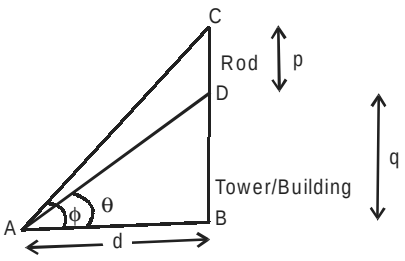
# ANSWER KEY - IIFT 2007-09

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | A, D | **2** | A, C | **3** | B, C | **4** | B, D | **5** | A,C,D | **6** | A,B,C,D | **7** | A,B,C | **8** | A,B,C |
| **9** | A,C | **10** | A,B,D | **11** | A,C,D | **12** | A,C,D | **13** | A,B,D | **14** | *B | **15** | D | **16** | D |
| **17** | A | **18** | *A | **19** | B | **20** | A | **21** | C | **22** | C | **23** | B | **24** | * |
| **25** | A | **26** | C | **27** | C | **28** | C | **29** | A | **30** | A | **31** | A,D | **32** | B,C,D |
| **33** | A,D | **34** | A,B,D | **35** | A,B | **36** | C | **37** | A | **38** | B,C | **39** | A,D | **40** | A |
| **41** | D | **42** | C | **43** | C,D | **44** | B,D | **45** | B,C,D | **46** | B,C | **47** | A,B | **48** | B |
| **49** | B,C,D | **50** | A,D | **51** | C,D | **52** | A,B,D | **53** | C,D | **54** | A,D | **55** | D | **56** | D |
| **57** | A,D | **58** | B,C,D | **59** | A,D | **60** | C,D | **61** | A,B,D | **62** | B,C,D | **63** | A,B,C,D | **64** | D |
| **65** | A | **66** | A | **67** | C | **68** | B | **69** | D | **70** | A,B | **71** | D | **72** | B,D |
| **73** | A,D | **74** | A,B,C,D | **75** | A | **76** | A,B,D | **77** | A,B,C,D | **78** | A,B,D | **79** | A,B,C | **80** | D |
| **81** | C | **82** | D | **83** | D | **84** | B | **85** | B | **86** | A,B,D | **87** | A,C,D | **88** | A,B,C,D |
| **89** | C,D | **90** | D | **91** | A,B,C,D | **92** | A,B,D | **93** | A,C | **94** | B,C,D | **95** | B,C | **96** | A,B,C,D |
| **97** | A,B | **98** | C,D | **99** | B,C | **100** | A,C | **101** | A,D | **102** | C,D | **103** | A,C | **104** | A,B,D |
| **105** | A | **106** | A,C | | | | | | | | | | | | |

# SOLUTION IIFT - 2007-09

1. A,D




$\frac{p+q}{d}=\tan\phi$ ...(i) and $\frac{q}{d}=\tan\theta$ ...(ii)

Dividing (i) by (ii), we get

$\Rightarrow \frac{p}{q}+1=\frac{\tan\phi}{\tan\theta}$

$\Rightarrow \frac{p}{q}=\frac{\tan\phi-\tan\theta}{\tan\theta}$

Height of the tower is $q=\frac{p\tan\theta}{\tan\phi-\tan\theta}$ and

Height of the rod is $p=q\frac{(\tan\phi-\tan\theta)}{\tan\theta}$

So (A) and (D) are the only correct options.

2. A,C

Let the roots be $\alpha$ and $\beta$. Then,

$\alpha+\beta=\frac{-q}{p}$ and $\alpha\times\beta=\frac{r}{p}$ ...(i)

Now, $\frac{1}{\alpha^2}+\frac{1}{\beta^2}=\frac{\alpha^2+\beta^2}{(\alpha\beta)^2}=\frac{(\alpha+\beta)^2-2(\alpha\beta)}{(\alpha\beta)^2}$

$=\frac{\left(\frac{-q}{p}\right)^2-2\left(\frac{r}{p}\right)}{\left(\frac{r}{p}\right)^2}$ (From (i))

