National Level Science Talent Search Examination - 2012
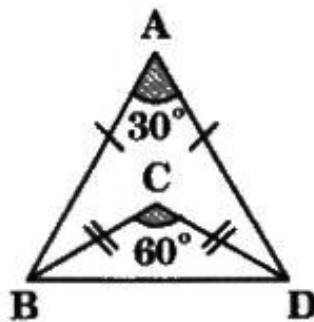
1 In the diagram, what is the measure of $\angle ABC$?

(A) 45° (B) 30° (C) 15° (D) 65°

2 If 23 integers are multiplied and the product is negative then which of the following statements can be true about them?

(A) 10 are negative, 13 are positive.

(B) 14 are negative, 9 are positive.

(C) 12 are negative, 21 are positive.

(D) 17 are negative, 6 are positive.

3 The vertical angle of an isosceles triangle measures $(5p-18)^{\circ}$ and one of the base angles measures $3p^{\circ}$. What is the value of p?

(A) 24   (B) 15   (C) 18   (D) 12

4 Which of the following divisions has the greatest quotient?

(A) $20 \div (-4)$ (B) $20 \div 4$ (C) $(-20) \div (-5)$ (D) $(-30) \div 5$

5 Of all the line segments that can be drawn to a given line from a given point outside it, which angle of inclination among the following alternatives has the shortest length?

(A) 55° (B) 60° (C) 70° (D) 65°

6 Due to virus problems, Bill Gates computer changes one fraction into another in a particular pattern. It changes $\frac{1}{3}$ into $\frac{7}{3}$, $\frac{1}{7}$ into 1 and $\frac{2}{5}$ into $\frac{14}{5}$. What fraction will the computer change into $\frac{3}{14}$?

(A) $\frac{1}{3}$ (B) $\frac{3}{2}$ (C) $\frac{2}{3}$ (D) $\frac{3}{98}$

7 $\triangle PQR \cong \triangle SRQ$ by SAS axiom. Which of the following is not a matching part?

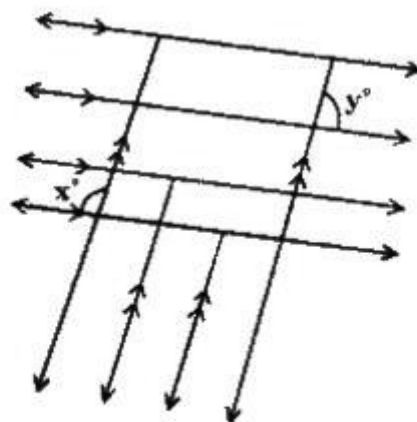(A) PQ = SR (B) $\angle PQR = \angle SRQ$ (C) PQ = SQ (D) QR = RQ

8 What value of 'P' makes the statement 'P $\div 3\frac{2}{5}$ = P' true?

(A) $\frac{17}{5}$ (B) $3\frac{5}{2}$ (C) 0   (D) 1

9 Harika wants to prove that $\triangle TUV \cong \triangle XYZ$ using RHS axiom. She knows that TU = XY and TV = XZ. What additional information does she need?

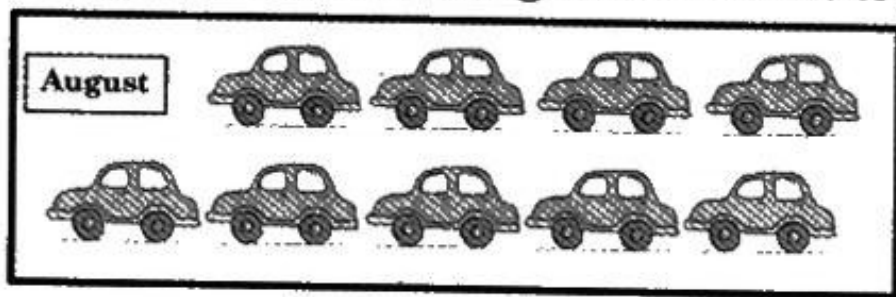(A) $\angle U = \angle Y = 90^0$ (B) $\angle T = \angle X = 90^0$

(C) $\angle T = \angle U = 90^0$ (D) $\angle X = \angle Z = 90^0$

10 In the adjoining figure, parallel lines are shown with similar markings. Find $\angle x$, if $\angle x = 5\angle y$.

(A) 30°   (B) 60°   (C) 150°   (D) 170°

11 In September, the number of NANO cars produced is $\frac{2}{3}$ of the number produced in August shown in the pictogram.

