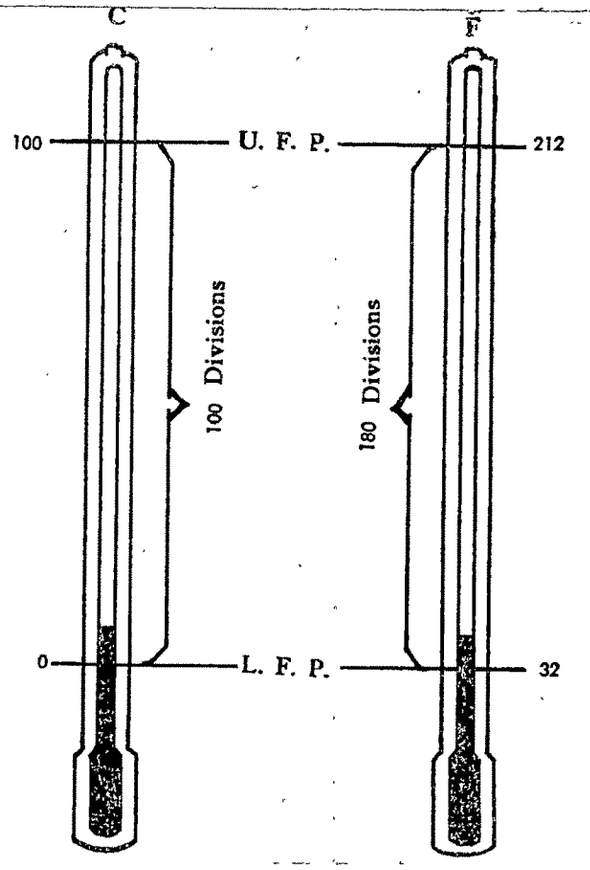
74 Marking the divisions and numbers of the temperature scale is called _____ the thermometer.

graduating

---

divisions numbers	75	Graduating the thermometer is the process of marking the _____ and _____ of the temperature scale (any order).
upper lower	76	The divisions and numbers are made after marking the _____ and _____ fixed points (any order).
temperature scale	77	By marking the divisions and numbers, we get the _____ (U.F.P. and L.F.P./ temperature scale).
No	78	After graduating (marking the divisions and numbers) we get either the centigrade (C) scale or Fahrenheit (F) scale of temperature. C and F scales differ in 3 ways. i) the value of L.F.P. ii) The value of U.F.P. iii) the number of divisions between U.F.P. and L.F.P. Do C and F scales contain the same numbers marked at U.F.P. or L.F.P.? _____ (Yes/No).

79 Now we shall study the differences between the C and F scales.



U.F.P.

a) 100 a) U.F.P. marked on the C scale is ___°C.

b) 212 b) U.F.P. marked on the F scale is ___°F

---

80 L.F.P.

a) 0°C a) L.F.P. marked on the C scale is ____.

b) 32°F b) L.F.P. marked on the F scale is ____.

---

81 Number of divisions between the U.F.P. and L.F.P.

a) 100 a) How many divisions are there in C Scale?____

b) 180 b) How many divisions are there in F scale?____

c) ~~f~~ c) 32°F is the U.F.P. of ___(C/F) scale.

---

82 32°F is marked at the_____(U.F.P./L.F.P.)

L.F.P. of the F scale.

---

83 Using a Fahrenheit scale, can we measure temperature very much higher than 100°C?

No. ____(Yes/No)

---

84 What the following abbreviations and symbols stand for?

i) Lower Fixed Point
ii) Degree
iii) Degree Centigrade
iv) Upper Fixed Point
v) Fahrenheit
vi) Centigrade

i) L.F.P. : _____
ii) ° : _____
iii) °C : _____
iv) U.F.P. : _____
v) F : _____
vi) C : _____

---

85 Compare the Centigrade and Fahrenheit scales.

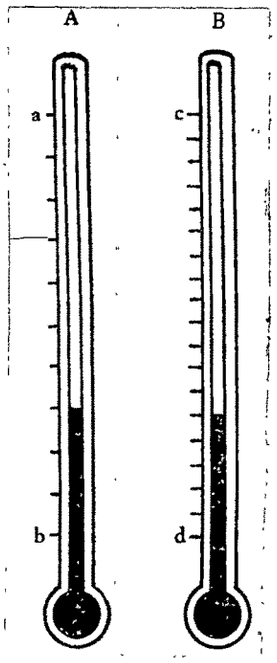
	Centigrade	Fahrenheit
a) 100°C, 212°F	a) U.F.P. is _____	_____
b) 0°C, 32°F	b) L.F.P. is _____	_____
c) 100, 180	c) No. of divisions are _____	_____