According to the question,

$\frac{-q}{p}=\frac{\left(\frac{-q}{p}\right)^2-2\left(\frac{r}{p}\right)}{\left(\frac{r}{p}\right)^2}$

$\Rightarrow 2p^2r=pq^2+qr^2$

$\Rightarrow \frac{2p^2r}{pqr}=\frac{p.q^2}{pqr}+\frac{qr^2}{pqr}$ (dividing by pqr)

$\Rightarrow \frac{2p}{q}=\frac{q}{r}+\frac{r}{p}$

Option (A): Clearly $\frac{r}{p},\frac{p}{q}$ and $\frac{q}{r}$ are in arithmetic progression. (A) is correct.

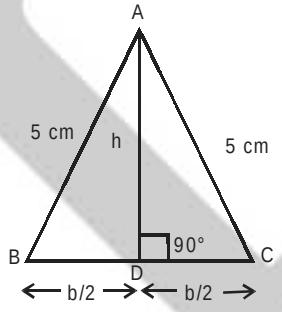
Option (B): As $\frac{q^2}{p^2}\neq\left(\frac{p}{r}\right)\times\left(\frac{r}{q}\right)=\frac{p}{q}$, (B) is incorrect.

Option (C): As $\frac{r}{p}$, $\frac{p}{q}$ and $\frac{q}{r}$ are in arithmetic progression, their reciprocals are in harmonic progression.

Option (D): It is wrong as these terms as in harmonic progression, not in arithmetic progression.

Hence, only options (A) and (C) are correct.

3. B,C




$\text{Area}(\Delta ABC)=\frac{1}{2}\times b\times h=12$ sq. cm

$\Rightarrow b\times h=24$ ...(i)

Also, in right triangle ABD,

$(5)^2=\left(\frac{b}{2}\right)^2+h^2$

$\Rightarrow b^2+4h^2=100$ ...(ii)

$\Rightarrow b^2+\left(\frac{48}{b}\right)^2=100$ ...(iii)

b = 6 and 8, are the roots of the above equation.

Hence, only options (B) and (C) are correct.

4. B, D

Initial mixture = 40 kg

S and (S): Cement (C) = is 1 : 4

$\Rightarrow$ S (by weight) $=\frac{1}{5}\times 40=8$ kg

and C (by weight) $=\frac{4}{5}\times 40=32$ kg

Let he mixes x kg of sand to the 40 kg mixture. Then,

$\frac{8+x}{40+x}=\frac{3}{7}\Rightarrow x=16$ kg

$\Rightarrow$ He mixed 16 kg of sand to the 40 kg mixture.

Option (A): Weight of second mixture = 40 + 16 = 56 kg which is $\frac{56}{40}=1.4$ times heavier and not 1.5 times.

Hence, (A) is incorrect.

Option (B): Correct. x = 16 kg, as solved above.

Option (C): If the original mixture was in 8 : 3 ratio, then weight of sand would have been

$\frac{3}{8+3}\times 40=10.9$ kg $\neq 12$ kg

Hence, (C) is incorrect.

Option (D): The mixture weighs 56 kg. After selling 7 kg of it, he is left with 49 kg of the mixture. In 11 kg of new mixture (7 : 4 ratio),

Sand is $\frac{4}{7+4}\times 11 = 4$ kg

and Cement is $\frac{7}{7+4}\times 11 = 7$ kg

In the final mixture,

Cement = $\frac{4}{7}\times(49)+7 = 28 + 7 = 35$ kg

Sand $\frac{3}{7}\times(49)+4 = 25$ kg

Cement : Sand ratio = $\frac{35}{25}=\frac{7}{5}$

$\therefore$ (D) it is correct.
Hence, options (B) and (D) are correct.

5. A,C,D

The correct option will have exactly one country assigned (or matched) to a single year out of the four given. Total number of ways of randomly answering (randomly matching) the question are = 4 × 3 × 2 × 1 = 24 ways.
Option (D):
P (X = 4) = P(All four matches are correct)

= P(Answer is marked correctly) $=\frac{1}{24}$

Hence, (D) is correct.
Option (C): P(X = 3) = P(Exactly three matches are correct & fourth is not correct)
If 3 countries are matched correctly, fourth must be correct as well.
So P(X = 3) event will never occur.
Hence, P(X = 3) = 0 is also correct.
Option (B): P(X = 1)
Let's assume that the match given in the question is the correct match. We have to count, all the possible ways of matches where exactly one is correct and the rest three are wrong.

