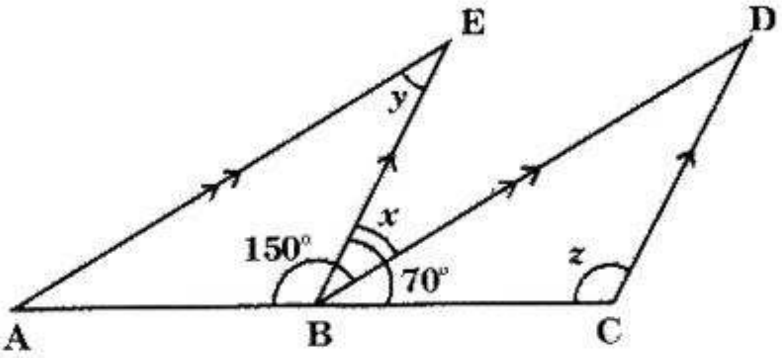
National Level Science Talent Search Examination - 2014

Class : VII — **Mathematics**

1 **Identify the sum of 'x', 'y' and 'z' from the following figure.**



(A) 180° (B) 70° (C) 190° (D) 80°

2 **The table gives the weights (in kg) of 50 boys of class 7.**

Weight (in kg)	48	49	50	51	52
Number of boys	6	8	9	14	13

Find their mean weight.

(A) 52 kg (B) 48 kg (C) 50.4 kg (D) 49 kg

3 **$\frac{1}{2}$ is subtracted from a number and the difference is multiplied by 4. If 25 is added to the product and the sum is divided by 3, the result is equal to 10. Find the number.**

(A) $\frac{3}{5}$ (B) $1\frac{3}{4}$ (C) $\frac{6}{7}$ (D) $\frac{2}{3}$

4 **In a ΔABC, if AB + BC = 10 cm, BC + CA = 12 cm, CA + AB = 16 cm, what is its perimeter?**

(A) 19 cm (B) 17 cm (C) 38 cm (D) 30 cm

5 **Which of the following are the symbols of operations on integers that satisfy commutative property?**

(A) $-, \div$ (B) $-, \times$ (C) $+, -$ (D) $+, \times$

6 **How many primes between 1 and 1000 are divisible by 13?**

(A) 14 (B) 1 (C) 246 (D) 0

7 **A pudding is made of 200 g sugar, 800 g eggs, 600 g flour and 200 g dry fruits. What percent of sugar is present in the pudding?**

(A) $11\frac{1}{9}\%$ (B) $16\frac{2}{3}\%$ (C) $6\frac{1}{4}\%$ (D) $3\frac{1}{2}\%$

8 **The hour hand of a clock is 4.5 cm long. What distance on the clock does its tip cover in 12 hours?**

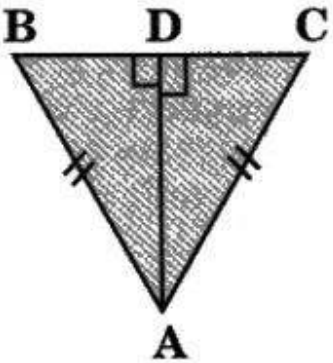
(A) 56.56 cm (B) 33.6 cm

(C) 28.28 cm (D) 20 cm

9 **If $\frac{3p+2}{5} - \frac{4p-3}{7} + \frac{p-1}{35} = 4$, find the value of 'p'.**

(A) 65 (B) 63 (C) 36 (D) 56

10 **ΔABC is isosceles with AB = AC and $AD \perp BC$.**



Which of the following is correct?

(A) $\Delta ADC \cong \Delta ADB$ (B) $\Delta ADB \ncong \Delta ADC$

(C) $\Delta ADB \cong \Delta ABC$ (D) $\Delta ABC \cong \Delta ADC$

11 The product of two rational numbers is $\frac{-8}{9}$. If one of the numbers is $\frac{-4}{15}$, what is the other number?

(A) $3\frac{1}{3}$ (B) $\frac{3}{10}$ (C) $1\frac{1}{9}$ (D) $\frac{9}{10}$

12 The sides of a right angled triangle are 2a cm, (2a + 2) cm and (4a – 2) cm long. What is its area if its perimeter is 24 cm?

(A) 48 cm^2 (B) 24 cm^2

(C) 10 cm^2 (D) 36 cm^2

13 Jai made a 9 m by 3 m rectangular garden and Rohit made a square garden of side 6 m. How much larger (in sq. m.) is the area of Rohit's garden than that of Jai?

(A) 6 (B) 9 (C) 16 (D) 12

14 A man sold 10 eggs for 5 rupees and gained 20%. How many eggs did he buy for 5 rupees?

(A) 12 (B) $\frac{25}{12}$ (C) 25 (D) 20

15 A wire bent in the form of a circle of radius 42 cm is again bent in the form of a square. What is the ratio of the regions enclosed by the circle and the square?

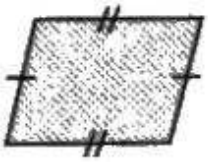
(A) 11 : 12 (B) 22 : 28

(C) 22 : 33 (D) 14 : 11

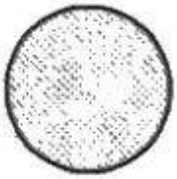
16 The mean of five numbers is 27. If one of the numbers is excluded, the mean gets reduced by 2. What is the excluded number?

