NTSE SAT ANSWER 2015

1.	2	16.	2	31.	3	86.	3
2.	1	17.	4	32.	2	87.	4
3.	4	18.	1	33.	1	88.	2
4.	3	19.	1	34.	4	89.	4
5.	2	20.	3	35.	3	90.	1
6.	1	21.	2	36.	3	91.	1
7.	3	22.	3	37.	1	92.	wrong que.
8.	4	23.	1	38.	2	93.	2
9.	No Solution	24.	2	39.	1	94.	3
10.	1	25.	2	40.	2	95.	2
11.	3	26.	2	81.	1	96.	3
12.	2	27.	1	82.	2	97.	1
13.	2	28.	2	83.	2	98.	2
14.	2	29.	1	84.	4	99.	1
15.	2	30.	2	85.	2	100.	3

PHYSICS SOLUTIONS

1. (2)
Solution:
Phase

2. (1)
Solution.
Zero, avg of random velocity (motion) is zero here

3. 4
Solution.
Alternating current.

4. 3
Solution.
Rayleigh scattering has dependence on size of particle as well as wavelength of light.

5. 2
Solution.
Let speed in air = V
In the medium = 0.6 V

$\therefore$ refractive index of medium w.r.t. air $= \dfrac{1}{0.6} = \dfrac{5}{3}$

$= 1.67$

6. 1
Solution.
Thicknening of eye lens $\Rightarrow$ move stressed eye
Focal length decreases $\Rightarrow$ cilliary muscle contract
I – B – i

7. 3
Solution.
Hydrogen ion $\Rightarrow$ proton
net flow is 3 x 1 x 10^{18} electrons travelling left

$\therefore$ current $= \dfrac{ne}{t} = \dfrac{3 \times 1 \times 10^{18} \times 1.6 \times 10^{-19}}{1} = 4.8 \times 10^{-1}A = 0.48$

8. 4
Solution.
Tangent of field line gives local direction.

9. No Solution
Solution.
Tap key to keep circuit open   I – C – iv
Ammeter to be connected in series   II – A – i
Voltmeter to be connected in parallel.   III – d – ii
Galvenometer detects presence of current   IV – b – iii

No choice is correct
In option 4 $\Rightarrow$ ii & i is replaced, to be it correct.

10.   1
Solution.
    Virtual image can be produced by other optical insinemt.

11.   3.

12.   2.

Chemistry Solution
14.   NO of elements is
    1st period -2   H-He   (1 – 2)
    2nd period -8   Li-Ne   (3-10)
    3rd period -8   Na-Ar   (11-18)
    4th period -18   K-Kr   (19-36)

    Answer – 2

15.   Antacids are used for indigestion
    Ex - $Mg(OH)_2$
    Answer – 2

16.   Mercury ore is cinnabar (Hg5)
    Bauxite - $Al_2O_3.2H_2O$

    Haematite - Fe_2O_3

    Cinnabar – Hg5
    Dolomite - $MgCO_3.CaCO_3$

    Answer – 2

17. $KNO_3 + H_2O \longrightarrow K^+ + NO_3^- + H_2O$
    Temperature of solution falls endothermic reaction

    Answer - 2

18.   Ammonium chloride is salt of weak base and strong acid
    $NH_4OH + HCl \longrightarrow NH_4Cl + H_2O$

    Answer – 4

19. $CH_3 - CH = CH - CH_2 - CH_3$
       1   2   3   4   5
    2-pentene or pent – 2-ene
    Answer – 1

20.   Oxygen electron dot structure

    $: \overset{..}{O} :: \overset{..}{\underset{.}{O}} :$

    Oxygen – 8 - $1s^2 2s^2 2p^4$ ($6e^0$s in valence shall)

    Answer – 1

21.   Eka – Aluminium can form an oxide like
    Aluminium i e Ga_2O_3 (like Al_2O_3)

    Answer - 3

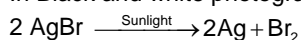22.   Pure copper acts as cathode and impure copper acts as anode

Answer - 2

23.   (1) $CuO + H_2 \longrightarrow H_2O + Cu$ (single displacement)

     (2) $Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$ (single displacement)

     (3) $AgNO_3 + NaCl \longrightarrow AgCl + NaNO_3$ (Double displacement)

     (4) $Zn + 2HCl \longrightarrow 2nCl_2 + H_2$ (Single displacement)

Answer – 3

24. H_2O

    2: 16 = 1:8

    Answer – 1

25.   In Black and white photography AgBr is involved.

     $2\ AgBr \xrightarrow{\text{Sunlight}} 2Ag + Br_2$

Answer - 2

26.   (1) $Mg + H_2SO_4 \longrightarrow MgSO_4 + H_2$ (Occurs)

     (2) $Cu + 2HCl \longrightarrow CuCl_2 + H_2$ (Do not)

     (3) $2Al + 6HCl \longrightarrow 2AlCl_3 + 3H_2$ (Occurs)

     (4) $Fe + 2HCl \longrightarrow FeCl_2 + H_2$ (Occurs)

    This is based on metal activity series

    Answer – 2

Biology :

27.   (1)
    Mushroom
    Explanation: Mushroom exhibits saprophytic mode of nutrition while others (ticks, tape worms, Cuscuta exhibit parasitic mode of nutrition.