Lets say, Italy $\rightarrow$ 82 is a correct match. For a wrong match, WG can be 90 or 98 and F $\rightarrow$ 98 or 66 and E $\rightarrow$ 90 or 66.

Case 1: When F is 98; only one way of assignment is (E $\rightarrow$ 66 & WG $\rightarrow$ 90).

Case 2: When F is 66; only one way of assignment is (E $\rightarrow$ 90 & WG $\rightarrow$ 98).

So if the only correct match is that of Italy, there are exactly two ways of marking the other countries, wrongly.

$\Rightarrow P(X=1)=\frac{4\times(2)}{24}=\frac{8}{24}=\frac{1}{3}.$

$\Rightarrow$ $P(X=1)=\frac{1}{3}$. Hence, option (B) is wrong.

Option (A): $P(X\geq 1)$
= P(X = 1) + P(X = 2) + P(X = 3) + P(X = 4)
P(X = 2) going as in option (B)

$P(X=2)=\frac{({}^4C_2\times 1)}{24}=\frac{6}{24}=\frac{1}{4}$

$\Rightarrow P(X\geq 1)=\frac{1}{3}+\frac{1}{4}+0+\frac{1}{24}=\frac{15}{24}$.

$P(X\geq 1)=\frac{5}{8}\Rightarrow$ Option(A) is correct.
Hence, options (A), (C) & (D) are correct.

6. A,B,C,D

Joshi's total cost price = 20,000 + 8,000 + 2,000
= Rs.30,000
Joshi's selling price = Wadhwa's cost price

$=30{,}000\left(1+\frac{20}{100}\right)=$ Rs.36,000

And then Wadhwa sells it back to Joshi.
Option (A): Wadhwa lost Rs.7200 while selling the shop back to Joshi.

$\Rightarrow$ Wadhwa's loss $=\frac{7200}{36000}=20\%$
$\therefore$ Option (A) is correct.
Option (B): Joshi's new total cost price
= 14000 + 8000 + 2000 = Rs.24,000
Joshi's selling price is still the same = Rs.36,000

$\Rightarrow$ Joshi's profit % $=\frac{36000-24000}{24000}\times 100$

= 50%
$\therefore$ Option (B) is correct.
Option (C): At a profit of 40% on his total cost price of Rs. 36,000, Joshi's monetary gain is

$=30000\times\frac{40}{100}$ = Rs.12,000

$\therefore$ Option (C) is correct.
Option (D): If Joshi sold the shop to Wadhwa at 40% profit, then Wadhwa's cost price = Rs.42,000
Wadhwa sells it back to Joshi at a loss of 40% i.e., at a price $=42000\times\left(1-\frac{40}{100}\right)$

= Rs. 25,200.
As Joshi had a monetary gain of Rs. 12,000 in selling the same shop to Wadhwa earlier, his net investment in taking the shop back = 25200 – 12000 = Rs.13,200
$\Rightarrow$ Option (D) is correct.
Hence, all the 4 options are correct.

7. A,B,C

$\frac{\log x}{b-c}=\frac{\log y}{c-a}=\frac{\log z}{a-b}=k,$ say. Let B be the base.

Then, $\log_B x = k(b-c)\Rightarrow x = B^{k(b-c)}$ and

$y = B^{k(c-a)}$ and $z = B^{k(a-b)}$.

Option (A): xyz = 1, is correct.
$B^{k(b-c)}\times B^{k(c-a)}\times B^{k(a-b)}$
$= B^{k(b-c+c-a+a-b)} = B^{k\times 0} = 1$

Option (B): $x^a.y^b.z^c$

$=\left[B^{k(b-c)}\right]^a\times\left[B^{k(c-a)}\right]^b\times\left[B^{k(a-b)}\right]^c$

$=B^{k[a(b-c)+b(c-a)+c(a-b)]}=B^{k\times 0}=B^0=1$
$\therefore$ Option (B) is correct.

