SSC (Tier-II) - 2013 (Mock Test Paper - 2) [SOLUTION]

1. (C) $\frac{47^{47}+47}{48}=\frac{47^{47}}{48}+\frac{47}{48}$

$R \cong \frac{47}{48}+\frac{47}{48}=\frac{94}{48} \Rightarrow R = 46$

2. (D) Let the first odd integer = x
So, the second odd integer = $x + 2$
Now,
Difference between the squares of these two consecutive odd integers
$= (x + 2)^2 - x^2$
$= x^2 + 4 + 4x - x^2$
$= 4(x + 1)$
↑
will be divisible by 2 as $(x + 1)$ will be even
$\Rightarrow$ $4(x + 1)$ will be divisible by 4×2 i.e. by 8

3. (D) Let x = the larger number
and y = the smaller number
Now,
ATQ, $x - y = 2395$ ... (i)
and $\frac{x}{y}$; Quotient = 7 and Remainder = 25
$\Rightarrow$ $x = 7y + 25$ ... (ii)
Now on putting value of y from (i) in (ii)
We get,
$x = 7(x - 2395) + 25$
or, $x = 7x - 16765 + 25$
or, $6x = 16765 - 25$
$\Rightarrow$ $x = \frac{16740}{6} = 2790$

4. (C) Let A, B, C and D are four consecutive prime numbers in descending order ($\Rightarrow A > B > C > D$)
So, ATQ,
$A \times B \times C = 2431$ ... (i)
and $B \times C \times D = 1001$ ... (ii)
Now, both 2431 and 1001 are divisible by 11.
i.e. 11 is a common factor of both 2431 and 1001.
and $\because$ B & C are the common factors of 2431 and 1001.
$\Rightarrow$ Out of B & C, one must be 11.
So, from (i),
Product of other two prime nos. $= \frac{2431}{11}$
$= 221$
and $\because$ $221 = 17 \times 13$
$\Rightarrow$ Out of A, B and C, one is 17, one is 13 and one is 11.
and $\because$ $A > B > C$
$\Rightarrow$ A = 17, B = 13 and C = 11
So, the largest given prime no. = 17

5. (A) $\sqrt[3]{4}+\sqrt[3]{16}+1=\sqrt[3]{2\times2}+\sqrt[3]{2\times8}+1$
$= (\sqrt[3]{2}\times\sqrt[3]{2})+(2\times\sqrt[3]{2}\times1)+(1\times1)$
$= (\sqrt[3]{2})^2+(2\times\sqrt[3]{2}\times1)+(1)^2$
$= (\sqrt[3]{2}+1)^2$
So, square root of $(\sqrt[3]{4}+\sqrt[3]{16}+1)$
i.e $(\sqrt{\sqrt[3]{4}+\sqrt[3]{16}+1}) = \sqrt[3]{2}+1$

6. (B) $0.5 = \frac{5}{10}=\frac{1}{2}$
$2.1 = \frac{21}{10}$
$2.8 = \frac{28}{10}=\frac{14}{5}$
So, LCM of 0.5, 2.1 & 2.8
= LCM of $\frac{1}{2}, \frac{21}{10}$ & $\frac{14}{5}$
$= \frac{\text{LCM of } 1, 21 \& 14}{\text{HCF of } 2, 10 \& 5} = \frac{42}{1} = 42$

7. (C) Required multiplication
$= 2 \times 4 \times 6 \times 8 \times 10 \times 12 \times 14 \times 16 \times 18 \times 20 \times 5 \times 10 \times 15 \times 20 \times 25$
Here, nos. (o) = no. of complete pairs of 2 & 5.
= no. of 5 [$\because$ here n(5) < n(2)]
= 7

8. (C) $\frac{0.7\times0.7\times0.7+0.3\times0.3\times0.3\times0.3\times0.7\times3}{0.7\times0.7+0.3\times0.3+0.42}$
$= \frac{0.7\times0.7\times0.7+0.3\times0.3\times0.3\times3\times0.7\times0.3\times1}{0.7\times0.7+0.3\times0.3+2\times0.7\times0.3}$
$= \frac{(0.7)^3+(0.3)^2+0.3\times0.7\times0.3\times(0.7+0.3)}{(0.7)^2+(0.3)^2+2\times0.7\times0.3}$
$= \frac{(0.7+0.3)^3}{(0.7+0.3)^2}=\frac{1^3}{1^2}=\frac{1}{1}=1$

9. (D) $\because$ each three distance is same.
Let, S_1, S_2 and S_3 respectively are the speeds with which three distances have been covered.
So,

$$\text{Average Speed} = \frac{3S_1S_2S_3}{S_1S_2+S_2S_3+S_3S_1}$$

$$= \frac{3\times15\times30\times40}{15\times30+30\times40+40\times15}$$

$$= \frac{3\times15\times30\times40}{450+1200+600}$$

$$= \frac{54000}{2250} = 24 \text{ km/hr}$$

10. (B) $A + C = \frac{22}{37}$ part

$\Rightarrow B = 1-\frac{22}{37}$ part $= \frac{15}{37}$ part

and,

$B + C = \frac{21}{37}$ part

or, $\frac{15}{27}+C=\frac{21}{37} \Rightarrow C = \frac{21}{37}-\frac{15}{37}=\frac{6}{37}$ part

So,

Wage of C $= \frac{6}{37}\times9250 =$ Rs. 1500

11. (C) Let,

(A + B) $\xrightarrow{\text{days taken}}$ x days

So, A alone $\xrightarrow{\text{days taken}}$ $(x + 8)$ days

and, B alone $\xrightarrow{\text{days taken}}$ $(x + 18)$ days

In such type of questions

The no. of days taken by A and B working together to do the work $= \sqrt{8\times18}$ days

$= \sqrt{144}$ days

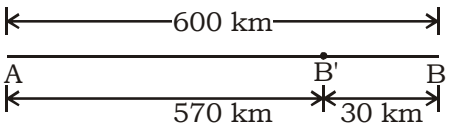
$= 12$ days

12. (*)

		A		B
Ratio of speed	=	2	:	1
Ratio of duration	=	3	:	1
Ratio of distance covered during any same duration of time	=	6	:	1

($\because$ Distance = Speed × time)

13. (A)



Distance covered by B before movement of A.

i.e. Distance covered by B in 20 minutes

$= \left(90\times\frac{20}{60}\right)$ km

$= 30$ km

$\Rightarrow$ When train from station A starts to move; the another train will be B' and distance between A & B'

$= (600 - 30)$ km $= 570$ km

Now,

Relative speeds of trains

$= (100 + 90)$ km/hr

$= 190$ km /hr

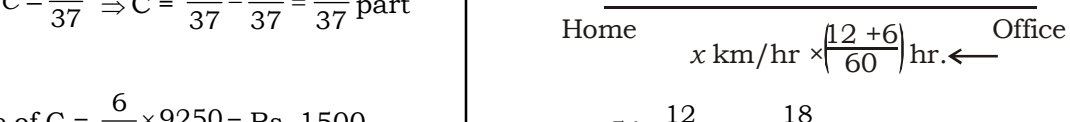
So, Time taken by each train to reach each other $= \left(\frac{570}{190}\right)$hr. $= 3$ hrs.

