Sat Sol:

1. $q = 3 \text{ x } 1.6 \text{ x } 10^{-19} C$, $V = 10V$, $W = ?$

   $W = qV$

   $W = 3 \text{ x } 1.6 \text{ x } 10^{-19} \text{ x } 10$

   $W = 4.8 \text{ x } 10^{-18} \text{ J}$

   In moving one Lithium Nucleas, work done is 10 J
   So in moving 10 nucleus

   $W' = 10W$

   $= 4.8 \text{ x } 10^{-17} \text{ J}$

2. Direction of Magnetic field produced near a current carrying wire is given by right hand thumb rule (direction only) and was discovered by Hans Oerested.
   Direction of electric current is generated in a conductor moving in a magnetic field can be find out by using Fleming's Right hand rule and was discovered by Michael Faraday

3. M.R.I is Magnetic Resonance Imaging and is based on the magnetic effect of electric current.

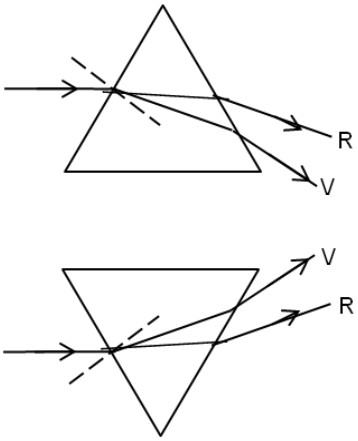
4. As we know

   $\mu_{diamod} > \mu_{rock\ salt} > \mu_{water} > \mu_{air}$

   So speed of light

   $V_{diamond} < V_{rock\ salt} < V_{water} < V_{air}$

   $V_3 < V_1 < V_2 < V$

5. 

   Form figure we can see that deviation in violet is maximum in both cases, as violet remains near the normal in both cases.

6. The order of the parts of eyes are cornea, iris, pupil, lens, retina.

7. By analysing the graph
   For March

   $300 \text{ x } 3.50 = 1050 \text{ Rs}$

   For April

   $500 \text{ x } 4.50 = 2250 \text{Rs}$

   For May

   $500 \text{ x } 4.50 = 2250 \text{ Rs}$

   For June

   $300 \text{ x } 2.50 = 750 \text{ Rs}$

   Total = $1050 + 2250 + 2250 + 750 = 6300 \text{Rs}$

8. When object is placed at focus, it gives maximum magnification as the image is formed at infinity.

9. $h_1 = 3cm,\ f = +15cm,\ h_2 = -15cm, u = ?,\ v = ?$

   We know that

$$m = \frac{h_2}{h_1} = \frac{v}{u}$$

$$\frac{-15}{3} = \frac{v}{u}$$

$$-5u = v$$

$$\therefore \frac{1}{v} - \frac{1}{u} = \frac{1}{f} \Rightarrow \frac{1}{-5u} - \frac{1}{u} = \frac{1}{15}$$

$$\frac{-1-5}{5u} = \frac{1}{15} \Rightarrow u = -18\,cm$$

$$\therefore v = +90\,cm$$

10. From n to n_1 light passes without deviation. So it means n= n_1 and this concave lens behaves as converging lens (opposite behaviour) in this case so,

$$n_2 > n_1 = n$$

11. $Sn^{th} = u + \frac{1}{2}a(2n-1)$

So it depends on initial velocity (Most appropriate answer)

12. K.E is maximum at mean position means at A.
Acceleration is maximum at extreme position means B and C

13. P = 300 W, time per day = 1.5 hrs.
Rupees per unit = 3.50, time in days = 30 days
Cost for one day
= P x t x Ruppes
$= 0.3$ x 1.5 KW / hr x 3.50
$= 4.5$ x 3.50 Rs
Cost for 30 days
$= 0.45$ x 3.50 x 30
$= 47.25$ Rs

14. A, C and D are halogens.

15. On moving left to right in periodic table, electro negativity increases.

16. H_2S is reducing agent as it is undergoing in oxidation SO_2 is oxidising agent as it is undergoing in reduction.

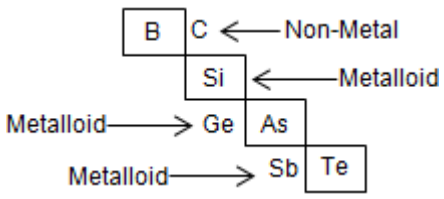
17. Fact

18. $CuCl_2 + H_2SO_4(aq) \rightarrow CuSO_4(aq) + HCl_{(g)} \uparrow$

19. (a) tomato juice, $pH = 3$ to 4
(b) Vinegar pH = 2 to 3
(c) Washing soda pH above 7
(d) human blood pH > 7

20. According to reactivity series

21.



