



UNIFIED COUNCIL

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NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

Paper Code: **UN439 (UPDATED)**

Solutions for Class : 6

MATHEMATIC

1. (A) 'A' is largest whose value is 75321
2. (A) $2x + 4 = x - 6$
 $2x - x = -6 - 4$
 $x = -10$
3. (C) Distance travelled by bus and train = 63.257 km
 Distance travelled by bus = 48.56 km
 \therefore Distance travelled by train
 $= (63.257 - 48.56) \text{ km}$
 $= 14.697 \text{ km}$
4. (A) Nissi marks = $92 - 15 = 77$
 Rishi marks = $77 + 4 = 81$
 Difference between Jessy & Rishi = $92 - 81 = 11$
5. (D) $\frac{3}{4}$ of $x = \text{Rs } 15,000 = x = 20,000$
 $\frac{1}{2}x = \frac{20,000}{2} = 10,000$
6. (A) Area of a photo = $12 \times 18 = 216 \text{ sq cm}$
 Cost of frame per square centimetre = ₹ 1.20
 \therefore Cost of framing = $216 \times ₹ 1.20$
 $= ₹ 259.20$
7. (D) Perimeter of the field = $2(l + b) = 2(135 + 78) = 2 \times 213 = 426 \text{ mts}$
 Distance covered for one round = 426 mts
 Distance covered for 4 rounds = $4 \times 426 \text{ mts} = 1704 \text{ mts}$.
8. (C) Numbers with 3 in numbers from 1 to 100 are 3, 13, 23, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 43, 53, 63, 73, 83 and 93.
 So, 3 appears 20 times.
9. (C) Rajani's amount = $\frac{3}{5} \times \text{Rs } 150 = \text{Rs } 90$
 Narmada's amount From Rajani
 $= \text{Rs } \frac{90}{2} = \text{Rs } 45$.
 Anu's remaining amount = $\text{Rs } 150 - \text{Rs } 90 = \text{Rs } 60$
 Narmada's received amount from Anu
 $= \text{Rs } \frac{60}{2} = \text{Rs } 30$
 Narmada's total amount = $45 + 30 = \text{Rs } 75$
10. (A) $2n - 1$ is 1 subtracted from the product of 2 and n .
11. (B) M & $M + 1$ are prime means both numbers must be 2 & 3.
 $\therefore m = 2$ & $m + 1 = 3$.
 $M(M - 2) + 1 = 2(2 - 2) + 1 = 0 + 1 = 1$
 Which is neither prime nor composite.
12. (B) A mixed fraction can be written as an improper fraction.
13. (C) $\triangle ABE$, $\triangle BEC$, $\triangle ABC$, $\triangle AED$, $\triangle EDC$, $\triangle ACD$, $\triangle ABD$, $\triangle BCD$ are there
14. (D) 256 is not a perfect cube.
15. (D) Division of whole numbers is neither closed, nor commutative nor associative.

$$16. \text{ (C)} \quad \frac{1}{2015} + \frac{2}{2015} + \frac{3}{2015} + \dots + \frac{2014}{2015}$$

$$= \frac{1+2+3+\dots+2014}{2015}$$

$$= \frac{2014 \times 2015}{2} \times \frac{1}{2015}$$

$$= 1007$$

$$17. \text{ (D)} \quad \text{Karan, Rahim, Kiran marbles ratio} = 2 : 5 : 7 = 2x : 5x : 7x$$

$$\text{Total marbles} = 2x + 5x + 7x = 14x$$

$$\text{Given } 14x = 280$$

$$x = 20$$

$$\text{Difference of marbles between kiran and kara} = 7x - 2x = 5x$$

$$= 5 \times 20$$

$$= 100$$

$$18. \text{ (D)} \quad \text{No. of stamps with Meena}$$

$$= 150 - (25 + 45 + 35)$$

$$= 150 - 105$$

$$= 45$$

$$19. \text{ (C)} \quad \text{HCF of } 56 \text{ \& } 77 = 7.$$

$$\therefore k - 8 = 7$$

$$K = 15$$

$$20. \text{ (A)} \quad \begin{array}{r|l} 5 & 20, 25, 35, 40 \\ 2 & 4, 5, 7, 8 \\ 2 & 2, 5, 7, 4 \\ \hline & 1, 5, 7, 2 \end{array}$$

