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NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

Paper Code: UN436 (UPDATED)

Solutions for Class : 6

MATHEMATICS

1. **(C)** $0 \times 130 = 0$

2. **(D)** $2\overline{)6,\ 14,\ 16}$

$3,\ 7,\ 6$

LCM of 6, 14 and 16 = 336

3. **(C)** Amount given by Hari = ₹ 450

Part of amount spent on food

$= \frac{1}{9}$ of ₹ 450

Part of amount spent on clothes

$= \frac{2}{5}$ of ₹ 450

Total amount spent

$= \left(\frac{1}{9} + \frac{2}{5}\right)$ of ₹ 450

$= \frac{23}{45} \times$ ₹ 450 = ₹ 230

4. **(C)** Except 'C' option remaining are not polygons.

5. **(B)** Area of the poster

= 2.5 × 2.5 sq m

= 6.25 sq m

Area of the wall

= 10.5 × 8.5 sq m

= 89.25 sq m

Area of the wall to be painted

= (89.25 – 6.25) sq m

= 83.00 sq m

Cost of painting

= 83 × ₹ 12 = ₹ 996

6. **(B)** Let original number be 100

Given 25% increased ⇒ New number = 125

25% decreased ⇒ 125 – 20% of 125

= 125 – 25 = 100

7. **(B)** Given ratio = 3 : 4 : 5 = 3x : 4x : 5x

P and Q's marbles = 3x + 4x = 7x

∴ 7x = 315

x = 45

∴ R's marbles = 5x = 5 × 45 = 225

8. **(A)** 3000000 – 300 = 2999700

9. **(C)** Given l = 3b = 3 × 19mts = 57 mts

Area = l × b = 57 × 19 cm^{+2} = 1083 cm^{+2}

10. **(A)** Charge per minute for local call = ₹ 0.05

Number of local calls = x minutes.

∴ Charge for local calls = ₹ (0.05 x)

Charge per minute for long distance calls = ₹ 0.12

Number of long distance calls = y

∴ Charge of long distance calls

= ₹ (0.12 y)

Therefore, the required expression for total cost = ₹ (0.05 x + 0.12 y)

11. **(B)** $\frac{15}{16}$ mts $- \frac{9}{16}$ mts $= \frac{6}{16}$ mts $= \frac{3}{8}$ mts

12. **(D)** The increasing order of the given number is –30, –15, –4, –2, 0, 7.

13. **(A)** Smallest number = 23

Biggest number = 37

Difference = 37 – 23 = 14

14. **(A)** $36\frac{1}{3}-(12\frac{2}{5}+13\frac{1}{2}+5\frac{4}{15})$

$$=\frac{109}{3}-\left(\frac{62}{5}+\frac{27}{2}+\frac{79}{15}\right)$$

$$=\frac{109}{3}-\left(\frac{372+405+158}{30}\right)$$

$$=\frac{109}{3}-\frac{\overset{187}{\cancel{935}}}{\underset{6}{\cancel{30}}}$$

$$=\frac{218-187}{6}=\frac{31}{6}=5\frac{1}{6}$$

15. **(C)** Each ◎ represents 15 beads. There are 510 beads in the box.

∴ Number of symbols

$=\frac{510}{15}=34$

Number of symbols present on the graph $=10+9+8=27$

∴ Number of symbols to be drawn to represent yellow beads = 34 – 27 = 7.

16. **(A)** A square is a parallelogram.

17. **(A)** The predessor is 1 less than the given number and the successor is 1 more than the given number. Hence the required difference is 2.

18. **(A)** Sum of digits

= 5 + 7 + 4 + 3 + 2 + 5 + 1 + 7 + 9 + 2 = 45

∴ Given number is divisible by '9' and '3'

∴ '3' to be added to that number so that the new number is divisible by '3' but not by '9'

19. **(A)** 0, 1, 2, 3, 4 are not in descending order

20. **(A)** Vertex is common end point of two rays of an angle.

21. **(A)** 6 : 3 : : 5 : 15

3 × 5 = 6 × 15

15 ≠ 90

They are not in proportion.

22. **(A)** $3^3 – (–0.6)^3 = 27 – (–0.216) = 27 + 0.216 = 27.216$

23. **(D)** $81 \rightarrow 3 \times \boxed{3 \times 3 \times 3}$

$108 \rightarrow 2 \times 2 \times \boxed{3 \times 3 \times 3}$

HCF of 81 and 108 is 27

$\Rightarrow p + 3 = 27$

Hence p is 24.