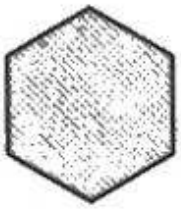
(A) 35 (B) 27 (C) 25 (D) 40

17 **Identify the figure with only 5 lines of symmetry.**

(A) 

(B) 

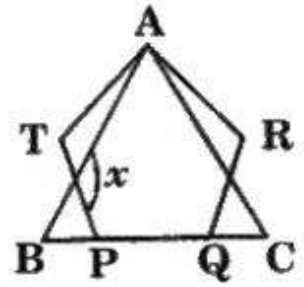
(C) 

(D) 

18 **Given 'a' is 63% and 'c' is $\frac{3}{8}$, which of the following is the closest equivalent of the ratio of 'a' to 'c'?**

(A) 0.595 (B) 1.680 (C) 0.381 (D) 0.006

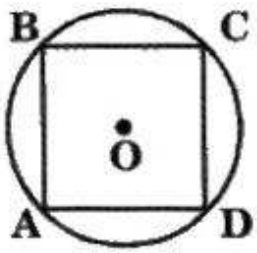
19 **The given figure shows an equilateral triangle ABC and a regular pentagon PQRAT.**



Find the measure of angle 'x'.

(A) 132° (B) 108° (C) 120° (D) 148°

20 **In the given figure, a square of area 50 sq. units is inscribed in a circle with centre O.**



Which of the following is the circumference of the circle?

(A) 100π units (B) 25π units (C) 50π units (D) 10π units

21 **When a number is reduced by 4, it becomes 80% of itself. Find the number.**

(A) 20 (B) 30 (C) 40 (D) 50

22 **144 beads were shared equally among some children. If there were 3 children fewer, each child would have got 16 beads. How many children shared the beads?**

(A) 8 (B) 9 (C) 12 (D) 11

23 **For how many integers 'p' between 30 and 40 is it true that $\frac{5}{p}$, $\frac{8}{p}$ and $\frac{13}{p}$ are all in lowest terms?**

(A) 3 (B) 5 (C) 2 (D) 7

24 **Given $a = 1\frac{5}{7}$, $b = \frac{1}{4}$, $c = \frac{1}{9}$ and $d = \left(-1\frac{1}{4}\right)$, identify the value of $a(b - c) \div d$.**

(A) $\frac{-4}{21}$ (B) $\frac{-6}{23}$

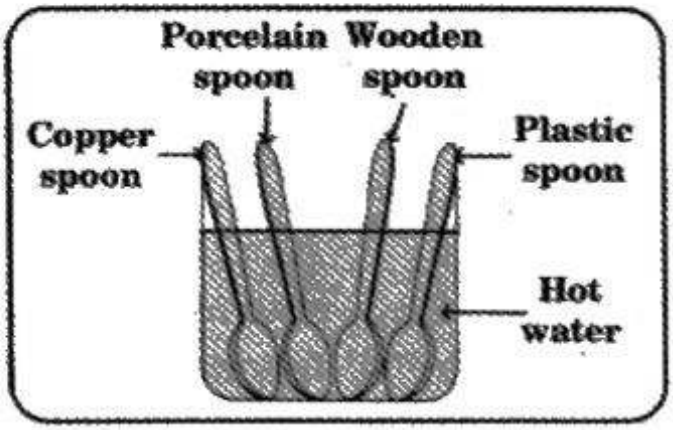
(C) $\frac{-5}{27}$ (D) $\frac{4}{21}$

25 **A father is 26 years older than his son. In 3 years' time the son's age will be one-third his father's age. What is the present age of the son?**

(A) 29 years (B) 13 years

(C) 39 years (D) 10 years

26 **Some spoons are placed in a beaker of hot water.**



Which spoon would you feel the hottest after 5 minutes?

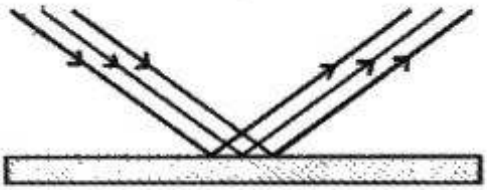
(A) Plastic spoon (B) Copper spoon

(C) Wooden spoon (D) Porcelain spoon

27 **A horse runs a distance of 1200 m in 2 minutes. What is its speed?**

(A) 6 m/s (B) 10 m/s (C) 24 m/s (D) 600 m/s

28 **Observe the given figure.**



Object Z

What type of surface does object Z have?

(A) Flat and Rough (B) Rough and Hard

(C) Flat and Magnetic (D) Shiny and Smooth

29 **Which type of fuse is generally used in electrical appliances for domestic use?**

(A) Kitkat (B) Ordinary

(C) Cartridge (D) Miniature Circuit Breaker

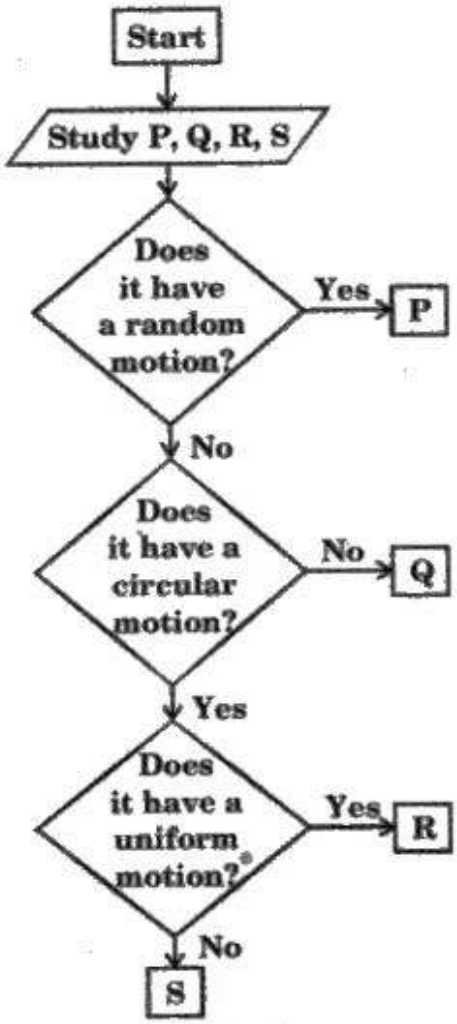
30 **A body covers 20 m in the first second, 25 m in the next second and 45 m in the third second. What is its average speed?**