---

86 Observe the figure carefully.

The parts of the two thermometers with their U.F.P. and L.F.P. are shown. You have to write the values of those points in the blanks given below:

Figure A shows the scale that contains 100 divisions.



Fill in the blanks:

A.(1) Centigrade

B.(1) 100°C
(2) 0°C
(3) 212°F
(4) 32°F

A. 1) The figure 'A' shows the _____ (Centigrade/Fahrenheit)

B. 1) Value at 'a' is _____ (100°C/212°F)

2) Value at 'b' is _____ (0°C/32°F)

3) Value at 'c' is _____.

4) Value at 'd' is _____.

---

87 Temperatures are written as 23°C, 71°F, 48°C, 5.6°F etc.

Two decimal eight degrees Fahrenheit is written as _____ (2.8°F/2.8°C)

2.8°F

---

88 Twentytwo degrees Centigrade is written as _____ (22°C/22°F)

22°C

---

89 61°C is the temperature which is 61 degrees above the zero degree of _____ (Fahrenheit/Centigrade).

Centigrade

---

90 If the temperature is expressed in Fahrenheit scale, the symbol _____ (C/F) is to be used.

F

---

91 Temperature below the 0°C are expressed with a minus sign.
-61°C is a temperature which is _____ (above/below) the 0°C.

below

---

92 -47°C is a temperature which is 47 degrees _____ (above/below) the 0°F.

below

---

93 17 degrees below the 0°C is written as _____ (17°C/-17°C).

-17°C

---

94 -38°F is a temperature, 38 degrees below the _____ (0°C/0°F)

0°F

---

95 -23°F is a temperature which is _____
(Tickmark _/_ the correct answer):

(1) above the 0°F ( )
(2) below the 0°F ( )
(3) below the 0°C ( )

(2) _/_

96

a) To find the temperature of hot water, the bulb of the thermometer is immersed in hot _____

b) Due to the high temperature of hot water, there is a _____ (rise/fall) in the mercury level.

c) The main scale divisions to which the level of _____ rises is noted.

d) The number marked on that particular division where mercury level remains steady gives the _____ OF THE hot water.

a) water
b) rise
c) mercury
d) temperature

97

The temperature of water at 50°C is more than the temperature of water at _____(60°C/40°C)

40°C

98

The bulb of a thermometer is first kept in water at 50°C. Then it is kept in water at 45°C. The level of mercury at 50°C is comparatively _____ (higher/lower) than that at 45°C.

higher

99

When the mercury level is higher, we can say that the temperature is comparatively _____(high/low)

high

100

Below are given the steps followed in using a thermometer. But it is not given in the proper order. Write the correct order (or) the steps in the brackets:

..... Final recording of temperature e.g. 51°C ( )

..... Mercury level of thermometer changes. ( )

..... Bulb of the thermometer is put in the liquid. ( )

..... Main scale division near the Mercury level is noted. ( )

(4)
(2)
(1)
(3)

101 Common thermometers are used to measure the temperature of a substance. To measure the atmospheric temperature of a day, that is, the maximum and minimum temperatures of a day, or the body temperature of a patient, we need some special thermometers.

The minimum temperature of a day can be measured using a _____(common/special) thermometer.

special

---

102 Thermometers which record the atmospheric temperatures of a day are:

i) Maximum thermometer

ii) Minimum thermometer

iii) Six's combined thermometer.

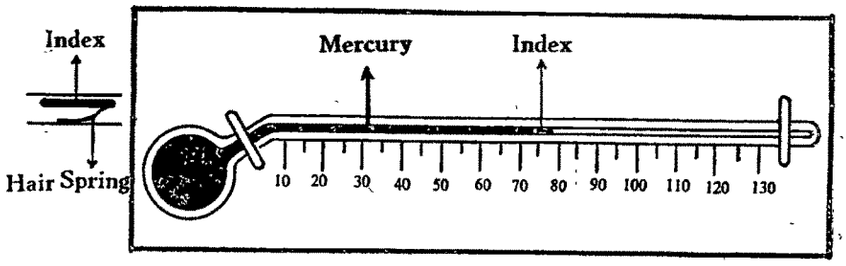
Thermometer to measure our body temperature.