24. **(B)** $x^2 + 12x + 36 = (x+6)^2$

$\therefore x = 64 \Rightarrow x + 6 = 64 + 6 = 70$

$\therefore (x+6)^2 = 70^2 = 4900$

25. **(D)** Total length of ribbon after attaching = (5.36 + 3.69) m

= 9.05 m

Length of ribbon used up = 2.72 m

∴ Length of ribbon left = (9.05 – 2.72) m

= 6.33 m

PHYSICS

26. **(B)** Rubber, glass and wood are good electrical insulators.

27. **(C)** The distance travelled by each cyclist is 400 m. The speed of each cyclist is 4 m/s, which means, each cyclist travels 4 meters in 1 second. The time taken for them to hit each other is $\frac{400}{4} = 100$ seconds.

The speed of naughty butterfly is 6 m/s, which means, it travels 6 meters in 1 second. The total distance travelled by the butterfly is 6 × 100 = 600 meters.

28. **(C)** When light is shone at the side of the cone, a triangular shadow is formed. When light is shone from the top of the cone, a circular shadow is formed.

29. **(C)** All magnets have two poles

30. **(A)** The given lengths in the increasing magnitude are:

1 micrometre 1 millimetre

1 centimetre 1 metre

1 kilometre

31. **(C)** Tungsten has a high melting point. Hence, it is used as a filament in electric bulbs.

32. **(B)** As the puppets are made up of opaque materials, their shadows are clearly formed on the screen.

33. **(B)** The force of attraction of a magnet is weakest at its centre at point Q.

34. **(B)** A torchlight is powered by dry cells which convert chemical energy to electrical energy. This in turn, is converted into light energy by the torch light.

35. **(C)** Millimetre and centimetre are units of length.

36. **(C)** Iron, tin and steel are all metals and good conductors of heat and electricity. Glass is a bad conductor of heat and electricity.

37. **(B)** P and T are unlike poles in a horse-shoe magnet that attract most of the paper clips.

38. **(C)** Figures shown in options (B) and (D) are not the correct ways of making a magnet.

39. **(C)** In rectilinear motion, bodies move from one point to another in a straight line. The minutes hand of a clock does not undergo translatory (rectilinear) motion. It merely rotates about the fixed point.

40. **(D)** The light that glow worms produce is known as biolumin escence. It occurs due to chemical reactions that take place inside the worms body which enables them to glow due to chemical energy. Chemical energy is a type of potential energy that is stored in the ponds of atoms and molecules.

41. **(B)** In circuit P $\rightarrow$ The bulb glows as it is a complete circuit.

In circuit Q $\rightarrow$ There is no cell and so no current flows to light up the bulbs.

In circuit R $\rightarrow$ The filament is broken in the bulb. So, the bulb does not light up.

42 **(C)** Shadows are formed because light rays cannot pass through the opaque bodies.

43. **(C)** As per the given figure, N and O are like poles, so they are repelled. Statements (A), (B) and (D) are not true.

(A) M and O are unlike poles

(B) N and O are like poles

(C) N will be attracted to P as they have unlike poles.

(D) P will not be attracted to M as they have like poles.

44. **(D)** Statements (A) and (B) are true.

45. **(C)** Ceramic articles do not conduct electricity.

46. **(D)** The plastic ruler as shown in the figure moves up and down at regular intervals of time. Hence, it is said to be in vibratory motion.

47. **(A)** Due to regular reflection on a smooth surface like a mirror, we see our image.

48. **(B)** Object H, a penknife is made up of magnetic material iron that got attracted to magnet G.

49. **(B)** The lengths of three different wires are:

J : 12 cm = 0.12 m ; K : 2.8 m

L : 203 mm = 0.203 m

The arrangement of the given wires from the longest to the shortest are K, L, J.

50. **(C)** The symbols of electrical components used in the construction of the given circuit are X – Battery, Y – Switch, Z – Bulb.

CHEMISTRY

51. **(D)** Kerosene burns in the presence of oxygen to form carbon diosxide alongwith light and heat. It is a chemical change that is not reversible.

52. **(A)** Tin is a metal. Metals are good conductors of heat.

53. **(B)** Pure substances do not have impurities as they are made up of only one substance.