(A) 10 m/s (B) 20 m/s (C) 30 m/s (D) 40 m/s

31 **Which of the given metals is the best conductor of electricity?**

(A) Zinc (B) Copper (C) Aluminium (D) Iron

32 **Study the given flow chart. P, Q, R and S are four objects that exhibit different types of motion.**



Which of these can 'R' be?

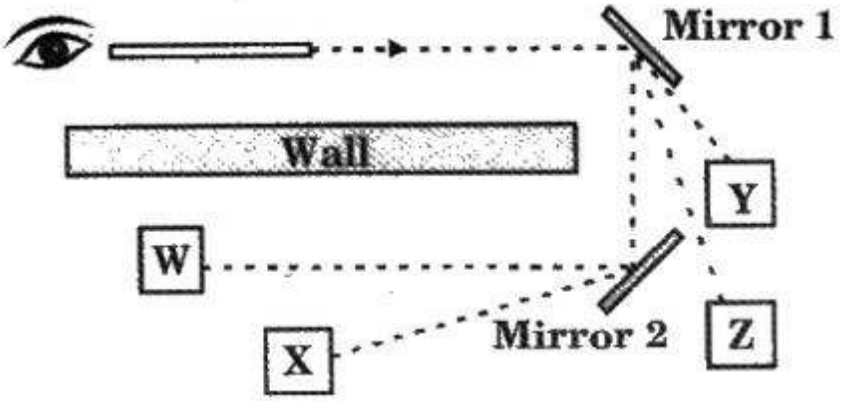
(A) The pointer of a speedometer.

(B) Hand in a stop watch.

(C) Movement of butterflies.

(D) A bus moving on a road.

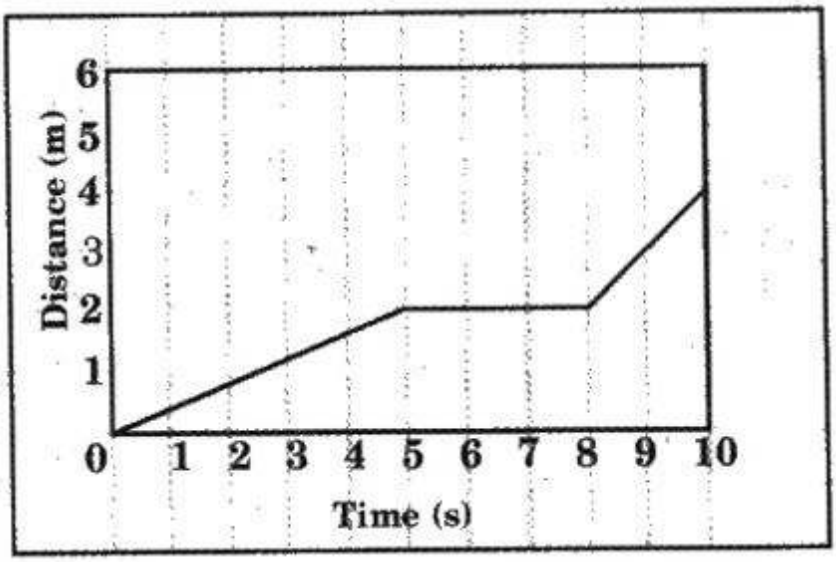
33 **A student looks through a steel tube in the setup shown.**



Which of the four boxes W, X, Y and Z will he/she be able to see?

(A) W (B) X (C) Y (D) Z

34 **Observe the given graph, that depicts a squirrel's movement for 10 seconds.**



Which of the following statements can be concluded about its motion?

(A) It moved with a constant speed between 0 s and 8 s.

(B) It remained at rest between 5 s and 8 s.

(C) It moved with a constant speed between 5 s and 8 s.

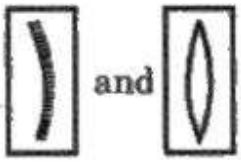
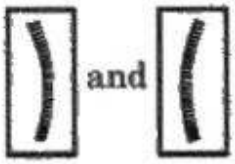
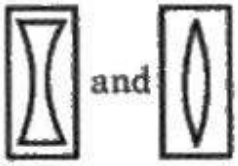
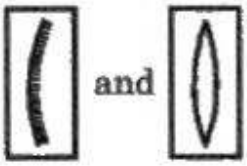
(D) It moved with the greatest speed between 0 s and 8 s.

35 **The following is the figure of an igloo in which eskimos live.**

Which of the following acts as an insulator in an igloo?

(A) Ice – Water
(B) Snow – Water
(C) Air – Snow
(D) Air – Water

36 **Which of the following can form a real and inverted image when objects are placed in front of them?**

(A)  and
(B)  and
(C)  and
(D)  and

37 **Which of the following is the cause for sea and land breezes?**

(A) Convection
(B) Radiation
(C) Conduction
(D) Both (A) and (C)

38 **The time period of a pendulum depends upon the**

(A) size of the bob.
(B) mass of the bob.
(C) length of the pendulum.
(D) angle through which the pendulum swings.

