SSC MAINS MOCK TEST - 8 (MATHS SOLUTION)

1.(B) Here first term; a = 4, common diffference; d = 3 & no. of terms; n = 20
So, sum up to 20 terms;

$S_{20} = \frac{20}{2}$ [2 (4) + (20-1) × 3] = 10[8 + 57] = 650

2.(B) Given expression, $10x + y = 7 (x + y)$
or, $3x - 6y = 0$
$\therefore \Rightarrow x = 2y$
Now, When each digit is increased by 3,
then, $10(x + 3) + (y + 3) = 6 (x +3 + y +3) +6$
$\Rightarrow 4x - 5y = 9$
or, $8y - 5y = 9$ form eq. (i)
$y = 3$ & $x = 6$
$\Rightarrow$ The given number is 63.

3.(D) Given experssion = $3^{25} (1 + 3 + 3^2 + 3^3)$
$= 3^{25} \times 40$
$= (3^{24} \times 3) (4 \times 10)$
$= (3^{24} \times 4) (3 \times 10)$
Which is divisible by 30

4.(A) LCM of 6, 9 and 12 = 36
$\therefore$ Number is the form of 36p + 4
Since, the required number between 300 and 400
So, the numbers will be 328 (when p = 9) and 364 (when p = 10)
Required sum = 328 + 364 = 692

5.(C) Area of the courtyard = 3.78 × 5.25 sq m
= 378 × 525 sq cm = 198450
$\therefore$ 198450 = 21 × 21 × 450
450 sq marble stones shall be used of size 21 cm × 21 cm

6. (C) 1st day = 4km, 2nd day = $4 \times \frac{1}{2} = 2$km,

3rd day = $2 \times \frac{1}{2} = 1$km

$\therefore$ Total distance S = $4 + 2 + 1 + \frac{1}{2} + \frac{1}{4}$ ....
Which is infinite GP with

a = 4, r = $\frac{1}{2}$

Now, $\because r < 1$

So, Sum; $S = \frac{a}{1-r} = \frac{4}{1-\frac{1}{2}} = \frac{4}{\frac{1}{2}} = 8$km

7.(C) $\because \frac{a^3 + b^3 + c^3 - 3abc}{a^2 + b^2 + c^2 - ab - bc - ca} = a + b + c$

So, $\frac{(1.5)^3 + (4.7)^3 + (3.8)^3 - 3 \times 1.5 \times 4.7 \times 3.8}{(1.5)^2 + (4.7)^2 + (3.8)^2 - 1.5 \times 4.7 - 4.7 \times 38 - 3.8 \times 1.5}$
= 1.5 + 4.7+ 3.8 =10

8.(A) $8 - \left[7 - \left\{x - \left(4 - \frac{7}{2}\right)\right\}\right] = 5$

$\Rightarrow 8 - \left[7 - \left\{x - \frac{1}{2}\right\}\right] = 5$

$\Rightarrow 8 - \left[7 - x + \frac{1}{2}\right] = 5$

$\Rightarrow 8 - \left[\frac{15}{2} - x\right] = 5$

$\Rightarrow 8 - \frac{15}{2} + x = 5$

$\Rightarrow \frac{1}{2} + x = 5$

9.(D) $2^3 + 4^3 + 6^3 + \ldots.. + 20^3$
$= (2 \times 1)^3 + (2 \times 2)^3 + (2 \times 3)^3 + \ldots.+ (2 \times 10)^3$
$= 8 \times 1^3 + 8 \times 2^3 + 8 \times 3^3 + \ldots.+ 8 \times 10^3$
$= 8 \times [1^3 + 2^3 + 3^3 + 4^3 + \ldots.+ 10^3]$
$= 8 \times 3025 = 24200$

10.(C) Required number of arrangements
= 9 × 9× 8 ×7× 6× 5 × 4× 3× 2 ×1
= 9 ×9!

11.(B) Investment and Income in 2000
= ₹ x and ₹ $1.20x$
Investment and Income in 2000
= ₹ $(x - 50000)$ and ₹ $1.20x$
$\therefore$ Profit = 20 + 6 = 26%
Income in 2001 = ₹ $(x - 50000) \times (1.00+0.26)$
Thus, $1.26 (x - 50000) = 1.20x$
x = ₹ 1050000

12.(B) Total population of town
= 15 × $\frac{\text{Number of males}}{\text{Number of females}} = \frac{7}{8}$
$\therefore$ Number of males and females = $7x$ and $8x$
Number of male children = 25% of $7x$

$= \frac{25}{100} \times 7x = 1.75x$

Number of female children = 20% of $8x$

$= \frac{20}{100} \times 8x = 1.6x$

$\therefore$ Number of adult females = $8x - 1.6x = 6.4x$
$\Rightarrow 6.4x = 235200$

$\Rightarrow x = \frac{235200}{6.4} = 36750$

$\therefore$ Total population of town = 15 × 36750
= 551250

13.(C) Given, x = 20%, y = 30%, z = 10%, A = 100.80
Required total money

$= \frac{A \times 100 \times 100 \times 100}{(100 - x)(100 - y)(100 - z)}$

$= \frac{100.80 \times 100 \times 100 \times 100}{80 \times 70 \times 90}$

$= \frac{100800}{8 \times 7 \times 9} =$ ₹ 200

14. (A) Let Initial investments = 3x , 5x and 7x
After one year
$(3x - 45600) : 5x : (7x + 337600) = 24 : 59 : 167$

$\therefore \frac{3x - 45600}{5x} = \frac{24}{59} \Rightarrow x = 47200$

$\Rightarrow$ initial investment of A = 47200 × 3 = Rs. 141600

15.(B) Given, $\frac{a}{b} \times \frac{c}{d} = \frac{14}{15}$ and

$\frac{a}{b} \div \frac{c}{d} = \frac{35}{24}$ or $\frac{a}{b} \times \frac{d}{c} = \frac{35}{24}$

(where $\frac{a}{b}$ is greater fraction)

Now multiplying both the equations

$\frac{ac}{bd} \times \frac{ad}{bc} = \frac{14}{15} \times \frac{35}{24}$

$\Rightarrow \frac{a^2}{b^2} = \frac{49}{36}$

$\Rightarrow \frac{a}{b} = \frac{7}{6}$

$\Rightarrow$ the greater fraction is $\frac{7}{6}$

16. (D) 15% of (A + B) = 25% of (A - B)

$\Rightarrow \frac{15}{100}(A+B) = \frac{25}{100}(A-B)$

$\Rightarrow$ 15 (A + B) = 25 (A - B)

$\Rightarrow$ 15 A+ 15B = 25A - 25B

$\Rightarrow$ 10A = 40B

$\Rightarrow$ A = 4B

Now let x% of B is equal to A

$\therefore \frac{x}{100} \times B = A = 4B$

$\Rightarrow x = 400\%$

17. (C) Let the third number be x,
A.T.Q.,

First number = $\frac{20}{100} \times x = \frac{x}{5}$

& Second number = $\frac{50}{100} \times x = \frac{x}{2}$

$\Rightarrow$ Required percentage

$= \frac{\frac{x}{5} \times 100}{\frac{x}{2}} = \frac{x}{5} \times \frac{2}{x} \times 100 = 40\%$

18.(A) Let, Average age of 11 member hockey team = x years

$\Rightarrow$ Total age of hockey team = 11x yreas.
When captain aged 26 yrs and goal keeper aged 26 + 3 = 29 yrs. are excluded.
Total age of remaining 9 players = $11x$ - (26 + 29) = ($11x$ - 55) yrs.