And in 3 hours, distance travelled by A

$= (100 \times 3)$ km $= 300$ kms

$\Rightarrow$ Both train will cross each other at a distance 300 km & from A i.e. at the exact middle point of A and B.

14. (B) Let x = the required speed



$\Rightarrow 54\times\frac{12}{60} = x\times\frac{18}{60}$

$\Rightarrow x = 36$ km/hr

15. (C)

	A		B
Ratio of speeds	3	:	5
Time taken	$(x + 8)$hr	:	x hr.

(where x → time taken by B to cover the distance)

As the distance is same.

$\Rightarrow 3(x + 8) = 5x$

$\Rightarrow 3x + 24 = 5x$

$\Rightarrow x = 12$ hr.

So,

Actual time taken by A to cover the distance i.e. $(x + 8)$ hr. $= (12 + 8)$ hrs

$= 20$ hrs.

16. (C) Sum of wrongly entered marks

$= 73 + 78 + 80$

$= 231$

and Sum of correct marks

$= 63 + 70 + 82$

$= 215$

i.e. Sum of corrected marks <sum of wrongly marks (by 16 marks)

So,

Actual average (after rectification)

$= \frac{40\times72-16}{40} = \frac{2864}{40}$

$= 71.6$ marks

17. (A) $\underline{n}$ $\underline{n+1}$ $\underline{n+2}$ $\underline{n+3}$ $\underline{n+4}$

The average of above 5 consecutive integers

$= m = \frac{n+n+4}{2} \Rightarrow m = n+2$

Now,

$\underline{n+2}$ $\underline{n+3}$ $\underline{n+4}$ $\underline{n+5}$ $\underline{n+6}$ $\underline{n+7}$

The average of above 6 consecutive integers

$= \frac{n+2+n+7}{2} = \frac{2n+9}{2}$

$= \frac{2n+4+5}{2} = \frac{2(n+2)+5}{2} = \frac{2m+5}{2}$

18. (D) Total money spent by all of them
$= (18 \times 25) + \{1 \times (25 + 15)\}$
$= 450 + 40$
$= 490$

19. (C) Let x = no. of girls
So,
600 × 11 yr 9 months
$= x \times 11$ yrs $+ (600 - x) \times 12$ yrs
$\Rightarrow$ 7050 yr. $= (11x + 7200 - 12x)$yr.
$\Rightarrow$ $x = 7200 - 7050$
$= 150$

20. (A)

Vessel '1'		Vessel '2'	
Water	Milk	Water	Milk
3	2	5	3

Ratio of contents of vessel '1' to vessel '2' to mix with each other = 1 : 2
$\Rightarrow$ Ratio of water and milk in the resulting

$$\text{mixture} = \frac{\frac{3}{5}+\left(\frac{5}{8}\times 2\right)}{\frac{2}{5}+\left(\frac{3}{8}\times 2\right)} = \frac{\frac{24+50}{40}}{\frac{16+30}{40}} = \frac{74}{46}$$

21. (B) Initial Ratio = 4 : 6 : 9
Initial nos. = $4x, 6x, 9x$
Final Ratio = 7 : 9 : 12
(on increasing 12 students in each class)

$\Rightarrow \frac{4x+12}{6x+12} = \frac{7}{9}$

or, $36x + 108 = 42x + 84$
$\Rightarrow 6x = 24 \Rightarrow x = 4$
$\Rightarrow$ Total no. of students in the three classes before the increase $= 4x + 6x + 9x$
$= 19x = 76$

22. (B) ATQ
10% of 1st no. = 6

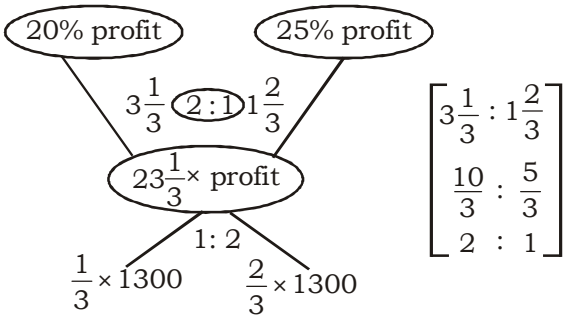
or, $\frac{1}{10}$ of 1st no. $6 \Rightarrow$ 1st no. = 60

and, $\because$ Ratio of 1st no. to 2nd no. = 4 : 3
$\Rightarrow$ Nos. are $\rightarrow$ 60 & 45

Now, 20% of 2nd no. = 20% of 45 = 9
& 5% of 1st no. = 5% of 60 = 3
And, $\because$ 9 is 3 times of 3.
$\Rightarrow$ 20% of 2nd no. is 3 times of 5% of the first no.

23. (D) 1st no. : 2nd no. & 2nd no. : 3rd no.
= 3 : 2 = 3 : 2
$\Rightarrow$ 1st no. : 2nd no. : 3rd no.
= 9 : 6 : 4
So, Let the nos. are $9x$, $6x$ & $4x$
ATQ, $(9x)^2 + (6x)^2 + (4x)^2 + 532$
$\Rightarrow 133x^2 = 532$
$\Rightarrow x = 2$
So, the 2nd no.
i.e. $6x = 6 \times 2 = 12$

24. (?)



= Rs. 433.33

$\Rightarrow$ Cost price of table = Rs. 433.33

Alternative method:-
Let,
x = C.P. of table
$\Rightarrow (1300 - x)$ = C.P. of chair
Now, ATQ,
Profit on table + profit on chair
= Total profit
or, 20% of x + 25% of $(1300 - x)$
$= 23\frac{1}{3}\%$ of 1300

or, $\frac{20}{100}x + \frac{25}{100}(1300 - x) = \frac{70}{3\times 100}\times 1300$

or, $\frac{x}{5} + \frac{1300}{4} - \frac{x}{4} = \frac{910}{3}$

or, $\frac{x}{5} - \frac{x}{4} = \frac{910}{3} - 325$

or, $\frac{4x-5x}{20} = \frac{910-975}{3}$

or, $-\frac{x}{20} = -\frac{65}{3}$

$\Rightarrow x = \frac{65\times 20}{3}$ = Rs. 433.33

25. (C) A's share = Rs. 12000

$= \frac{3}{8}$ of (100% – 20%) of total profit

$= \frac{3}{8}$ of 80% of total profit

$\Rightarrow$ 80% of total profit = Rs. $12000 \times \frac{8}{3}$

So, Total profit (i.e. 100%)

$= \text{Rs. } 12000 \times \frac{8}{3} \times \frac{100}{80}$

= Rs. 40000

26. (A) Let the third no. be 100.

So, A and B will be 80 and 72 respectively.