Key : Each [car] represents 50 NANO cars.

Find the number of NANO cars produced in September.

(A) 9   (B) 90   (C) 300   (D) 600

12 Sachin obtained 430 marks out of a maximum of 500 marks. What increase or decrease in % is required to get 90%?

(A) 3% increase   (B) 430 is 90% score

(C) 2% decrease   (D) 4% increase

13 The probability of raining on day 1 is 0.3 and on day 2 is 0.2. What is the probability of raining on both the days?

(A) 0.06   (B) 0.20   (C) 0.25   (D) 0.30

14 If the selling price of 10 pencils is equal to the cost price of 12 pencils, then decide the gain percentage.

(A) $16\frac{2}{3}$ %   (B) 18%   (C) 20%   (D) 25%

15 "I am a number,

Tell my identity!

Take me twelve times over,

And add a fifty!

To reach a double century,

You still need thirty!"

Who am I?

(A) 10   (B) 12   (C) 20   (D) 24

16 In how many years will ₹900 yeild an interest of ₹324 at 12% per annum simple interest?

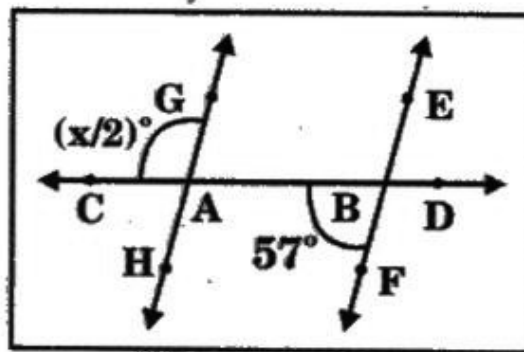(A) 1 year   (B) 2 year   (C) 3 year   (D) 4 year

17 After 12 years, Pravallika will be 3 times as old as she was 4 years ago. What is the present age of Pravallika?

(A) 16 years   (B) 15 years   (C) 14 years   (D) 12 years

18 In the following rational numbers, x is a positive integer. Which among these is the least?

(A) $\dfrac{-x}{3}$ (B) $\dfrac{-x}{4}$ (C) $\dfrac{x}{5}$ (D) $\dfrac{-x}{6}$

19 If EF is parallel to GH, then find the value of 'x'.

(A) 57^0 (B) 123^0 (C) 246^0 (D) 61.5^0

20 Akshay secured 76, 83, 70 and 83 marks in four tests. What is the least number of marks he has to secure in his next test, if he has to have a mean score of 80 marks in five tests?

(A) 82   (B) 84   (C) 86   (D) 88

21 How is quarter of 3% written as decimal?

(A) 0.0025   (B) 0.75   (C) 0.0075   (D) 0.25
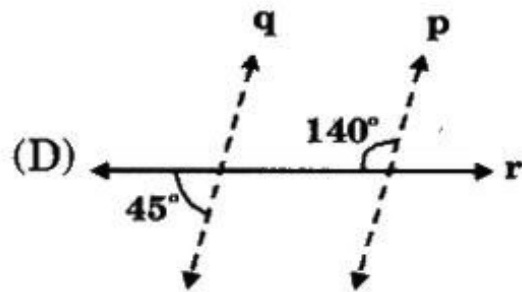
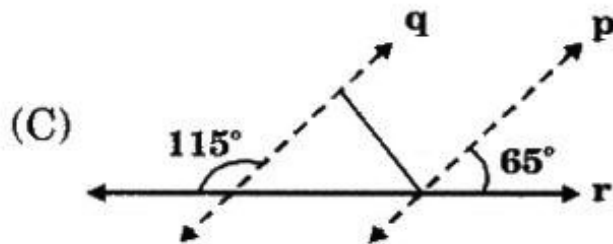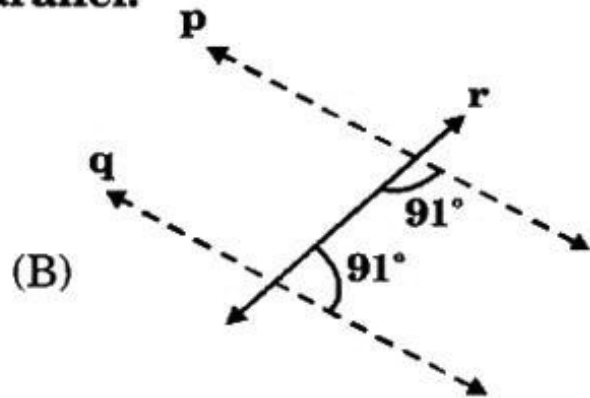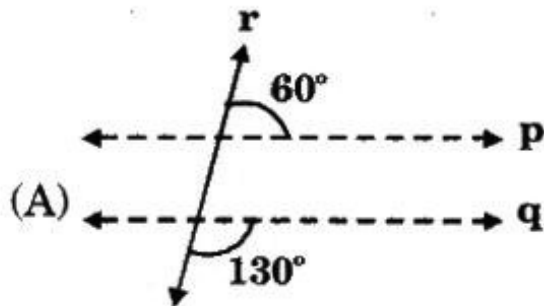**22** Find the value of the expression below.