22. 3, Propanoic Acid

23. $C_2H_4O_2$ is ethamoic acid

$$CH_3COOH + NaHCO_3 \rightarrow \underset{\text{effervescence}}{CH_3COONa + H_2O + CO_2 \uparrow}$$

24. Fact

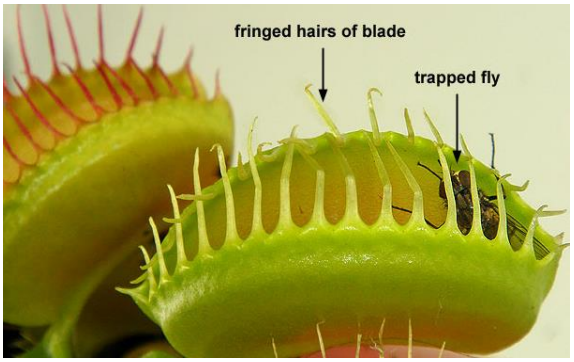
25. Fact

26.

K	L	M	N
2	8	8	2

27. urea, uric acid and ammonia are harmful products of biochemical reaction but lymph is not produced by biochemical reaction

28. (1) (D)



(2) (C)

(3) (A)

(4) (B) Lotus flower open in the morning and petals fall in the afternoon.

29. Humans show Holozoic mode of nutrition which follows option (1)

30. The label (A) is dendrite where the environmental information is picked in the neuron.

31. Cytokinins

32. Hydra reproduces by budding, fragmentation

33. 2 male gametes in angiosperms are required for the formation of seed (1 male gamete fuses with the egg to form the zygote and the second male gamete fuses with the two polar nucleus to form the triploid endosperm). Therefore 25 seeds 50 male gametes are involved

34. The basis process in reproduction is a creation of DNA copy, because DNA is the genetic material

35. Lungfish is a connecting link between Pisces and amphibian

36. The F_2 ratio is 9 : 3 : 3 : 1. The 9/16 of 320 = 180, shows yellow and round phenotype

37. The burning of rice straw produces green house gases like CO_2, CH_4, SO_2 etc.,

38. The biomedical waste like syringes is not handle properly can transmit disease like AIDS

39. Family is the category the lies between genus and order

40. Earthworm belongs to Annelida Phylum.

81. $\text{Sum} = 5x^2 - 5n$

$a_1 = S_1 = 5(1)^2 - 5(1) = 0$

$a_2 = S_2 - S_1 = 10 - 0 = 10$

$a_3 = S_3 - S_2 = 5(3)^2 - 5(3) - 10 = 20$

$\Rightarrow d = a_2 - a_1 = 10$

$\Rightarrow a_{10} = a + 9d = 90$

Option (2) is correct

82. $\frac{a}{x+y} = \frac{b}{y+z} = \frac{c}{z-x} = k$

$a = k(x+y)$

$c = k(z-x)$

$a + c = k(y+z) = b$

So, option (4) is correct

83. $\alpha - \beta = 2$

$\alpha^3 - \beta^3 = 98$

$\Rightarrow (2+\beta)^3 - \beta^3 = 98$

$\Rightarrow 8 + \beta^3 + 6\beta(\beta+2) - \beta^3 = 98$

$\Rightarrow 6\beta(\beta+2) = 90$

$\Rightarrow \beta^2 + 2\beta = 15$

$\Rightarrow \beta = \frac{-2 \pm \sqrt{4-(-60)}}{2}$

$= \frac{-2 \pm \sqrt{64}}{2}$

$\beta = \frac{-2 \pm 8}{2}$

$\beta = \frac{-2 \pm 8}{2}$ or $\beta = \frac{-2-8}{2} = -5$

$\beta = 3$ or -5

$\Rightarrow \beta = 3, \alpha = 3 + 2 = 5$

$\Rightarrow \beta = -5, \alpha = -5 + 2 = -3$

$\Rightarrow x^2 - (\alpha+\beta)x + \alpha\beta$

$(3,5) \Rightarrow x^2 - 8x + 15$

$(-3,-5) \Rightarrow x^2 - (\alpha+\beta)x + \alpha\beta = 0$

$\Rightarrow x^2 - (-8)x + 15 = 0$

$\Rightarrow x^2 + 8x + 15 = 0$

So, option (1) is correct

84. No. of heart cards = 13
Total cards = 52
But face club are removed
So, total cards remained = 52 – 3 = 49.

Probability that the card drawn is a Heart card $= \frac{13}{49}$

So, option (2) is correct

85. Let speed of boat in still water = x km/hr
Let speed of stream = y km/h
Net speed of Boat for upstream = (x – y) km/hr
Net speed of Boat for downstream =(x + y) km/hr

