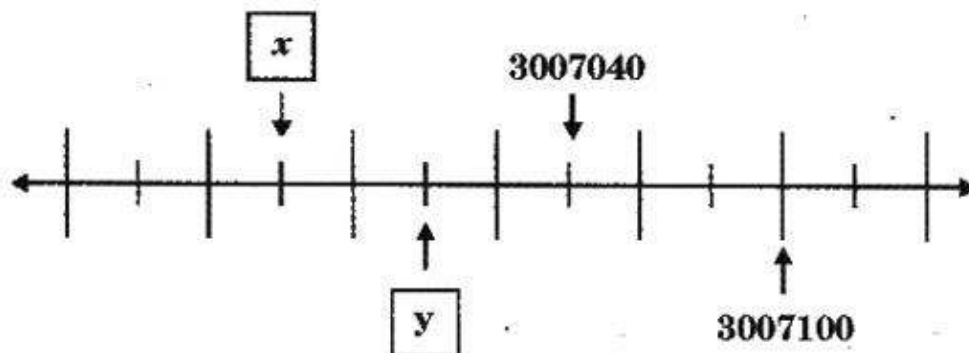# National Level Science Talent Search Examination - 2013

Class : VI **Mathematics**

1 **What is the sum of numbers *x* and *y* given on the number line?**

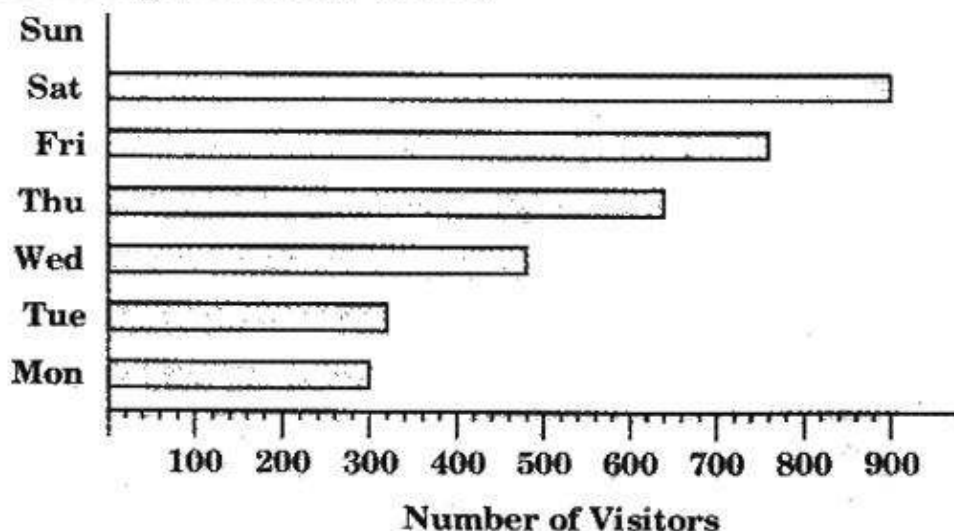(A) 6013040 (B) 3008940 (C) 6008940 (D) 6013960

2 **What is the missing number in the box?**

$$1\frac{2}{5} + 1\frac{2}{5} + 1\frac{2}{5} + 1\frac{2}{5} = \boxed{?} \times \frac{7}{5} + 1\frac{2}{5}$$

(A) 21 (B) 2 (C) 3 (D) 4

3 **The graph given shows the number of visitors to a zoo in a particular week.**

Number of Visitors

On which day was the number of visitors thrice that on Monday?

(A) Sunday (B) Saturday (C) Friday (D) Thursday

4 What is the difference between the smallest 6-digit odd number and the largest 4-digit even number?

(A) 90002   (B) 90003   (C) 101113   (D) 101121

5 What is the value of 108 thousandths multiplied by 15 ones?

(A) 1.62   (B) 15.108   (C) 108.0   (D) 16.20

6 Which of the following statements is correct?

(A) $m + m = 3 \times m$ (B) $m \div m = m$
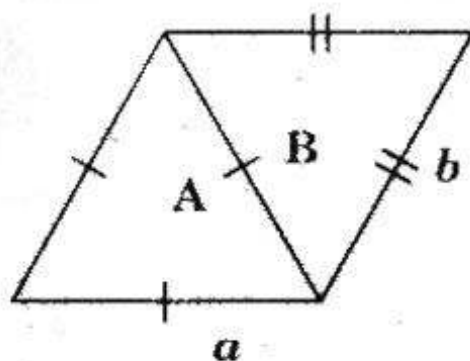
(C) $2 \times m + 6 = 2m + 6$ (D) $m + 5m + 6 = 11m$

7 What is the value of $120 - 60 \div (15 \times 4) + 4 - 2$?

(A) 18   (B) 102   (C) 3   (D) 121

8 The perimeter of figure A is 3a units and that of figure B is (2b + a) units.

Find the perimeter (in units) of the figure given.