$0 - 1 + 2 - 3 + 4 - 5 + 6 - 7 + 8 - 9 + \ldots$
$- 17 + 18 - 19 + 20.$

(A) − 10   (B) 0   (C) 10   (D) 20

23 What type of angles are the two acute angles in a right triangle?

(A) Supplementary angles   (B) Complementary angles

(C) Reflex angles   (D) Obtuse angles

24 Observe the diagram carefully and decide in which option, the pair of dotted lines is parallel.

25 If P : Q : R = 1 : 2 : 3 and P's investment is ₹ 15, 000, then what is the investment of R?

(A) ₹ 30, 000   (B) ₹ 40, 000

(C) ₹ 45, 000   (D) ₹ 50, 000

Class : VII	**Physics**

26 Which of the following is *not* in uniform motion?

> (i)   A bullet travelling with a constant speed in a straight line.
>
> (ii) A swinging pendulum.
>
> (iii) The rotation of earth.

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

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

27 In a Celsius scale, the lower fixed point on the Celsius scale is 'X' while the upper fixed point is 'Y'. What are 'X' and 'Y'?

	X	Y
(A)	Melting point of ice	Boiling point of water
(B)	Melting point of mercury	Boiling point of mercury
(C)	Melting point of ice	Boiling point of ice
(D)	Mean of melting point and boiling point of ice	Mean of melting point and boiling point of mercury

28 Which of the following letters will be seen without any change in a plane mirror?

(A) S   (B) T   (C) L   (D) P

29 For effective radiation of heat by an electric room heater, which of the following need to be done?

(A) Unclean   (B) Polish it to a shine

(C) Paint it to green   (D) Paint it black

30 A simple pendulum takes 8 s to complete 24 oscillations. What is the time period of the pendulum?

(A) 3 s   (B) $\frac{1}{3}$ s   (C) 4 s   (D) 0.25 s

31 What is rectilinear propagation?

(A) Mode of travelling in curved lines.

(B) Mode of travelling in straight lines.

(C) Ability to bend around obstacles.

(D) Displaying the phenomenon of diffraction.

32 Which of the following is NOT matched *correctly*?

(A) Speedometer : Speed
(B) Odometer : Odour
(C) Anemometer : Wind speed
(D) Stopwatch : Time

33 Why do cooking vessels usually have copper bottoms?

(A) Copper has low melting point.
(B) Copper is an insulator of heat.
(C) Copper is a good conductor of heat.
(D) Copper is cheap.

34 Observe the figure given below.
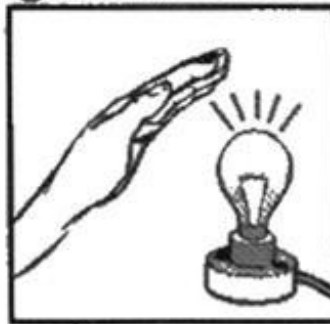
The hand feels the heat from the lighted bulb. Which effect of electric current is demonstrated by this?

(A) Heating effect   (B) Magnetic effect

(C) Lighting effect   (D) Chemical effect

35 Sunitha types 1800 words in half an hour. What is her typing speed in words per minute?

(A) 60   (B) 600   (C) 750   (D) 3000

36 On what factors does the radiation of heat depend?

(i)	The temperature of the substance
(ii)	The colour of the substance
(iii)	Medium to transfer the energy

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

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

37 **What are transparent objects?**

(A) Objects that allow light to pass through them.