So, required % $= \frac{\text{difference of A \& B}}{\text{value of A}} \times 100\%$

$= \frac{8}{80} \times 100\% = 10\%$

27. (B) Total no. of illiterate persons in the town = no. of literate men + no. of illiterate women

$= \left\{(100\% - 24\%) \text{of} \frac{40}{83} \times 311250\right\} +$

$\left\{(100\% - 8\%) \text{of} \frac{43}{83} \times 311250\right\}$

$= \frac{76}{100} \times \frac{40}{83} \times 311250 + \frac{92}{100} \times \frac{43}{83} \times 311250$

= 114000 + 148350

= 262350

28. (B) Let x = maximum marks

So, ATQ,

30% of x + 50 = 320 + 30

or, $\frac{30}{100}x = 300$

$\Rightarrow x = \frac{300 \times 100}{30} = 1000$ marks

29. (D) Let x = man's initial income

So, Man's increased income = (x + 1200)

Now, ATQ,

12% of x = 10% of (x + 1200)

$\Rightarrow 12x = 10(x + 1200)$

or, $12x - 10x = 12000$

$\Rightarrow x = 6000$

So, increased income;

i.e. x + 1200 = Rs. 6000 + Rs. 1200

= Rs. 7200

30. (D) 20% profit on one and 20% loss on other

$\Rightarrow$ net loss

and loss % $= \frac{(20)^2}{100} = 4\%$

$\Rightarrow$ Total SP = (100 – 4)% of total CP

$\Rightarrow$ 2 × 4.5 lakh = 96% of total CP

So,

loss i.e. 4% of total CP

$= \frac{2 \times 4.5 \text{lakh}}{96} \times 4$

= Rs. 37500

$\Rightarrow$ loss of Rs. 37500

31. (A) Required single discount

= (1 – 0.9 × 0.8 × 0.75) × 100%

= (1 – 0.54) × 100%

= 0.46% × 100%

= 46%

32. (D) SP per mango = Re. $\frac{1}{10}$

= 140% of CP per mango

So, CP per mango (i.e. 100%)

= Re. $\frac{1}{10} \times \frac{100}{140}$ = Re. $\frac{1}{14}$

$\Rightarrow$ 14 mangoes for Re. 1.

33. (A) Let x = CP of 2nd watch

So, (1120 – x) = CP of 1st watch

ATQ, Profit = Loss

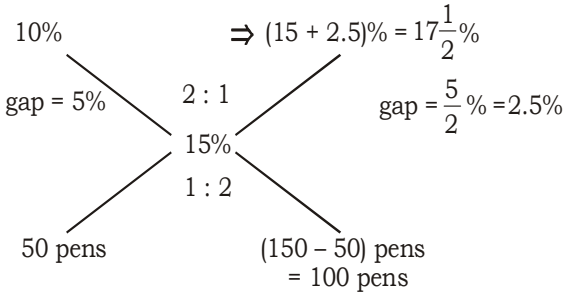
$\Rightarrow$ 15% of (1120 – x) = 10% of x

$\Rightarrow 15(1120 - x) = 10x$

$\Rightarrow 25x = 15 \times 1120$

$\Rightarrow x = \frac{15 \times 1120}{25} = \text{Rs. } 672$

34. (D)



35. (D) C.P. of 40 article = SP of 25 articles

In such type of questions,

Gain percent $= \frac{40 - 25}{25} \times 100\%$

$= \frac{15}{25} \times 100\%$

= 60%

36. (B)

C.P.		S.P.
A	⟶	B
Rs. x		Rs. $\left(x+\frac{x}{5}\right)$ = Rs. $\frac{6}{5}x$

Now,

B	20% profit ⟶	C
Rs. $\frac{6}{5}x$		Rs. $\left(\frac{120}{100}\times\frac{6}{5}x\right)$ = Rs. $\frac{36}{25}x$

Now,

C	⟶	Rs. 600
Rs. $\frac{36}{25}x$		Rs. $\left(\frac{36}{25}x-\frac{1}{6}\times\frac{36}{25}x\right)$

$= \text{Rs. } \frac{5}{6}\times\frac{36}{25}x = \text{Rs. } \frac{6}{5}x$

$\Rightarrow \text{Rs. } \frac{6}{5}x = \text{Rs. } 600$

So, CP of A i.e. Rs. x $= \text{Rs. } \frac{600\times5}{6}$

$= \text{Rs. } 500$

37. (*)

M.P.	10% discount ⟶	Price after 10% discount
Rs. x		Rs. $\frac{9}{10}x$

Again,

Rs. $\frac{9}{10}x \xrightarrow[\text{(additional)}]{6\%\text{ discount}}$ Rs. $\frac{94}{100}\times\frac{9x}{10}$ = Rs. 846

$\Rightarrow$ The original marked price i.e. x

$= \text{Rs. } \frac{846\times100\times10}{94\times9}$

$= \text{Rs. } 1000$

38. (B) Single equivalent discount of 20% & then $6\frac{1}{4}\%$.

$= 20\% + \frac{25}{4}\% - \frac{20\times\frac{25}{4}}{100}\%$

$= 25\%$ discount

C.P.	20% gain ⟶	S.P.	25% discount ⟶	M.P.
Rs. 100 (let)		Rs. 120 =75% of M.P.		

So, 100% of MP $= \frac{120}{75}\times100$

$= \text{Rs. } 160$

$\Rightarrow$ MP should be above CP by

$= \frac{160-100}{100}\times100\%$

$= 60\%$

39. (C) 20% discount on L.P. – 25% discount on L.P. = Rs. 500

$\Rightarrow$ 80% value of L.P. – 75% value of L.P.

= Rs. 500

$\Rightarrow$ 5% value of L.P. = Rs. 500

$\Rightarrow$ L.P. (i.e. 100%) $= \text{Rs. } \frac{500\times100}{5}$

$= \text{Rs. } 10000$

So, Tarun bought the TV at 80% of L.P.

$= \text{Rs. } \frac{80}{100}\times10000$

$= \text{Rs. } 8000$

40. (B) SI @ 3% p.a. for 4 yrs. = 12% of sum

SI @ 2% p.a. for 5 yrs. = 10% of sum

ATQ,

(12% – 10%) of sum = Rs. 150

$\Rightarrow$ 2% of sum = Rs. 150

$\Rightarrow$ sum $= \text{Rs. } \frac{150\times100}{2}$

$= \text{Rs. } 7500$

41. (C)

	S.I.	C.I.
For 1st year	Rs. 135	Rs. 135
For 2nd year	Rs. 135	Rs. 162 = Rs.135 + Rs. 27

Now,

if r = rate of interest per annum

$\Rightarrow$ r% of 135 = 27

$\Rightarrow$ $r = \frac{27\times100}{135} = 20$

Also,

$\Rightarrow$ 20% of the sum = 135

$\Rightarrow$ sum $= \frac{135\times100}{20} = \text{Rs. } 675$

42. (C)

	C.I.
For 4 years	Rs. 3840
For 5 years	Rs. 3936 = Rs. 3840 + Rs. 96

Now,

if r = rate of interest per annum

$\Rightarrow$ r% of 3840 = 96

$\Rightarrow$ $r = \frac{96\times100}{3840} = 2.5\%$

43. (B) ATQ,

$P\left(1+\frac{20}{100}\right)^t > 2P$ (where P → Principal & t → required no. of years)

or, $\left(1+\frac{1}{50}\right)^t > 2$ or $\left(\frac{6}{5}\right)^t > 2$

Now,

$\left(\frac{6}{5}\right)^1 < 2, \left(\frac{6}{5}\right)^2 < 2, \left(\frac{6}{5}\right)^3 < 2$ but $\left(\frac{6}{5}\right)^4 > 2$

$\Rightarrow$ Required least no. of complete yrs. = 4yrs.