Now, ATQ,

$\frac{11x - 55}{9} = x - 1$

or, 11x - 55 = 9x - 9 = $2x = 44$

$\Rightarrow x = 22$ yrs

19.(B) Sum of temperature of first 3 days = 22°C × 3 = 66°C

Sum of temperature of last 3 days = 24 °C × 3 = 72°C

Sum of temperature of whole week = 23.5°C × 7 = 164.5°C

$\therefore$ The temperature of the last day
= (164.5 - 66- 72)°C = 26.5°C

20. (A) Let the present ages of mother and son be x years and (45 -x) years respectively.

Then, (x - 5) (45 -x -5) = 4 (x -5)

$\Rightarrow x^2 + 41x - 180 = 0$

$\Rightarrow x = 36$

$\therefore$ The present ages of mother and son are 36 yrs & 9 yrs. respectively.

21.(A) Let x years ago the ratio of their ages was 3 : 5.

So, A.T.Q.,

$\frac{40 - x}{60 - x} = \frac{3}{5}$

$\Rightarrow 200 - 5x = 180 - 3x$

$\Rightarrow 2x = 20$

$\therefore x = 10$ yrs.

22.(A) Let the four parts into which 3150 is divided are a, b, c and d.

$\Rightarrow \frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{d}{12} = k$

Then a = 2k, b = 3k , c = 4k and d = 12k
As a + b + c + d = 3150

$\Rightarrow$ (2k + 3k +4k +12k) = 3150

$\Rightarrow$ 21k = 3150

$\Rightarrow$ k = 150

Hence the four parts are 300, 450, 600, 1800
So, the largest part is 1800

23.(A) Let the total monthly sales of companies A and B be Rs. 2x and Rs.3x and their total monthly expenditure be ₹ 3y & ₹ 4y.

Given that A's profit = 1/5 of sales = $2x/5$

$\therefore$ 2x - 3y = $\frac{1}{5}(2x)$

$\Rightarrow \frac{4}{5}(2x) = 3y \Rightarrow y = \frac{8}{15}x$

Profit of company

B = 3x – 4y = 3x – 4× $\frac{8}{15}x = \frac{13x}{15}$

Hence the ratio of the profits of the two companies are

$\frac{2}{5}x : \frac{13x}{15} = 6:13$

24.(B) Milk : water in first glass = $\frac{1}{3}:\frac{2}{3}$ = 4 : 8

and Milk: Water in second glass = $\frac{1}{4}:\frac{3}{4}$ = 3 : 9

Milk in the vessel = 4 + 3 = 7
Water in the vessel = 8 + 9 = 17
Ratio of milk and water in the vessel = 7 :17

25.(D) Total quantity of milk = 2 × 0.9 + 5 × 0.8 + 9 × 0.7= 12.1 litre
Milk concentration in the resultant mixture

$= \frac{12.1}{2+5+9}\times 100 = 75.625\%$

Water concentration in the resultant mixture = 100- 75.625% = 24.735%

$\Rightarrow$ Milk : Water = $\frac{75625}{24735}$ = 121: 39

26. (D) Let each day's salary = ₹ x

Given, $18x + 8\times\frac{x}{2} - 60 = 1700$

$\Rightarrow 22x = \frac{1760}{22}$

$\Rightarrow$ Monthly Salary = $\frac{1760}{22}\times 30$ = ₹ 2400

27.(B) As each works for 3 hrs.

Sangeeta's work for 3 h = $3\times\frac{1}{6}=\frac{1}{2}$ part

So, Sangeeta gets Rs. $\left(\frac{1}{2}\times 320\right)$ = ₹ 160

Manisha's works for 3h = $3\times\frac{1}{8}=\frac{3}{8}$ part

So, Manisha gets ₹ $\left(\frac{3}{8}\times 320\right)$ = ₹ 120

Rekha gets = 320 – (160 + 120)
= 320 – 280 = ₹ 40

28.(D) Let the person invest amount x and y into two different rates of interest.

$\therefore \frac{x\times 12\times 1}{100}+\frac{y\times 10\times 1}{100} = 130$

$\Rightarrow 12x + 10y = 13000$ ________(i)

and $\frac{y\times 12\times 1}{100}+\frac{x\times 10\times 1}{100} = 134$

$\Rightarrow 12y + 10x = 13400$ ________(ii)

On solving Eqs. (i) and (ii), we get
x = ₹ 500 and y = ₹ 700

29.(B) Let sum = P,
As amount = 2P $\Rightarrow$ SI = P
and time = 8 yr.

$\therefore$ Rate = $\frac{100\times SI}{Sum\times Time} = \left(\frac{100\times P}{P\times 8}\right)\% = 12\frac{1}{2}\%$

30. (D) Cost price of article = ₹ x
and selling price of article = ₹ y

$y\times\frac{7}{100} = x\times\frac{8}{100} \Rightarrow y = \frac{8x}{7}$

ATQ,

$y\times\frac{9}{100} - x\times\frac{10}{100} = 1$

$\Rightarrow \frac{8x}{7}\times\frac{9}{100} - \frac{x}{10} = 1$

$\Rightarrow \frac{18x}{175} - \frac{x}{10} = 1$

$\Rightarrow \frac{36x - 35x}{350} = 1$

$\therefore x = 350$

31.(C) Cost price of an aticle = ₹ $\frac{10}{11}$

Selling price of an article = ₹ $\frac{11}{10}$

$\therefore$ Profit $= \frac{11}{10} - \frac{10}{11} = \frac{121-100}{110}$ = ₹ $\frac{21}{100}$

$\therefore$ Profit percent = $\frac{\frac{21}{110}\times 100}{\frac{10}{11}} = \frac{2100}{110}\times\frac{11}{10} = 21\%$

32.(B)Let x km/h be the speed of the boat in still water.
speed of the boat downstream=(x+2)km/h
and speed of the boat upstream= (x - 2) km/h
So, A.T.Q.,

$\frac{20}{x+2}+\frac{20}{x-2} = \frac{110}{60}$

$\frac{20(x-2+x+2)}{(x+2)(x-2)} = \frac{11}{6}$

$\Rightarrow 11x^2 - 44 = 240x$
$\Rightarrow (x - 22)(11x + 2) = 0$
or, $x - 22 = 0 \Rightarrow x$ = 22km/h

33. (B) Distance = Difference × $\frac{\text{Sum of speed}}{\text{Difference in speed}}$

$= 165\times\frac{155}{15}$ = 1705 km

34. (C) Speed of bus = $\frac{20\times 50}{60}\times\frac{18}{5}$ = 60km/h

35. (A) Since the car runs at $\frac{7}{11}$th of its own speed, the time it takes will be $\frac{11}{7}$th of its usual speed.
Let the the usual time taken by t h.