39 **Which of the following correctly shows how heat is transferred when a kettle is used for boiling water?**

(A) Heating coil → Kettle body → Water → Surroundings

(B) Heating coil → Water → Kettle body → Surroundings

(C) Surroundings → Heating coil → Kettle body → Water

(D) Kettle body → Heating coil → Water → Surroundings

40 **Uses of electricity are listed in the box.**

(i)	**For heating of water and cooking food.**
(ii)	**For cooling in fridge, air conditioners etc.**
(iii)	**For lighting bulbs and working of motors.**
(iv)	**In the working of solar cookers.**

Identify the correct ones.

(A) Only (i), (ii) and (iv) (B) Only (i), (iii) and (iv)

(C) Only (i), (ii) and (iii) (D) Only (ii), (iii) and (iv)

41 **A boy takes 30 minutes to go to his school on a bicycle from his house. If he rides with a speed of 2 m/s, how far is the school from his house?**

(A) 900 m (B) 1800 m (C) 3600 m (D) 5400 m

42 **Which of the given parts of a thermos flask CANNOT help to reduce loss of heat by radiation?**

(A) Vacuum (B) Cork stopper

(C) Double glass walls (D) Shiny silvery wall

43 **Which of the given alloys is used for making a strong electromagnet?**

(A) Duralumin (B) Alnico (C) Bronze (D) Brass

44 **Which of the following reflects white light but forms no image?**

(A) Plane mirror
(B) Metal sheet
(C) White curtain
(D) Brick

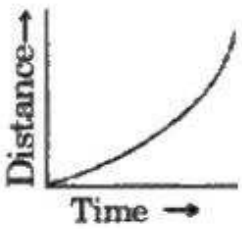
45 **Why is a chocolate wrapped in a shiny, metal foil?**

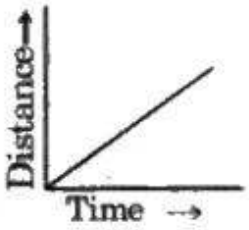
(A) To reflect heat from the chocolate.
(B) To radiate heat from the chocolate.
(C) To absorb heat from the chocolate.
(D) To conduct heat from the chocolate.

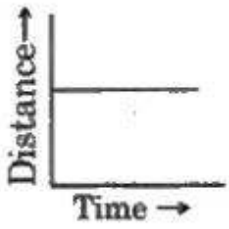
46 **Identify the false statement about heat.**

(A) It travels through all states of matter.
(B) It flows from a body at a higher temperature to a body at a lower temperature.
(C) It is transmitted by convection in solids.
(D) A large object absorbs more heat than a small object.

47 **Which of the given graphs represents constant speed of an object?**

(A)


(B)


(C)


(D)


48 **Why does a fluorescent tubelight glow brightly?**

(A) The tubelight is filled with mercury vapours at high pressure.

(B) Vapours of mercury emit infrared rays that strike the fluorescent material coated inside the tubelight.

(C) Energy from the UV rays excites the fluorescent material.

(D) There is a lot of energy loss in fluorescent tubelight.

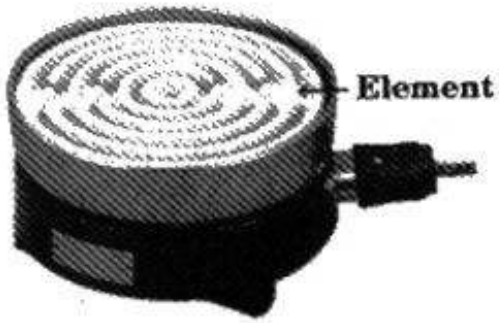
49 **The characteristics of a particular type of mirror are given in the box.**

- **It has a flat surface.**
- **It forms an erect, virtual image of the object.**
- **Image formed is laterally inverted.**
- **Object and image are of the same size.**

Identify the mirror.

(A) Plane mirror
(B) Convexo-concave mirror
(C) Convex mirror
(D) Concave mirror

50 **Observe the given figure of an electric heater.**



Identify the alloy used for making the element in it.

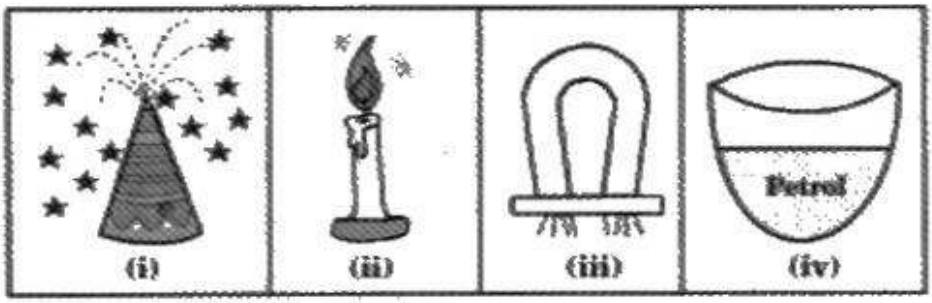
(A) Brass
(B) Solder
(C) Nichrome
(D) Alnico

51 **Which of the following statements are true of wind speed on a Beaufort scale?**

(i) Wind at a speed of 4 km/h is called breeze.
(ii) Wind at a speed of 8 km/h is called a strong wind.
(iii) Wind at a speed of 9 km/h and above is called storm.

(A) Only (i) and (ii)
(B) Only (ii) and (iii)
(C) Only (i) and (iii)
(D) Only (iii)

52 **Observe these figures.**



Which of the given figures show a chemical change?

