NATIONAL TALENT SEARCH EXAMINATION-2018-19, GUJARAT

SCHOLASTIC APTITUDE TEST (SAT) HINTS & SOLUTIONS

1. (B)
    $$(A \cap B')' = A' \cup (B')' = A' \cup B$$

2. (C)
    Complementary = 90 – 23 = 67^0
    Complementary = 180 – 67 = 113^0

3. (B)
    60.5 – 55.5 = 5

4. (A)
    Area of Triangle $= \dfrac{1}{2} \times 6 \times 16 = \dfrac{1}{2} \times 8 \times CA$

    CA = 12 cm

5. (C) $x^2 + x - 6$

    $$x+3 \overline{\smash{\big)}\ x^3 + 4x^2 - 3x - 18}$$
    $$x^3 + 3x^2$$
    \- \-
    _____
    $$x^2 - 3x$$
    $$x^2 + 3x$$
    \- \-
    _____
    $$-6x - 18$$
    $$-6x - 18$$
    + +
    _____

6. (D)
    HCF $\times$ LCM = Product of two Numbers
    LCM = $\dfrac{384}{8} = 48$

7. (D)
    Sum of zeros = $\dfrac{-b}{a} = \dfrac{-5}{3}$

8. (C)
    Let the number xy = 7y = 7(10) + y = 70 + y

9. (B)
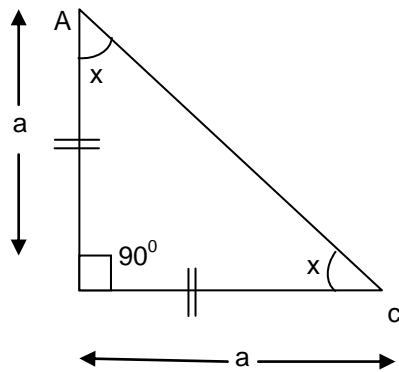
$\triangle ABC \square \triangle EFD$

$$\frac{AB}{EF} = \frac{BC}{FD} = \frac{AC}{DE}$$
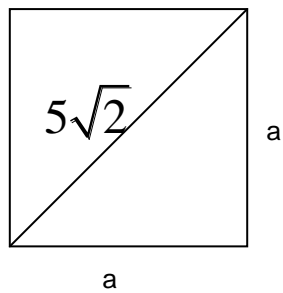
10.

(C)

$\angle x = 45^0$

By Pythagoras

AC = $\sqrt{a^2 + a^2}$

$= \sqrt{2a}$

Ab : AC = a : $\sqrt{2a}$

11.

By Pythagoras

$a^2 + a^2 = \left(5\sqrt{2}\right)^2$

$2a^2 = 25 \times 2$

a = 5 unit

12. (B)

13. (C)
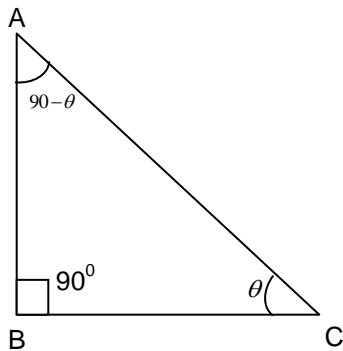
$\tan 5\theta . \tan 4\theta = 1$

Go by option put $\theta = 10$

$\tan 50 . \tan 40$

tan(90-40) tan40

∵ tan(90-θ)= cotθ

cot40tan40

=1

14. $\sin^2 A + \sin^2 B + \sin^2 C$

$\sin^2(90-\theta)+\sin^2 90+\sin^2(\theta)$

∵ $\sin(90-\theta) = \cos\theta$

$=\cos^2\theta+\sin^2\theta+1$

$= 1+1 = 2$

15.   (A)

16.   (A)

PLACE = $\dfrac{4}{52}$

P(NOT ACE) = $1-\dfrac{4}{52} = \dfrac{48}{52} = \dfrac{12}{13}$

17.   (D)

$P = \dfrac{7}{36}$

{(1,4)(4,1)(2,3)(3,2)(5,5)(4,6)(4,6)(6,4)}

18.   (D)

$K(x+\sqrt{3})(x-\sqrt{3}) = k(x^2-3)$

19.   (D)