44. (D) $12M + 16B \rightarrow 10$ days ... (i)

$18M + 50B \rightarrow 5$ days

$\Rightarrow 9M + 25B \rightarrow 10$ days ... (ii)

From (i) & (ii)

We have

$12M + 16B = 9M + 25B$

$\Rightarrow 3M = 9B$

$\Rightarrow 1M = 3B$

So,

Efficiency of a man to that of a boy = 3 : 1

45. (A)

Prem $\xrightarrow{\text{does the whole work in}}$ 10 days

Prem $\xrightarrow{\text{in 1 day}}$ $\frac{1}{10}$ part of work

Also,

Raj $\xrightarrow{\text{does the whole work in}}$ 12 days

Raj $\xrightarrow{\text{in 1 day}}$ $\frac{1}{12}$ part of work

Now,

Work done by Prem in initial 6 days

$= \left(\frac{1}{10} \times 6\right)$

$= \frac{3}{5}$ part of work

$\Rightarrow$ Remaining part of the work

$= 1 - \frac{3}{5}$

$= \frac{2}{5}$ part of the work

Now,

Amount of work done by Prem & Raj together in 1 day

$= \left(\frac{1}{10} + \frac{1}{12}\right)$

$= \frac{11}{60}$ part of the work

So,

No. of days taken by Prem & Raj together to do the remaining part of the work

$= \frac{\frac{2}{5}}{\frac{11}{60}} = \frac{2 \times 60}{5 \times 11} = 2\frac{2}{11}$ days

$\Rightarrow$ Raj actually did the work for $2\frac{2}{11}$ days.

46. (*) **A** **B**

6 hours 2 hours

Let the capacity of tank = 12 litres

$\Rightarrow$ Rate of filling of tank by pipe A

$= \left(\frac{12}{6}\right)$ litre per hour

= 2 litre per hour

and rate of filling of tank by pipe B

$= \left(\frac{12}{2}\right)$ litre per hour

= 6 litre per hour

$\Rightarrow$ Rate of filling of tank by pipe A & B together

= 8 litre per hour

Now,

Pipe B was opened $\frac{1}{2}$ hour earlier than pipe A.

Volume of tank filled by pipe B in $\frac{1}{2}$ hour

= 3 litre

$\Rightarrow$ Remaining part of the tank which is still empty = (12 – 3) litre

= 9 litre

Time required to fill 9 litre of tank by pipe A & B together

$= \frac{9}{8}$ hours

$= 1\frac{1}{8}$ hours

= 1 hours 7.5 minutes

$\Rightarrow$ Required point of time

= 2 : 30 pm + 1 hour 7.5 mins

$= 3 : 37.5$ pm or $3 : 37\frac{1}{2}$ pm

Alternative method

Part of tank filled by pipe B alone in $\frac{1}{2}$ hour

$= \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ part

Time taken by pipe A & B together to fill the remaining part

$= \frac{1 - \frac{1}{4}}{\frac{1}{6} + \frac{1}{2}} = \frac{\frac{3}{4}}{\frac{4}{6}} = \frac{9}{8}$ hours

$\Rightarrow$ Required point of time

= 2 : 30 pm + 1 hour 7.5 min

$= 3 : 37\frac{1}{2}$ pm

47. (B) Let x hour = time taken by pipe A alone to empty the pool

$2x$ hr. = time taken by pipe B

alone to empty the pool

So, Time taken by pipe A & B together to empty the pool

$$= \frac{x \times 2x}{x + 2x} \text{ hours}$$

$$= \frac{2x^2}{3x} \text{ hours} = \frac{2}{3}x \text{ hours}$$

$\Rightarrow$ Time taken by pipe C alone to empty the pool $= \left(\frac{2}{3}x \times 2\right)$ hours

$$= \frac{4}{3}x \text{ hours}$$

$\Rightarrow$ Part of the pool which will be empty when A, B & C work together

$$= \left(\frac{1}{x} + \frac{1}{2x} + \frac{3}{4x}\right) \text{part}$$

$$= \left(\frac{4+2+3}{4x}\right) \text{part}$$

$$= \frac{9}{4x} \text{part}$$

$\Rightarrow$ Total time taken by A, B & C working together to empty the pool

$$= \frac{4x}{9} = 400 \text{ minutes}$$

[$\because$ 6 hour 40 minutes = 400 min]

$$\Rightarrow \quad x = \frac{400 \times 9}{4} \text{ minutes}$$

$= 900$ minutes $= 15$ hours

48. (A) 12 km up + 18 km down $\rightarrow$ in 3 hrs.

$\Rightarrow$ 36 km up + 54 km down $\rightarrow$ in 9 hrs. ..... (i)

Also, 36 km up + 24 km down $\rightarrow$ in $6\frac{1}{2}$ hrs. ..... (ii)

From (i) & (ii), we get,

30 km down $\rightarrow$ in $2\frac{1}{2}$ hours

$\Rightarrow$ S_{down} (i.e. $S_B + S_C$) $= 12$ km/hour

Also,

$\Rightarrow$ S_{up} (i.e. $S_B + S_C$) $= 8$ km/hour

So,

Speed of current

$$\text{i.e. } S_C = \frac{S_{down} - S_{up}}{2}$$

$$= \frac{12-8}{2} \text{ km/hour}$$

$= 2$ km/hour

49. (C) $-24, -20, -16, \ldots\ldots\ldots$

Let, n = required no. of terms

Now,

$$S_n = \frac{n}{2}\{2a + (n-1)d\}$$

$$\text{i.e. } 180 = \frac{n}{2}\{2 \times (-24) + (n-1)4\}$$

$$\text{or, } 180 = \frac{n}{2}(-48 + 4n - 4)$$

$$\text{or, } 360 = 4n^2 - 52n$$

$$\text{or, } 4n^2 - 52n - 360 = 0$$

$$\Rightarrow n = 18$$

50. (D)

3	18	12	72	66	396	?
	3×6	$18 - 6$	12×6	$72 - 6$	66×6	$396 - 6$

$\Rightarrow$ The missing no. $= 396 - 6$

$= 390$

51. (A) $\left(x + \frac{1}{x}\right)^2 = 3$

$$\Rightarrow \quad x + \frac{1}{x} = \sqrt{3}$$

On cubing both the sides we get,

$$\left(x + \frac{1}{x}\right)^3 = 3\sqrt{3}$$

$$\text{or, } x^3 + \frac{1}{x^3} + 3\left(x + \frac{1}{x}\right) = 3\sqrt{3}$$

$$\text{or, } x^3 + \frac{1}{x^3} + 3\sqrt{3} = 3\sqrt{3} \Rightarrow x^3 + \frac{1}{x^3} = 0$$

$$\text{or, } \frac{x^6 + 1}{x^3} = 0 \Rightarrow x^6 + 1 = 0 \Rightarrow x^6 = -1$$