(A) Only (i) and (ii)
(B) Only (ii) and (iii)
(C) Only (i) and (iii)
(D) Only (i) and (iv)

53 **Identify the insect whose sting is basic.**

(A) Wasp
(B) Ant
(C) Honeybee
(D) Nettle

54 **How can we universally overcome the problem of water scarcity?**

(A) By overusing water from water bodies.
(B) By keeping the taps open, even after filling the containers.
(C) By reducing pressure in public water taps in a locality.
(D) By better water management.

55 **Which of the follow. ing elements is absent in inorganic acids?**

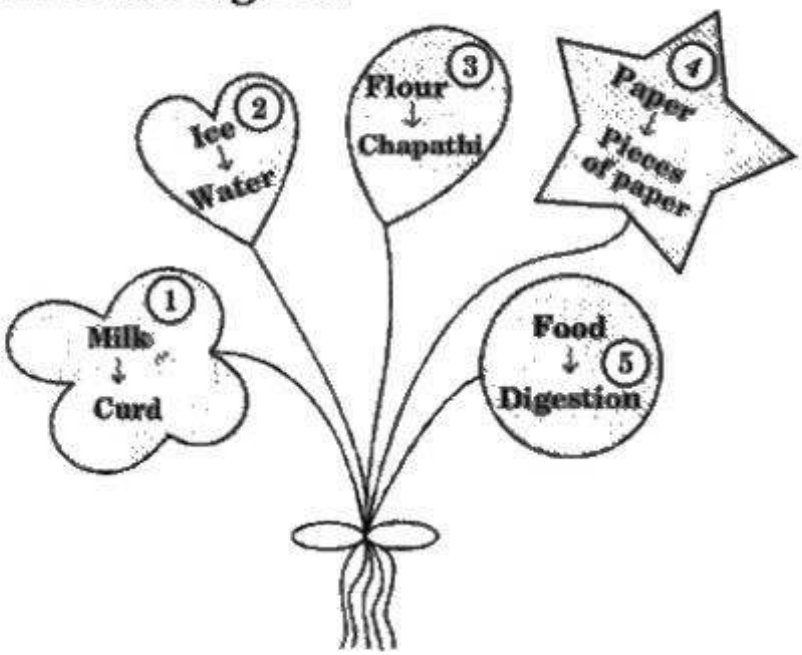
(A) Calcium (B) Carbon (C) Magnesium (D) Zinc

56 **Which of the following are the essential factors that cause a cyclone?**

(i) High atmospheric humidity
(ii) High temperature in the atmosphere
(iii) High speed of spiral winds
(iv) High depression in water bodies

(A) Only (i) and (ii) (B) Only (ii) and (iii)
(C) Only (i) and (iii) (D) Only (ii) and (iv)

57 **A few examples of physical and chemical changes are shown in the figure.**



Identify the changes that are only chemical.

(A) 1, 2, 4 (B) 1, 3, 5 (C) 2, 4, 5 (D) 1, 3, 4

58 **What is a tornado?**

(A) Strong circulatory winds in the tropical region
(B) Uneven heating between two regions
(C) A violent, twisting funnel of wind
(D) Uneven pressure between two regions

59 **Which oxide on hydrolysis forms the 'King of acids'?**

(A) Sulphur trioxide
(B) Phosphorus pentoxide
(C) Magnesium oxide
(D) Calcium oxide

60 **The roof of which of these houses will be blown off due to strong wind during a storm?**

(A) 

(B) 

(C) 

(D) 

61 **Which of the following contents make up a fruit salt?**

(A) Dry organic acid + Dry baking soda
(B) Wet organic acid + Wet baking soda
(C) Dry inorganic acid + Wet baking soda
(D) Wet inorganic acid + Dry baking soda

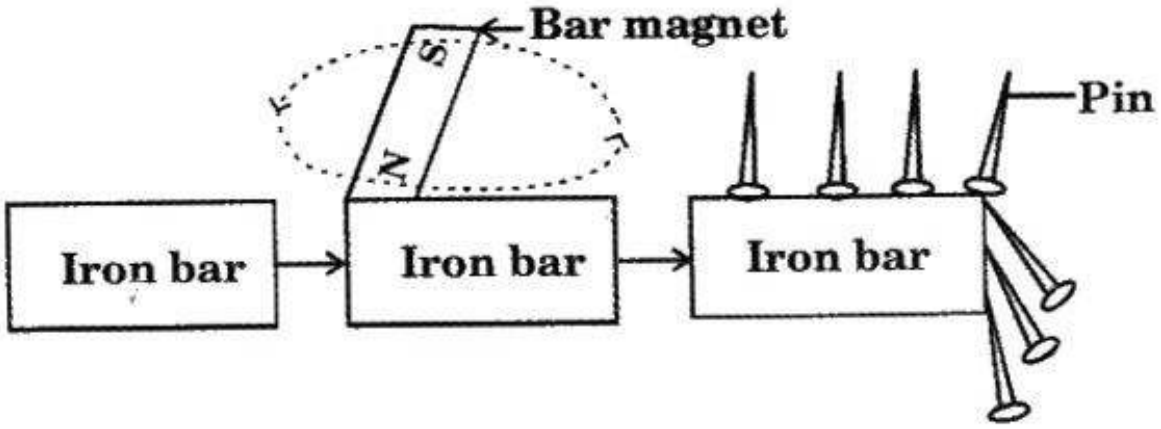
62 **Why do fishmongers add common salt to the ice used for preserving fish?**

(A) To lower the temperature of the ice.
(B) To make the ice absorb more heat.
(C) To make the ice melt faster.
(D) To slow down the melting of the ice.