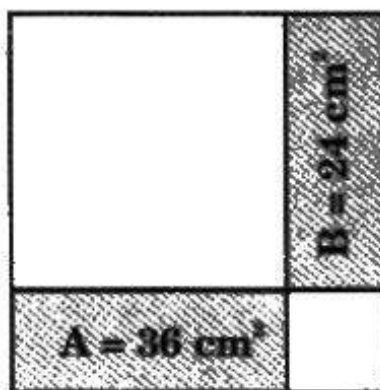(A) $2b + 3a$ (B) $2(b + 2a)$ (C) $2(a + b)$ (D) $2(2b + a)$

9 The difference between two numbers is 108 less than their sum. If the larger number is twice the smaller number, find the difference between the two numbers.

(A) 48   (B) 54   (C) 36   (D) 72

10 The figure shows two shaded rectangles A and B in a square. The areas of the shaded parts are 24 cm² and 36 cm² as shown.

What is the area of the square?

(A) 144 cm² (B) 100 cm²

(C) 121 cm² (D) 169 cm²

11 Kavya is K years old. In 7 years time, her father's age will be twice her age. How old will her father be, in terms of K in 7 years time?

(A) $\dfrac{K+7}{2}$ years (B) $\dfrac{2K+7}{2}$ years

(C) $(2K + 7)$ years (D) $2(K + 7)$ years

12 What is the L.C.M. of X and Y if X is the first odd prime number and Y is the only even prime number?

(A) 6 (B) 2 (C) 8 (D) 12

13 Pranay spent $\dfrac{1}{8}$ th of his money on food. He spent 3 times as much as what he spent on food on a pair of shoes and $\dfrac{1}{3}$ rd of it on transport. What fraction of his money was left?

(A) $\dfrac{7}{8}$ (B) $\dfrac{13}{24}$ (C) $\dfrac{1}{2}$ (D) $\dfrac{1}{6}$

 + + **stands for 98 marbles and**

+ **stands for 72 marbles. How many marbles does** + + + + + + **stand for ?**

(A) 176   (B) 246   (C) 192   (D) 222

15. Study the number pattern given.

$$3 \times 37 = 111$$
$$6 \times 37 = 222$$
$$9 \times 37 = 333$$
$$\cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot$$
$$\cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot$$
$$Z \times 37 = 888$$

Identify the value of Z.

(A) 32   (B) 24   (C) 12   (D) 14

16. The total mass of a sack of rice and 8 identical bags of flour is 51.4 kg. If the mass of each bag of flour is 4.92 kg, what is the mass of the sack of rice?

(A) 12.04 kg   (B) 12.4 kg   (C) 39.36 kg   (D) 411.2 kg

17. My broken calculator divides instead of multiplying and subtracts instead of adding. I type 12 × 3 + 4 × 2. What answer does the calculator show?

