RAJASTHAN NTSE STAGE-I (2014-15)

CLASS-X [SAT]

HINTS & SOLUTIONS

ANSWER KEY

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

PHYSICS

1. Distance covered , $d = 2\pi R$
time taken is t

so speed will be $= \frac{\text{distance}}{\text{time}} = \frac{2\pi R}{t}$

Ans. (2)

2. Object is moving with uniform velocity
so Resultant force is zero.
Ans (4)

3. Pressure $P = \frac{\text{Normal force (thrust)}}{\text{Area}}$

so. it's S.I. unit $\Rightarrow N/m^2$
Ans (2)

4. Frequency n = 50 Hz
It means it will complete 50 vibrations per second.
Number of cycles in one minutes
will be = 50 × 60 = 3000

Ans. (3)

5. Height h = 40 × 15 = 600 cm = 6m

Power $P = \frac{mgh}{t} = \frac{50 \times 10 \times 6}{6} = 500$ w

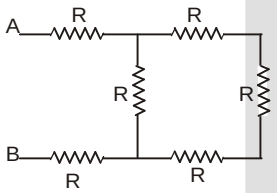
Ans. (2)

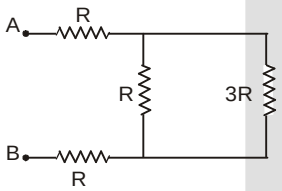
6. Focal length of mirror $f = \frac{R}{2}$

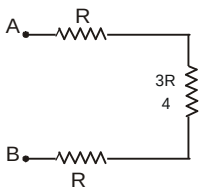
it doesnot depend on medium
so correct option is
Ans (1)

7. When object is between focus point and optical centre then image will be virtual, erect & magnified.
Ans. (4)

8.







$Req = R + \frac{3R}{4} + R$

$= \frac{11R}{4}$

Ans.(3)

9. For Myopia $\Rightarrow$
$u = \infty$
$v = -75$ cm

$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

$\frac{1}{f} = -\frac{1}{75} - \frac{1}{\infty} \Rightarrow f = -75$ cm

$\Rightarrow$Power $P = -\frac{100}{f}$

$= -\frac{100}{75}$

$= -1.33D$

Ans.(2)

10. By fleming's left hand rule
Force on electron will be perpendicular into the page.
Ans. (4)

11. Potential Difference $v = \frac{w}{q} = \frac{1}{1} = 1$ volt.

Ans (1)

12. 1 unit = 1kwh = 3.6×10^6 J
so 200 unit = $200 \times 3.6 \times 10^6$ J
= 7.2×10^8 Joule.
Ans (4)

CHEMISTRY

13. $CuSO_{4(aqs)} + Ag \rightarrow$ no reaction
$CuSO_{4(aqs)} + Hg \rightarrow$ no reaction
$CuSO_{4(aqs)} + Au \rightarrow$ no reaction

$\underset{\text{blue}}{CuSO_{4(aqs)}} + Zn \rightarrow \underset{\text{Colourless}}{ZnSO_{4(aqs)}} + Cu_{(s)}$

14. IUPAC name of the first member of homologous series of Ketone is (Propanone) $CH_3 - \overset{\overset{O}{\|}}{C} - CH_3$

15. When Na_2CO_3 dissolve in H_2O the nature of solution will be basic due to the formation of strong basic solution

$Na_2CO_3 + 2H_2O \rightarrow \underset{\text{Strong base}}{2NaOH} + \underset{\text{Weak acid}}{H_2CO_3}$

16. Valence electron = two General electronic configuration for third period and second group is i.e. Mg –$1s^2 2s^2 2p^6 3s^2$

17. Since HNO_3 is acid and KOH is base $\therefore$ it is a neutralisation and double displacement reaction

18. Since pH = – log[H^+]
and pH – 0 – 6 $\rightarrow$ acidic
7 – neutral
8 – 14 – basic
hence nature of solution will be acidic