$\dfrac{2}{3}x+\dfrac{3}{2}y=5$

Taking LCM

4x + 9 y = 30

4x +9y -30 = 0

20. (A) $\dfrac{317}{2^0 \times 5^4}$ Terminating

21. (B)

    100 m = ___ nm

    1 m = 10^9 nm

    100 m = 100 x 1m = 100 x 10^9 nm

    100 m = 10^{11} nm

22. (C)

    Bucky-ball of born atoms

23. (A)

    Refractive index of glass = $\dfrac{3}{2}$

    Refractive index of glass = $\dfrac{Speed\ of\ light\ in\ Vacuum}{Speed\ of\ light\ in\ glass}$

    $\dfrac{3}{2} = \dfrac{3 \times 10^8}{x}$

    So speed of light in glass = 2 x 10^8 m/s

24. (D)

    Snell's law

    $\dfrac{Sin\,i}{Sin\,r} = \dfrac{n_r}{n_i} = \dfrac{n_2}{n_1}$
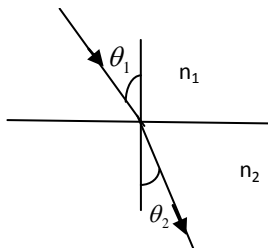
    $\dfrac{Sin\,\theta_1}{Sin\,\theta_2} = \dfrac{n_2}{n_1}$

    $\Rightarrow n_1 \sin\theta_1 = n_2 \sin\theta_2$

    Also

    $\dfrac{n_1}{n_2} = \dfrac{\sin\theta_2}{\sin\theta_1}$
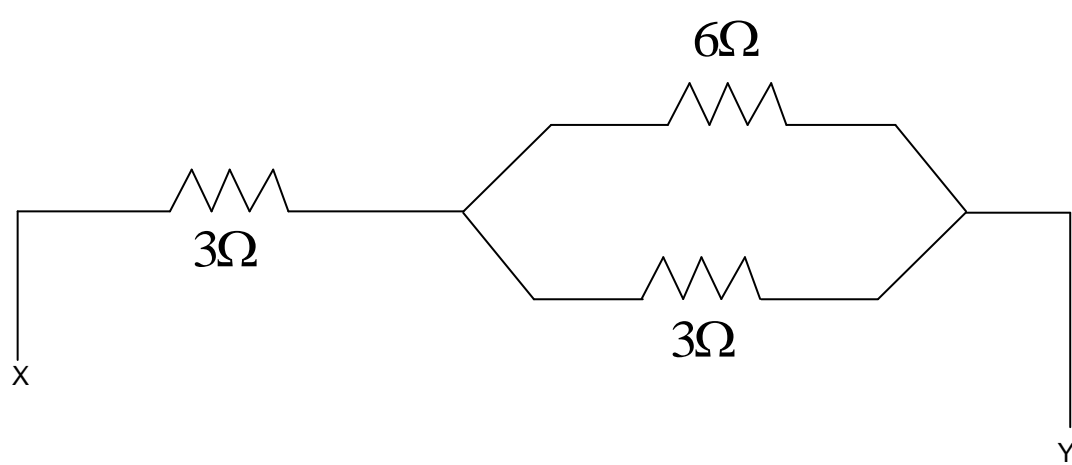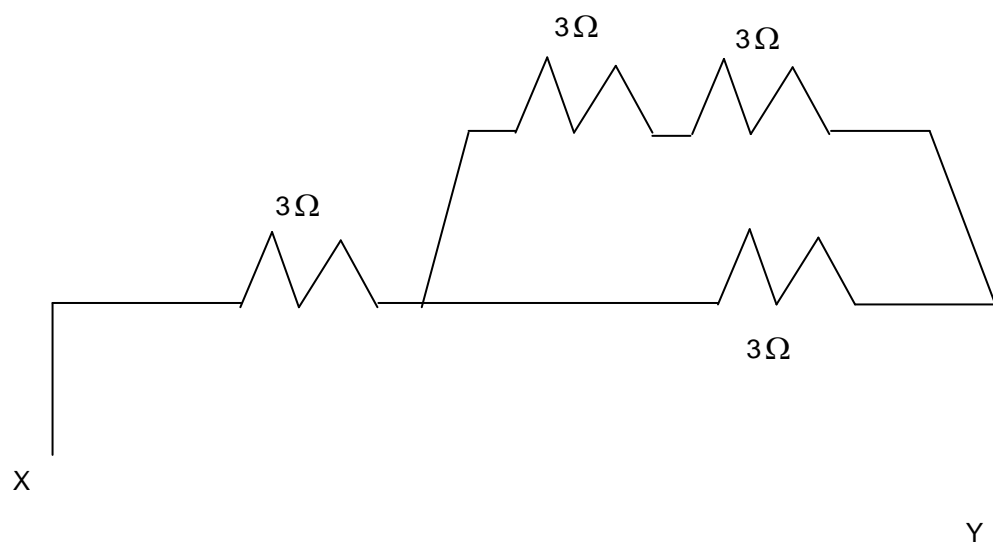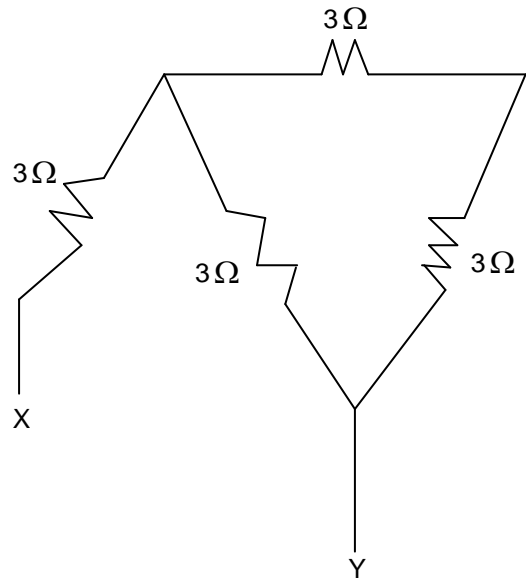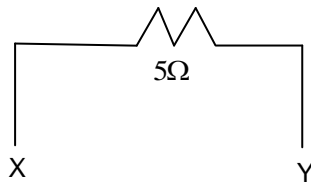
25. (D)