28.   (2)
    Right atrium
    Explanation: Right atrium receives deoxygenated blood
    Left atrium receives oxygenated blood from the lungs
    Right ventricle pumps blood to the lungs
    Left ventricle pumps blood into aorta which supplies blood to the various regions of the body

29.   (1)
    Drosera

30.   (2)
    Hydra
    Explanation Nerve net is primitive stage of development od nervous system

31.   (3)
    Bryophyllum

Leaf buds
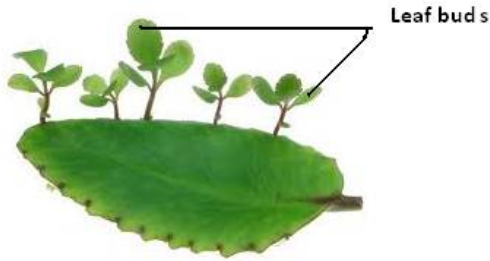
32. (2)
two male gametes
Explanation : The pollen tube contains 2 male gametes and one tube nucleus which generates the pollen tube

33. (1)
Four
Explanation: Considering a cross TtYy x TtYy , the groups of phenotypic characters are (TY, ty, Ty, tY)

34. (4)

Fish $\longrightarrow$ Amphibians $\longrightarrow$ Reptiles $\longrightarrow$ Birds $\longrightarrow$ Mammals
According to origin, identify the secondary air pollutants

35. (3)
Smoke

36. (3) 45

37. (1) cuboidal epithelium

38. (2) species

39. (1) estrogen

40. (2) bile juice   (pancreas – pancreatic juice, stomach- gastric juice, bile juice – liver and intestine   – various digestive juice)

MATHEMATICS Solution

81.   (1)

Hint.

$1+3+5+.....\text{to}\,365\ \text{terms}$

$=\dfrac{365}{2}\{2+(364\times 2\}$

$=\dfrac{365}{2}\{2+728\}$

$=\dfrac{365}{2}\times 730$

$=365\times 365$

$=133225$

82.   (2)

Let $x =$ price of one apple

$y =$ price of one guava

ATQ

$19x+11y-482=0$

$11x+19y-418=0$

by cross multiplicate

$\dfrac{x}{-4598+9158}=\dfrac{y}{-5302+7942}=\dfrac{1}{361-121}$

$\Rightarrow x=\dfrac{4560}{240}=19\ \&\ y=\dfrac{2640}{270}=11$

Hence $x-y=8.$

83.   (2)

Given one root is $2+\sqrt{5}$

$\therefore$ **other root is** $2-\sqrt{5}$

Hence, requires equation

$$x^2 - \left\{(2+\sqrt{5})+(2-\sqrt{5})\right\}x + (2+\sqrt{5})(2-\sqrt{5}) = 0$$
$$\Rightarrow x^2 - 4x - 1 = 0$$

84. **(4)**

From formulae,

$$97.5 = 94.5 + h\left(\frac{x+15-x}{2(x+15)-x-(x+5)}\right)$$
$$\Rightarrow 3 = h\left(\frac{15}{25}\right) = \frac{3h}{5}$$
$$\Rightarrow h = 5$$
$$\therefore \text{upper limit} = 94.5 + 5 = 99.5$$

85. **(2)**

By expanding the determinants, we get

$$49 - 18 = 30 - 4b$$
$$\Rightarrow 4(a+b) = 48$$
$$\Rightarrow a+b = 12$$
$$\text{ans.2}$$

86. **(3)**

$$a = \sqrt{6} + \sqrt{9}, b = \sqrt{6} - \sqrt{5}$$
$$\therefore 2(a^2+b^2) = 2.2(6+5) = 4\times 11 = 44$$

Given $5ab = 5\cdot(1) = 5$

$$\therefore 2(a^2+b^2) - 5ab = 44 - 5 = 39.$$

87. **(4)**

Let the total no. of swan = x

ATQ.

$$\frac{7}{2}\sqrt{X} + 2 = X$$
$$\Rightarrow x - 2 = \frac{7\sqrt{x}}{2}$$
$$\Rightarrow 2x - 4 = 7\sqrt{x}$$
$$\Rightarrow 4x^2 - 65x + 16 = 0$$
$$\Rightarrow x = 16$$

88. **(2)**

$s = \{H, T\} \times \{1, 2, 3, 4, 5, 6,\}$

$\therefore n(s) = 12$

$n \in = \{(T, 2), (T, 3), (T, 5)\}$

$\therefore n(E) = 3$

$\Rightarrow P(E) = \dfrac{3}{12} = \dfrac{1}{4}$

89.   (4)

Mode $= 3$Median $- 2$Mean

$\therefore 5.2 = 3 \times \left(\dfrac{11}{10} \times \text{Mean}\right) - 2\text{Mean}$

$\qquad = \left(\dfrac{33}{10} - 2\right) \times \text{Mean}$

$\qquad = \dfrac{13}{10} \times \text{Mean}$

$\Rightarrow \text{Mean} = 4$

90.   (1)

Hint : Let $\dfrac{x}{2y + z - x} = \dfrac{y}{2z + x - y} = \dfrac{2}{2x + y - 2} = K$

$\Rightarrow x = K(2y + z - x)$

$\quad y = K(2z + x - y)$

$\quad z = K(2x + y - z)$

Add. $(x + y + z) = K(2x + 2y + 2z)$

$\qquad K = \dfrac{1}{2}$

91.   1

92.   wrong question

93.   2

94.   3

95.   2

96.   3

97.   1

98.   2

99.   1

100. 3