Now,

$x^{72} + x^{66} + x^{54} + x^{36} + x^{24} + x^6 + 1$

$= (x^6)^{12} + (x^6)^{11} + (x^6)^9 + (x^6)^6 + (x^6)^4 + x^6 + 1$

$= (-1)^{12} + (-1)^{11} + (-1)^9 + (-1)^6 + (-1)^4 + (-1) + 1$

$= 1 - 1 - 1 + 1 + 1 - 1 + 1$

$= 1$

52. (A) Let $x = (27 + \sqrt{756})^{1/3} + (27 - \sqrt{756})^{1/3}$

$$x^3 = 27 + \sqrt{756} + 27 - \sqrt{756} + 3(27 + \sqrt{756})^{1/3}(27 - \sqrt{756})^{1/3}\{(27 + \sqrt{756}) + (27 - \sqrt{756})\}$$

$$x^3 = 54 + 3(729 - 756)^{1/3}\, x$$

$$= 54 + 3 \times (-27)\, x$$

$$x^3 = 54 - 9x$$

$$x^3 + 9x - 54 = 0$$

$$(x-3)(x^2 + 3x + 18)$$

$$x = 3$$

53. (D) $a^2d^2 + b^2c^2 - 2abcd + a^2c^2 + b^2d^2 + 2abcd$

$= a^2(c^2 + d^2) + b^2(c^2 + d^2)$

$= (a^2 + b^2)(c^2 + d^2)$

$= 2 \times 1 = 2$

54. (B) $\sqrt{-\sqrt{3} + \sqrt{3 + 8\sqrt{7 + 4\sqrt{3}}}}$

$= \sqrt{-\sqrt{3}+\sqrt{3+8\sqrt{(2+\sqrt{3})^2}}}$

$= \sqrt{-\sqrt{3}+\sqrt{3+8\sqrt{(2+\sqrt{3})}}}$

$= \sqrt{-\sqrt{3}+\sqrt{(3+16+8\sqrt{3})}}$

$= \sqrt{-\sqrt{3}+\sqrt{(4+\sqrt{3})^2}}$

$= \sqrt{-\sqrt{3}+4+\sqrt{3}}$

$\Rightarrow \sqrt{4} = 2$

55. (A) $x = 1+\sqrt{2}+\sqrt{3}$

$\Rightarrow x-1 = \sqrt{3}+\sqrt{2} \Rightarrow \frac{1}{x-1} \Rightarrow \sqrt{3}-\sqrt{2}$

So, $x+\frac{1}{x-1} = 1+\sqrt{2}+\sqrt{3}+\sqrt{3}-\sqrt{2}$

$= 2\sqrt{3}+1$

56. (B) $n = 7+4\sqrt{3}$

$= 4+3+4\sqrt{3}$

$= (2)^2+(\sqrt{3})^2+2\times2\times\sqrt{3}$

$= (2+\sqrt{3})^2$

So, $\left(\sqrt{n}+\frac{1}{\sqrt{n}}\right) = 2+\sqrt{3}+\frac{1}{2+\sqrt{3}}$

$= \frac{7+4\sqrt{3}+1}{2+\sqrt{3}}$

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

57. (A) $\frac{(K-1)}{(2-K)} = \frac{1}{-3} = \frac{-2}{1}$

or, $-3(K-1) = 2-K$
or, $-3K+3 = 2-K$
or, $-3K+K = 2-3$
$\Rightarrow -2K = -1$

$\Rightarrow K = \frac{1}{2}$

58. (B) $a+b+c = 6$

On squaring both sides, we get

$(a+b+c)^2 = 6^2$

or, $a^2+b^2+c^2+2(ab+bc+ca) = 36$

or, $14+2(ab+bc+ca) = 36$

$\Rightarrow ab+bc+ca = \frac{36-14}{2}$

i.e. $ab+bc+ca = 11$

Now,

$a^3+b^3+c^2-3abc = (a+b+c)\{a^2+b^2+c^2-(ab+bc+ca)\}$

i.e. $36-3abc = 6(14-11)$

$\Rightarrow 3abc = 36-18$

$\Rightarrow abc = 6$

59. (D) $(x^2+5x+10)^{-1} = \frac{1}{(x^2+5x+10)}$

$\frac{1}{(x^2+5x+10)}$ will be maximum when $x^2+5x+10$ is minimum and maximum value of $x^2+5x+10 = -\left(\frac{5^2-4\times1\times10}{4}\right)$

$= \frac{15}{4}$

So, Required maximum value $= \frac{1}{\frac{15}{4}} = \frac{4}{15}$

60. (D) $\sin^2\theta+\cos^2\theta+\sec^2\theta+\cos ec^2\theta+$

$+\tan^2\theta+\cot^2\theta$

$= (\sin^2\theta+\cos^2\theta)+(\sec^2\theta-\tan^2\theta)$

$+\tan^2\theta+(\cos ec^2\theta-\cot^2\theta)+\cot^2\theta$

$+\tan^2\theta+\cot^2\theta$

$= 1+1+1+2(\tan^2\theta+\cot^2\theta)$

$= 3+2\{(\tan\theta-\cot\theta)^2+2\tan\theta\cot\theta\}$

$= 3+2\{(\tan\theta-\cot\theta)^2+2\}$

$= 3+4+2(\tan\theta-\cot\theta)^2$

$= 7+2(\tan\theta-\cot\theta)^2 > 7$

$\because (\tan\theta-\cot\theta)^2 > 0$

61. (D) $P = \sqrt{\frac{1-\sin x}{1+\sin x}} \Rightarrow P = \frac{1-\sin x}{\cos x}$

and $Q = \frac{1-\sin x}{\cos x}$

$R = \frac{\cos x}{1+\sin x}\times\frac{1-\sin x}{1-\sin x}$

$= \frac{\cos x(1-\sin x)}{\cos^2 x}$

$\Rightarrow R = 1-\sin x$

$\Rightarrow P = Q = R$

62. (*) $\frac{\tan57^\circ+\cot37^\circ}{\tan33^\circ+\cot53^\circ} = \frac{\cot33^\circ+\tan53^\circ}{\tan33^\circ+\cot53^\circ}$

$$= \frac{\frac{1}{\tan 33^\circ} + 53^\circ}{\tan 33^\circ + \frac{1}{\tan 53^\circ}} = \frac{\frac{(1+\tan 53^\circ \times \tan 33^\circ)}{\tan 33^\circ}}{\frac{(\tan 33^\circ \times \tan 55^\circ + 1)}{\tan 53^\circ}}$$

$$= \frac{\tan 53^\circ}{\tan 33^\circ} = \tan 53^\circ \times \cot 33^\circ$$

$$= \cot 37^\circ \times \tan 57^\circ$$

63. (D) $\sin\theta + \sin^2\theta + \sin^3\theta = 1$

$\Rightarrow \sin\theta + \sin^3\theta = \cos^2\theta$

$\Rightarrow \sin\theta(1+\sin^2\theta) = \cos^2\theta$

$\Rightarrow \sin\theta(2-\cos^2\theta) = \cos^2\theta$

$\Rightarrow \sqrt{1-\cos^2\theta}(2-\cos^2\theta = \cos^2\theta$

$\Rightarrow (1-\cos^2\theta)[4+\cos^2\theta - 4\cos^2] = \cos^4\theta$

$\Rightarrow 4 + \cos^4\theta - 4\cos^2\theta - 4\cos^2\theta - \cos^6\theta$

$+ \cos^4\theta = \cos^4\theta$

$\Rightarrow -\cos^6 + 4\cos^4\theta - 8\cos^2\theta + 4 = 0$

$\Rightarrow -\cos^6 + 4\cos^4\theta + 8\cos^2\theta = 4$

64. (B) Let $x = \sin\theta + \cos\theta$

$\Rightarrow x^2 = \sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta$

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

Now, $\because 0^\circ < \theta < 90^\circ$

$\Rightarrow \sin\theta < 1$ and $\cos\theta < 1$

$\Rightarrow \sin\theta \times \cos\theta < 1$

$\Rightarrow 0 < 2\sin\theta \times \cos\theta < 2$

$\Rightarrow 1 + 0 < 1 + 2\sin\theta\cos\theta < 1 + 2$

$\Rightarrow 1 < x^2 < 3$

$\Rightarrow \sqrt{1} < x < \sqrt{3}$

$\Rightarrow 1 < \sin\theta\cos\theta < \sqrt{3}$

$\Rightarrow \sin\theta + \cos\theta > 1$

65. (B) $\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ$

$= \sin(90^\circ - 80^\circ)\sin(90^\circ - 40^\circ)\sin(90^\circ - 20^\circ)\sin 30^\circ$