(1) Clinical or Doctor's thermometer. Maximum thermometer records the _____(maximum/minimum) temperature of the day.

maximum

---

103 Maximum thermometer records the maximum temperature of the day. Observe the figure of the maximum thermometer carefully and recognize the parts before you proceed further.



a) The bulb and a part of the stem of the maximum thermometer are filled with _____.
b) The steel index is above the level of _____.
c) Look at the enlarged figure of steel index. It consists of a special part called hair_____.
d) Hair spring is a part of steel _____.
e) The scale is marked from ___°F to ____°F.

a) mercury
b) mercury
c) spring
d) index
e) 10,130

104 The steel index is shown separately in its enlarged form. It consists of two important parts namely _____ and _____ (any order).

index
hairspring

---

105 a) The scale is marked from ___°F to ____°F.
b) The highest value of the scale (130°F) shown in the figure is _____ (near/away from) the bulb.

a) 10,130
b) away from

---

106 Above the level of mercury is a steel _____

index

---

107 When the temperature of the day rises, the mercury _____ (expands/contracts) and moves upwards.

expands

---

108 The index is _____ (above/below) the level of mercury.

above

---

109 So the rising mercury pushes the index _____(upwards/downwards).

upwards

---

110 The upward movement continues till the _____ (maximum/minimum) temperature is reached.

maximum

---

111 When the maximum temperature is reached, the mercury stops moving.

The steel index _____ (stops moving/moves further).

Stops moving.

---

112 When the temperature falls, the mercury _____ (expands/contracts).

contracts

---

113 The contracting mercury moves _____(up/down).

down

---

114 When the temperature falls, the steel index does not move with mercury because it is prevented by the hair _____.

spring

---

115 When the temperature rises, mercury expands and pushes the index _____ (upwards/downwards) till the maximum temperature is reached.

upwards

---

116 When the temperature falls, mercury contracts and moves _____ (up/down).

down

---

117 The steel index does not move because the hair spring prevents it from moving _____ (upwards/downwards).

downwards.

---

118 The downward movement of the steel index is prevented by the _____.

hairspring

---

119 The mercury level falls with fall in temperature. So the maximum temperature cannot be indicated by the level of _____.

mercury

---

120 When the mercury falls, the steel index _____.

(Tickmark _/ the correct answer)

i) moves upwards ( )
ii) moves downwards ( )
iii) does not move ( )

iii) ✓

---

121 Maximum temperature of the day is recorded by the steady position of the _____ (mercury/index.)

index

---

122 When the temperature falls, the level of _____ changes.

mercury

123 **The index remains in the steady position** showing the maximum temperature of the day because it is provided with _____ .

hair spring

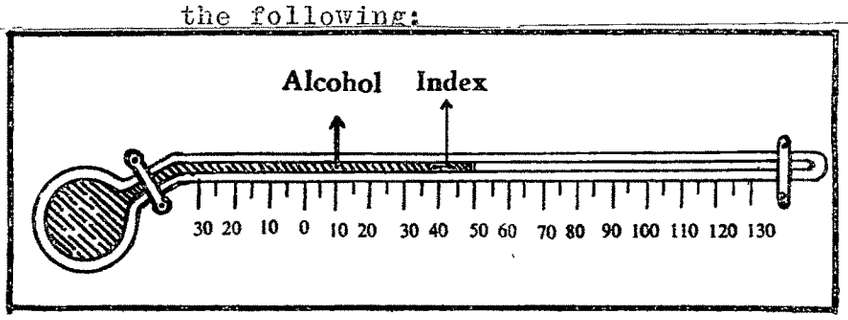
---

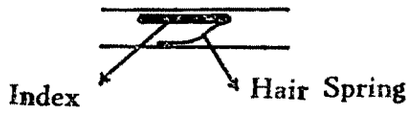
124 The maximum temperature of the day is recorded by the lower end of the _____.