Option (C); $x^{b+c}.y^{c+a}.z^{a+b}$

$=\left[B^{k(b+c)(b-c)}\right]\times\left[B^{k(c+a)(c-a)}\right]\times\left[B^{k(a+b)(a-b)}\right]$

$=B^{k\left[(b^2-c^2)+(c^2-a^2)+(a^2-b^2)\right]}=B^0=1$

∴ Option (C) is correct.
Option (D) is wrong.

8. A,B,C

In the pot, there are 'x' tickets of the Knife throwing game and 'y' tickets of the Talking Dolls game. Starting from Ajay, one ticket out of a total of (x + y) is drawn. If the ticket is one of the x tickets for the Knife throwing game, the drawing of tickets is stopped. If a Talking Dolls ticket is drawn, it is put back in the pot.
Probability that Ajay got the first knife throwing ticket ($P_A$) = (Ajay gets it in first draw)
+ (Ajay gets it in third draw)
+ (Ajay gets it in fifth draw)+ …… ∞

$$P_A = \frac{x}{x+y} + \left(\frac{y}{x+y}\right)^2 \times \left(\frac{x}{x+y}\right) + \left(\frac{y}{x+y}\right)^4 \times \left(\frac{x}{x+y}\right) \ldots \infty$$

$$P_A = \frac{\frac{x}{x+y}}{1-\left(\frac{y}{x+y}\right)^2} = \frac{x+y}{x+2y} \Rightarrow P_A = \frac{x+y}{x+2y}$$

Probability that Mohan got the first Knife throwing ticket ($P_M$)
= (Mohan gets it in second draw)
+ (Mohan gets it in fourth draw)
+ (Mohan gets it in sixth draw)
+ …… ∞

$$P_M = \left(\frac{y}{x+y}\right) \times \left(\frac{x}{x+y}\right) + \left(\frac{y}{x+y}\right)^3 \left(\frac{x}{x+y}\right) + \left(\frac{y}{x+y}\right)^5 \times \left(\frac{x}{x+y}\right) + \ldots \infty$$

$$= \frac{\frac{xy}{(x+y)^2}}{1-\left(\frac{y}{x+y}\right)^2}$$

$$\therefore P_M = \frac{y}{x+2y}$$

Option (A): Given, $P_A = 4\,P_M$

i.e., $\frac{x+y}{x+2y} = \frac{4y}{x+2y}$

$\Rightarrow \frac{x}{y} = \frac{3}{1}$

Hence, (A) is correct.
Option (B): Given, $P_A = 5\,P_M$

$\Rightarrow \frac{x}{y} = \frac{4}{1}$

Hence, (B) is correct.

Option (C): $P_A = 2\,P_M$

$\Rightarrow \frac{x}{y} = \frac{1}{1}$

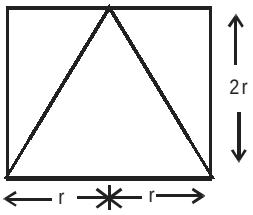
Hence, (C) is correct.

Option (D): $P_M < P_A$ always. $\{\because y < (x+y)\}$

Here, (D) cannot be a valid statement.
Hence, only options (A), (B) and (C) are correct.

9. A,C

Here, height of the cone = diameter of the cone = side of the cube.



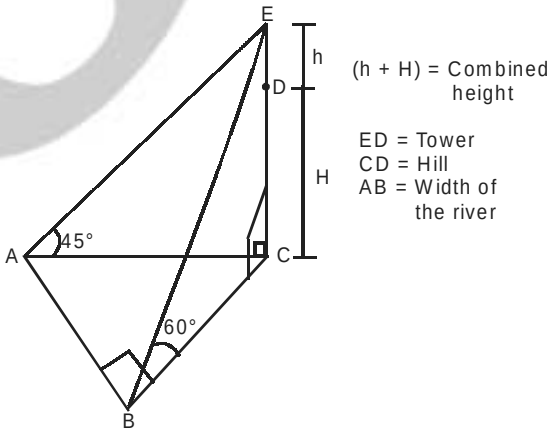

Volume of the memento = $718\frac{2}{3}$ cc (given)

$\Rightarrow \frac{1}{3} \times \pi \times r^2(2r) = 718\frac{2}{3}$

$\Rightarrow r = 7$ cm and side of cube = 14 cm.

