NTSE STAGE-II (2012)
CLASS-VIII [SAT]

HINTS & SOLUTIONS

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans	1	3	4	1	2	2	4	1	1	3	2	Bonus	1	3 & 4	3
Ques.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans	1	2	2	1	1	4	4	2	2	2	1	3	2	1	3
Ques.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans	2	2	1	2	3	1	1	1 & 4	1	3	2	3	4	3	2
Ques.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans	2	1	3	4	4	2	3	4	4	2	3	3	1	3	3
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans	4	3	1	1	3	2	2	4	2	4	4	3	2	4	3
Ques.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans	2	3	1	4	4	1	2	1	4	2	4	3	4	3	4
Ques.	91	92	93	94	95	96	97	98	99	100					
Ans	3	4	3	4	3	2	3	4	2	3					

CHEMISTRY

9. The larvae make their cocoons by using the wet sticky substance produced by the silk glands.

13. Lohi $\rightarrow$ Good quality wool
Nali $\rightarrow$ Carpet Wool
Patanwadi $\rightarrow$ Hosiery
Marwari $\rightarrow$ Coarse wool

15. Polycot $\Rightarrow$ Poly + Cot
$\quad\quad\quad\quad\quad\downarrow\quad\quad\quad\downarrow$
$\quad\quad\quad\quad$ Polyster $\quad$ Cotton

16. Malamine $\quad\rightarrow$ Flame resistant
Nylon $\quad\quad\rightarrow$ Appears like silk [Lustrous]
Teflon $\quad\quad\rightarrow$ Non-Sticking Cookwares
Cotton $\quad\quad\rightarrow$ Easily biodegradable

17.

$P_4 + 5O_2 \longrightarrow 2P_2O_5$
(x) $\quad\quad\quad\quad\quad\quad\quad$ (y)

$P_2O_5 + 3H_2O \longrightarrow 2H_3PO_4$
$\quad\quad\quad\quad\quad\quad$ (soluble) [acidic in nature so doesn't change the colour of red litmus solution]

$H_3PO_4(aq) + 3NaOH (aq) \longrightarrow Na_3PO_4(aq) + 3H_2O$
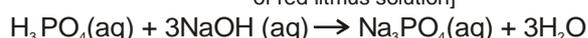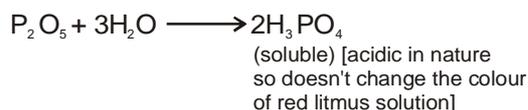
18. Iron $\rightarrow$ deposition of redish brown layer of $Fe_2O_3 . xH_2O$ (rust) on exposure to moist air
Copper $\rightarrow$ Green layer of corrosion [basic copper carbonate]
Potassium $\rightarrow$ Very soft so cut easily with knife
Mercury $\rightarrow$ Liquid at room temperature.

19. Naphthalene is one of the products of the fractional distillation of coal tar.

20. (a) CNG is a compressed form of natural gas which is used as a fuel in motor cars.

(b) $CH_4 \xrightarrow{\text{Strong heating}} C + 2H_2$
hydrogen is used in manufacture of ammonia and ammonia is used for manufacturing of fertilizers.
(c) Natural gas is used for generation of electricity
(d) Natural gas is exhaustible source.

21. Antimony trisulphide & potassium chlorate are used on head of match stick while red phosphorus and glass powder are used on striking surface of match box.

22. The correct order of temperature of zones of candle flames is -
Outermost zone > Middle zone > innermost zone.

23. Statements (B) and (D) are correct, but (A) and (C) are incorrect . Apart from CO_2, other gases like CH_4, CFC etc. also causes global warming. Water vapours also contributes to the global warming.

24. Bite or sting of ants release formic acid on skin and causes irritating effect. It can be reduced by using calmine solution which contains zinc carbonate.

25. Chemical fertilizers are basic in nature on using in excessive amount in acidic soil, it has become alkaline. Due to this crop yield has been reduced.

26. (A), (B) and (C) are physical change because in all of them there is no change in chemical composition but (D) is chemical change because combustion of charcoal formed new product.

27. (B) and (D) are chemical change because in both chemical composition has been changed.

PHYSICS

30.
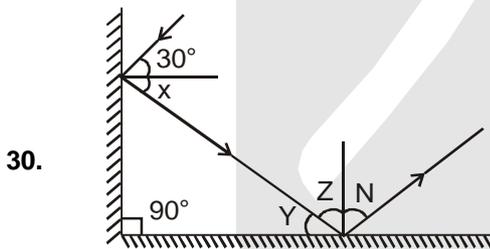
given x = 30°   ($\angle i = \angle r$)
Y = x = 30   (Alternate angles)
Z = 90– y = 90 – 30 = 60
N = Z   ($\angle i = \angle r$)
N = 60°

36. We know that $\dfrac{F_1 - 32}{9} = \dfrac{c - 0}{5}$

$\dfrac{F_1 - 32}{9} = \dfrac{25}{5}$

$F_1 - 32 = 45$
$F_1 = 77°F$

39. Average speed = $\dfrac{15 - 5}{20 - 4}$

$= \dfrac{10}{16} = \dfrac{5}{8}$ km/min.