index

---

125 The minimum thermometer records the minimum temperature of the day.
Below is given a diagram of the minimum thermometer.
Observe the figure carefully and answer the following:





The bulb and a part of the stem are filled with _____.

alcohol

---

126 The steel index is _____ (above/below) the alcohol.

below

---

127 As the temperature of the day falls, the level of alcohol _____ (rises/falls).

falls

---

128 The scale extends below the 0°F on the _____ (lower/upper) side of the scale.

lower

129 So, can be minimum thermometer record temperatures below the 0°F? ____ (Yes/No)

Yes

---

130 The index is provided with a _____

hair spring

---

131 The steel index of the minimum thermometer is placed inside the _____(alcohol/mercury).

alcohol

---

132 The steel index can move downwards only. Can the index move upwards? _____ (Yes/No)

No

---

133 When the temperature rises, alcohol _____ (expands/contracts) and moves upwards in the stem.

expands

---

134 The index _____ (will/will not) move upwards.

will not

---

135 When alcohol expands and moves upwards, the steel index _____ (moves upwards/doesn't move).

doesn't move

---

136 The steel index does not move when the alcohol _____ (expands/contracts)

expands

---

137 When the temperature rises, alcohol expands and moves _____ (upwards/downwards).

upwards

---

138 The index is provided with a special part called the _____.

hair spring

---

139 The hair spring prevents the _____ from moving upwards.

index.

---

140 So when the alcohol expands and moves upwards, the steady position of the index _____ (is/is not) changed.

is not

---

141 When the temperature falls, alcohol contracts and moves _____ (upwards/downwards).

downwards

---

142 When alcohol moves downwards, it drags the steel index _____ (upwards/downwards) along with it.

downwards

---

143 When the minimum temperature is reached, alcohol stops moving downwards.

Steel index _____ (stops moving/ moves downwards).

stops moving

---

144 The upward movement of the steel index of the minimum thermometer is prevented by the _____.

hair spring

---

145 When alcohol expands and moves upwards, the steel index _____.
(Tickmark _/ the correct answer):
i) moves upwards ( )
ii) moves downwards ( )
iii) does not move ( )

(iii)_/

---

146 When alcohol contracts and moves downwards, the index _____.
(Tickmark _/ the correct answer):
i) moves upwards ( )
ii) moves downwards ( )
iii) does not move ( )

(ii) _/

147 The minimum temperature of the day is recorded by the upper end of the _____.

index

---

148 The part that records the minimum temperature of the day is _____.
(Tickmark _/ the correct answer):
i) the level of alcohol ( )
ii) upper end of the index ( )
iii) lower end of the index ( )

(ii) _/

---

149 Before using the maximum or minimum thermometers a second time the position of the steel _____ IS TO BE ADJUSTED using a small magnet (magnet attracts steel).

index

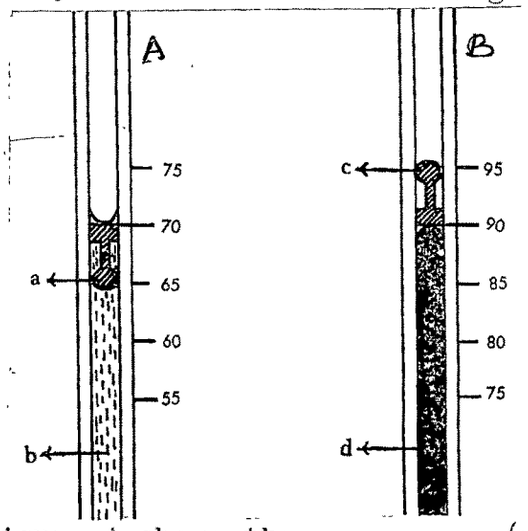
---

150 Using a magnet, the index of the minimum thermometer is to be brought _____ (above/inside) the alcohol.

inside

---

151 In the figure, the position of the indices of maximum thermometer and minimum thermometer are given. Observe the figure carefully and answer the following:



minimum — The figure A shows the _____ (maximum/minimum) thermometer.