$$\therefore \text{L.C.M} = 5 \times 2 \times 2 \times 5 \times 7 \times 2 = 1400$$

$$20 - 14 = 25 - 19 = 35 - 29$$

$$= 40 - 34 = 6$$

$$\therefore \text{The required number} = \text{L.C.M} - 6$$

$$= 1400 - 6 = 1394$$

$$21. \text{ (D)} \quad \text{If 'n' is negative then } n^2 \text{ is always positive.}$$

$$\therefore n^2 + 1 \text{ is always positive.}$$

$$22. \text{ (C)} \quad \text{Shaded area} = \text{Total area} - \text{unshades area}$$

$$= 4 \times 3 \text{ cm}^2 - 8 \times \frac{1}{2} \times 1 \times 1 \text{ cm}^2$$

$$= 12 \text{ cm}^2 - 4 \text{ cm}^2 = 8 \text{ cm}^2$$

$$23. \text{ (C)} \quad \text{Final height} = 250 + 50 - 125 = 175 \text{ mts}$$

$$24. \text{ (D)} \quad \text{Total loss} = - ₹ (48 + 57) = - ₹ 105$$

$$25. \text{ (B)} \quad 4\frac{1}{6}\% \text{ of } 600 = \left(\frac{25}{6}\right) \times \frac{600}{100}$$

$$= \frac{25}{600} \times 600$$

$$= 25.$$

PHYSICS

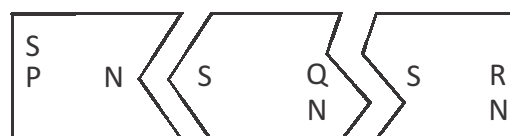
$$26. \text{ (D)} \quad \text{Adding a cell in position X increases chemical energy that flows through the circuit and makes the bulb glow more brightly.}$$

$$27. \text{ (D)} \quad \text{Both the star and the lightning give out their own light.}$$

$$28. \text{ (C)} \quad \frac{1}{10} \text{ cm} = 0.1 \text{ cm and } 1 \text{ cm} = 100 \text{ mm;}$$

$$\therefore 0.1 \text{ cm} = 1 \text{ mm}$$

$$29. \text{ (B)} \quad \text{If Q is the north pole, the poles at P and R are south pole and north pole respectively as shown below :}$$



$$30. \text{ (C)} \quad \text{The speed of an aeroplane is much more than that of clouds. Hence, the passenger feels that he is in motion. But there is no relative motion with respect to the interior of the aeroplane. Hence, he is at rest with respect to the interior of the plane.}$$

$$31. \text{ (D)} \quad \text{All the bulbs must have their metal tip and metal casing connected to the other components in the circuit in order to light up. In option (D), the bulb at the top does not have its metal casing connected to the rest of the circuit, so electric current cannot flow through it to light it up.}$$

32. (D) The property of light is used for comparing a transparent glass and an opaque glass like a mirror. When a transparent glass is coated on one side with a paint, it becomes opaque. Glass of an electric bulb is transparent and that of a mirror glass is opaque. When light falls on a mirror, it reflects back but does not undergo refraction nor it acts as a reflector. A reflector is a piece of glass or metal used for reflecting light in a required direction. Reflectors have wide use in photography and cinematography.
33. (A) Like poles of magnets repel but unlike poles of magnets attract. P - North pole, Q - South pole, R - South pole, S - North pole, T - South pole.
34. (C) If the two terminals of a cell are connected directly with a wire, then the chemicals get used up very fast and the battery will become dead.
35. (B) Kilometre is used to measure distance between Delhi and Agra.
36. (A) Electric current flows only when the path (circuit) is complete. Thread being an insulator (bad conductor) of electricity will not provide a continuity to the path of the current and hence no current will flow in the circuit and the bulb does not glow.
- To make the bulb glow, current must flow continuously through the bulb and all the parts of the circuit. Using a metal wire in the place of the thread will complete the circuit.
37. (B) Storing of magnets is correctly shown in figures P and R respectively, but in Q two like poles are placed together instead of opposite poles.
38. (B) 2 mirrors are used to make a periscope.
39. (B) $1 \text{ km} = 1000 \text{ m}$, $1 \text{ m} = 100 \text{ cm}$, $1 \text{ cm} = 10 \text{ mm}$. Therefore, the increasing magnitude is mm, cm, m, km.
40. (A) Bhavya concludes that the metal ball is a magnet because it moved away from the magnet due to repulsion.
41. (D) A very thin, high resistance tungsten filament of an electric bulb becomes white-hot and emits light. The tungsten filament of an electric bulb produces enormous heat but almost negligible heat is produced in the connecting wires of copper as it has very low resistance. Due to very high melting point, the tungsten filament can be kept white-hot without melting away.
42. (D) Graph shown in option (D) gives the correct length of a shadow of an object from 6 a.m. to 12 noon.
43. (C) The poles in a circular magnet are at the top and at the bottom of the magnet.