(A) 2   (B) 6   (C) 12   (D) 28

18 What is the value of $\dfrac{2013 \times 2.013}{201.3 \times 20.13}$?

(A) 0.01   (B) 0.1   (C) 1   (D) 10

19 The five digit number '24x 8y' is divisible by 4, 5 and 9. What is the sum of the digits x and y?

(A) 10   (B) 5   (C) 9   (D) 4

20 Which one of the following is the best estimation of 5663 × 2234?

(A) 5000 × 2000   (B) 5700 × 2200

(C) 5660 × 2230   (D) 5660 × 2330

21 If $a + b + c + d = 2012$ and $b + d = 2013$, what is the value of $a - b + c - d$?

(A) –2014   (B) –4   (C) 2014   (D) 2

22 The circumference of a circle is approximately equal to how many times its diameter?

(A) $\dfrac{\pi}{4}$ (B) $\dfrac{\pi}{3}$ (C) $\dfrac{\pi}{2}$ (D) π

23 How many faces does the given solid have?
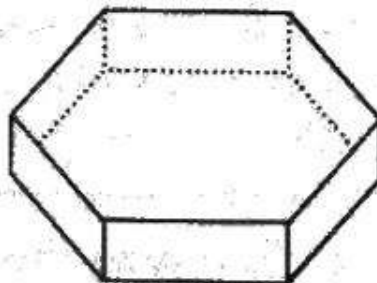
(A) 6   (B) 7   (C) 8   (D) 9

24 The figure given shows a rectangle. Find the area of the shaded region within the rectangle.

7 cm

12 cm
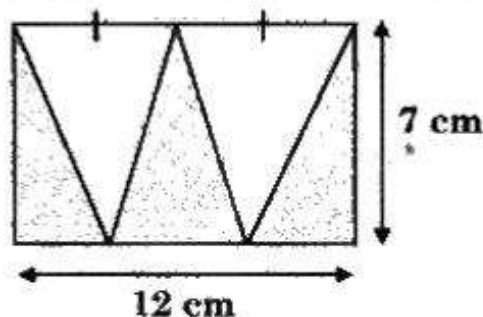
(A) 28 cm²   (B) 38 cm²   (C) 42 cm²   (D) 84 cm²

25 Which one of the following is the same as $30 - (14 - 2 \times 3)$?

(A) $30 - 14 - 2 \times 3$ (B) $(30 - 14) - 2 \times 3$

(C) $30 - (14 - 6)$ (D) $30 - 14 - 6$

Class : VI   Physics

26 Identify the combination of metals used for making highly coiled wire to produce heat in an electric heater.

(A) Aluminium, Nickel   (B) Copper, Aluminium

(C) Nickel, Chromium   (D) Nickel, Copper

27 If a centimetre length is divided into 10 parts equally, what will be the length of each part?

(A) One millimetre   (B) One metre

(C) One kilometre   (D) One decimetre

28 A device has the following features.

> (i)   It is 'Z' shaped
>
> (ii)   Two plane mirrors are arranged at corners making an angle of 45°
>
> (iii)   Reflections help us to see objects around the corners

Identify the device based on the given information.

(A) Stethoscope   (B) Periscope

(C) Microscope   (D) Thermoscope

29 In which of the following circuits does the bulb glow the brightest?

(A)

(B)

(C)

(D)
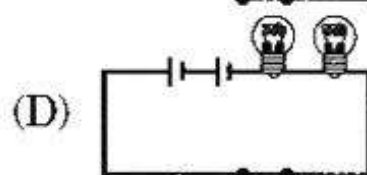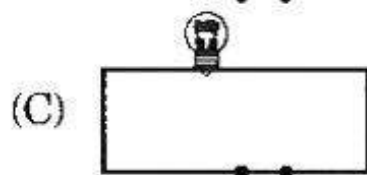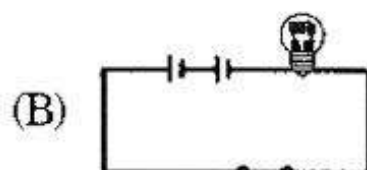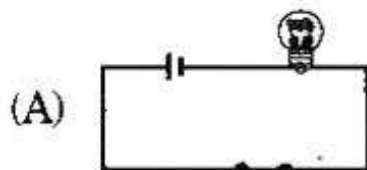
30 Observe the given figure.
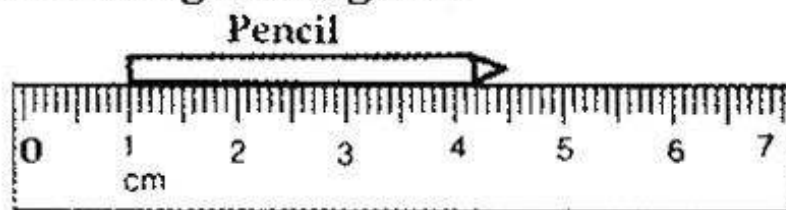
Find the correct length of the pencil from the figure.

(A) 5.5 cm (B) 4.5 cm (C) 3.5 cm (D) 4 cm

31 Which of the metallic articles is attracted by a magnet?

(A) A copper screw (B) A gold ring
(C) A silver spoon (D) An iron nail

32 Which of the following are insulators?

(i) Plastic
(ii) Rubber
(iii) Copper
(iv) Ebonite

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

33 Which type of motion is observed in a moving pendulum?

(A) Periodic (B) Translatory (C) Random (D) Non-periodic

34 Which of the following is formed when light rays are blocked by an opaque object?

(A) A convergent ray (B) A divergent ray
(C) A reflected ray (D) A shadow

35 Identify the appliance which correctly matches with its effect from the following.

	Appliance	Effect
(A)	Microwave oven	Heat
(B)	Music system	Heat
(C)	Tube light	Sound
(D)	Electric bulb	Magnetic

36 Which of the following can be measured using a measuring tape?

> (i) Heights of pupils
> (ii) Length of a bag
> (iii) Thickness of a glass piece
> (iv) Body measurements

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

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

37 Which of the following is a natural magnet?

(A) Haematite (B) Magnetite
(C) Toroid (D) Solenoid

38 What is the purpose of using a switch in an electric circuit?

(A) To increase the brightness of a bulb.