---

152 In the maximum thermometer the index is _____ (above/inside) the mercury.

above

---

153 In the minimum thermometer the index is inside the _____ (write the name of the liquid.)

alcohol

---

154 The upper end of the index in the minimum thermometer is at ____ °F.

70

---

155 The lower end of the index in the maximum thermometer is at ___°F.

90

---

156 90°F indicates the _____ (maximum/minimum) temperature of the day.

maximum

---

157 Minimum temperature of the day is ____ °F.

70

---

158 Maximum temperature is recorded by the _____ (upper/lower) end of the index.

lower

159 Tickmark (_/) the TWO special parts of the maximum and minimum thermometers not found in common thermometers:

a) Scale ( )
b) Glass tube ( )
c) Hair spring ( )
d) Bulb ( )
(c) _/ e) Index ( )
(e) _/ f) Mercury ( )

---

160 Below is given a table comparing the maximum and minimum thermometers. Column I gives the points of comparison and alternative answers. Fill in the blanks in columns II and III by selecting the correct words given in brackets in Column I.

I Points of comparison	II Maximum thermometer	III Minimum thermometer
1. Liquid used is (alcohol/mercury)	_____	_____
2. Index is (above/inside) the liquid	_____	_____
3. Index moves (downwards/upwards)	_____	_____
4. Temperature of the day is recorded by this end of the index (lower end/upper end).	_____	_____
5. Index moves when the liquid (falls/rises)	_____	_____

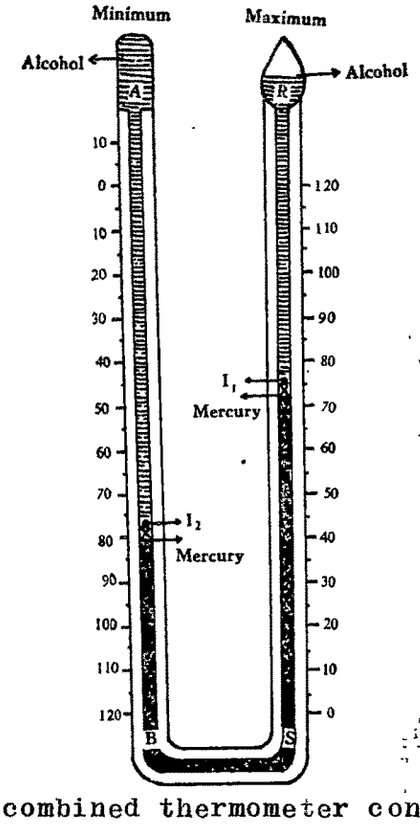
1. mercury, alcohol
2. above, inside
3. upwards, downwards
4. lower end, upper end
5 rises, falls

161 So far we have studied the maximum and minimum thermometers separately. We have a combined thermometer called Six's Combined Thermometer, which records both the maximum and minimum temperature of a _____ (day/substance).

day

---

162 Observe the figure of Six's thermometer carefully and answer the following questions:



a) Six's combined thermometer consists of a ____ shaped glass tube.

a) U

b) Six's thermometer contains the liquids _____ and _____ (any order)

b) alcohol, mercury

c) It has two arms, one for recording the _____ temperature and the other for recording the _____ temperature of the day (any order).

c) maximum, minimum

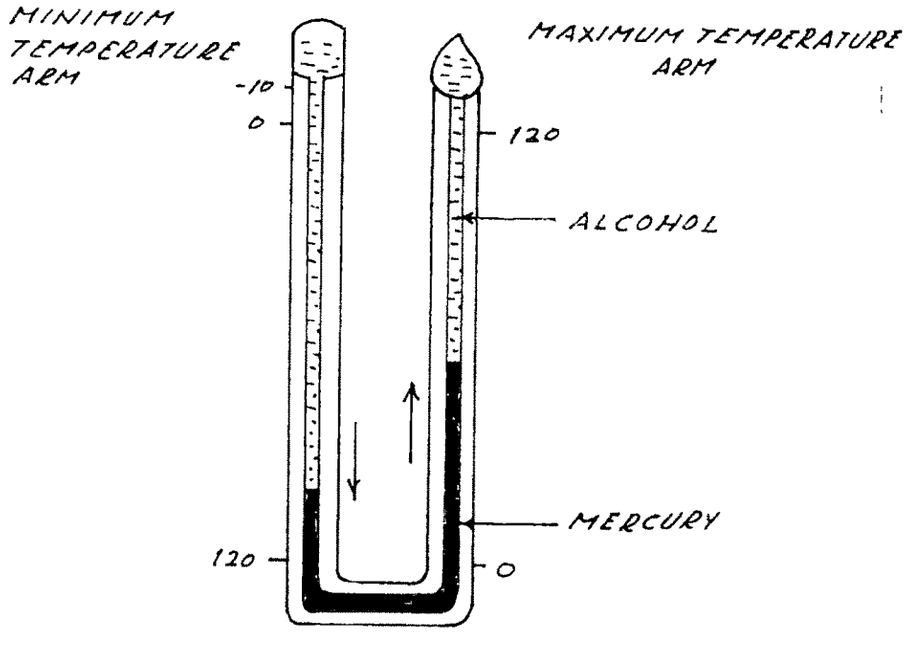
d) There is a vacuum in the arm carrying the _____ (maximum/minimum) temperature scale.