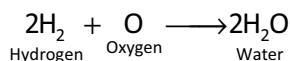
44. (C) All the given functions are performed by the cap of a cell. The main function of a cap of a cell is to act as a positive terminal.
45. (D) When light falls on a non-luminous object, it gets reflected. When this reflected light falls on our eyes, it causes a sensation of vision and enables us to see a non-luminous object.
46. (C) $1 \text{ h} = 3600 \text{ s}$
 $1 \text{ m} = 60 \text{ s}$
 $5 \text{ h} = 5 \times 3600 \text{ s} = 18000 \text{ s}$
 $25 \text{ min} = 25 \times 60 \text{ s} = 1500 \text{ s}$
 $\therefore 5 \text{ h } 25 \text{ min} = (18000 + 1500) \text{ s}$
 $= 19500 \text{ s}$
47. (B) Among the four magnets, magnet Q is the strongest as it attracted more number of thumbtacks.
48. (C) Among the four objects, only a cylinder produces both the shadows shown.
49. (A) (a) In the case of rotatory motion, a body remains in the same place with respect to time and rotates about an axis passing through it. Ex: Merry-go-round, potter's wheel, blades of a mixer grinder.

(b) In the case of circular motion, a body does not remain in the same place but it moves and changes its position with time. A body moves along a path whose axis will not pass through the body. Ex: Motion of the earth around the sun, a cyclist on a circular track, movement of a toy car on a circular road and motion of blades of a fan.

50. (C) Statements (A), (B) and (D) are correct of dry cells. All dry cells are not rechargeable is an incorrect statement. A dry cell consists of an electrolyte in the form of paste that undergoes chemical reactions when both the terminals are connected to a circuit to produce a very small electricity. On continuous use of a dry cell, the electrolyte paste becomes dry and it stops working.

CHEMISTRY

51. (C) Fermentation of cane juice is a chemical change.
52. (A) Sulphur dissolves in carbon disulphide solution. It is insoluble in water. By filtering a mixture of water and sulphur, sulphur remains on the filter paper and water flows down into the beaker. Sulphur is a water insoluble solid. So, it is separated from water by filtration.
53. (B) A metal ball is hard, strong, heavy and sinks in water.
54. (D) All the given activities explain the process of evaporation taking place.
55. (C) Both hydrogen and oxygen combine chemically to form water is a chemical change as given below.



Bending of a wire is only a change in its shape and not size. The lighting of a match stick is a fast, chemical change.

56. (D) Objects in options (A), (B) and (C) are grouped correctly. Leather handbag is not grouped correctly.
57. (C) 'W' does not have an atmosphere, so it is not a suitable place for living things to survive as living things need air to

breathe. X has no oxygen, so it is not a suitable place for living things to survive as they need to respire. As Y has oxygen for respiration and contains water, it is a suitable place for living things to survive. Oxygen makes up 21% of the air on the Earth. As Z has an atmosphere that is mainly made of carbon dioxide, it is not a suitable place for living things to survive.