$= \cos 20 \cos 40 \cos 80 \times \frac{1}{2}$

We know,

$\cos\theta\cos 2\theta\cos 4\theta = \frac{1}{4}\cos 3\theta$

$\Rightarrow \cos 20\cos 40\cos 80 \times \frac{1}{2}$

$\Rightarrow \frac{1}{4}\cos(3\times 20^\circ) \times \frac{1}{2}$

$\Rightarrow \frac{1}{8}\cos 60^\circ$

$\Rightarrow \frac{1}{8} \times \frac{1}{2} = \frac{1}{16}$

66. (B) $\sec^2\theta - (1+\sqrt{3})\tan\theta + \sqrt{3} - 1 = 0$

$1 + \tan^2\theta - \tan\theta - \sqrt{3}\tan\theta + \sqrt{3} - 1 = 0$

$\tan^2\theta - \sqrt{3}\tan\theta - \tan\theta + \sqrt{3} = 0$

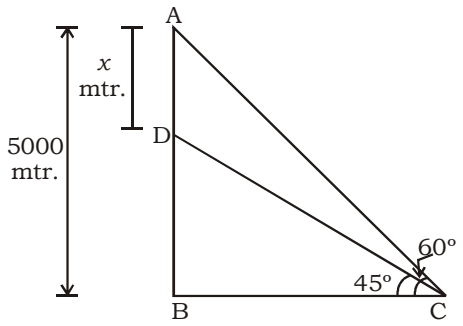
$\tan\theta(\tan\theta - \sqrt{3}) - 1(\tan\theta - \sqrt{3}) = 0$

$(\tan\theta - \sqrt{3})(\tan\theta - 1) = 0$

$\tan\theta - \sqrt{3} = 0$

$\tan\theta = \sqrt{3}$

67. (C)



$\angle ACB = 60^\circ$

$\angle DCB = 45^\circ$

AB = 5000 mtr.

Let, AD= x mtr.

$\therefore$ From ΔABC,

$\tan 60^\circ = \frac{AB}{BC}$

$\Rightarrow \sqrt{3} = \frac{5000}{BC}$ mtr. $\Rightarrow$ BC= $\frac{5000}{\sqrt{3}}$ mtr.

From ΔDBC,

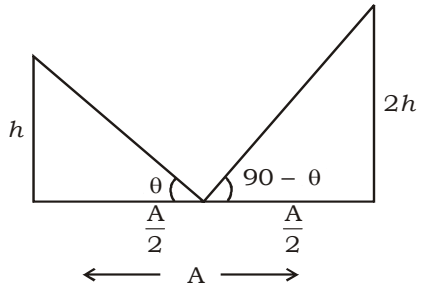
$\tan 45^\circ = \frac{DB}{BC} = DB = BC = \frac{5000}{\sqrt{3}}$

Now, AD = AB - BD

$= 5000 - \frac{5000}{\sqrt{3}}$

$= 5000\left(1 - \frac{1}{\sqrt{3}}\right)$ mtr.

68. (D)



$$\tan\theta = \frac{h}{\frac{A}{2}} = \frac{2h}{A} \quad \text{...(i)}$$

$$\tan(90-\theta) = \frac{2h}{\frac{A}{2}}$$

$$\cos\theta = \frac{4-h}{A}$$

$$\tan\theta = \frac{A}{4h} \quad \text{...(ii)}$$

From (i) & (ii)

$$\frac{2h}{A} = \frac{A}{4h}$$

$8h^2 = A^2$

$h^2 = A^2$

$$h^2 = \frac{A^2}{8}$$

$$h = \frac{A}{2\sqrt{2}}$$

69. (D) $$2\sin\left(\frac{\pi x}{2}\right) = x^2 + \frac{1}{x^2}$$

or, $$2\sin\left(\frac{\pi x}{2}\right) = \left(x + \frac{1}{x}\right)^2 + 2$$

$[\because a^2+b^2=(a-b)^2+2ab]$

$$\Rightarrow \left(x - \frac{1}{x}\right)^2 = 2\left\{\sin\left(\frac{\pi x}{2}\right) - 1\right\}$$

$$\Rightarrow \left(x - \frac{1}{x}\right) = \sqrt{2\times 0} \qquad \left[\sin\frac{\pi}{2} = 1\right]$$

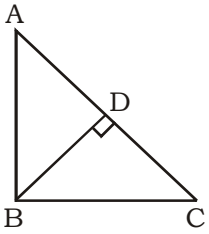
$= 0$ Also, $\left[1 = \sin\frac{\pi x}{2}\right]$

70. (D) $$\frac{Per(\Delta ABC)}{Per(\Delta DEF)} = \frac{AB}{DE}$$

$$\frac{Per(\Delta ABC)}{25} = \frac{9.1}{6.5}$$

Per (ABC) = 35

71. (B)



$\Delta ADB \cong \Delta ABC$

$$\Rightarrow \frac{AD}{AB} = \frac{AB}{AC}$$

$\Rightarrow AB^2 = AD \times AC$

72. (B) Let side of D = x

$$\Rightarrow \frac{\sqrt{3}}{4}(x+2)^2 - \frac{\sqrt{3}}{4}x^2 = 2\sqrt{3}$$

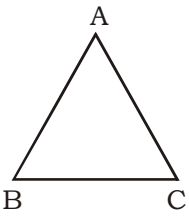
$$\Rightarrow \frac{\sqrt{3}}{4}\left[x^2 + 4 + 4x - x^2\right] = 2\sqrt{3}$$

$4x + 4 = 8$

$4x = 4$

$x = 1$

73. (B)



In ΔABC,

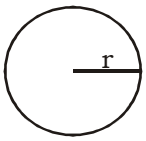
AB + BC = 12 cm

BC + CA = 14 cm

& CA + AB = 18cm

$\Rightarrow 2(AB + BC + CA) = 44$ cm

$\Rightarrow AB + BC + CA = 22$ cm



Now,

ATQ

$2\pi r = 22\text{cm}$

$$\Rightarrow 2\times\frac{22}{7}\times 22\text{cm}$$

$$\Rightarrow r = \frac{7}{2}\text{ cm}$$

74. (D) Sum of all interior angles

= 2× sum of all exterior angles

$\Rightarrow (n-2)\times 180^\circ = 2\times 360^\circ$

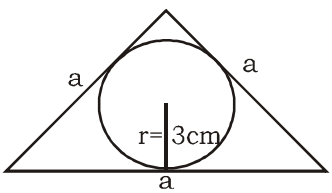
or, $(n-2)\times 180^\circ = 720^\circ$

$\Rightarrow (n-2) = 4$

$\Rightarrow n = 6$

$\Rightarrow$ Required no. of sides of the polygon = 6

75. (B)