Then we can write, $\frac{11}{7}t = 22$

$\therefore t = \frac{22\times 7}{11}$ = 14 h

$\therefore$ Time saved = 22 – 14 = 8 h

36.(A) P = ₹ 9000, r = – 10%
n = 3years

So, $A = 9000\left(1-\frac{10}{100}\right)^3$

$= 9000\times\frac{9}{10}\times\frac{9}{100}\times\frac{9}{10}$ = ₹ 6561

37.(D) Here, R_1 = 8%, R_2 = 10%, R_3 = 12%

P = ₹ 6000

$T = T_1 + T_2 + T_3$ = 3yr.

$T_1 = T_2 = T_3 = 1$ *yr.*

$\Rightarrow A = 6000\left(1+\frac{8}{100}\right)\left(1+\frac{10}{100}\right)\left(1+\frac{12}{100}\right)$

$= ₹\left[6000\times\left(\frac{108}{100}\right)\times\left(\frac{110}{100}\right)\times\left(\frac{112}{100}\right)\right]$

$= ₹\left[6000\times\frac{27}{25}\times\frac{11}{10}\times\frac{28}{25}\right]$ = ₹ 7983.366

$\Rightarrow$ Compound Interest = 7983.366 – 6000
= Rs. 1983.366

38. (C)The speeds of the trains be a m/s and b m/s.

Now, when they are moving in the same direction.

$\Rightarrow$ Relative speed = (a - b) m/s

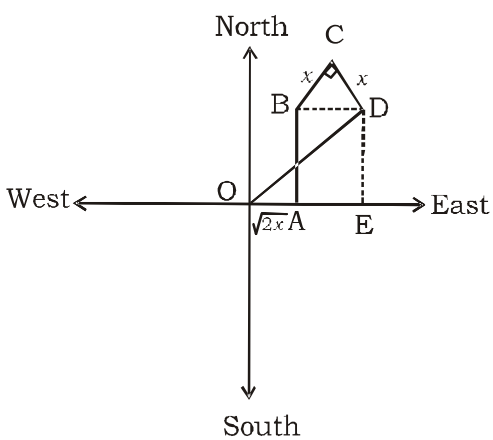
$\therefore$ a - b = $\frac{100+80}{18}$ =10

Similarly a + b = $\frac{100+80}{9}$ = 20

By solving Eq. (i) and Eq. (ii), we get
a = 15m/s and b = 5m/s

$\Rightarrow$ Speed of faster train = 15 m/sec.

39.(B) In ΔBCD,



$BD^2 = BC^2 + CD^2 = x^2 + x^2$

$\Rightarrow$ BD = $\sqrt{2}x$

$\Rightarrow$ BD = AE = $\sqrt{2}x$

$\therefore$ OE = OA + AE = $\sqrt{2}.x + \sqrt{2}.x = 2\sqrt{2}x$

$\therefore$ BA = DE = x

$\therefore$ In ΔODE,
$OD^2 = OE^2 + DE^2$

$\therefore$ Minimum distance

$\therefore$ OD = $\sqrt{\left(2\sqrt{2}.x\right)^2 + x^2} = \sqrt{8x^2+x^2} = 3x$ km

40. (A) $\therefore$ Water that leaks in 5.5 min = 2.25 tones

$\therefore$ Water that leaks in 60 min = $\frac{2.25}{5.5}\times 60$

$= \frac{1350}{55}$ tones

After pumping water that is left in boat in 60min.

$= \frac{1350}{55} - 12 = \frac{690}{55}$ tones

$\therefore$ 92 tones water that remains in boat in

$\frac{55}{690}\times 92 = \frac{22}{3}$ hr

$\therefore$ Required speed = $\frac{77}{\frac{22}{3}} = \frac{231}{22}$ = 10.5km/h

41.(D) Let the capactiy of the tank = x litres

A.T.Q.,

Quantity of water emptied by the leak in 1 hour = $\frac{x}{20}$ litres

Quantity of water filled by the tap in 1 hour = 120 litres

According to the question,

$\frac{x}{20}-\frac{x}{30} = 120 \Rightarrow \frac{x}{10}-\frac{x}{15} = 240$

$\Rightarrow \frac{3x-2x}{30} = 240$

$\Rightarrow \frac{x}{30} = 240$

$\Rightarrow x = 240 \times 30 = 7200$ liters

42.(B) A's investments for 3 yrs.

= (250000 × 3 + 100000 × 2 + 100000 ×1)

= ₹ 1005000

B's investment for 3 yrs

= 350000 × 2 = ₹ 700000

C's investment for 3 yrs. = 350000 × 1
= ₹ 350000

$\therefore$ Ratio of investment of A : B: C
= 1005000 : 700000 : 350000
= 3: 2 :1

B's profit = $\frac{2}{3+2+1}\times 1500000$

= ₹ 500000

43.(A) Work done/hour by a female, a male and a child are x, y and z, unit respectively.

So, $8x = 6y = 12z$

$\Rightarrow x = \frac{3}{4}y$ and $z = \frac{Y}{2}$

9 males can complete a work in 6 days working 6 h/ day.

$\therefore$ Work done =9 ×6 ×6y = 324y
Work done by 12 males, 12 females and 12 children in 1 day = 8h/day
$= (12y + 12x + 12z) \times 8$

$= \left[12y + 12 \times \frac{3}{4}y + 12 \times \frac{Y}{2}\right] \times 8 = 216y$

Days required to finish work = $\frac{324y}{216y} = 1\frac{1}{2}$ days

44. (*) 1 man's one day's work = $\frac{1}{100}$

1 man's six day's work = $\frac{3}{50}$

10 men's six day's work = $\frac{3}{5}$

Remaining $\frac{2}{5}$ of the work is done by 15 women in 6 days.