58. (B) Lemon juice contains citric acid and it is added to milk to prepare paneer to remove water and obtain a protein called casein. It is further processed to obtain paneer. Milk contains lactic acid, protein called casein and water. Curd is prepared by adding previous day's curd or butter milk so that the protein globules come closer to form thick curd with the help of lactic acid bacteria by fermentation.
59. (B) Following are the correct processes:
Change of ice to water - melting
Change of water to ice - freezing
Change of water to steam - boiling
Change of water vapour to water - condensation
60. (B) Material R has all the properties suitable for making clothes for sports such as football and badminton. R is soft, light and elastic to enable easy movement during sports. It also allows sweat to evaporate quickly as it dries easily when wet, allowing the wearer to be comfortable and dry. The material cannot be water proof, stiff, hard or transparent.
61. (A) Alcohol and sugar are both water-soluble. Others are insoluble in water.
62. (B) On boiling, the composition of eggs changes. It is an irreversible change that is wrongly classified. Burning of wax is a chemical and irreversible change whereas melting of wax is a physical and reversible change.
63. (D) All the given properties are true of clear glass.

64. (A) If we breathe air through our mouth, the dust particles present in the air will enter the lungs and cause harm. But if the nose is used for breathing, the hair present in the nose filters the air and prevents the dust particles from entering the lungs.
65. (B) Condensation is the change in the state of water from the gaseous state to liquid state.
66. (D) Paper and cloth are not water proof. When these materials are placed in water, they absorb water and become completely wet after a day.
67. (D) When an electric bulb is switched on, the filament becomes white hot, and glows. The same filament is in the bulb when it is switched off, but it is cold and does not glow. No new substance is formed. Hence it is a physical and reversible change.
68. (D) The difference in one or more of the given physical properties of the constituents is utilised to separate the components of a mixture. It is based on physical state, density, size of constituents, solubility, magnetic properties, diffusion, ability to sublime, volatility and melting and boiling points.
69. (D) Saline water is hard due to dissolved salts in it. Therefore, it is not used for the given purposes.
70. (C) Sand comes from rocks, while glass is made from sand. Iron comes from ore in the ground. Wool and feather come from animals, while rattan and coffee come from plants. Clay comes from the ground.
73. (C) Coir is made from the fibre of coconut plant.
74. (A) Carrot is vitamin A rich food. Vitamin A prevents night blindness.
75. (C) Neck joint is pivot joint and thumb joint is saddle joint.
76. (C) In the given classification 'X' is terrestrial ecosystem.
77. (D) Balsam is a dicot have taproot system.
78. (A) Rose, hibiscus and bougainvillea are shrubs.
79. (A,B,C,D) Amla contain good amount of vitamins, calcium, phosphorous, iron, vit. B, vit C, protein, carbohydrates and cholersterol.
80. (D) Deficiency of vitamin D leads to rickets, softbones, muscle weakness and skeletal deformities.
81. (C) Mould is a saprophyte, rat is an omnivore and snake is carnivore.
82. (C) Gills are the respiratory organs of fish.
83. (C) Water is important for proper function of the body as it helps in dissolving many substance and provides medium.
84. (D) Frogs have endoskeleton made of cartilage, cockroach with exoskeleton and worm with hydrostatic skeleton.
85. (B) Stamen is the male reproductive part of flower that produces pollens.
86. (A) Movement of sunflower towards the sun is the response of plant towards stimuli.
87. (C) A grasshopper can hop away quickly and can compouffage itself in the grass to get protect on from its predators
88. (D) Fungi are decomposers. Decomposers are saprotrophs that recycle dead plants and animals into chemical nutrients.
89. (D) Stripes on skin help animals to blend with their surroundings to get protection from predators and to hunt.
90. (B) Heart, blood vessels and blood are parts of circulatory system.

BIOLOGY

71. (B) Blood is oxidised in lungs. Oxygenated blood from the lungs enters into the heart and transported or carried by blood to all parts of the body.
72. (A) Petals of most of the flowers are coloured to attract insects for pollination.

GENERAL AWARENESS

- | | | |
|---------|---------|------------------|
| 91. (C) | 92. (B) | 93. (D) |
| 94. (D) | 95. (D) | 96. (A) |
| 97. (C) | 98. (C) | 99. (D) 100. (B) |