Now, surface area of the box = $6 \times (14)^2 = 1176$ cm$^2$ and expenditure on packing = $1176 \times 1.5 = $ Rs.1764
Option (A): Madan's total expenditure on the box = (Cost of the box) + (Expenditure in the covering) = 500 + 1764 = Rs.2264.
Hence, option (A) is correct.
Option (B): Wrong, as expenditure was Rs.1764.
Option (C): Correct, as area of any one side of the box = $(14)^2 = 196$ cm$^2$.
Option (D): Volume of the box = $(14)^3 = 2744$ cc
Hence, option (D) is incorrect.
Hence, only options (A) and (C) are correct.

10. A,B,D




Water does not move in the lake.
In right triangle ACE, $\angle A = 45°$

$\Rightarrow EC = AC = (h+H) = 300$ m ...(i)

In right triangle BCE, $\angle B = 60°$

$\Rightarrow \frac{EC}{BC} = \tan 60° = \sqrt{3}$ ...(ii)

And in right triangle ABC,
$AC^2 = AB^2 + BC^2$ ...(iii)
Speed of the boat = 2 km/hr.
Option (A): AC = 300 m

$\frac{EC}{BC} = \sqrt{3} \Rightarrow BC = \frac{300 \times \sqrt{3}}{3} = 100\sqrt{3}$m

$\Rightarrow AB = \sqrt{AC^2 - BC^2}$

$\therefore AB = 100\sqrt{6}$ m is the breadth of the river.

Time taken by boat to move from A to B,

$\text{Time}_{A\to B} = \frac{100\sqrt{6}\times 60}{2\times 1000} = 3\sqrt{6}$ minutes.

$\therefore$ Option (A) is correct.

Option (B): The breadth of the river is $100\sqrt{6}$m,

Option (C): Incorrect, as Rajan took $3\sqrt{6}$ minutes.

Option (D): h + H = 450 m

Speed of boat = 1 km/hr

As all the angles remain the same, we will get 3 new right triangles which are correspondingly similar to the earlier ones.

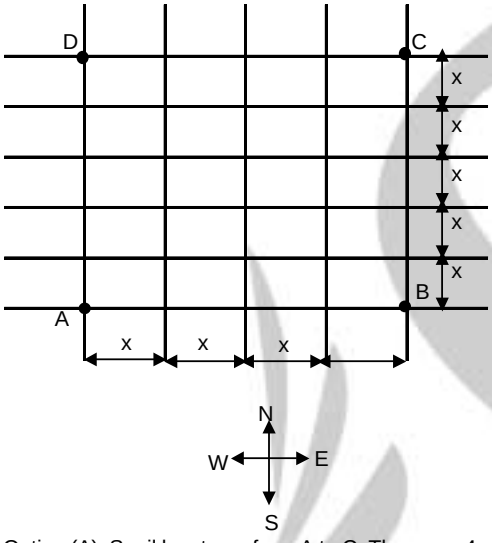
Breadth of the river $= \frac{450}{300}\times(100\sqrt{6})\text{ m} = 150\sqrt{6}$ m

$\therefore$ Time taken $= \frac{150\sqrt{6}\text{m}}{1\text{km/hr}} = 9\sqrt{6}$ minutes

$\Rightarrow$ Option (D) is correct.

Hence, only options (A), (B) & (D) are correct.

11. A,C,D




Option (A): Sunil has to go from A to C. There are 4 x's horizontally and 5 x's vertically which have to be arranged in order to reach C, from A. The total number of routes $= \frac{9!}{4!\ 5!} = 126$.