MATHEMATICS

41.

	Pen	Pencil
No.	x	3/2 x
CP of 1	5	1
Total CP	5x	3/2 x
Total SP	1.12 $\times$ 5x	1.1 $\times$ 3/2 x

$\dfrac{112}{100} \times 5x + \dfrac{11}{10} \times \dfrac{3}{2} x = 725$

$\dfrac{560x + 165x}{100} = 725$

$\dfrac{725x}{100} = 725$

x = 100
No. of pen = x = 100

No. of pencil = $\dfrac{3}{2} x = 100 \times \dfrac{3}{2} = 150$

Required answer = 150 – 100 = 50.

42. % Change in revenue = $- 15 + 10 + \dfrac{-10 \times 15}{100}$

$= - 5 - \dfrac{3}{2}$

$= \dfrac{-13}{2} = - 6\dfrac{1}{2}$

Revenue decreases by $6\dfrac{1}{2}$%.

43. Unit digit of $3^{1001} \times 7^{1002} \times 13^{1003}$ is unit digit of $3 \times 9 \times 7 = 9$.

44. Square of root X lies between 6 and 7.
∴ X lies between 36 and 49
So it cuberoot must lies between $3\sqrt{27}$ and

$3\sqrt{64}$
i.e. 3 and 4

45. $\dfrac{(n-2)180}{n} = 165$

$\dfrac{n-2}{n} = \dfrac{165}{180} = \dfrac{33}{36} = \dfrac{11}{12}$

12n – 24 = 11n
n = 24.

46. $x \propto \dfrac{1}{y}$

$x = \dfrac{k}{y}$

$\dfrac{x_1}{x_2} = \dfrac{y_2}{y_1}$

$\dfrac{x}{1.2x} = \dfrac{y_2}{y}$

$y_2 = \dfrac{y}{1.2} = \dfrac{5}{6}y$

i.e. decrement of $\left(y - \dfrac{5}{6}y\right) = \dfrac{1}{6}y$

In % $= \dfrac{1}{6} \times 100\% = 16\dfrac{2}{3}\%$.

47.

A	B	C
d	d–20	$\dfrac{d-10}{d} \times (d-20)$
		d–10
d		d–28

$\dfrac{d-10}{d} \times (d-20) = d - 28$

$(d - 10)(d - 20) = d(d - 28)$

$d^2 - 30d + 200 = d^2 - 28d$

$-2d = -200$

$d = 100$.

48. $x = 2^{48} - 1$

$= (2^{24})^2 - (1)^2$

$= (2^{24} - 1)(2^{24} + 1)$

In the same we proceed and in the end we get

$x = (2^3 - 1)(2^3 + 1) \ldots \ldots$

$x = (7)(9)$

So X have factor 7, and 9 which lies between 5 and 10

So we have 2 factor which lies between 5 and 10.

49. abcd
dcba
d + d = b + c = 7
a × 1000 + b × 100 + c × 10 + d
d × 1000 + c × 100 + b × 10 + a
_____
(1001)a + b(110) + c (110) + (1001) d
= (1001) (a + d) + (110) (b + c)
= (1001) (7) + (110) (7)
= 7007 + 770
= 7777
so it is not divisible by 111.

50. Let the number of deer = x.
Then according to problem

$\dfrac{x}{2} + \dfrac{3}{4}\left(\dfrac{x}{2}\right) + 9 = x$

$x - \dfrac{x}{2} - \dfrac{3x}{8} = 9$

$\dfrac{x}{8} = 9$

x = 72.
Difference between number of deer who are grazing and those who are playing = 36 – 27
= 9.
So, it is a multiple of 9.

51. Let 2 angles be a & (180 – a)
a = 4 (90 – a)
a = 360 – 4a
5a = 360
a = 72°
∴ Angles are 72°, 108°
Difference of 2 angles = 36°.

52. Let angle be 3x, 7x, 6x, 4x
∴ 20x = 360°
x = 18°
∴ Angles are   3x = 3 × 18 = 54°
7x = 7 × 18 = 126°
6x = 6 × 18 = 108°
4x = 4 × 18 = 72°
∴ Figure is trapezium, as all angles are different.