(B) Objects that do not let light to pass through them.

(C) Objects that absorb some amount of light and allow the remaining to pass through them.

(D) Objects that reflect all the amount of light falling on them.

38 **In a marathon, Varun runs 800 metres in 2 minutes 40 seconds. What is his speed in metres per second?**

(A) $4 \, m \, s^{-1}$ (B) $5 \, m \, s^{-1}$ (C) $200 \, m \, s^{-1}$ (D) $1600 \, m \, s^{1}$

39 **Which of the following statements about solar cooker is correct?**

(A) Electricity is used to cook food.

(B) Chemical energy is converted to electrical energy.

(C) Radiation from the sun is used to cook food.

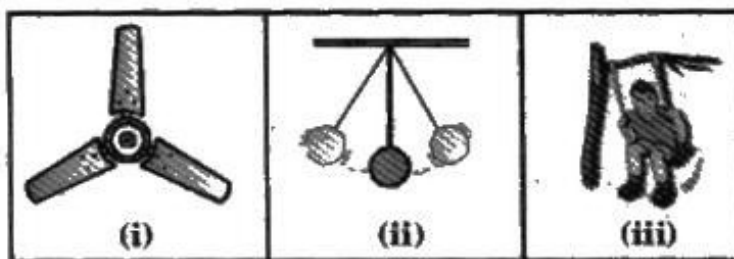(D) Heat energy is converted to light energy.

40 **Observe the figure given below.**
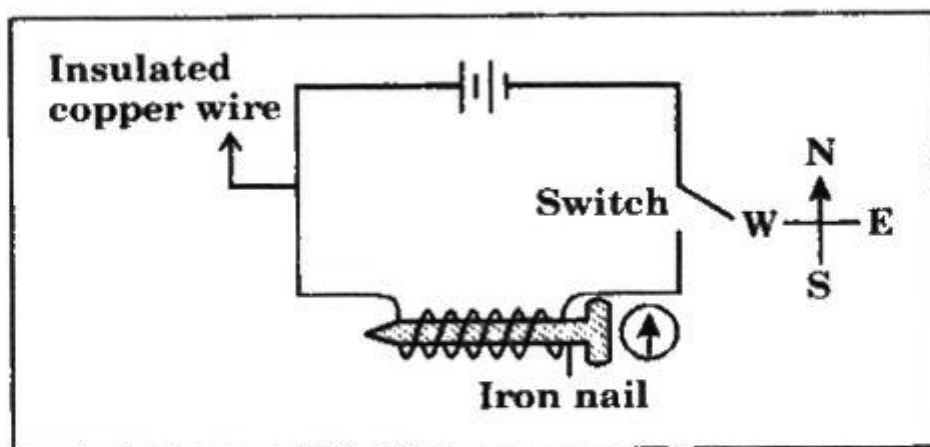
What will you observe in the compass shown in the above figure when the circuit is switched on?

(A) It points towards east.   (B) It points towards west.

(C) It points towards north.   (D) It points towards south.

41 **Which of the following shows oscillatory motion?**

(A) (i) and (ii) only   (B) (ii) and (iii) only
(C) (i) and (iii) only   (D) (i), (ii) and (iii)

42 **Why do woollen clothes keep us warm during winter?**

> (i) Air is a poor conductor of heat.
>
> (ii) Wool traps air in between the fibres.
>
> (iii) Air trapped helps the flow of heat from our body to the surroundings.

(A) (i) and (ii) only   (B) (ii) and (iii) only
(C) (i) and (iii) only   (D) (i), (ii) and (iii)

43 **Which of the following is *not* a scale of temperature?**

(A) Kelvin scale   (B) Celsius scale
(C) Fahrenheit scale   (D) Richter scale

44 **A man runs at a constant speed of 3.2 m s⁻¹, then what distance does he cover?**

> (i) 6.4 m in 2 seconds
>
> (ii) 192 m in 1 minute
>
> (iii) 32 cm in 1 second

(A) (i) and (ii) only   (B) (ii) and (iii) only
(C) (iii) and (i) only   (D) (i), (ii) and (iii)

45 **When do chemical reactions produce heat energy?**

(A) Energy required by reactants is more than the energy used in the formation of products.