19. gypsam = $CaSO_4 . 2H_2O$

Plaster of paris = $CaSO_4 . \frac{1}{2} H_2O$

difference = $\left(2 - \frac{1}{2}\right) H_2O$

= $\frac{3}{2} H_2O$

20. Alkye $H–C \equiv C – \overset{\overset{H}{|}}{\underset{\underset{H}{|}}{C}}–H$

if no. of carban is three then no. of Hydrogen = 4

21. mwf of CO = 28 gm
$\because$ 28 gm CO contain no, of CO molecule is = 6.022×10^{23}

$\therefore$ 14 gm CO contain no, of CO molecule is = $\frac{6.028 \times 10^{23}}{28} \times \frac{14}{1}$

= 3.011×10^{23} molecule

22. B.P. = – 80°C
Temperature in K = degree centigrade + 273
= – 80°C + 273
= 193 K

23. Suger solution does not show Tyndall effect since it is a true solution.
but milk, starch and ink form a colloidal solution therefore these all are show Tyndall effect.

MATHEMATICS

36. $\left(x^{b-c}\right)^{\frac{1}{bc}} \left(x^{c-a}\right)^{\frac{1}{ca}} \left(x^{a-b}\right)^{\frac{1}{ab}}$

$= x^{\frac{a(b-c)+b(c-a)+c(a-b)}{abc}}$

$= x^{\frac{0}{abc}} = x^\circ = 1$

37. option (4) is correct

38. 10,15,20,.....,95
so total no are 18

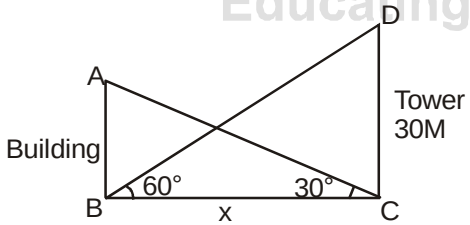
39. $\alpha, \frac{1}{\alpha}$

$\alpha \times \frac{1}{\alpha} = \frac{B}{2}$ B = 2

40. sin(A + B) = cos (A – B)
A + B + A – B = 90°
2A = 90°
A = 45°
if B = 0 then A + B = $\pi/4$
if B = 45° then A + B = $\pi/2$. So option (1) & (2) both are possible.

41. $\cos^2\theta + \cos^4\theta$
$= \cos^2\theta + \sin^2\theta$
= 1

42.



$\tan 60^\circ = \frac{30}{x}$

$\sqrt{3} = \frac{30}{x}$

$x = \frac{30}{\sqrt{3}}$

$\tan 30 = \frac{AB}{x}$

$\frac{1}{\sqrt{3}} = \frac{AB\sqrt{3}}{30}$

AB = $\frac{30}{3}$ = 10

43. For No solution

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

$\frac{3}{2k-1} = \frac{1}{k-1} \neq \frac{1}{2k+1}$

$3k - 3 = 2k - 1$ and $2k + 1 \neq k - 1$

$k = 2$ $\quad\quad$ $k \neq -2$

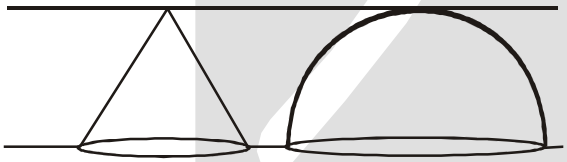
44. $\overline{X} = \frac{2\times1+2\times2+.....+2\times10}{10}$

$= \frac{2(1+2+3+.....+10)}{10}$

$= \frac{2\times10\times11}{2\times10} = 11$

45. Req. Probability $= \frac{18}{36} = \frac{1}{2}$

46.



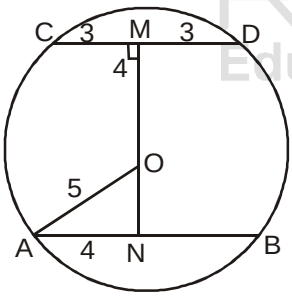
$V_c : V_H$

$\frac{1}{3}\pi r^2 h : \frac{2}{3}\pi r^3$

$\frac{1}{3}\pi r^3 : \frac{2}{3}\pi r^3$

1 : 2

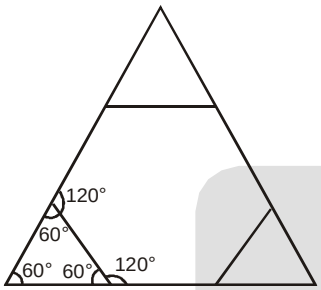
47.