In an equilateral triangle,

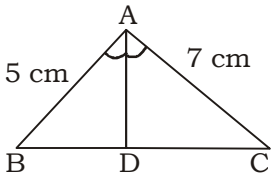
side = $2\sqrt{3}$ × inradius

i. e. $a = 2\sqrt{3} \times r$

$= 2\sqrt{3} \times 3\,cm$

$= 6\sqrt{3}\,cm$

76. (D)



Here,
AD = angle bisector of $\angle A$

$\Rightarrow \angle BAD = \angle DAC$

In such case,

$\frac{BD}{CD} = \frac{AB}{AC} = \frac{5}{7} \Rightarrow 5:7$

77. (*) No. of diagonals of a polygon of n sides

$= {}^{n}C_2 - n$

$\Rightarrow$ ATQ,

$${}^{n}C_2 - n = 54$$

$$\frac{\lfloor n}{\lfloor 2 \lfloor n-2} = 54 + 1$$

$$\frac{n(n-1)\lfloor n-2}{(2\times 1)\lfloor n-2} = 54 + n$$

$$\Rightarrow n^2 - n = 108 + 2n$$

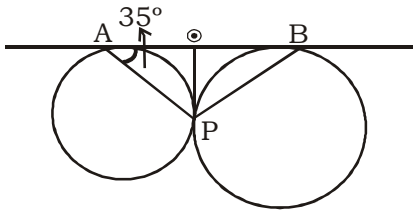
$$\Rightarrow n^2 - 3n - 108 = 0$$

$$\Rightarrow n = 12, -9$$

$$\Rightarrow n = 12$$

[$\because$ n cannot be negative.]

78. (B)



Here, in ΔAOP,
AO = OP

$\Rightarrow \angle PAO = \angle APO = 35°$

$\Rightarrow \angle AOP = 180° - (2 \times 35°)$
$= 110°$

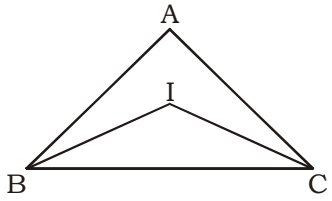
$\Rightarrow \angle POB = 180° - 110° = 70°$

Also, In ΔPOB,
BO = OP

$\Rightarrow \angle PBO = \angle OPB = \frac{180° - 70°}{2} = 55°$

$\Rightarrow \angle ABP = 55°$

79. (B)



$\angle ABC = 65°$

$\Rightarrow \angle IBC = \frac{\angle ABC}{2} = 32.5°$

Also, $\angle ACB = 55°$

$\Rightarrow \angle ICB = \frac{\angle ACB}{2} = 27.5°$

$\Rightarrow \angle IBC = 180° - (\angle IBC + \angle ICB)$
$= 180° - 60°$
$= 120°$

80. (C) Ratio of no. of sides = 1: 2
Then, Let the nos. of sides are n and $2n$
Now, Ratio of their interior angles = 2 : 3

$$\frac{\frac{(2n-4)}{n}\times 90°}{\frac{(4n-4)}{2n}\times 90°} = \frac{2}{3} \Rightarrow \frac{2n-4}{4n-4} = \frac{1}{3}$$

$\Rightarrow 6n - 12 = 4n - 4 \Rightarrow 2n = 8 \Rightarrow n = 4$
$\Rightarrow$ Respective nos. of sides of these polygons are 4 and 8.

81. (B) $\frac{a^3}{\frac{4}{3}\pi\left(\frac{a}{2}\right)^3} = \frac{a^3}{\frac{4}{3}\pi\frac{a^3}{8}} = \frac{6}{\pi} \Rightarrow 6:\pi$

82. (?) $4\pi r^2 = 2\pi(r + h_2) = \pi r(l + r)$
or, $4r = 2(r + h_2) = l + r$
Now, $\because$ $4r = 2(r + h_2)$
or, $4r = 2r + 2h_2$
or, $2r = 2h_2$
$\Rightarrow r : h_2 = 1 : 1$
Again, $\because 4r = l + r$

or, $4r = \sqrt{r^2 + h_3^2} + r$

or, $3r = \sqrt{r^2 + h_3^2}$

$\Rightarrow 9r^2 = r^2 + h_3^2$

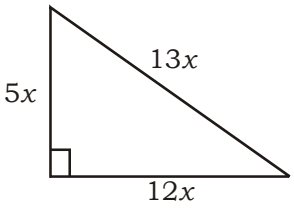
$\Rightarrow 8r^2 = h_3^2$

$\Rightarrow 2\sqrt{2}\,r = h_3$

$\Rightarrow r : h_3 = 1 : 2\sqrt{2}$

$\Rightarrow r(h_1) : h_2 : h_3 = 1 : 1 : 2\sqrt{2}$

83. (C)



Let the sides are $13x$, $12x$ and $5x$.

ATQ,

$13x + 12x + 5x = 450$

or, $30x = 450 \Rightarrow x = 15$

$\Rightarrow$ Sides are of length 195m, 180m and 75m.

Now,

$\because$ Ratio of sides are 13 : 12 : 5

(Pythagorian triplet)

$\Rightarrow$ Triangle is a right angled triangle.

So,

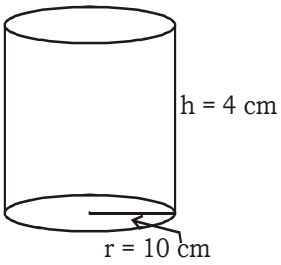
$$\text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$= \frac{1}{2} \times 12x \times 5x$$

$$= \frac{1}{2} \times 180 \times 75 \text{ m}^2$$

$$= 6750 \text{ sq. meter}$$

84. (A)



Let radius is increased by x cm.

$\Rightarrow$ New volume of cylinder $= \pi(10 + x)^2 \times 4$

Again,

Let the height is increased by x cm.

$\Rightarrow$ New volume of cylinder $= \pi \times 10^2 \times (4 + x)$

$\Rightarrow \pi(10 + x)^2 \times 4 = \pi \times 10^2 \times (4 + x)$

$\Rightarrow (10 + x)^2 \times 4 = 100(4 + x)$

$\Rightarrow (10 + x)^2 = 25(4 + x)$

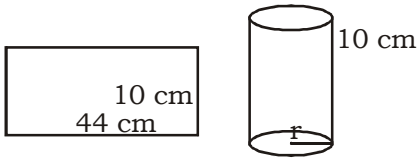
$\Rightarrow 100 + x^2 + 20x = 100 + 25x$

$\Rightarrow x^2 - 5x = 0$

$\Rightarrow x(x - 5) = 0$

$x = 5$ cm

85. (B)



Volume of the cylinder $= \pi r^2 h$

$= \pi \times 7^2 \times 10$

$= \frac{22}{7} \times 49 \times 10$

$= 1540 \text{ m}^3$.