(B) Energy required by reactants is less than the energy used in the formation of products.

(C) Energy required by reactants is equal to the energy used in the formation of products.

(D) All of the above

46 Observe the circuit shown below:
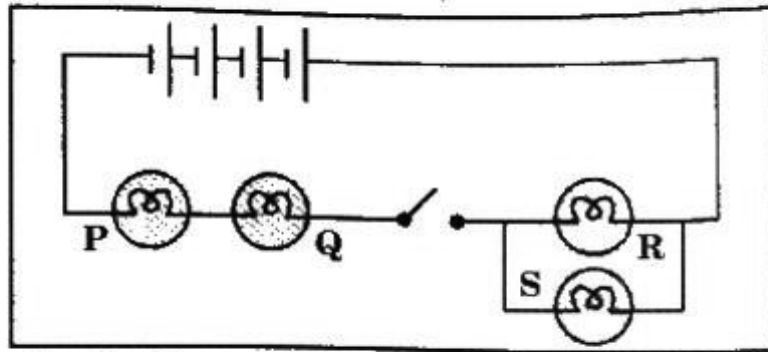
Identify the bulbs that glow when switch is in the 'OFF' position?

(A) P and Q only   (B) Only S

(C) R and S only   (D) None of the bulbs glow

47 A truck can travel 840 km on a full tank of 60 litres of diesel fuel. What is the fuel consumption of the truck?

(A) 14 km per litre   (B) 14 litre per km

(C) 140 km per litre   (D) 140 litre per km

48 What must be done to enable a mercury in a glass thermometer to respond quickly to changes in temperature?

(A) The bore should be narrow.

(B) The wall of stem should be thin.

(C) The bulb should contain a lot of mercury.

(D) The wall of glass bulb should be thin.

49 Which of the following is a natural source of light?

(A) Electric lamp   (B) Electric filament

(C) Torch light   (D) Sun

50 Observe the block shown in figure below.

Identify the motion described by the block on this frictionless path.

(A) Rotational   (B) Translatory

(C) Periodic   (D) Both (B) and (C)

51 **From where is the natural indicator litmus extracted?**

(A) Mycorrhizu (B) Lichens

(C) Mucor (D) Mycelia

52 **Adding salt to water makes it salty. Which of the following is *true* regarding this change?**

(A) It is a chemical change because a new substance is formed.

(B) It is a physical change because the original substances can be recovered.

(C) It is a chemical change because there is exchange of heat.

(D) It is a physical change because there is a slight change in colour.

53 **Study the chart given below.**
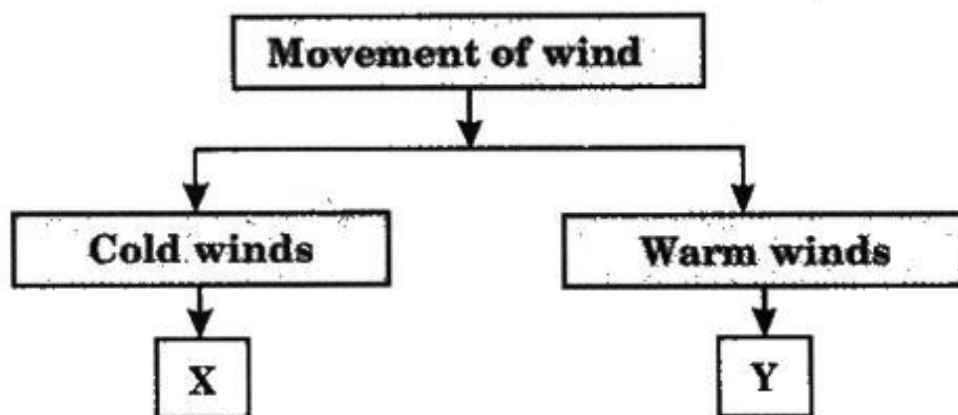
Identify 'X' and 'Y'.