$\therefore$ Whole work is done by 15 women in $\frac{6 \times 5}{2}$ = 15 days

$\therefore$ One women alone can finish the work in 225 days

45.(B) In such type of question

$$CP = \frac{\text{Total cost}\,(100 + \text{percent profit})}{(100 - \text{percent loss}) + (100 + \text{percent profit})}$$

$= \frac{720 \times 119}{85 + 119} = \frac{720 \times 119}{204} = ₹\,420$

46.(C) Cost price of each table watch = $250 + \frac{2500}{150}$

$= \frac{800}{3}$

Labelled pirce = ₹ 320
SP = 320 - 5% of 320 = 304

Profit percent = $\frac{304 - \left[\frac{800}{3}\right]}{\frac{800}{3}} \times 100$

$= \frac{112}{3} \times \frac{3}{800} \times 100 = 14\%$

47.(C) $\left(1 - \frac{5}{6}\right)$ of time taken by Sneha
= 1 hour 15 minutes
$\therefore$ Time taken by Sneha
= 1 hours 15 minutes × 6
= 7 hours 30 minutes

48.(A) $\therefore$ At 45g per man per day the provision is for 16 weeks for 220 men
$\therefore$ 1 g per man per day provision is for 1 week = 220 × 45 ×16

$\therefore$ 32 g per man per day the provision is for 24 weeks = $\frac{220 \times 45 \times 16}{33 \times 24} = 200$

Number of men to go out = 220 -200 = 20

49.(C) The part of field cultivated by A in 1 day

$= \frac{2}{5 \times 6} = \frac{1}{15}$

The part of field cultivated by B in 1 day

$B = \frac{1}{3 \times 10} = \frac{1}{30}$

$\therefore$ The part of field cultivated by A and B together in 1 day = $\frac{1}{15} + \frac{1}{30} = \frac{3}{30} = \frac{1}{10}$

$\therefore$ $\frac{4}{5}$ part of field is cultivated by A and B together in 1 day = $\frac{\frac{4}{5}}{\frac{1}{10}}$ days = $\frac{4 \times 10}{5}$ = 8 days

50.(D) X : Y : Z = ₹ (16000 × 3 + 11000 × 9 : 12000 × 3 + 17000 × 9 : 21000 × 6)
= 7 : 9 : 6
$\therefore$ (Y's share - Z's share)

$= ₹\left[\left(26400 \times \frac{9}{22}\right) - \left(26400 \times \frac{6}{22}\right)\right]$

= ₹ (10800- 7200) = ₹ 3600

51.(D) Speed of boat = x m/sec
Speed of stream = Y m/sec
Then,

$$\frac{\text{Distance travelled}}{x + y} = \frac{1}{3}\left(\frac{\text{Distance travelled}}{x - y}\right)$$

$\Rightarrow x = 2y$
$\therefore x : y = 2 : 1$

52.(B) Gain = 2 min + 4 min 48s = 6min 48s
= 408 seconds
Hour = (7× 24 + 2) = 170 hrs.

$\Rightarrow$ Clock gains = $\frac{408}{170}$ = 2.4 s/h

$\therefore$ It will gain 2 min or 120s in $\frac{120}{2.4}$ h. = 50h

$\Rightarrow$ Clock will show correct time 2pm to Tuesday

53. (*) $\because$ α, β, γ are the roots of polynomial
$3x^3 - 5x^2 - 11x - 3$

$\Rightarrow \alpha + \beta + \gamma = \frac{-(-5)}{3} = \frac{5}{3}$

$$\alpha\beta+\beta\gamma+\alpha\gamma = \frac{-11}{3}$$

$$\alpha\beta\gamma = \frac{-(-3)}{3} = \frac{3}{3} = 1$$

Now,

$$\alpha^3+\beta^3+\gamma^3-3\alpha\beta\gamma = (\alpha+\beta+\gamma)[\alpha^2+\beta^2+\gamma^2-\alpha\beta-\beta\gamma-\alpha\beta]$$

$$\Rightarrow \alpha^3+\beta^3+\gamma^3-3\alpha\beta\gamma = (\alpha+\beta+\gamma)[(\alpha+\beta+\gamma)^2 - 2\alpha\beta-2\beta\gamma-2\alpha\gamma - \alpha\beta-\beta\gamma-\alpha\gamma]$$

$$\Rightarrow \alpha^3+\beta^3+\gamma^3-3\times1 = \frac{5}{3}\left[\left(\frac{5}{3}\right)^2-3(\alpha\beta+\gamma\beta+\alpha\gamma)\right]$$

$$= \frac{5}{3}\left[\frac{25}{9}-3\times\frac{-11}{3}\right]$$

$$= \frac{5}{3}\left[\frac{25}{9}+11\right]$$

$$= \frac{5}{3}\left[\frac{25+99}{9}\right]$$

$$\alpha^3+\beta^3+\gamma^3 = \frac{5}{3}\times\frac{124}{4}+3$$

$$= \frac{620}{27}+3$$

$$= \frac{620+81}{27} = \frac{701}{27}$$

54. (C) $\because$ $x = \sqrt{2}$ and $x = -\sqrt{2}$ are zeroes of the polynomial $2x^4 - 3x^3 - 3x^2 + 6x - 2$

$\Rightarrow$ $(x-\sqrt{2})$ and $(x+\sqrt{2})$ are factors of $2x^4 - 3x^3 - 3x^2 + 6x - 2$

$\Rightarrow$ $(x^2 - 2)$ is a factor of $2x^4 - 3x^3 - 3x^2 + 6x - 2$

Now,

$$\begin{array}{r|l} & 2x^2 - 3x + 1 \\ \hline x^2-2 & 2x^4 - 3x^3 - 3x^2 + 6x - 2 \\ & -2x^4 \quad \mp 4x^2 \\ \hline & -3x^3 + x^2 + 6x - 2 \\ & \mp 3x^3 \quad \pm 6x \\ \hline & x^2 \quad -2 \\ & -x^2 \quad \mp 2 \\ \hline & 0 \end{array}$$

Other factor $= 2x^2 - 3x + 1$

for other zeroes

$2x^2 - 3x + 1 = 0$

$\Rightarrow$ $2x^2 - 2x - x + 1 = 0$

$\Rightarrow$ $2x(x-1) - 1(x-1) = 0$

$\Rightarrow$ $(2x-1)(x-1) = 0$

$\Rightarrow$ $x = \frac{1}{2}, 1$

55. (B) $\because$ $a-b, a, a+b$ are zeroes of $x^3 - 3x^2 + x + 1$

$\therefore$ sum of zeroes $= \frac{-(-3)}{1} = 3$

$\Rightarrow$ $a - b + a + a + b = 3$

$3a = 3$

$a = 1$

Product of zeroes $= \frac{-1}{1}$

$(a-b)(a)(a+b) = -1$

$\Rightarrow$ $(1-b)(1)(1+b) = -1$

$\Rightarrow$ $1 - b^2 = -1$

$\Rightarrow$ $2 = b^2$

$b = \sqrt{2}$

Hence, $a = 1$, $b = \sqrt{2}$

56. (B) $\because$ $(x-1)$ is a factor of $4x^3 + 3x^2 - 4x + k$

$\therefore$ Remainder $P(1) = 0$

$\Rightarrow$ $4(1)^3 + 3(1)^2 - 4\times1 + k = 0$

$4 + 3 - 4 + k = 0$

$k = -3$

57. (C) Volume of the cuboid

$= 12ky^2 + 8ky - 20k$

$= 4k[3y^2 + 2y - 5]$

$= 4k[3y^2 + 5y - 3y - 5]$

$= 4k[y(3y+5) - 1(3y+5)]$

$= (4k)(y-1)(3y+5)$

3rd dimension $= 3y + 5$

58. (B) Let the present age of Jacob $= x$ yrs.