(B) To save electrical energy in the circuit.

(C) To prevent the melting of insulated wire.

(D) To complete the circuit.

39 The distance between Alok's school and his house is 245 m. What distance does he cover if he goes once to school and comes back home?

(A) 245 m (B) 490 m (C) 335 m (D) 380 m

40 Which material given is a conductor of heat and electricity?

(A) Silver

(B) Plastic

(C) Glass

(D) Wood

41 Which of the following is the smallest, standard unit of length?

(A) Centimetre

(B) Metre

(C) Kilometre

(D) Millimetre

42 In which of these circuits does the bulb glow?

(A)

(B)

(C)

(D)
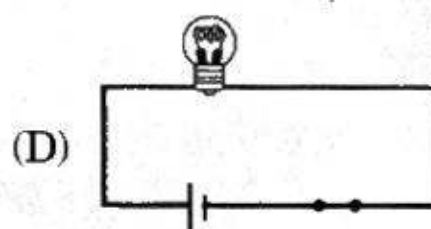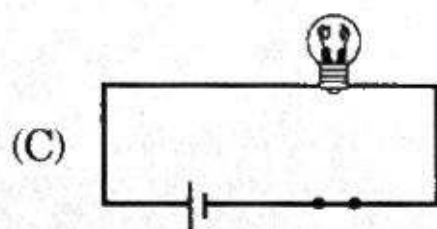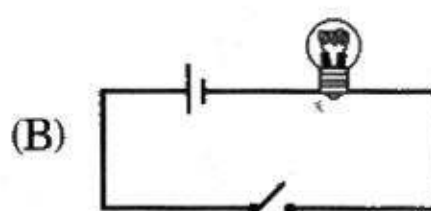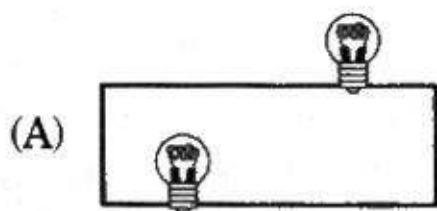
43 Which of these tools given can be used to measure the length of a curved line as shown?

(A) Scale, Thread, Ink pen

(B) Pencil, Silk thread, Steel rod

(C) Wooden piece, Scale, Pencil

(D) Stick, Wool, Pen

44 Which material is suitable to make the outer casing of an electric bulb?

(A) Metal

(B) Plastic

(C) Glass

(D) Acrylic

45 Look at the given figure.
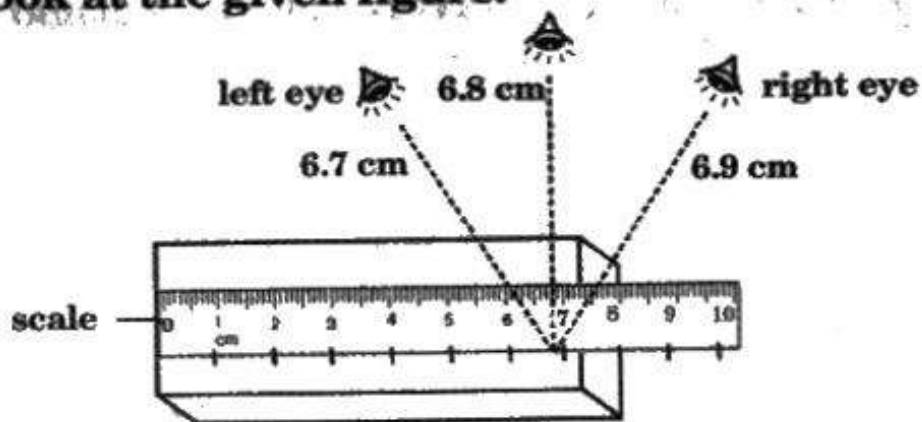
Which of the following is the correct reading to be taken as the length?

(A) 6.7 cm   (B) 6.6 cm   (C) 6.9 cm   (D) 6.8 cm

46 Which of the following is the smallest unit of time in all the three systems of units?

(A) An hour   (B) A day   (C) A minute (D) A second

47 Which of the following coloured paints, when coated on one side of a glass converts it into a mirror?

(A) Green   (B) Blue   (C) Red   (D) Black

48 Identify the type of motion observed in the movement of honey bees.

(A) Periodic   (B) Oscillatory (C) Resultant (D) Random

49 Observe the given electric cell.
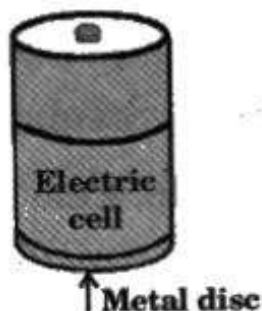
What is the metal disc in the cell pointed by the arrow called?