	X	Y
(A)	Lateral	Vertical
(B)	Vertical	Lateral
(C)	Lateral	Lateral
(D)	Vertical	Vertical

54 Study the chart given below.

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                    ┌──────────┐
          ┌─────────│ Changes  │─────────┐
          │         └──────────┘         │
          ▼                              ▼
┌──────────────────────┐    ┌──────────────────────────┐
│ (i)   Photosynthesis │    │ (i)   Melting of ice     │
│ (ii)  Burning of coal│    │ (ii)  Salt water         │
│ (iii) Beating aluminium│   │ (iii) Evaporation of alcohol│
│       to make foil    │    │                          │
└──────────────────────┘    └──────────────────────────┘
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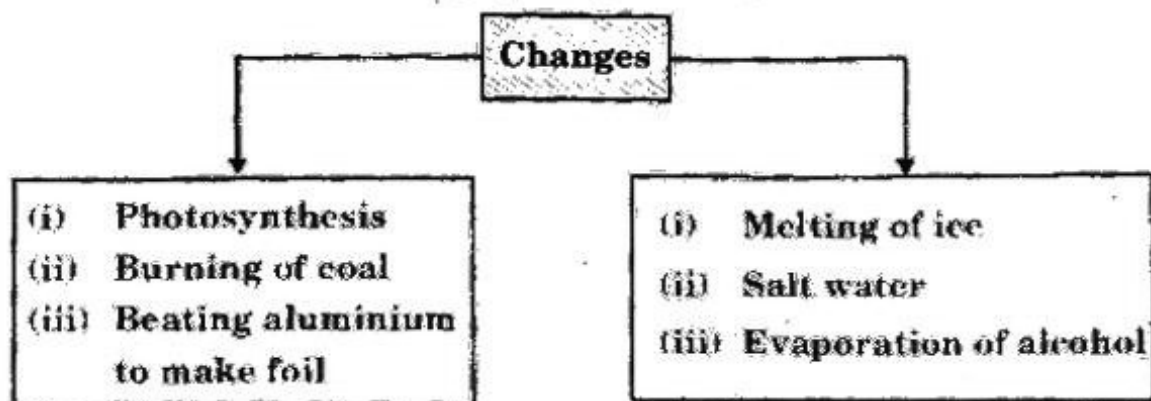
Based on the given chart, identify the odd example.

(A) Photosynthesis.

(B) Digestion of food.

(C) Beating aluminium to make a foil.

(D) Burning of coal.

55 A base reacts with an acid to form salt and water. What is this reaction called?

(A) Oxidation reaction.   (B) Neutralisation reaction.

(C) Reduction reaction.   (D) Ionisation reaction.

56 Which of the following is *not* affected by air pressure?

(A) Riding a bicycle against the wind.

(B) Flying a kite.

(C) Ball falling to the ground.

(D) Drinking a soft drink through a straw.

57 Sonu's mother prepares chapaties from wheat flour. What kind of change is undergone by wheat flour in the process?

(A) Physical change.

(B) Reversible chemical change.

(C) Irreversible chemical change.

(D) Change of state.

58 Upon heating gases become lighter. Why?

(A) Increase in molecular spaces.

(B) Decrease in molecular spaces.

(C) Breaking of molecules.

(D) Formation of new molecules.

59 When an ant bites, what kind of liquid is injected into the skin?

(A) Acid   (B) Base   (C) Salt   (D) Water

60 What kind of change is undergone by expansion of railway tracks during summer?

(A) Irreversible physical change.

(B) Reversible physical change.

(D) Irreversible chemical change.

(D) Reversible chemical change.

61 Identify the acid present in tamarind.

(A) Tannic acid   (B) Lactic acid

(C) Tartaric acid   (D) Citric acid

62 What is created temporarily behind a vehicle that moves very fast ?

(A) Low pressure   (B) High pressure

(C) Eye   (D) Cyclone

63 What does $Ba(OH)_2$ stand for?

(A) Beryllium hydroxide   (B) Barium hydroxide

(C) Boron hydroxide   (D) Bismuth hydroxide

64 Which of the following are *not correctly* paired?

(A) Sublimation – Physical change

(B) Precipitation – Physical change

(C) Decomposition – Chemical change

(D) Decantation – Physical change

65 The winds on the earth do not flow in the exact "north to south" or "south to north" directions. Why?

(A) Due to the seasons of the earth.

(B) Due to the shape of the earth.

(C) Due to rotation of the earth.

(D) Due to revolution of the earth.

66 Which of the following is a chemical change ?

(A) Foul smell coming out of spoiled food.

(B) Pollution of air caused due to explosion of fireworks.

(C) Change of colour of a cut apple if left outside.

(D) All of the above

67 Which of the following are *not* paired *correctly*?

(A) Baking soda - sodium hydrogen carbonate.