53. Let angle be 2x, 4x, 9x.
15x = 180°
x = 12°
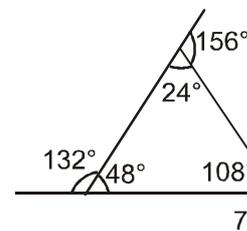
∴ Angles are 24°, 48°, 108°.
Difference of 2 smaller exterior angles = 132 – 72
= 60°.

54.
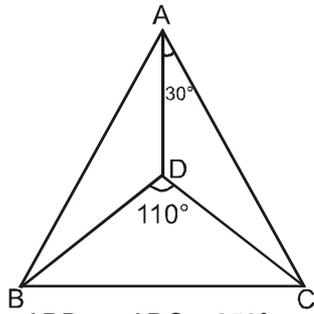
∠ADB + ∠ADC = 250°
As ΔABD ≅ ΔACD
∴ ∠DAC = ∠DAB = 30°
& ∠ADB = ∠ADC = 125°
So, ∠ADB + ∠BAD + ∠DBA = 180°
∴ 125° + 30° + ∠DBA = 180°
∠DBA = 180° − 155° = 25°

55.
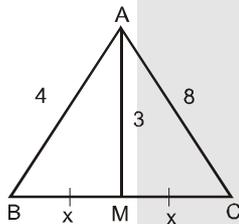
By appanuies theorem
$AB^2 + AC^2 = 2(AM^2 + BM^2)$
$4^2 + 8^2 = 2(3^2 + x^2)$
$16 + 64 = 2(9 + x^2)$
$x = \sqrt{31}$
$BC = 2x$
   $= 2\sqrt{31}$.

56.

$C = 2\pi r$ $C^1 = xC$
$A = \pi r^2$ $A^1 = 2A$
                       $\pi(r^1)^2 = 2(\pi r^2)$
                       $r^1 = \sqrt{2}\ r$
                       $C^1 = xC$
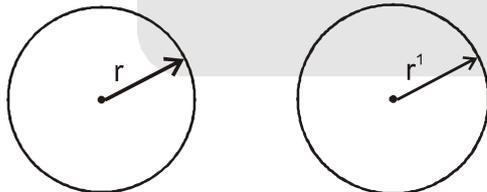
$2\pi r^1 = x\ 2\pi r$

$2\pi \sqrt{2}\ r = x\ 2\pi r$

$x = \sqrt{2}$.

57.
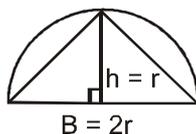
Area will larger is base and height is larger.
So Base = 2r

height = r

Area = $\frac{1}{2}$ B × h

   = $\frac{1}{2}$ × 2r × r

   = r^2

58.
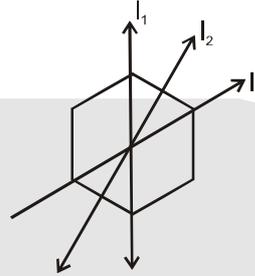
l_1, l_2, l_3 all are line of symmetry the angle
between l_1 & l_3 is 60°.
l_2 is the angle bisector of l_1 & l_3

∴ Angle between l_1 & l_2 is $\frac{1}{2}$ (60°) = 30°

59.
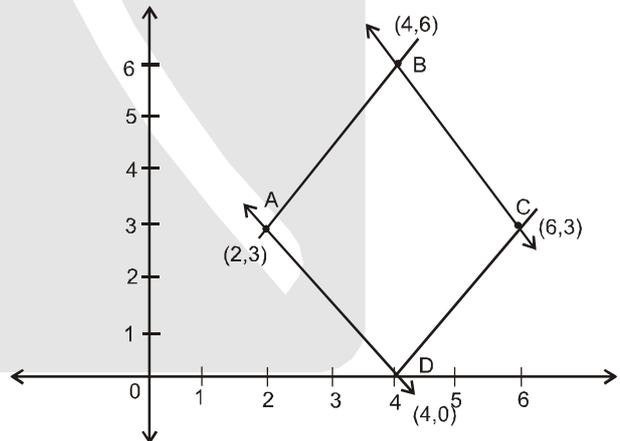
∵ AB = BC = CD = DA = $\sqrt{13}$ and diagonal
AC ≠ BD.
So, it is a rhombus.

60.   Arranging in ascending order
21, 39, 39, 45, 54, 54, 56, 56, 56, 77, 84, 84
No. of terms = 12

∴ Median = $\frac{6^{th}\ term + 7^{th}\ term}{2}$ = $\frac{54 + 56}{2}$

   = 55
Mode = 56
Range = Highest value − lowest value
      = 84 − 21 = 63

∴ Mean = $\frac{55 + 56 + 63}{2}$ = $\frac{174}{3}$ = 58.