63 **In which of the following is hydrofluoric acid stored?**

(A) Teflon bottle
(B) Plastic container
(C) Glass bottle
(D) Both (A) and (B)

64 **Observe the given figures showing a process.**



Which type of change has occurred in the iron bar?

(A) Irreversible (B) Chemical

(C) Reversible (D) Periodic

65 **Which of the given combinations of reactants undergo chemical reactions inside a fire extinguisher to produce CO_2 gas?**

(A) $AgCl_2 + 2HNO_3$ (B) $2\,KCl + H_2SO_4$

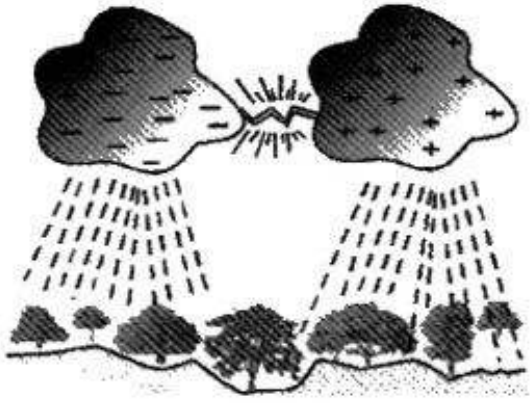
(C) $Na_2CO_3 + H_2SO_4$ (D) $MgCl_2 + 2HNO_3$

66 **When apple, brinjal and potato are cut, they turn brown. Which enzyme is responsible for the change in colour of the cut surfaces?**

(A) Tyrosinase (B) Phenol oxidase

(C) Enterokinase (D) Both (A) and (B)

67 **Observe the given figure.**



Which of the given statements is false of lightning and thunder?

(A) The negative charges collect near the upper edges of the clouds and the positive charges accumulate near the lower edges.

(B) The electric discharge between the clouds and the earth or between the different clouds causes lightning.

(C) Lightning can cause loss of life and property.

(D) We hear thunder after we see the lightning.

68 **Identify the type of change and gas released apart from formation of water vapour when some amount of wax is burnt in a vessel.**

	Type of change	Gas released
(A)	Physical	Hydrogen
(B)	Chemical	Hydrogen
(C)	Physical	Carbon dioxide
(D)	Chemical	Carbon dioxide

69 **Which of the given substances can be placed in the middle of the pH scale?**

(A) Water (B) Vinegar

(C) Washing soda (D) Baking soda

70 **Metallic oxides dissolve in water to form a/an**

(A) acidic solution. (B) neutral solution.

(C) basic solution. (D) Both (A) and (B)

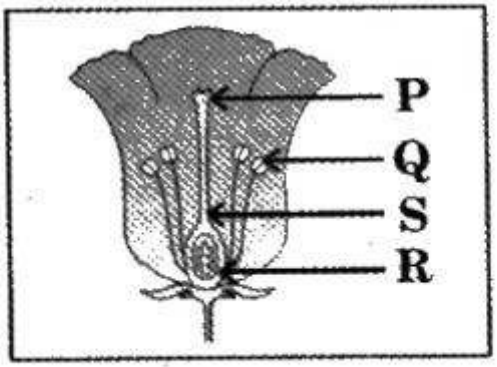
71 **Gaseous exchange and photosynthesis take place in the leaves of plants. The table shows how the gases P, Q, R and S are involved in the two processes.**

Process	Gas taken in	Gas given out
Respiration	P	Q
Photosynthesis	R	S

Which of the following correctly identifies P, Q, R and S?

	P	Q	R	S
(A)	Water vapour	Oxygen	Carbon dioxide	Carbon dioxide
(B)	Carbon dioxide	Oxygen	Oxygen	Water vapour
(C)	Oxygen	Carbon dioxide	Hydrogen	Hydrogen
(D)	Oxygen	Carbon dioxide	Carbon dioxide	Oxygen

72 **Study the given diagram.**



In which of the labelled parts will the male and female gametes fuse?

(A) P (B) Q (C) R (D) S

73 **Plant Z has a thick juicy stem. It is green in colour and covered with needle like leaves. Plant Z is most likely to be found in**

(A) an ocean.
(B) a desert.
(C) a swamp.
(D) the arctic region.

74 **Which of the following are decomposers?**

(A) Bacteria and fungi (B) Bryophytes
(C) Dead leaves (D) Dead animals

75 **Identify the food that is considered to be complete except that it lacks fibres.**