d) maximum

e) The maximum temperature scale starts from the _____(bottom/top) while the minimum temperature scale starts from the _____.

e) bottom, top

163



When the temperature rises, the mercury and alcohol expands (expands/contracts) and mercury moves upwards in the maximum temperature arm.

expand

---

164 Both the maximum and minimum temperature arms of the Six's thermometer are _____ (disconnected/connected).

connected

---

165 The mercury in Six's thermometer ____ (can/cannot) flow from one arm to the other.

can

---

166 When the temperature rises, alcohol and mercury expand and move upwards in the maximum temperature arm. So mercury level _____ (rises/falls) in the maximum temperature arm.

rises

---

167 When the temperature rises, mercury level rises in the _____ (maximum/minimum) temperature arm.

maximum

---

168 When the mercury level rises in one arm, it falls in the other arm. With rise in temperature, mercury level rises in the maximum temperature arm. Mercury level in the minimum temperature arm _____ (rises/falls)

falls

---

169 The index in the maximum temperature arm is above the level of _____.

mercury

---

170 The mercury while expanding pushes the index _____ (upwards/downwards) till the maximum temperature is reached.

upwards

---

171 When the maximum temperature is reached, the mercury does not rise further.

So at the maximum temperature the index _____ _____ (remains steady/moves further).

remains steady

---

172 Steel index does not move from its steady position because it is prevented by the _____ .

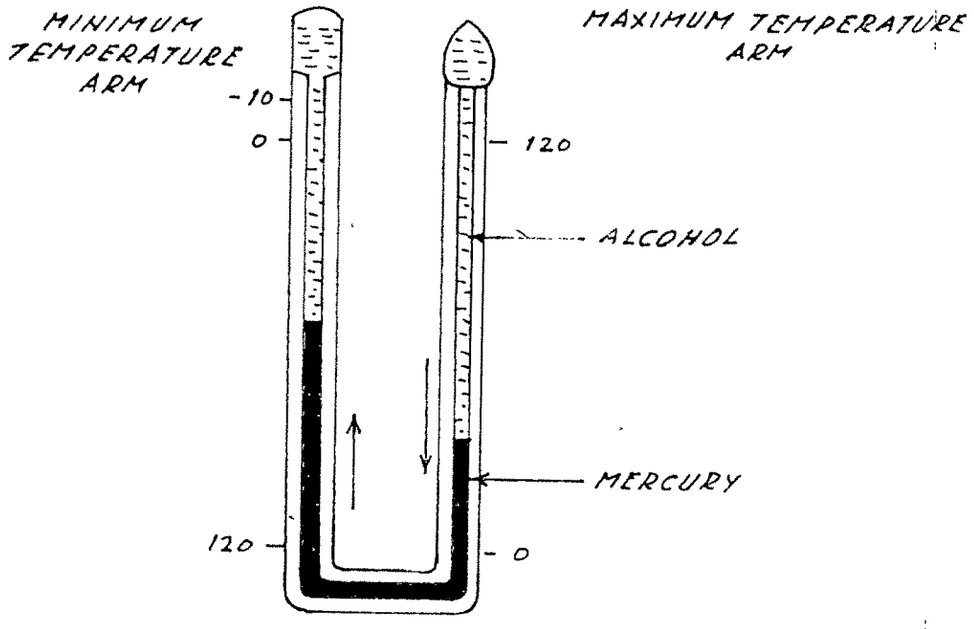
hair spring

---

173 The scale of the maximum temperature arm starts from the bottom. So higher the position of the index, _____ (higher/lower) will be the temperature of the day.