(A) A positive terminal   (B) A spring

(C) A switch   (D) A negative terminal

50 The given figure shows rays X, Y and Z which are observed in the working of a pinhole camera when an apple is placed in front of it.
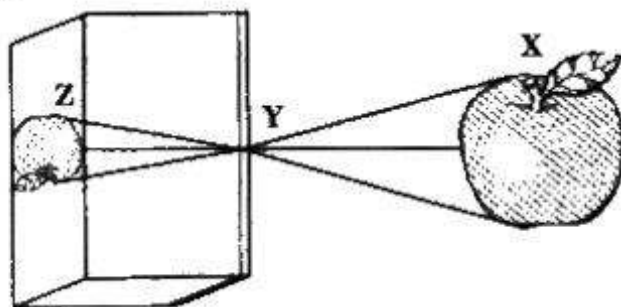
Identify X, Y and Z.

	X	Y	Z
(A)	Intersect	Diverge	Converge
(B)	Diverge	Intersect	Converge
(C)	Converge	Intersect	Diverge
(D)	Intersect	Converge	Diverge

Class : VI **Chemistry**

51 On burning, paper changes into ash and smoke. Identify the type of change from the following.

(A) Irreversible change (B) Temporary change

(C) Bio-chemical change (D) Reversible change

52 Study the information given in the box.

> (i) Remove impurities
> (ii) Separate useful components
> (iii) Remove harmful substances

Which of the above must be done to the food grains in order to obtain a clean product before cooking?

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

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

53 **Look at the given figure.**
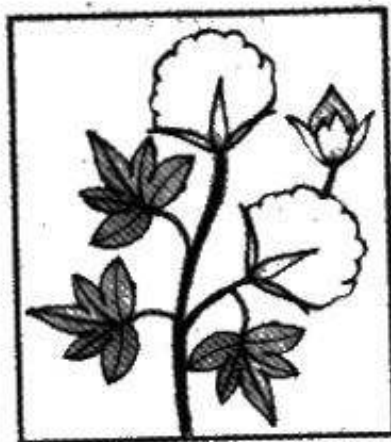
Identify the part from which cotton fibre is made.

(A) Flower

(B) Bud

(C) Fruit

(D) Stem

54 **Which one of the following gases is used in our kitchen as a fuel which is obtained by the decomposition of organic wastes?**

(A) Carbon dioxide gas

(B) Hydrogen gas

(C) Oxygen gas

(D) Biogas

55 **By which of the following processes can the stalks be separated from grains?**

(A) Winnowing

(B) Threshing

(C) Sieving

(D) Handpicking

56 **Which of the following processes are involved in converting cotton bolls into cotton fabric?**

(A) Spinning, Knitting

(B) Weaving, Knitting

(C) Reeling, Weaving

(D) Ginning, Weaving

57 The given figure is that of a bowl containing a mixture of iron filings, salt and sand.

Which of the following processes help in separating the three of them?

(A) Magnetic separation, Filtration, Evaporation

(B) Handpicking, Filtration, Condensation

(C) Threshing, Filtration, Evaporation

(D) Magnetic separation, Evaporation, Winnowing

58 A small ball of wheat dough is rolled into a flat, round shape and fried in oil. Which kind of change does it undergo?

(A) Chemical change   (B) Reversible change

(C) Both (A) and (B)   (D) Physical change

59 Which of the following usually undergoes changes in its physical state at room temperature in different seasons?

(A) Refined oil   (B) Kerosene oil

(C) Groundnut oil   (D) Coconut oil

60 Which of the following is a natural process in which impure salt solution is obtained from salt meadows?

(A) Decantation   (B) Evaporation

(C) Condensation   (D) Sedimentation

61 Which of these processes is invisible?

(A) Falling of leaves from trees

(B) Drying of wet clothes

(C) Shaping of wet clay into an article

(D) Counting numbers with fingers

62 Match the entries in Column – I with those in Column – II correctly.

	Column - I		Column - II
i.	Book	p.	Ductile
ii.	Metal wire	q.	Malleable
iii.	Liquid	r.	Opaque
iv.	Sheets	s.	Miscible

(A) i - p, ii - s, iii - r, iv - q (B) i - r, ii - p, iii - s, iv - q

(C) i - r, ii - s, iii - p, iv - q (D) i - q, ii - s, iii - p, iv - r

63 Identify the material which is translucent in nature.

(A) Cardboard (B) Ground glass

(C) Glass (D) Metal

64 Which process is used to separate wheat flour from its bran?

(A) Sieving (B) Filtration

(C) Sedimentation (D) Decantation

65 Which two materials from the following are used in the making of a pressure cooker?

(A) Iron, Wood (B) Zinc, Glass

(C) Brass, Plastic (D) Aluminium, Ebonite

66 Rajasthan receives scanty rainfall every year. The people living there store rain water in pits for future use. Which of the following pits do they use?