the present age of his son $= y$ yrs

Their age 5 years ago

Jacob $= x - 5$ yrs

his son $= y - 5$ yrs

Case I:

$x - 5 = 7(y-5)$

$x - 7y + 30 = 0$ .... (1)

Five years later their age

Jacob $= x + 5$ yrs

his son $= y + 5$ yrs

Case II:

$x + 5 = 3(y+5)$ .... (2)

On solving eqns. (1) & (2)

$x = 40$, $y = 10$

Hence their present age = 40 yrs & 10 yrs

59. (A) $\because$ The given linear equations have no solution.

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

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

$\Rightarrow$ $3k - 3 = 2k - 1$

$k = 2$

60. (B) Let A & B are two friends.

Case I:

A + 100 = 2(B – 100)

A – 2B = –300 .... (1)

Case II:

B + 10 = 6(A – 10)

6A – B = 70 .... (2)

On solving eq^{n}s. (1) & (2), we have

A = Rs. 40 & B = Rs. 170

61. (A) Let $2^x = 3^y = 6^{-z} = k$

$\Rightarrow \quad 2 = (k)^{1/x},\ 3 = (k)^{1/y},\ 6 = (k)^{-1/z}$

Now, 2 × 3 = 6

$\Rightarrow \quad (k)^{1/x} . (k)^{1/y} = (k)^{-1/z}$

$\Rightarrow \quad \frac{1}{x}+\frac{1}{y}=-\frac{1}{z}$

Hence $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=0$

62.(B) $4\cot\theta = 3 \Rightarrow \cot\theta = \frac{3}{4}$

$$\left(\frac{\sin\theta-\cos\theta}{\sin\theta+\cos\theta}\right)=\left(\frac{1-\frac{\cos\theta}{\sin\theta}}{1+\frac{\cos\theta}{\sin\theta}}\right)=\left(\frac{1-\cot\theta}{1+\cot\theta}\right)$$

$$=\frac{\left(1-\frac{3}{4}\right)}{\left(1+\frac{3}{4}\right)}=\frac{\frac{1}{4}}{\frac{7}{4}}=\frac{1}{7}$$

63.(C) As, $3\sin\theta - 4\sin^3\theta = \sin 3\theta$

So, $3\sin 15^\circ - 4\sin^3 15^\circ = \sin 3(15^\circ) = \sin 45^\circ$

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

64.(C) The maximum value of $a\sin\theta + b\cos\theta$ is $\sqrt{a^2+b^2}$

&, here a = 1 , b = 1

So, Maximum value = $\sqrt{1+1} = \sqrt{2}$

65.(A) $\sin(\alpha+\beta)=\sqrt{1-\cos^2(\alpha+\beta)}=\sqrt{1-\frac{16}{25}}=\sqrt{\frac{19}{25}}=\frac{3}{5}$

$\cos(\alpha-\beta)=\sqrt{1-\sin^2(\alpha-\beta)}=\sqrt{1-\frac{25}{169}}=\sqrt{\frac{144}{169}}=\frac{12}{13}$

$\therefore \quad \tan(\alpha+\beta)=\frac{\sin(\alpha+\beta)}{\cos(\alpha+\beta)}=\left(\frac{3}{5}\times\frac{5}{4}\right)=\frac{3}{4}$

$\tan(\alpha-\beta)=\frac{\sin(\alpha-\beta)}{\cos(\alpha-\beta)}=\frac{5}{13}\times\frac{13}{12}=\frac{5}{12}$

$\therefore \quad \tan(2\alpha)= \tan[(\alpha+\beta)+(\alpha-\beta)]$

$$=\frac{\tan(\alpha+\beta)+\tan(\alpha-\beta)}{1-\tan(\alpha+\beta)\tan(\alpha-\beta)}=\frac{\frac{3}{4}+\frac{5}{12}}{1-\frac{3}{4}\times\frac{5}{12}}=\frac{56}{33}$$

66. (A) $\sin 3A = \cos(A-30)$

$\Rightarrow \cos(90-3A) = \cos(A-30)$

$\Rightarrow (90-3A) = A - 30$

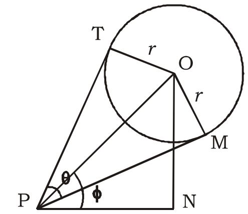
$\Rightarrow 120 = 4A$

$\Rightarrow A = 30^\circ$

Now $\tan 2A = \tan 2\times 30^\circ$

$= \tan 60^\circ = \sqrt{3}$

67. (C) Let the balloon subtends an angle θ at the eye of the observer at P.



In ΔOMP,

$\frac{MO}{PO} = \sin\theta/2$

$\frac{r}{PO} = \sin\theta/2$

$PO = r \text{ cosec } \theta/2$

Now,

In ΔONP

$\sin\phi = \frac{ON}{PO} = \frac{ON}{r\,\text{cosec}\,\theta/2}$

$\Rightarrow \quad ON = r \text{ cosec } \theta/2 \sin\phi$

$\therefore$ The height of the ballon

$= r\sin\phi\,\text{cosec}\,\theta/2$

68. (C) Let 'A' the point h m above the lake where the angle of elevation of the cloud is 'θ' and the angle of depression in the lake is 'ϕ'

Let MB = x m

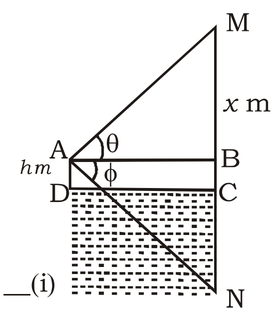
In Δ ABM

$\tan\theta = \frac{MB}{AB}$

$\Rightarrow AB = \frac{MB}{\tan\theta}$

$=\frac{x}{\tan\theta}$

$\therefore$ AB $= x\cot\theta$ __(i)



In ΔABN

$\tan\phi = \dfrac{BN}{AB}$ [Now BN = BC + NC

$= h + x + h = (x + 2h)$m

$\tan\phi = \dfrac{x+2h}{AB}$

$\Rightarrow$ AB $= (x + 2h)\cot\phi$

[$\because$ In a plane mirror, image distance = object distance]