OC = $\sqrt{3^2+4^2}$ = 5

ON = $\sqrt{5^2-4^2}$ = 3

48.



So side of hexagon = $\frac{1}{3}$ side of Δ

$= \frac{1}{3} \times 6 = 2$

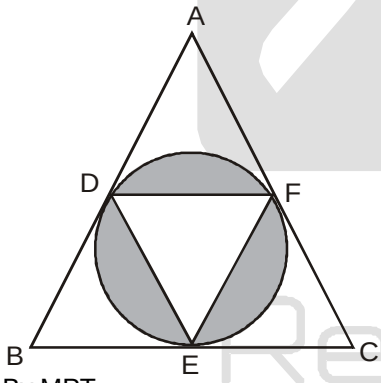
area of hexagon $= 6 \times \frac{\sqrt{3}}{4} \times (2)^2$

$= 6\sqrt{3}$

49.

$\angle BAC = \angle BDC$
$= 180 - (22 + 78)$
$= 180 - (100)$
$= 80$

50.



By MPT

$DF = \frac{1}{2} BC$

$= \frac{1}{2} 2\sqrt{3} = \sqrt{3}$

ΔDEF is also eq.Δ

$\Delta = rs$

$\frac{\sqrt{3}}{4} (2\sqrt{3})^2 = r3\sqrt{3}$

$\frac{\sqrt{3}}{4} \times \frac{4 \times 3}{3\sqrt{3}} = r$

$r = 1$

shaded area $= \pi(1)^2 - \frac{\sqrt{3}}{4} (\sqrt{3})^2$

$= \pi - \frac{3\sqrt{3}}{4} = \frac{1}{4}(4\pi - 3\sqrt{3})$

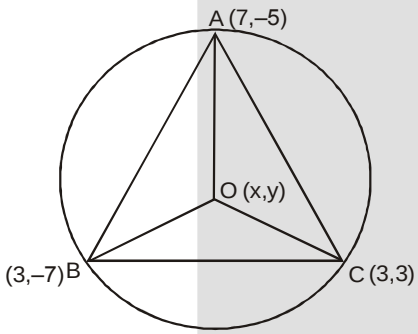
51. $\pi(3)^2\ 10 = N\ \frac{4}{3}\pi\left(\frac{1}{2}\right)^3$

$\frac{\pi 90 \times 3 \times 8}{4\pi} = N$

$540 = N$

52. option (3) is correct

53.



$OA = OB = OC$

$OA^2 = OB^2$

$(x - 7)^2 + (y + 5)^2 = (x - 3)^2 + (y + 7)^2$

$-8x - 4y = -16$

$2x + y = 4$

$2x - 2 = 4$

$x = 3$

$\therefore\ x = 3,\ y = -2$

$OB^2 = OC^2$

$(x - 3)^2 + (y + 7)^2 = (x - 3)^2 + (y - 3)^2$

$20y = -40$

$y = -2$

54. $\angle OBA = 80°$ (AIA)

$115 = 80 + \angle OAB$

$\angle OAB = 35$

55. $\tan 43° \tan 45° \tan 47°$

$(\tan 43° \tan 47°)\tan 45°$

$(\cot 47° \tan 47°)\ 1$

$= (1)(1)$

$= 1$

NTSE STAGE-I (2014-15)

CLASS-X [LANGUAGE TEST]

ENGLISH

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	2	3	1	4	1	3	4	2	1	3	1	2	2	4	1
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Ques.	31	32	33	34	35	36	37	38	39	40					
Ans.	2	1	4	2	2	1	2	4	1	2					

HINDI

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	2	3	1	4	1	3	4	2	1	3	1	2	2	4	1
Ques.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	3	4	4	2	1	4	2	3	1	2	4	3	2	3	2
Ques.	31	32	33	34	35	36	37	38	39	40					
Ans.	2	1	4	2	2	1	2	4	1	2					