(A) Sand pit (B) Clay pit

(C) Mud pit (D) Cement pit

67 Identify the plant which is harvested in the flowering stage.

(A) Wheat   (B) Jute   (C) Maize   (D) Paddy

68 Observe the given sequence of figures.

Balloon filled with air	Pressure ↓ ? ↑ Pressure	Balloon without air
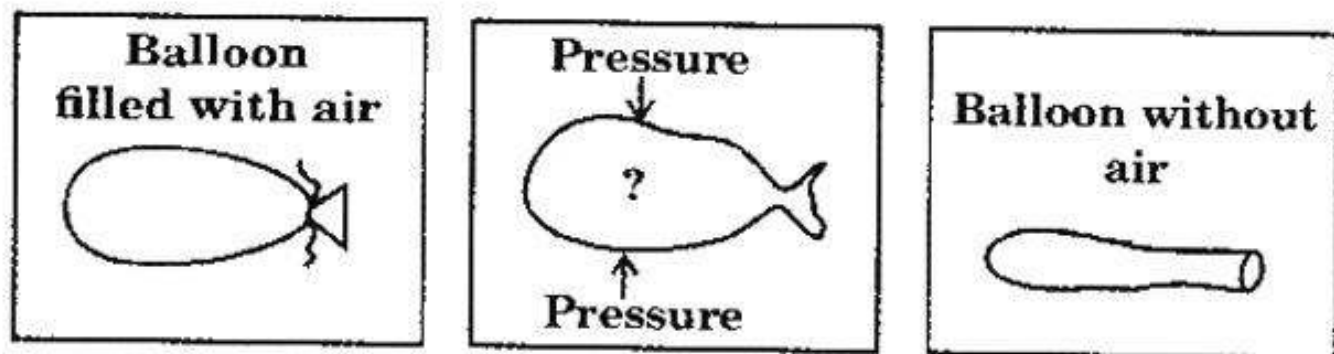
Which of these properties of air is observed in the given figures?

(A) Expansion   (B) Depression

(C) Absorption   (D) Compression

69 Two objects 'X' and 'Y' were placed in separate beakers containing equal amount of water. It was observed that one object was floating while the other sinked. What could 'X' and 'Y' be?

(A) Magnet, Glass piece   (B) Cork, Coin

(C) Eraser, Iron nail   (D) Soap, Chalk

70 Which of these examples given is a reversible change?

(A) Boiling of egg   (B) Stretching of rubber band

(C) Burning of petrol   (D) Ripening of fruits

71 Which of the following illustrations correctly demonstrates the process of transpiration in plants?
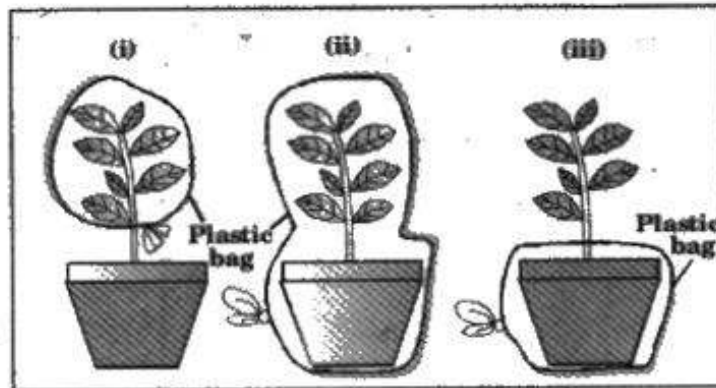
(A) Only (i) (B) Only (ii) (C) Only (iii) (D) Only (ii) and (iii)

72 Abhi found an animal and he observed the following characteristics.

> ♦ It feeds on insects
> ♦ It lays eggs in water
> ♦ It can move about in more than one way
> ♦ It has a soft and moist skin

Which of these animals did Abhi find?
(A) Earthworm (B) Tortoise (C) Frog (D) Fish

73 Read the information given in the box and identify who I am.

> I protect the brain. I consist of bones which are fused firmly together to form a shell like structure.