$\Rightarrow$ MC = NC

$x + h$ = NC

From (1) & (2), we have

$x\cot\theta\,(x + 2h)\cot\phi$

$x(\cot\theta - \cot\phi) = 2h\cot\phi$

$\Rightarrow \quad x = \dfrac{2h\cot\phi}{\cot\theta - \cot\phi}$

Height of the cloud above the lake = $x + h$

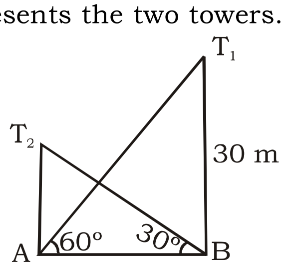
$= \dfrac{2h\cot\varphi}{\cot\theta - \cot\varphi} + h$

$= \dfrac{2h\cot\varphi + h\cot\theta - h\cot\varphi}{\cot\theta - \cot\varphi}$

$= \dfrac{h\cot\phi + h\cot\theta}{\cot\theta - \cot\phi}$

$h\left[\dfrac{\cot\phi + \cot\theta}{\cot\theta - \cot\phi}\right] = h\left[\dfrac{\tan\phi + \tan\theta}{\tan\phi - \tan\theta}\right]$

69. (B) Let T_1 & T_2 represents the two towers.



In ΔABT_1

$\tan 60° = \dfrac{T_1B}{AB}$

$\sqrt{3} = \dfrac{30}{AB}$

$\Rightarrow AB = \dfrac{30}{\sqrt{3}}$

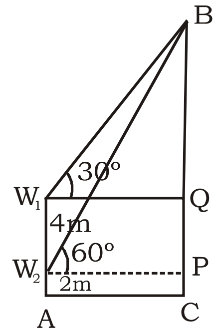
In ΔABT_2

$\tan 30° = \dfrac{T_2A}{AB}$

$\dfrac{1}{\sqrt{3}} = \dfrac{T_2A}{10\sqrt{3}}$

$\Rightarrow T_2A = \dfrac{10\sqrt{3}}{\sqrt{3}} = 10m$

70. (B) Let W_1 & W_2 are two window of a house which are at the height of $6m$ & $2m$ above the ground



Let AC = x cm

$\Rightarrow W_1P = W_2Q = AC = x$ m

$\Rightarrow$ QP = 4 m

In ΔBPW_1

$\tan 60° = \dfrac{BP}{W_1P}$

$\sqrt{3} = \dfrac{BQ + 4}{W_1P}$

$BQ + 4 = \sqrt{3} \times W_1P = \sqrt{3} \times x$ m

$\Rightarrow$ BQ $= \sqrt{3}\,x - 4$ m

In ΔBQW_2

$\tan 30° = \dfrac{BQ}{W_2Q}$

$\dfrac{1}{\sqrt{3}} = \dfrac{\sqrt{3}x + 4}{x}$

$\Rightarrow x = 3x - 4\sqrt{3}$

$\Rightarrow -2x = -4\sqrt{3}$

$\therefore x = 2\sqrt{3}$

Height of the ballon = BQ

$= \sqrt{3}x - 4$

$= \sqrt{3} \times 2\sqrt{3} - 4 = 6 - 4 = 2$m

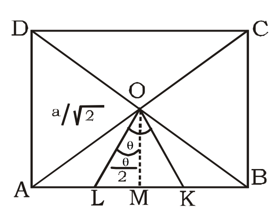
Height of the balloon above the ground

$= 2 + 4 + 2 = 8$ m

71.(C) Let sides of a square be a.

Then, AC = a $\sqrt{2}$ and AO = OC = $\dfrac{a}{\sqrt{2}}$

Here, AM = $\dfrac{a}{2}$



$\therefore$ LM = $\dfrac{a}{\sqrt{2}} - \dfrac{a}{2}$ and OM = $\dfrac{a}{2}$

In Δ OML

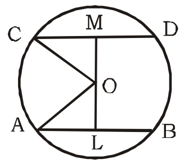
$$\tan\frac{\theta}{2} = \frac{\frac{a}{\sqrt{2}} - \frac{a}{2}}{\frac{a}{2}} = \frac{\frac{\sqrt{2}-1}{2}}{\frac{1}{2}} = \sqrt{2} - 1$$

$$\therefore \quad \tan\theta = \frac{2\tan\frac{\theta}{2}}{1-\tan^2\frac{\theta}{2}} = \frac{2\left(\sqrt{2}-1\right)}{1-(2+1-2\sqrt{2})}$$

$$= \frac{2\left(\sqrt{2}-1\right)}{1-3+2\sqrt{2}} = \frac{2\left(\sqrt{2}-1\right)}{2\sqrt{2}-2}$$

$\Rightarrow \tan\theta = 1$

72.(B) From O draw OL $\perp$ AB and OM $\perp$ CD & join OA and OC



AL $= \frac{1}{2}$, AB = 5 cm, OA = 13cm

$OL^2 = OA^2 - AL^2 = (13)^2 - (5)^2$
$= (169 - 25) = 144$

$\Rightarrow$ OL $= \sqrt{144}$ = 12 cm

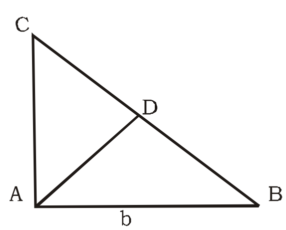
Now, CM $= \frac{1}{2} \times$CD = 12 cm and OC = 13cm

$\therefore$ $OM^2 = OC^2 - CM^2 = (13)^2 - (12)^2$
$= (169 - 144) = 25$

$\Rightarrow$ OL $= \sqrt{25}$ = 5cm

$\Rightarrow$ ML = OM + OL = (5 + 12)cm = 17cm

73.(A) In ΔABC



$$A = \frac{1}{2} \times \text{base} \times \text{altitude} = \frac{1}{2} \times b \times AC$$

$$AC = \frac{2A}{b}$$

Using Pythagorus theorem,
$AC^2 + AB^2 = BC^2$

$$\Rightarrow \quad BC = \sqrt{\frac{4A^2}{b^2} + b^2}$$

Again in ΔABC, $A = \frac{1}{2} \times BC \times AD$

$$\Rightarrow \quad AD = \frac{2A}{\sqrt{\frac{4A^2+b^4}{b^2}}} = \frac{2Ab}{\sqrt{4A^2+b^4}}$$

74. (C) $\therefore$ XY || AC,

$\Rightarrow$ ΔBXY & ΔBAC are similar
(by AA similarity.)

$\because$ XY divides ΔBAC into two parts of equal area.