higher

174



When the temperature falls, the level of mercury _____ (rises/falls) in the maximum temperature arm.

falls

---

175 When the temperature _____ (rises/falls), the mercury and alcohol contract.

falls

---

176 When the temperature falls, the level of mercury _____ (rises/falls) in the maximum temperature arm.

falls

---

177 Level of mercury rises in the _____ temperature arm.

minimum

---

178 The mercury in the minimum temperature arm moves upwards and pushes the _____ upwards.

index

---

179 When the temperature falls, the index, in the minimum temperature arm moves _____ (upwards/downwards).

upwards

---

remains steady	180	When the minimum temperature is reached, the index _____ (remains steady / moves further).
index	181	Minimum temperature can be noted even after sometime because the _____ remains steady.
lower	182	The scale in the minimum temperature arm starts from the top. So higher the position of the index, _____ (lower/higher) will be the temperature
mercury	183	In the Six's thermometer both the indices are above the level of _____ .
upwards	184	In Six's thermometer both the indices are pushed _____ (upwards/downwards) by mercury.
expands	185	The index in the maximum temperature arm is pushed upwards when the mercury _____ (expands/contracts).
upwards	186	The index in the minimum temperature arm is pushed _____ (upwards/downwards) when the mercury contracts.
top	187	The temperature scale in the minimum temperature arm starts from the _____ (top/ bottom).

188 Answer the following:

a) Six's thermometer is a _____ shaped thermometer.

b) How many indices are there in the Six's thermometer? _____

c) What are the liquids used in the Six's thermometer? _____, _____ (any order).

d) In Six's thermometer, both the indices are pushed by _____ (alcohol/mercury).

e) In Six's thermometer, the maximum temperature scale starts from the _____ (bottom/top) while the minimum temperature scale starts from the _____ .

f) In Six's thermometer, both the indices move _____ (upwards/downwards).

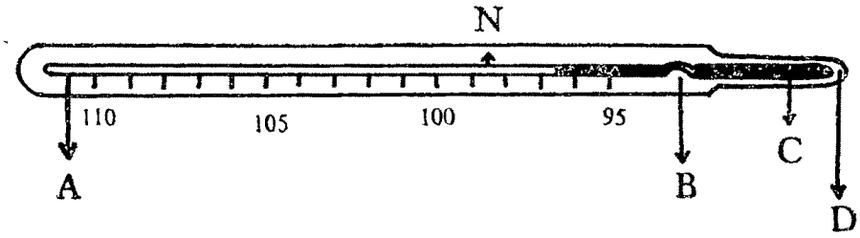
---

a) U
b) 2 or two
c) mercury, alcohol
d) mercury
e) bottom, top
f) upwards

189a Clinical thermometer is used to record the temperature of human body while Six's thermometer records the maximum and minimum temperatures of the day.

In the figure given below the parts of the clinical thermometer are marked by the different letters.

Part A: Shows the stem of the thermometer.
Part B: Shows the bent called constriction.
Part C: Shows mercury used in the thermometer.
Part D: Shows the bulb which is filled with mercury
Part N: The arrow at N (98.4°F) shows the normal body temperature.



Observe the figure and try to recognize the names of the parts. Now go to B part of this page.

189b Given below are the parts of the clinical thermometer. Observe the figure given above carefully and indicate which part is marked by which letter in the figure.

1) D
2) C
3) B
4) N
5) 98.4
6) A

1) Bulb is marked by the letter _____
2) Mercury is marked by the letter _____
3) Constriction is marked by the letter _____
4) Normal body is temperature is marked by the letter _____.
5) The value marked at N is _____°F.
6) The stem is marked by the letter _____.