    National science day = 28 February

26. (B)

    In cataract, Eye lens becomes milky and cloudy and person lose their vision partially or completely.

27.   (A)

3Ω

3Ω

3Ω   3Ω

X

Y

3Ω   3Ω

3Ω

3Ω

X

Y

6Ω

3Ω

3Ω

X

Y

5Ω

X   Y

28.   (C)

E = W = I^{2}Rt

$$\Rightarrow R = \frac{W}{I^2 t}$$

$$P = \frac{V^2}{R}$$

P = I^{2}R

$$R = \frac{P}{I^2}$$

So option C is wrong

29.   (B)

Unit Electric potential difference is Joule per coulomb or J/C

30.   (C) non-metal oxide + water = acid

31.   (A) oxalic acid is an organic acid. It is a weak acid.

32.   (D) milk of magnesia is magnesium hydroxide solution Mg(OH)2.

33.   (C) gold is highly malleable metal. 1 gram gold can be stretched to 2 km length.

34.   (A) Bronze (copper + tin) is used to prepare statues

35.   (C) corrosion is a natural phenomenon.

36.   In lizard respiratory organ is lungs and crabs, Prawn and sepia are aquatic animals and respire through gills.

37.   Anaerobic respiration takes place is cytoplasm in absence of oxygen.

38.   Small intestine receives secretion from liver and pancreas by hepato-pancreatic duct.

39.   Pulmonary vein carries oxygenated blood from the lungs and pour into left auricle.

40.   Small intestine has small finger like projections called villi which contains lymph vessel and are responsible for absorption of lipids

41.   Birds and mammals require more energy then other vertebrates to perform their life processes

42.   parathyroid glands are four small glands which are embedded in the thyroid gland.

43.   Too much secretion of Growth hormone after adolescence causes the enlargement of certain parts like hand and Jaws giving appearance like gorilla.

44. Ozone layer absorbs harmfull UV rays between
    200 nm – 310 nm wavelength

45. (C) polythene, PVC (plastics), detergent and glass are non-biodegradable substances.