$\therefore$ ar(ΔBXY) = ar(quad. XYCA) $= \frac{1}{2}$ar(ΔBAC)

$$\Rightarrow \quad \frac{ar(\Delta BXY)}{ar(\Delta BAC)} = \frac{BX^2}{BA^2}$$

$$\Rightarrow \quad \frac{ar(\Delta BXY)}{2ar(\Delta BXY)} = \frac{BX^2}{BA^2}$$

$$\frac{1}{2} = \frac{BX^2}{BA^2}$$

$$\frac{BX}{BA} = \frac{1}{\sqrt{2}}$$

$$\Rightarrow \quad 1 - \frac{BX}{BA} = 1 - \frac{1}{\sqrt{2}}$$

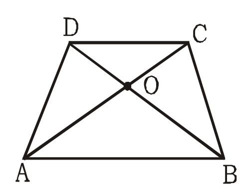
$$\Rightarrow \quad \frac{BA - BX}{BA} = \frac{\sqrt{2}-1}{\sqrt{2}}$$

$$\therefore \quad \frac{AX}{AB} = \frac{\sqrt{2}-1}{\sqrt{2}} = \frac{2-\sqrt{2}}{2}$$

75. (B) $\because$ AB || CD

$\Rightarrow$ $\Delta AOB \sim \Delta COD$

(by AA Similarity)



$$\Rightarrow \quad \frac{ar(\Delta AOB)}{ar(\Delta COD)} = \frac{AB^2}{CD^2} = \frac{(2CD)^2}{CD^2}$$

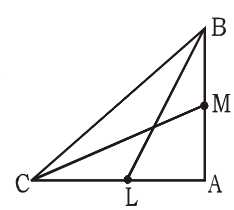
[$\because$ AB = 2CD]

$\therefore$ ar(ΔAOB) : ar(ΔCOD) = 4 : 1

76. (D) $\because BL^2 = BA^2 + AL^2$

$$= BA^2 + \left\{\frac{1}{2}AC\right\}^2$$

$$BL^2 = BA^2 + \frac{1}{4}AC^2$$



$4BL^2 = 4BA^2 + AC^2$ ______(1)

Again, $CM^2 = CA^2 + \left(\frac{1}{2}AB\right)^2$

$= CA^2 + \frac{1}{4}AB^2$

$4CM^2 = 4CA^2 + AB^2$ ______(2)

Adding (1) & (2)

$(4BL^2 + CM^2) = 4(BA^2 + CA^2) + AC^2 + AB^2$

$4(BL^2 + CM^2) = 5AB^2 + 5AC^2$

$= 5[AB^2 + AC^2]$

$= 5 \times BC^2$

[by Pythagorus theorem]

77. (B) In ΔACB & ΔDCE

$\angle A = \angle CEB$ (given)

$\angle ACB = \angle DCE$ (common)

$\Rightarrow$ By AA similarity,

$\Delta ACB \sim \Delta DCE$

$$\Rightarrow \frac{AB}{DE} = \frac{CB}{DC} = \frac{AC}{CE}$$

$$\Rightarrow \frac{9}{x} = \frac{8+7}{10}$$

$$\Rightarrow x = \frac{9\times 10}{15} = 6$$

78. (B) $\because$ QT & RT are bisectors of $\angle PQR$ & $\angle PRS$ respectively.

$\angle TRS = \frac{1}{2}\angle PQR + \angle QTR$ _____(1)

(Ext. angle property)

Also,

$\angle PRS = \angle PQR + \angle QPR$

$\frac{1}{2}\angle PRS = \frac{1}{2}\angle PQR + \frac{1}{2}\angle QPR$ _____(2)

$\angle TRS = \frac{1}{2}\angle PQR + \frac{1}{2}\angle QPR$

From (1) & (2)

$\frac{1}{2}\angle PQR + \angle QTR = \frac{1}{2}\angle PQR + \frac{1}{2}\angle QPR$

$\angle QTR = \frac{1}{2}\angle QPR$

79. (C) $\because$ (llgm ABCD) & (llgm ABMN) are on the same base & between the same parallels.

$\therefore$ ar(llgm ABCD) = ar(llgm ABMN)

$\therefore$ ar(llgm ABCD) = 80 sq. unit

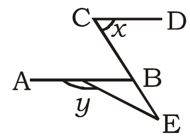
Again, ΔAPN & llgm (ABMN) are on the same base & between the same parallels.

$\therefore$ ar(ΔAPN) $= \frac{1}{2}$ar(llgm ABMN)

$= \frac{1}{2} \times 80$ sq. unit

$= 40$ sq unit.

80. (*) $\angle CMB = x = \angle DCM$ (alternate interior angles)



In ΔBME

$\angle 1 = 180^\circ - x$

$\angle 2 = 180^\circ - y$

$\therefore \angle CEB = 180^\circ - (\angle 1 + \angle 2)$

$\angle CEB = 180^\circ - [180^\circ - x + 180 - y]$

$= x + y - 180^\circ$

$= x + y - \pi$

81. (B) Suppose (–4, 6) divides AB in the ratio of K : 1

A(–6, 10) B(–4, 6) B(3, –8)

K 1

By section formula

$$-4 = \frac{K \bullet 3 + 1 \bullet -6}{K+1}$$

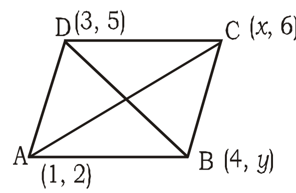
$-4K - 4 = 3K - 6$

$-7K = -2$

$$K = \frac{2}{7}$$

$\therefore$ Required ratio = 2 : 7

82. (B) $\because$ diagonals of a llgm bisect each other.



$\therefore$ Coordinates of mid point of AC = Coordinates of mid pp. of BD.

$$\left[\frac{1+x}{2}, \frac{2+6}{2}\right] = \left[\frac{3+4}{2}, \frac{5+y}{2}\right]$$

$$\Rightarrow \frac{1+x}{2} = \frac{7}{2} \quad \& \quad \frac{2+6}{2} = \frac{5+y}{2}$$

$\Rightarrow x = 6$ $\quad y = 3$

83.(B) Curved surface of tomb $= \pi rl = \frac{22}{7} \times 14 \times 50$

$= 2200 m^2$

$\therefore$ Cost of white washing $= 2200 \times 0.80$

$=$ ₹ 1760

84.(C) Let the sides of the two cubes are x and y So,

A.T.Q,

$$\frac{x^3}{y^3} = \frac{27}{64} = \frac{(3)^3}{(4)^3}$$

$$\therefore \frac{x}{y} = \frac{3}{4}$$

Now,

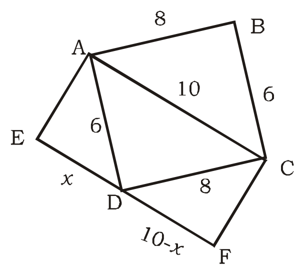
$\therefore$ surface area of the cube = 6× (side)2