(A) Ribcage   (B) Skull
(C) Vertebral column   (D) Ligament

74 Match the following groups in Column – I with the animals in Column – II.

	Column - I		Column - II
i.	Omnivore	p.	Giraffe
ii.	Herbivore	q.	Lizard
iii.	Carnivore	r.	Bear

(A) i - r, ii - q, iii - p   (B) i - q, ii - r, iii - p
(C) i - p, ii - q, iii - r   (D) i - r, ii - p, iii - q

75 Which of the following animals shows slithering movements?

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

76 The figure given shows some food items.

 Carrot   Papaya
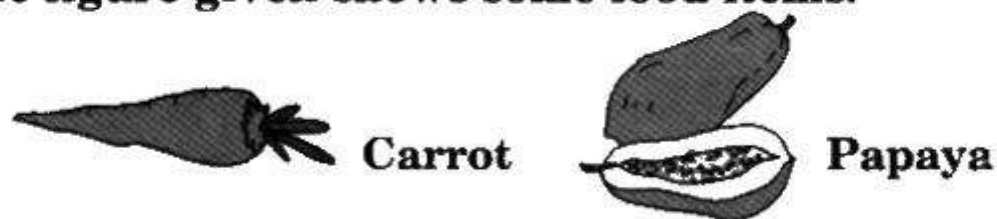
Which of the following vitamins is present in the given food?

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

77 Which of the following joints move in a similar way as that shown in the given figure?

(A) Ankle and knee joints   (B) Hip and shoulder joints
(C) Neck and wrist joints   (D) Shoulder and knee joints

78. The information given in the box is about the symptom of a malnutritional disease.

> ■ The bones become soft and weak with lean muscles.
> ■ Skin becomes rough and leads to mental retardation.

Identify the disease.

(A) Marasmus
(B) Anaemia
(C) Rickets
(D) Nightblindness

79. Which of the following sequences is arranged correctly in an increasing order of complexity in a multicellular organism?

(A) Tissue → Cell → Organ → System
(B) Organ → System → Tissue → Cell
(C) Cell → Tissue → Organ → System
(D) System → Cell → Tissue → Organ

80. The given diagram of a plant shows the movement of substances in the form of arrows.
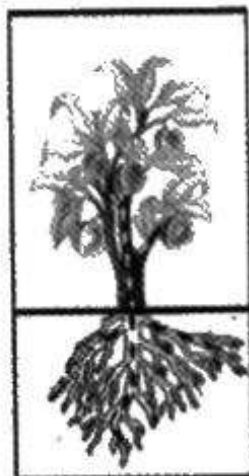
Which of the following substances is / are transported in the given plant as shown by the arrows ?

> (i) Water
> (ii) Mineral salts
> (iii) Oxygen
> (iv) Sugar

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

81 The given pie chart shows the composition of the different components of food found in fish.
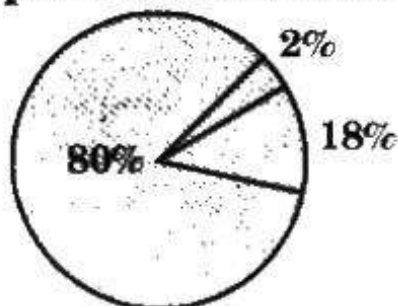
Why is the part labelled 80% needed?
(A) For growth and early healing of injuries.
(B) To provide energy.
(C) To absorb soluble vitamins.
(D) To prevent constipation.

82 An organism 'X' can walk, climb on a wall or fly in air for a short distance. Which of the following could 'X' be ?
(A) Cockroach   (B) Snail
(C) Bat   (D) Snake

83 What do the arrows in the given figure represent?

(A) Interdependence between plants only.
(B) Interdependence between animals only.
(C) Interdependence between plants and animals.
(D) Interdependence between abiotic factors.