Option (B): The total number of ways includes the shortest possible routes as well. There can be infinitely possible routes as retracing of the paths will not be restricted. Hence, (B) is wrong.

Option (C): A square is a special case of rectangle. To form a rectangle, we have to choose 2 N-S lines from the given 5 and 2 W-E lines, out of 6. Hence, the total number of rectangles = ${}^6C_2 \times {}^5C_2 = 150$. $\therefore$ Option (C) is correct.

Option (D): As in option (A), we have 11 objects now, out of which 5 are of one kind and 6 are of another kind. Total number of routes $= \frac{11!}{5!\times 6!} = 336$. $\therefore$ Option (D) is correct.

Hence, only options, (A), (C) and (D) are correct.

12. A,C,D

Laxman takes the first train which is the slower one. Bharat takes the faster train. Let the trains be A and B respectively. Speed of the faster train, B is $V_B = \frac{180\text{ km}}{3\text{ hr}} = 60$ km/hr.

Since, train A takes double time, $V_A = 30$ km/hr.

Speed of the train B, w.r.t. Laxman (when he is sitting in the train A) is (60 – 30) = 30 km/hr.

Laxman observes the train B that passes by him in 12 seconds. If $L_B$ was the length of the faster train, then

$30\text{ km/hr} = \frac{L_B}{12\text{ seconds}}$

$\Rightarrow L_B = 30\times\frac{5}{18}\times 12 = 100\text{m}$

Option (A): $30\text{ km/hr} = \frac{L_A + L_B}{30\text{ seconds}}$

{$L_A$ = Length of the slower train}

$\Rightarrow L_A + L_B = 30\times\frac{5}{18}\times 30 = 250\text{m}$

$\Rightarrow L_A = (250-100)\text{m}$

$\therefore L_A = 150$ m

So $L_A - L_B = 50$ m. Option (A) is correct.

Option (B): If $V_B = 60\times 2 = 120$ km/hr

$V_A = 30$ km/hr, as before.

To overtake train A, train B has to cover its length, $L_A$. As we cannot determine the length of the slower train, we cannot find the time taken to overtake. Hence, option (B) is not correct.

Option (C): $V_A = 30$ km/hr

$V_B = 60$ km/hr

$30\text{ km/hr} = \frac{L_A + L_B}{24}$

$\Rightarrow L_A + (100) = 30\times\frac{5}{18}\times 24$

$\therefore L_A = 200 - 100 = 100$ m.

Option (C) is correct.

Option(D): $V_A = 30\times\frac{3}{2} = 45\text{ km/hr}$ and

$V_B = 60\text{ km/hr}$

$\Rightarrow 15\text{ km/hr} = \frac{L_B}{t} = \frac{100}{t}\text{ m}$

$\Rightarrow t = 24$ seconds.

Hence, option (D) is correct.

13. A,B,D

20 men can complete a work in 10 days

$\therefore$ 10 men can complete the work in 20 days

Similarly, 10 women can complete the work in 30 days.

$\therefore$ 10 men + 10 women can complete the work in

$\frac{1}{\frac{1}{30}+\frac{1}{20}} = 12$ days.

Option (A): Total wages for men = 12 × 50 × 10
= Rs.6,000

Total wages for women = 12 × 10 × 45
= Rs.5,400

$\therefore$ Total wages bill = Rs.11,400

Hence, option (A) is correct.

Option (B): Total wages for men = 12 × 10 × 45
= Rs.5,400

Total wages for women = 12 × 10 × 40
= Rs.4,800

$\therefore$ Total wages bill = Rs.10,200

Hence, option (B) is correct.

Option (C): Total wages for men = 12 × 10 × 40
= Rs.800

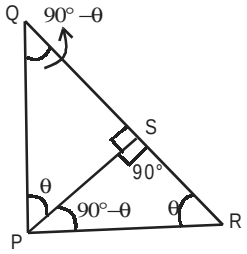
Total wage for women = 12 × 10 × 40
= Rs.4,800

$\therefore$ Total wages bill = Rs.9,600
Hence, option (C) is incorrect.
Option (D): If 20 men and 30 women are employed then, together they will finish the work in

$$\frac{1}{\frac{1}{10}+\frac{1}{10}} = 5 \text{ days.}$$

Total wages for men = 5 × 20 × 40 = Rs.4,000
Total wages for women = 5 × 30 × 35 = Rs.5,250
$\therefore$ Total wages bill = Rs.9,250
Hence, option (D) is correct.