$\Rightarrow 2\pi r = 44$ cm

$\Rightarrow r = \frac{44 \times 7}{22 \times 2}$ cm

$\Rightarrow r = 7$ cm

86. (C) Volume of cube $= a^3$ (where a = length of a edge)

When each edge is increased by 40%.

$\Rightarrow$ length of the new edge $= 1.4a$

$\Rightarrow$ Volume of new cube $= (1.4a)^3$

$= 2.744\ a^3$

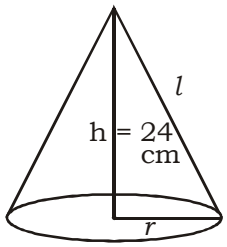
$\Rightarrow$ Required % increase

$$= \frac{2.744a^3 - a^3}{a^3} \times 100\%$$

$= (1.744 \times 100)\%$

$= 174.4\%$

87. (B)



$l = \sqrt{h^2 + r^2}$

$= \sqrt{24^2 + 7^2}$

$= 25$ cm

Volume of cone $= 1232 \text{ cm}^3$

$\Rightarrow \frac{1}{3}\pi r^2 h = 1232 \text{ cm}^3$

$\Rightarrow \frac{1}{3} \times \frac{22}{7} \times r^2 \times 24 = 1232 \text{ cm}^3$

$\Rightarrow r^2 = \frac{1232 \times 7 \times 3}{22 \times 24}$

$\Rightarrow r^2 = 49$ cm

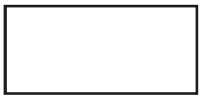
$\Rightarrow r = 7$ cm

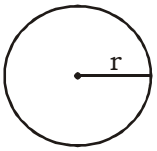
So, Curved surface area of cone $= \pi rl$

$$= \frac{22}{7} \times 7 \times 25 \text{ cm}^2$$

$= 550 \text{ cm}^2$

88. (D)





Perimeter of the rectangle
$= 2 \times (26 + 18)$ cm
$= 88$ cm

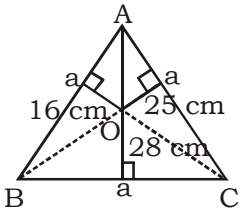
$= 2\pi r \Rightarrow r = \frac{88 \times 7}{22 \times 2} = 14$ cm

$\Rightarrow$ Area of the circle i.e. πr^2

$= \frac{22}{7} \times 14 \times 14$

$= 616$ cm^2

89. (A)



Area of ΔABC
= Area of $(\Delta AOB + \Delta AOC + \Delta BOC)$

$\Rightarrow \frac{\sqrt{3}}{4}a^2 = \frac{1}{2} \times a(16 + 25 + 28)$

$\Rightarrow a = \frac{4}{\sqrt{3} \times 2} \times 69$ cm

$\Rightarrow a = 46\sqrt{3}$ cm

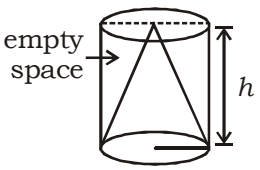
So,

Area of $\Delta ABC = \frac{\sqrt{3}}{4} \times (46\sqrt{3})^2$

$= \frac{\sqrt{3}}{4} \times 2116 \times 3$

$= 1587\sqrt{3}$ cm^3

90. (C)



Volume of water needed to fill the empty space
= Volume of cylinder – Volume of cone

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

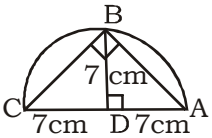
$= \frac{2}{3}\pi r^2 h$

$= 2 \times \left(\frac{1}{3}\pi r^2 h\right)$

$= 2 \times 27\pi$ cm^3

$= 54\pi$ cm^3

91. (B)



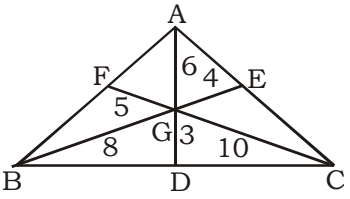
In right angled isosceles ABC,
AB = BC
Also,
AD = CD = BD = 7cm
= circum radius
(where $BD \perp AC$)
Now, Required area
= Area of semicircle – Area of ΔABC

$= \left(\frac{22 \times 7 \times 7}{7 \times 2} - \frac{1}{2} \times 14 \times 7\right)$ cm^2

$= (77 - 49)$ cm^2

$= 28$ cm^2

92. (B)



In the given ΔABC,
AD, BE and CF are medians and they cut one another at G.

$\Rightarrow \frac{AG}{GD} = \frac{BG}{GE} = \frac{CG}{GF} = \frac{2}{1}$

Here,
AD = 9 cm, BE = 12 cm and CF = 15 cm
$\because$ AG + GD = AD = 9 cm
$\Rightarrow$ AG = 6 cm and GD = 3 cm
Also,
BG + GE = BE = 12 cm
$\Rightarrow$ BG = 8 cm and GE = 4 cm
Also,
CG + GF = CF = 15 cm
$\Rightarrow$ CG = 10 cm and GF = 5 cm

$\Rightarrow$ Area of $\Delta AGB = \frac{1}{2} \times 6 \times 8 = 24$ cm^2

So, Area of $\Delta ABC = 3 \times \Delta AGB$
$= 2 \times 24$ cm^2
$= 72$ cm^2

93. (C) T.S.A. of prism = C.S.A. + 2 × Area of base

$\Rightarrow$ 608 = Perimeter of base × height + 2 × Area of base

$\Rightarrow$ 608 = 4x × 15 + 2x2

(where x = side of square)

$\Rightarrow$ $x^3 + 30x - 304 = 0$

$\Rightarrow$ $(x-8)(x+38) = 0$

$\Rightarrow$ $x = 8$

$\Rightarrow$ Volume of prism = Area of base × height

= 8 × 8 × 15

= 960 cm^3

94. (A) $\pi(r+1)^2 - \pi r^2 = 22$

$\Rightarrow$ $\pi(r^2 + 2r + 1 - r^2)$

$\Rightarrow$ $2\pi r + \pi = 22$

$\Rightarrow$ $\frac{22}{7}(2r + 1) = 22$

$\Rightarrow$ $2r + 1 = 7$

$\Rightarrow$ $2r = 6$

$\Rightarrow$ $r = 3$ cm

95. (B) Volume of water due to 2 cm rain on a square km land

= 1km × 1 km × 2 cm

$= 1000\text{m} + 1000\text{m} \times \frac{2}{100}\text{m}$

= 20000 m^3

$\Rightarrow$ 50% of volume of rain drops

= 10000m^3

Now,

Required level by which the water level in the pool will be increased

$= \frac{10000\,\text{m}^3}{100\text{m} \times 10\text{m}}$

= 10m

96. (A) Total income = Rs. 150000

$\Rightarrow$ Required difference

= (15% – 5%) of Rs. 150000

= Rs. 15000

97. (C) Maximum expenditure of the family other than on food, was on others.

98. (B) Saving = 15% = Housing

99. (D) Required % = 10% + 12% + 5%

=27%

100. (D) Money spent on food

= 23% of Rs. 150000

= Rs. 34500

SSC (Tier-II) - 2013 (Mock Test Paper - 2) (ANSWER SHEET)

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