(A) Maize (B) Mango (C) Milk (D) Methi

76 **Which of the following is an abiotic component of a habitat?**

(A) Insects (B) Earthworm
(C) Humus (D) Bacterium

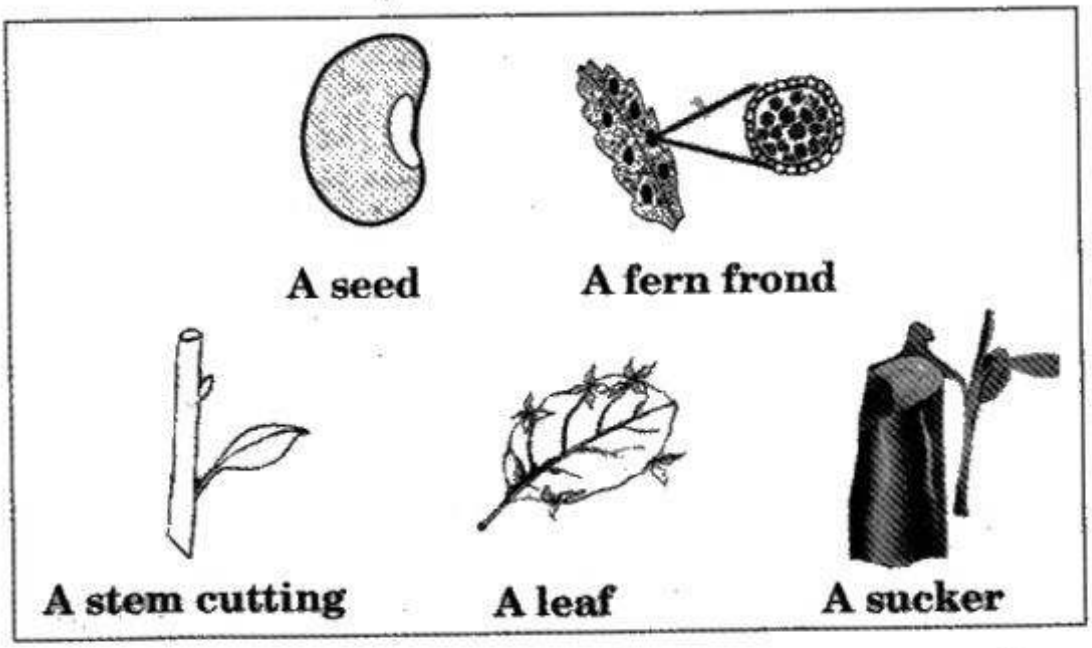
77 **Which of the following processes involves oxidation of food within a living body for the release of energy?**

(A) Photosynthesis (B) Respiration
(C) Reproduction (D) Excretion

78 **Which vitamin saves us from the problem of bleeding gums?**

(A) Vitamin A (B) Vitamin B (C) Vitamin C (D) Vitamin D

79 **Parts of different plants are shown in the box.**



Which of the following statements is true about all the given parts?

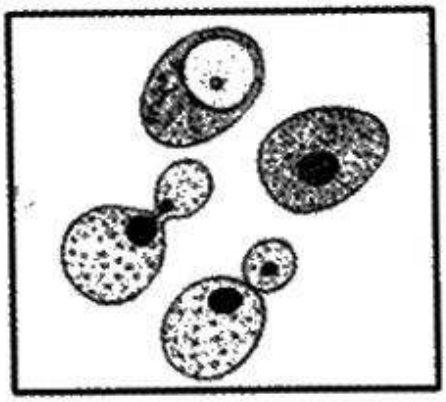
(A) They can grow into new plants.
(B) They depend only on stored food for growth.
(C) They do not need air, water and sunlight to grow.
(D) They cannot grow into new plants.

80 **Which of the following statements is / are true about a cockroach and a grasshopper?**

(i) Their young ones moult many times before they become adults.
(ii) Their young ones resemble the adults.
(iii) They have a pupal stage in their life cycles.

(A) Only (i)
(B) Only (i) and (ii)
(C) Only (iii)
(D) Only (ii) and (iii)

81 **Abhi looked through a microscope and found some cells as shown in the given box.**

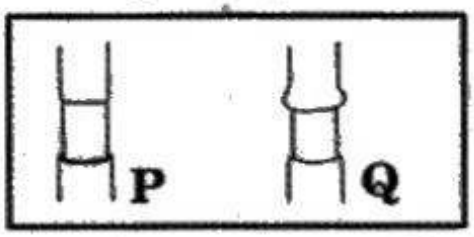


Based on his observation, Abhi can infer that these cells

(i) are photosynthetic.
(ii) are single celled organisms.
(iii) reproduce by budding.
(iv) have buds with identical genetic material.

(A) Only (i) and (ii)
(B) Only (ii) and (iii)
(C) Only (ii), (iii) and (iv)
(D) (i), (ii), (iii) and (iv)

82 **What causes the swelling above the girdle in a stem as shown in the figure Q?**