54. **(A)** Both Nitrogen and hydrogen have undergone a chemical change. A new substance (ammonia gas) having different properties is formed. It is an endothermic change requiring high temperature and pressure.

55. **(B)** The material used to make window grills should be hard, strong and does not break easily. Metal is the best choice.

56. **(D)** Air is regarded as a mixture of gases because its composition changes from place to place.

57. **(C)** The correct order of rain formation is
$D \rightarrow B \rightarrow C \rightarrow A$

58. **(D)** All the given human and natural activities increase the amount of water vapour in air.

59. **(C)** Plastic is a man-made material. The other three objects are made up of materials obtained from natural sources.

60. **(C)** The rate of water evaporation (how fast liquid evaporates) depends on how wide the surface area is. The wider the surface area the quicker the evaporation process will take place, which is shown by the more amount of water lost in the beaker.

Beaker	Amount of water at the beginning	Amount of water at the end	Amount of water lost
1	100 ml	70 ml	30 ml
2	90 ml	75 ml	15 ml
3	80 ml	55 ml	25 ml
4	70 ml	65 ml	5 ml

There are several other factors that affect the rate of evaporation, such as:

- Temperature: The rate of evaporation is higher when the temperature is higher.
- Wind: The rate of evaporation is higher when there is more wind.

61. **(D)** Centrifugation is a method in which substances with particles of different weights are separated by rotating them in a machine at a high speed. Washing machines use the process of centrifugation to remove water from clothes to make them dry using centrifugal force.

62. **(B)** Fabric is soft and flexible.

63. **(A)** Fabric curtain is not a waterproof, object.

64. **(C)** The atmosphere is made up of 78% nitrogen, 21% oxygen and 1% water vapour and other gases (including 0.03% carbon dioxide).

65. **(C)** The eruption of volcanoes is a natural, non-periodic change.

66. **(D)** Statements (A) and (B) are true of water

67. **(D)** A brick is made up of clay which does not allow light to pass through it. It sinks in water and breaks easily when dropped from a height.

68. **(B)** When the temperature of water in a fish tank drops from 37°C to 30°C, it implies that water has lost heat.

69. **(A)** When a substance absorbs heat or heated continuously, it starts boiling. It is a fast, man-made process. When a substance absorbs heat from the sun or surroundings of its own and changes from liquid to gaseous state, it is called evaporation. Evaporation of water is a slow, natural process.

70. **(A)** In wheat flour, flour is the wanted component while husk (X) is the unwanted component. When cut paddy (Y) stalks are beaten on a stone, the grain seeds separate from their stalks.

BIOLOGY

71. **(B)** Recycling is the process of converting waster materials into new materials.

72. **(C)** Mushroom is a fungi. Fungus are saprophytes.

73. **(B)** Elbow joint is a hinge joint and shoulder is ball & socket joint.

74. **(A)** Citrus fruits are rich in vitamin C. Vitamin C reduces scurvy.

75. **(C)** 'Y' is a green seedling that needs air and water to live.

76. **(B)** The given feet are found in hen. Hen digs the ground for worms using the claws.

77. **(D)** Animals that hunts and kills its prey (animals) are called predators.

78. **(B)** Earthworm breathe through its moist skin.

79. **(A)** The part labelled as 'X' is called ovary.

80. **(C)** Joints found in knee and fingres is hinge joint. Elbow joint is hing joint.

81. **(D)** The fleshy stem of cactus is green coloured and help in photosynthesis.

82. **(C)** Culturing of silkworms is called sericulture.

83. **(D)** Humerus is the upper bone of the arm.

84. **(D)** Bat is a mammal. Hen, Owl and Ostrich are birds.

85. **(C)** Circulatory system helps to transport gases and nutrients, it regulates body temperature and fight with infection.

86. **(A)** Cow, rabbit, goat and elephant are herbivores.

87. **(A)** Carbohydrates are energy giving foods.

88. **(C)** Y in the given figure are plants. Plants are autotrophs.

89. **(A)** Corm, ginger and potato are the modified stem parts that are eaten as food stored in them.

90. **(D)** The egg white is rich in proteins on addition of copper sulphate and sodium hydroxide, white of egg change to bluish-violet colour.

GENERAL AWARENESS

91. **(A)**	92. **(A)**	93. **(A)**
94. **(Del)**	95. **(B)**	96. **(D)**
97. **(D)**	98. **(A)**	99. **(D)**
100. **(B)**		

The End