84 Which one of the following groups of vegetables includes only roots that are eaten as food is stored in them?

(A) Beetroot, Sugarcane, Ginger, Radish
(B) Potato, Carrot, Radish, Beetroot
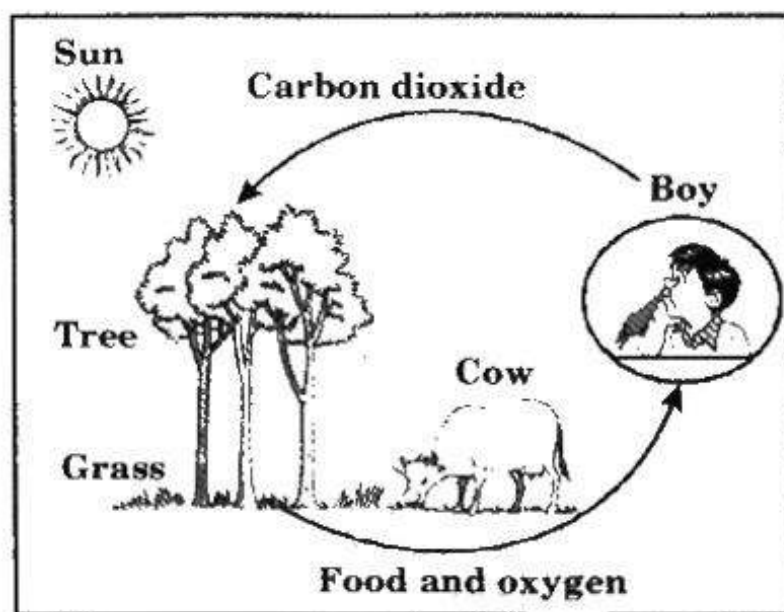(C) Carrot, Turnip, Radish, Beetroot
(D) Colocasia, Potato, Onion, Cabbage

85 Which of the following plants has breathing roots?

(A) Vallisneria   (B) Mangrove
(C) Sugarcane   (D) Maize

86 The diagram shows a green leaf of a potted plant that is exposed to sunlight.
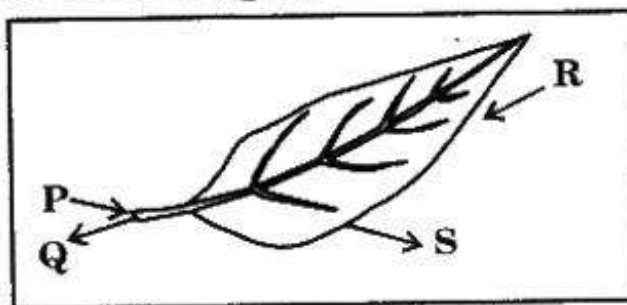
Which of the following rows correctly represents the arrows P, Q, R and S during photosynthesis?

	P	Q	R	S
(A)	Sugar	Water	Oxygen	Carbondioxide
(B)	Sugar	Water	Carbondioxide	Oxygen
(C)	Water	Carbondioxide	Oxygen	Water
(D)	Water	Sugar	Carbondioxide	Oxygen

87 Which of the following plants are phanerogams?

(A) Mosses   (B) Liverworts
(C) Ferns   (D) Coconut

88 **Which of the following is an adaptation that helps cuscuta plant to obtain its nutrition (to get its food)?**

(A) Stem is modified to take up the function of the leaves.

(B) Roots are modified to suck food from the host.

(C) Stem is modified to suck food from the host.

(D) Leaves trap insects to suck food from them.

89 **Shreya was grouping plants. She decided to draw a circle, a square, a triangle or leave a blank around the plants depending on their life span.**

One year   Two years   Many years

Around which of these plants should Shreya draw a circle?

(A) Banana   (B) Papaya   (C) Neem   (D) China rose

90 **The given figure shows a mimosa plant.**

When you step on the mimosa plant, its leaves will close up. This shows that the plant is exhibiting which of the following characteristics of living things?

(A) Reproduction   (B) Growth

(C) Locomotion   (D) Responding to stimuli

91 In London Summer Olympics 2012, which Indian wrestler bagged a silver medal?
(A) Amit Kumar   (B) Geeta Phogat
(C) Yogeshwar Dutt   (D) Sushil Kumar

92 What is the young one of a swan called?

(A) Cygnet   (B) Joey   (C) Cub   (D) Tadpole

93 What is the collective noun used for a group of camels?

(A) School   (B) Pride   (C) Caravan   (D) Class

94 Identify the staircase in which the stairs move upwards or downwards.
(A) An escalator   (B) An elevator   (C) A generator   (D) A laser

95 Identify the correct simile from the following.
(A) As mad as a lamb   (B) As happy as a lark
(C) As innocent as a fox   (D) As gentle as a feather

96 Which of the following is not a natural disaster?

(A) Drought   (B) Flood   (C) Hurricane   (D) Deforestation

97 Who is a 'martyr'?
(A) One who performs on stage
(B) One who writes books
(C) One who dies for a noble cause
(D) One who performs surgery

98 What is the full form of IAS?
(A) Indian Airlines Service
(B) Indian Administrative Service
(C) International Airline Shuttle
(D) International Administrative Service

99 Which musical instrument does Sri. M.S. Gopalakrishnan play?

(A) Violin   (B) Veena   (C) Flute   (D) Tabla

100 Identify the symbol of the currency of Japan.

(A) $ (B) ¥   (C) €   (D) ₹

Key for NSTSE-2013

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

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