(B) Calamine - zinc carbonate.

(C) Slaked lime - calcium oxide.

(D) Common salt - sodium chloride.

68 Which of the following is NOT affected by a difference in air pressure?

> P - Hurricane
> Q - Tornado
> R - Volcano

(A) P and Q only   (B) Q and R only

(C) Q only   (D) R only

69 Identify washing soda from the following.

(A) $NaCl \cdot xH_2O$ (B) $Na_2CO_3 \cdot 10H_2O$

(C) $NaHCO_3 \cdot 5H_2O$ (D) $NaOH \cdot 3H_2O$

70 Which of the following changes caused by heat is irreversible?

(A) Change in size and temperature.

(B) Change in state.

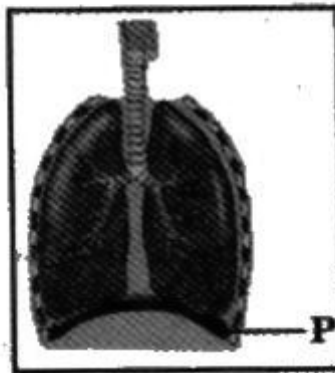(C) Change in colour.

(D) Change in substance.

71 Which of the following plants is an example of a total parasitic plant?

(A) Nepenthes   (B) Utricularia

(C) Cuscuta   (D) Drosera

72 Which of the following animals has incisors on its upper jaw?

(A) Cow   (B) Camel   (C) Sheep   (D) Buffalo

73 Observe the figure given below.

What happens when structure P curves upwards?

(A) Air is forced out of the lungs.

(B) The rib cage is pulled down.

(C) Air is forced into the lungs.

(D) The volume of the thoracic cavity increases.

74 Which of the following is an autotroph?

(A) Rafflesia   (B) Peaplant   (C) Mucor   (D) Mushroom

75 The following word equation shows a chemical process that takes place in an organism 'Y'.

Glucose → Ethylalcohol + Carbon dioxide

Which of the following is 'Y' ?

(A) Amoeba   (B) Hydra

(C) Yeast   (D) Chlamydomonas

76 Which of the following provides nutrients to the plants and makes the soil fertile?

(A) Gravel   (B) Humus   (C) Roundworms   (D) Tapeworm

77 Read the information given below.

> An animal bears strong claws, broad hip girdles, opposable thumb to grasp branches and prehensile tail as an additional arm.

Which of the following titles is best suitable to the given information?

(A) Terrestrial animal   (B) Aerial animal

(C) Arboreal animal   (D) Desert animal

78 Observe the figure given below.
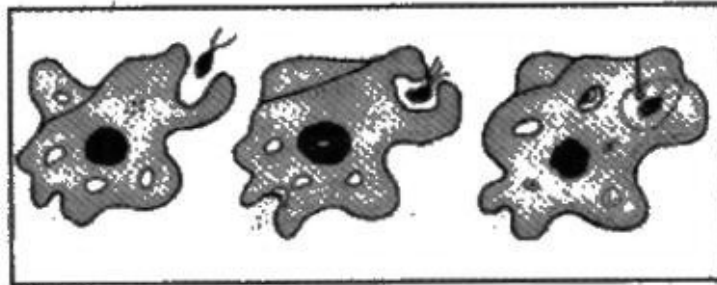
The given figure exhibits:

(A) Locomotion and movement in amoeba.

(B) Nutrition in amoeba.

(C) Respiration in amoeba.

(D) Defensive mechanism in amoeba.

79 The given figure is an example of:

(A) Symbiosis   (B) Parasitism   (C) Saprophyte   (D) Haustoria

80 Which of the following adaptations helps the animal given below to protect itself from extreme weather conditions?
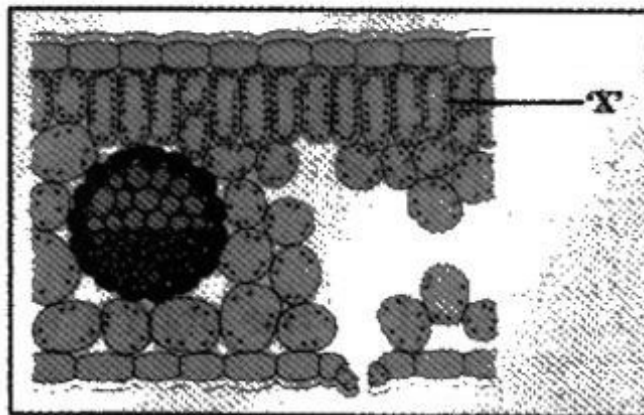

(A) Thick and heavy feathers   (B) Migratory nature

(C) Camouflage   (D) Arboreal habits

81 Caustic potash or potassium hydroxide has the property of absorbing which of the following gases?

(A) Oxygen   (B) Carbon dioxide

(C) Nitrogen   (D) Hydrogen

82 The given figure illustrates a section through a leaf.

Which of the following results if the part labelled 'X' is removed?