46. (A)
    Initial velocity (u) = 18 km/h

    $= 18 \times \dfrac{5}{18}$ m/s

    U = 5 m/s.
    Final Velocity (v) = 36 km/h

    $= 36 \times \dfrac{5}{18} m/s$

    V= 10 m/s
    Time taken (t) = 5 sec.

    Acceleration (a) = $\dfrac{v-u}{t}$

    $= \dfrac{10-5}{5}$

    = 1 m/s^2

    Ans. A

47. (C)
    Si unit of momentum kg ms^{-1}

48. (B)
    Mass of moon = 7.4 x 10^{22} kg

49. (D)

    45 Steps
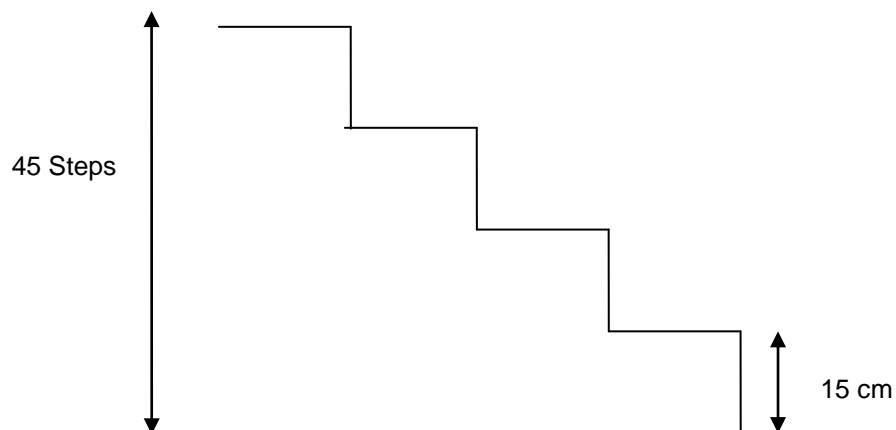
    15 cm

    Mass of boy = 50 kg
    Height of step = 15 cm

$$= 0.15 \text{ m}$$

No of steps = 45

So total height of steps

= 45 x 0.15

$$h = \frac{27}{4} m$$

Work done by the boy = mgh

$$= 50 \text{ x } 10 \text{ x } \frac{27}{4}$$

Time taken = 9 sec

$$\text{Power} = \frac{\text{work done}}{\text{time taken}} = \frac{50 \times 10 \times 27}{4 \times 9} = 375 W$$

50. (C)
As we go solid to gaseous state
Density of medium decreases so speed of sound also decreases.

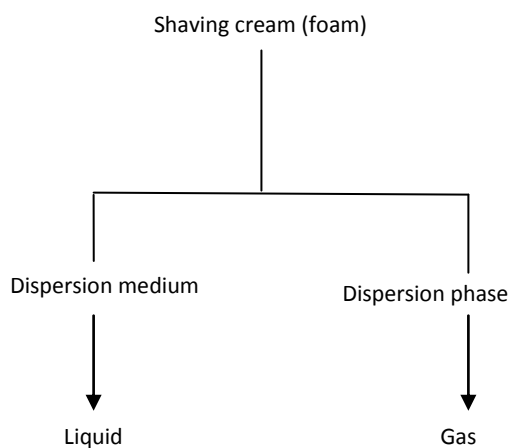51. (A) Carbon has 4 valency.

Element.   C   Cl

Valency.   +4   -1

Molecular formula of compound. CCl_4

52. (B) According to Bohr model of atom maximum 8 electrons can be accommodated in outermost orbit (except He atom).

53. (A)Ice melts at 273.15K temperature.

Shaving cream (foam)

Dispersion medium   Dispersion phase

Liquid   Gas

54.

(D) shaving cream is foam type of colloidhaving liquid as dispersion medium and gas as dispersed phase.

55.   (C) Lavoisier attempted to give explanatory definition of element.

56.   Lysosome acts as suicidal bag because it digest whole cell or part of it in the case of damage of cell.

57.   Phloem is made up of different type of tissues , so it is called complex tissue.

58.   Marchantia is the member of bryophayta

59.   Octopus is included in phylum mollusca

60.   Effect of Asthma on human body are strong and long term so it is called chronic disease.

        .