---

190 In order to measure the body temperature of the patient, the bulb of the _____ thermometer is put under the tongue or in the arm pit of the patient.

clinical

---

191 The mercury expands and moves upwards due to the _____ (rise/fall) in the body temperature of the patient.

rise

---

192 The special bent part above the bulb of the clinical thermometer is called the _____.

constriction

---

193 The constriction allows the mercury to pass through it in the upward direction only. The constriction does not allow the mercury to move in the _____ (downward/upward) direction.

downward

---

194 In most of the thermometers there is a special part at the lower end of the thermometer called the _____.

bulb

---

195 The bulb of the clinical thermometer contains _____ (write the name of the liquid).

mercury

---

196 There is a special bent in the clinical thermometer called the constriction. The constriction is _____ (above/below) the bulb.

above

---

197 Constriction does not allow the _____ to move downwards.

mercury

---

198 So when the clinical thermometer is removed from the body, the mercury does not move downwards because it is prevented by the _____ (constriction/bulb).

constriction

---

199 The body temperature of a patient is indicated by the steady position of the _____.

mercury

---

200 When the patient has fever, the steady level of mercury _____ (above/below) the constriction indicates his body temperature.

above

---

201 After recording the temperature of a patient, the clinical thermometer should be taken in order to bring the mercury _____ (downwards/upwards).

downwards

---

202 If the clinical thermometer is washed with water above 110°F, the _____ in the thermometer expands to that high temperature and forces through the glass and breaks the thermometer.

mercury

---

203 The temperature of boiling water is _____ (212°C/212°F).

212°F

---

204 The stem of the clinical thermometer is graduated upto _____ (110°C/110°F)

110°C

---

205 The maximum temperature to which the mercury in the clinical thermometer can expand in it is _____ (higher/lower) than the boiling point of water.

lower

---

206 So when the clinical thermometer is washed with the boiling water which is at 212°F, the mercury _____ (expands/contracts) too much. This breaks the clinical thermometer.

expands

---

207 Clinical thermometer should be washed with _____ (boiling water/cold water).

cold water

---

208 Complete the following sentences by selecting the correct words from the list given below:

WORDS: magnet, index, bulb, hair spring, arrow, constriction, vacuum

a) The thermometer would burst at higher temperature if there is no _____ above the mercury in the thermometer.

b) The steel index is prevented from moving by the _____.

c) The back flow of mercury is prevented by the _____.

d) The index is reset using a small _____.

e) The temperature of the day is recorded by the _____.

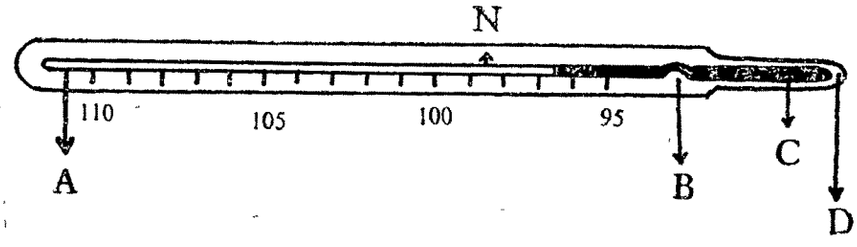
f) To measure the temperature of water, the _____ of the thermometer is immersed in it.

g) Normal body temperature (98.4°F) is shown in the clinical thermometer by the _____.

a) vacuum
b) hair spring
c) constriction
d) magnet
e) index
f) bulb
g) arrow

---

209 Below is given the diagram of clinical thermometer. Some parts of it are marked by A, B, C, D and N. Write the names of the parts in the blanks provided below:



1) Part A is the _____

2) Part B is the _____

3) Part C is the _____

4) Part D is the _____

5) Part Arrow indicates the _____

6) N is at the temperature of _____

1) stem
2) constriction
3) mercury
4) bulb
5) normal body temperature
6) 98.4°F

Some interesting things about thermometers:

* Galileo at the end of 16th century prepared a water thermometer (the first thermometer)
* Amonton discovered that water always boiled at the same temperature at sea level.
* Fahrenheit discovered mercury to be the most suitable thermometric liquid. He constructed a mercury thermometer called Fahrenheit thermometer.
* Celsius constructed the Centigrade thermometer.

Answer the following:

a) The use of mercury was discovered by
. . . . . .

b) The first thermometer was constructed by
. . . . . .

c) Centigrade thermometer was constructed by
. . . . . .

d) Steady boiling point of water was discovered by
. . . . . .

Answers are given on the left side of this page.

NOW THE PROGRAMME IS OVER

Answers

a) Fahrenheit
b) Galileo
c) Celsius
d) Amonton