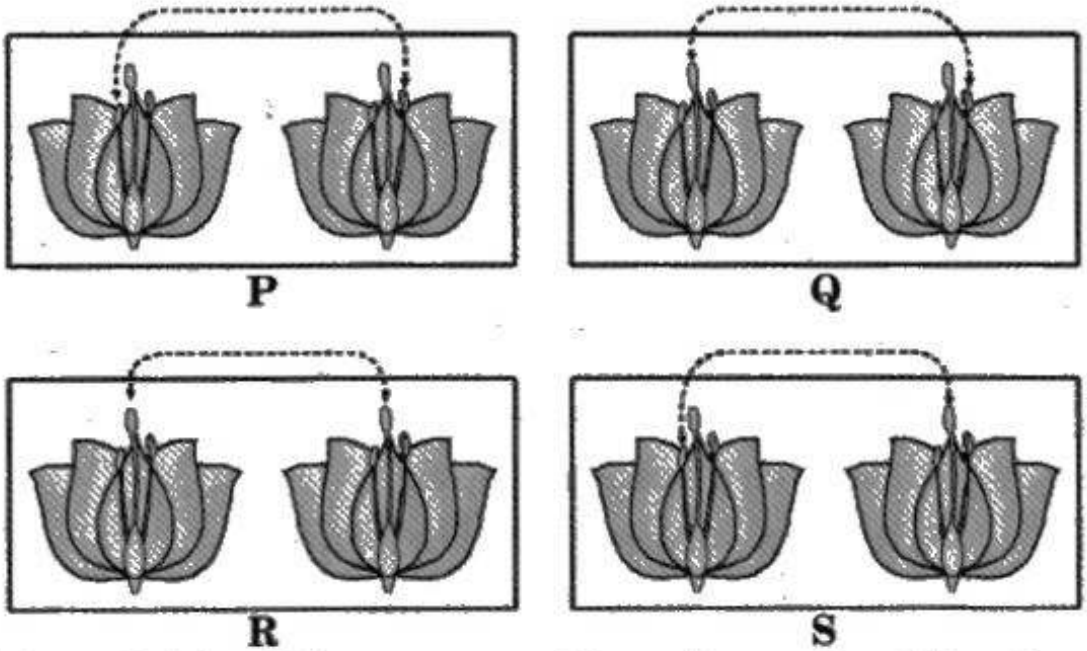


(A) Obstruction in the movement of food travelling up the stem.
(B) Obstruction in the movement of water travelling up the stem.
(C) Obstruction in the movement of food travelling down the stem.
(D) Obstruction in the movement of water travelling down the stem.

83 **Which of the following is a water conducting tissue in a plant?**

(A) Phloem
(B) Xylem
(C) Parenchyma
(D) Collenchyma

84 **The arrows in each of the following diagrams show the transfer of pollen grains between four pairs of flowers.**



Which pair(s) of flowers would undergo fertilisation and most likely develop into fruits?

(A) Only P
(B) Only Q and S
(C) Only R and S
(D) Only P and S

85 **Which of the following body liquids contains digestive enzymes?**

(A) Sweat
(B) Urine
(C) Saliva
(D) Mucus

86 **Identify the animal from whose hair shahtoosh is made.**

(A) Angoora rabbits
(B) Merino sheep
(C) Chiru
(D) Yak

87 **Which of the following events in the life cycle of a plant initiates the formation of a new individual?**

(A) Growth
(B) Photosynthesis
(C) Differentiation
(D) Fertilisation

88 **Which of the characteristics given in the box help a camel to survive in a desert?**

P – Broad padded feet
Q – A hump that helps to store fat
R – Long hairy eyelashes
S – The ability to conserve water in its body

(A) Only P and Q
(B) Only Q and R
(C) Only P and R
(D) P, Q, R and S

89 **Study the following process chart.**

Transfer of pollen grains from a mature anther.

↓ **Process P**

The fusion of the egg cell with the male gamete.

↓ **Process Q**

Ovary becomes R.

↓

Ovule becomes S.

Which of the following represents processes P, Q, R and S?

	P	Q	R	S
(A)	Pollination	Fertilization	Seed	Skin of the fruit
(B)	Sterilization	Pollination	Seed	Fruit
(C)	Pollination	Fertilization	Fruit	Seed
(D)	Fertilization	Pollination	Fruit	Skin of the fruit

90 **Frogs have the ability to live both on land and in water. Which of the following adaptations enable them to do so?**

(i) They can trap air bubbles in their throat.
(ii) They have webbed feet that help them to swim and leap on land.
(iii) They have lungs to help them breathe when they are on land.
(iv) Their skin when kept moist, can take in the oxygen dissolved in the water.

(A) Only (i) and (ii)
(B) Only (ii) and (iii)
(C) Only (i) and (iii)
(D) Only (ii), (iii) and (iv)

91 **Where is the tallest building in the world located?**

(A) U.S.A. (B) Dubai (C) Italy (D) Singapore

92 **Identify the stringed instrument from among the following.**

(A) Clarinet (B) Xylophone (C) Mandolin (D) Trombone

93 **Which movie won the "Best Director Oscar" in 2013?**

(A) Iron Man 3 (B) Life of Pi
(C) Star Trek into Darkness (D) Man of Steel

94 **Who is the first Indian who went into space?**

(A)  (B)  (C)  (D) 

95 **Who is the winner of 2013 Miss India contest?**

(A) Navneet Kaur Dhillon (B) Anukriti Gusain
(C) Manasi Moghe (D) Malvika Sitlani

96 **What does Kesari mean in 'Punjab Kesari' – a popular title of Lala Lajpat Rai?**

(A) Gold (B) Lion (C) Light (D) Elephant

97 **Which country gifted the 'Statue of Liberty' to U.S.A?**

(A) Russia (B) Canada (C) France (D) Germany

98 **Which of these brands of pens is named after the highest peak in western Europe?**

(A) Peak Parker (B) Montblanc
(C) Faber-Castell (D) Sheaffer

99 **With which sport is 'The Ashes series' related?**

(A) Baseball (B) Cricket (C) Tennis (D) Football

100 **How many languages feature on the language panel of contemporary Reserve Bank of India currency notes?**

(A) 12 (B) 13 (C) 15 (D) 18

Key for NSTSE-2014

1. C	2. C	3. B	4. A	5. D	6. B	7. A	8. C	9. D	10. A
11. A	12. B	13. B	14. A	15. D	16. A	17. B	18. B	19. A	20. D
21. A	22. C	23. A	24. A	25. D	26. B	27. B	28. D	29. C	30. C
31. B	32. B	33. A	34. B	35. C	36. A	37. A	38. C	39. B	40. C
41. C	42. A	43. B	44. C	45. D	46. C	47. B	48. C	49. A	50. C
51. A	52. A	53. A	54. D	55. B	56. B	57. B	58. C	59. A	60. C
61. A	62. D	63. D	64. C	65. C	66. D	67. A	68. D	69. A	70. C
71. D	72. C	73. B	74. A	75. C	76. C	77. B	78. C	79. A	80. B
81. C	82. C	83. B	84. B	85. C	86. C	87. D	88. D	89. C	90. D
91. B	92. C	93. B	94. A	95. A	96. B	97. C	98. B	99. B	100.C