$\therefore$ Ratio of their surface areas = $\frac{6x^2}{6y^2}$

$= \frac{6\times3^2}{6\times4^2} = \frac{9}{16} = 9:16$

85.(C) Let ED = x

Now, AC = $\sqrt{8^2+6^2} = 10$



In ΔAED,

$AE^2 = AD^2 - x^2 = 36 - x^2$ ______(i)

And in ΔCFD,

$CF^2 = (8)^2 - (10-x)^2$ ________(ii)

From Eqs. (i) and (ii), we get

$36 - x^2 = 64 - (10-x)^2$ $(\because AE = FC)$

$\Rightarrow 36 - x^2 = 64 - (100 + x^2 - 20x)$

$\Rightarrow 20x = 72$

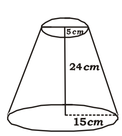
$\Rightarrow x = \frac{18}{5}$

$\because$ From Eq. (i)$AE^2 = 36 - \left(\frac{18}{5}\right)^2$

$AE^2 = 36 - \frac{324}{25} = \frac{900-324}{25}$

$\because \frac{\text{Area of rectangle ABCD}}{\text{Area of recetangle AEFC}} = \frac{8\times6}{10\times\frac{24}{5}} = 1$

86.(C)



Capacity of bucket
= Volume of frustrum of cone

$= \frac{\pi h}{3}[R^2 + r^2 + Rr]$

$= \frac{22}{7}\times\frac{24}{3}[(15)^2 + 5^2 + 15\times5]\text{cm}^3$

$= \frac{22}{7}\times 8\,[225 + 25 + 75]\text{cm}^3 = \frac{176}{7}(325)\text{cm}^3$

$= 8171.43\text{cm}^3$

87. (D) Side of the square field $= \sqrt{31684}$
= 178 m

Perimeter of the square field = 4 × 178
= 712 m

Length of the wire required to cover the field once = 105% of 712 m
= 1.05 × 712
= 747.6 m

Total length of the wire = 4 × 747.6
= 2990.4 m

88. (B) Total surface area of the closed cylindrical petrol tank = $2\pi r(h + r)$

$= 2\times\frac{22}{7}\times2.1(4.5+2.1)$

= 2 × 22 × 0.3 × 6.6

= 87.12 m^2

$\because \frac{1}{12}$ of the total steel wasted away

$\Rightarrow \frac{11}{12}$ of the total steel was used to make the tank.

$\Rightarrow \frac{11}{12}$ of total steel = 87.12

Total steel $= \frac{87.12\times12}{11} = 95.04\text{m}^2$

89. (B) Speed of the flowing water = 2 km/h

$= \frac{2\times1000}{60}$ m/min

Length of the water stored in 1 min in the river $= \frac{200}{6}$ m

Volume of the water = lbh

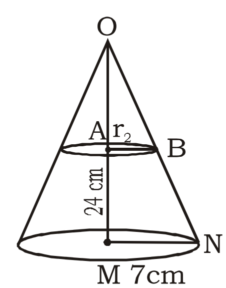
$= \frac{200}{6}\times40\times3 = 4000\text{ m}^3$

90. (B) Height of the upper part of the cone

$= \frac{1}{2}\times24$

=12 m

OA = 12 cm



$\because \Delta AOB \sim \Delta OMN$

$\Rightarrow \frac{OA}{OM} = \frac{AB}{MN}$

$\Rightarrow \frac{12}{24} = \frac{AB}{7}$

$\therefore AB = \frac{7}{2}$ cm

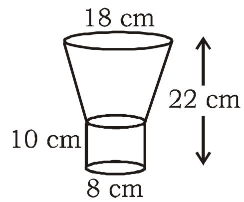
Volume of the upper part $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\times\frac{22}{7}\times\frac{7}{2}\times\frac{7}{2}\times12 = 154 \text{ cm}^2$

91. (B) For the Frustum
$r_1 = 9$ cm
$r_2 = 4$ cm
$h = 12$ cm

For the cylinder
$r = 4$ cm
$h = 10$ cm

$l = \sqrt{h^2 + (r_1 - r_2)^2}$
$= \sqrt{12^2 + (9-4)^2}$
$= \sqrt{144 + 25}$
$= \sqrt{169} = 13$ cm



Area of the sheet required
= area of frustum + area of cylinder
$= \pi(r_1 + r_2)l + 2\pi rh$

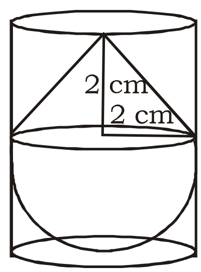
$= \frac{22}{7}[(9+4)\times 13 + 2\times 4\times 10]$

$= \frac{22}{7}[169 + 80]$

$= \frac{22}{7}\times 249$

$= 782.57 \text{ cm}^2$

92. (A) Volume of the toy



$= \frac{1}{3}\pi r^2 h + \frac{2}{3}\pi r^2$
$= \frac{1}{3}\pi\times2\times2\times2 +$
$\frac{2}{3}\pi\times2\times2\times2$

$= \frac{8\pi}{3} + \frac{16\pi}{3} = \frac{24\pi}{3} = 8\pi \text{ cm}^3$

Volume of the cylinder $= \pi r^2 h$
$= \pi\times2\times2\times4$
$= 16\pi \text{ cm}^3$

Required difference $= 16\pi - 8\pi$
$= 8\pi \text{ cm}^3$
$= 25.12 \text{ cm}^3$

93.(C) Slum population of A in 1991
= 35% of 91.9 lakh

$= \frac{35}{100}\times 91.9$ lakh

= 32.165 lakh = 32 lakh

94.(C) Difference = 21% of 25.5 lakh -10% of 29.2 lakh

$= \frac{22}{100}\times25.5 \text{ lakh} - \frac{10}{100}\times29.2 \text{ lakh}$

= 5.355 - 2.920 = 2.435 lakh

95.(A) Highest slum population is 38%. It is persent in B.

96.(A) Compostion of Bengalis is 12%. So the % of Tamilians with respect to Bengalis will be nearly $\frac{8}{12}\times100 = 67\%$.

97.(C) Hindi speaking population

$= \frac{18}{100}\times413 = 7.43 = 8$ million (aporox.)

98.(A) It is clear from the pie diagram that the answer is Punjabi and Hindi speaking = 17+18 = 35%

99.(B) Other 4 %

$\Rightarrow$ 2% of it $= \frac{2}{100}\times4 = 0.08$

$\Rightarrow$ Percentage of increase in Punjabis $= \frac{0.08}{17}\times100 = 0.5$ nearly

100.(C) Percentage of Punjabis = 0.5%

Increase in millions $= \frac{0.5}{100}\times413 = 0.20$

SSC MAINS MOCK TEST -8 ANSWER KEY

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