$\frac{30}{x-y}+\frac{28}{x+y}=7$ .....(1)

$\frac{21}{x-y}+\frac{21}{x+y}=5$ ....(2)

Equation :

$\frac{2}{x-y}+28\left[\frac{1}{x-y}+\frac{1}{x+y}\right]=7$

$\frac{2}{x-y}+28\times\frac{5}{21}=7$

$\Rightarrow \frac{2}{x-y}=7-\frac{140}{21}$

$\Rightarrow x-y=6$ .....(3)

Put $x-y=6$ in (1) equation

$\Rightarrow x+y=14$ ....(4)

From (3) & (4)

$\Rightarrow 2x=20$

$x=10\,km/hr$

So, option (1) is correct

86. Total Marks = 600
Marks in Maths = 60
Let marks scored by a students in the exam = x

$x\times\frac{60^o}{360^o}=60$

$\Rightarrow \frac{x}{6}=60$

$\Rightarrow x=360$

$\%of\ marks=\frac{360}{600}\times100=60\%$

So, option (1) is correct

87. $\sqrt{m^4n^4}\times\sqrt[6]{m^2n^2}\times\sqrt[3]{m^2n^2}=(mn)^k$

$\Rightarrow (mn)^2\times(mn)^{1/3}\times(mn)^{2/3}=(mn)^k$

$\Rightarrow (mn)^3=(mn)^k$

$\Rightarrow k=3$

So, option (2) is correct

88. Let's cost of guavas = Rs x.
Let's cost of apples = Rs y.

$20x+5y=12x+7y$

$\Rightarrow 8x=2y$

$\Rightarrow y=4x$

So, option (3) is correct

89. Let's total students = x.
< 20 = 10% of total students
20 - 40 = 20% of total students
40 – 60 = 35% of total students
60 – 80 = 20% of total students

80 – 100 = 30 students = $[100-110+20+35+20]\%$ of x.

$\Rightarrow 30^2 = \frac{15}{100} \times x$

$\Rightarrow x = 200$ students

So, slab (40 – 60) will have higher no. of students option (2) is correct.

90. One of the Root of Quadratic equation $= 3-\sqrt{2}$

Another conjugate will be = $3+\sqrt{2}$

Sum of the roots = 6

Product of the roots =

$(3-\sqrt{2})(3+\sqrt{2}) = 9-2$

$= 7$

$\Rightarrow x^2$ – (sum of the roots) x + product of the roots = 0

$\Rightarrow x^2-6x+7=0$

So, option (4) is correct.

91. $\frac{4\sqrt{5}}{AC} = \frac{4}{4\sqrt{5}}$

$AC = 20$

$BC = 8\sqrt{5}$

Area $(ABC) = 80$ sq. unit

92. $\frac{4\left(\frac{9}{4}a\right)^2 - 4a^2}{4a^2} \times 100\%$

$= 125\%$

93. $\sin x = 1$

So, $x = 90°$

94. Centroid $= \left(\frac{1+2+6}{3}, \frac{-9+5+7}{3}\right)$

$= (3,1)$

95. $\frac{5}{10} = \frac{SQ}{12}$

$SQ = 6$

$PQ = x$

$x(x+6) = 8 \times 20$

$x = 10$

96. $\frac{ar(AOB)}{ar(ABD)} = \frac{\frac{1}{2} \times h \times OB}{\frac{1}{2} \times h \times BD} = \frac{y}{4y} = \frac{1}{4}$

97. Perimeter of hexagon $= \frac{2}{3} per(ABC)$

98. $\frac{\sin^2\theta - \cos^2\theta}{\cos^2\theta} = \tan^2\theta - 1$

99. Volume of water comes out

$= 288\pi - (588\pi - 392\pi)$

$= 92\pi$

100. $\frac{4\sqrt{5}}{8} = \frac{x}{4\sqrt{5}}$

$x = 10$