I.	Capture of energy will not take place.
II.	Production of carbohydrate will get affected.
III.	Production of protein will get affected.

(A) I and III only   (B) II and III only

(C) I and II only   (D) I, II and III

83 Which of the following is called the partially digested food in ruminants?

(A) Chyme   (B) Bolus   (C) Cud   (D) Sap

84 Which of the following set of animals exhibits cutaneous respiration?

(A) Grasshopper and cockroach   (B) Fish and snake

(C) Caterpillars and tadpole   (D) Earthworm and frog

85 Which of the following types of soil is used to make pots, toys and statues?

(A) Loam soil   (B) Clay soil

(C) Sandy soil   (D) Silt

86 The figure given below shows an animal.

How does the given animal protect itself from extreme weather conditions?

(A) It migrates to warmer places.

(B) It undergoes moulting.

(C) It undergoes hibernation.

(D) It has dry skin.

87 Which of the following words complete the statement given below?

Silk : Cocoon :: Wool : ?

(A) Stem of cotton plant   (B) Hair of rabbit

(C) Fleece of sheep   (D) Skin of goat

88 Which of the following is formed when bacteria breaks down the sugars present in the left over food in between the gaps of teeth ?

(A) Salts

(B) Bases

(C) Acids

(D) Calcium

89 Polar bear and Arctic fox have thick white fur on their bodies. Which of the following conditions does this adaptation help them?

(A) To keep their bodies cool.

(B) To make their bodies more visible.

(C) To mix with the surroundings and to keep their bodies warm.

(D) To get spotted easily by the hunters.

90 Match the words in Column-I with the words in Column-II.

	Column-I		Column-II
a	Yolk	i	Pupa stage
b	Sericulture	ii	Removal of fleece from the skin of sheep
c	Chrysalis	iii	Oily layer over the fleece
d	Shearing	iv	Rearing of silkworm

(A) a-i, b-ii, c-iii, d-iv

(B) a-iv, b-iii, c-ii, d-i

(C) a-ii, b-iv, c-i, d-iii

(D) a-iii, b-iv, c-i, d-ii

91 India celebrates its Independence Day on 15th August. Which other country celebrates its Independence Day on the same day?

(A) China   (B) Indonesia (C) South korea   (D) Pakistan

92 In which Indian City is the film "Slumdog Millionaire" set?

(A) Delhi   (B) Mumbai   (C) Chennai   (D) Kolkata

93 What is the minimum age for casting a vote in a general election in India ?

(A) 21 years   (B) 18 years   (C) 25 years   (D) 16 years

94 Which was actor Ranbir Kapoor's debut film ?

(A) Saawariya   (B) 3 Idiots
(C) Ajab Premki Gajab Kahani (D) Rock Star

95 Who invented the first steam locomotive?

(A) Alexander (B) Edison   (C) Stephenson (D) J. R. D. Tata

96 Which country is known as the 'Land of White Elephants'?

(A) Thailand   (B) South Africa (C) Malaysia (D) Ireland

97 Which was the last book in the Harry Potter Series ?

(A) Harry Potter & the Deathly Hallows
(B) Harry Potter & the Chamber of Secret
(C) Harry Potter & the Goblet of Fire
(D) Harry Potter & the Half-Blood Prince

98 Which city will host the next Olympic games in 2012 ?

(A) Beijing   (B) Berlin   (C) London   (D) Moscow

99 What is measured using a sphygmomanometer?

(A) Lung pressure   (B) Atmospheric pressure
(C) Pressure at the workspace (D) Blood pressure

100 What is the art of drawing or painting on stone called?

(A) Origami   (B) Orthography (C) Lithography (D) Topiary

Key for NSTSE-2012

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