14.*B




Statement I: In $\Delta PQS$,

$\angle P = \theta,\ \angle Q = 90° - \theta$, and $\angle S = 90°$

In $\Delta RPS$, $\angle R = \theta,\ \angle P = 90° - \theta$ and $\angle S = 90°$
Since all the corresponding angles are equal,
$\therefore\ \Delta PQS \sim \Delta RPS$.
Hence, statement I is correct.

Statement II:

In $\Delta PSQ,\ \angle P = \theta, \angle S = 90°$ and $\angle Q = 90° - \theta$

In $\Delta RSP$, $\angle R = \theta$, $\angle S = 90°$ and $\angle P = 90° - \theta$

$\Rightarrow \Delta PSQ \sim \Delta RSP$

But, $\Delta PSQ \not\equiv \Delta RSP$ (not necessary)
Hence, statement II is incorrect.

Statement III:

In $\Delta PSQ,\ \angle P = \theta, \angle S = 90°$ and $\angle Q = 90° - \theta$

In $\Delta RPQ,\ \angle R = \theta, \angle P = 90°$ and $\angle Q = 90° - \theta$

$\therefore\ \Delta PSQ \sim \Delta RPQ$
Hence, statement III is correct.
Hence, statements I and III are correct.
***Option (B) in the given question has been mistyped. It should be 'I and II are correct'.**

15. D

$$S = \frac{3}{4}+\frac{5}{36}+\frac{7}{144}+....$$

$$S = \left(\frac{1}{1^2}-\frac{1}{2^2}\right)+\left(\frac{1}{2^2}-\frac{1}{3^2}\right)+\left(\frac{1}{3^2}-\frac{1}{4^2}\right) + ... + \left(\frac{1}{(n)^2}-\frac{1}{n+1)^2}\right)$$

$$\Rightarrow S = \left(1-\frac{1}{2^2}+\frac{1}{2^2}-\frac{1}{3^2}+\frac{1}{3^2}+...+\left(\frac{1}{n^2}-\frac{1}{(n+1)^2}\right)\right)$$

$$= 1-\frac{1}{(n+1)^2} = \frac{(n+1)^2-1}{(n+1)^2}$$

$$\Rightarrow S = \frac{n^2+2n}{(n+1)^2}$$

$$\therefore \frac{1}{S} = \frac{(n+1)^2}{n^2+2n}$$

Hence, option (D) is the correct answer.

16. D

$$(5+\sqrt{2})x^2-(4+\sqrt{5})x+(8+2\sqrt{5}) = 0$$

Let the roots be $\alpha$, $\beta$ and H be their harmonic mean.

$$\therefore \frac{2}{H} = \frac{1}{\alpha}+\frac{1}{\beta} = \frac{\alpha+\beta}{\alpha\beta} = \frac{\frac{4+\sqrt{5}}{5+\sqrt{2}}}{\frac{8+2\sqrt{5}}{5+\sqrt{2}}} = \frac{4+\sqrt{5}}{8+2\sqrt{5}}$$

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

$$\Rightarrow H = 4$$

$$\Rightarrow \sqrt{H} = \pm 2$$

Hence, option (D) is correct.

17. A

Given, $\tan\alpha$ is the G.M. of $\sin\alpha$ and $\cos\alpha$

$$\Rightarrow (\tan\alpha)^2 = (\sin\alpha)(\cos\alpha)$$

$$\Rightarrow (\sin\alpha) = (\cos\alpha)^3$$

$$\Rightarrow (\sin\alpha)^2 = \left[(\cos\alpha)^3\right]^2$$

$$\Rightarrow \sin^2\alpha = (1)^3+(-\sin^2\alpha)^3+3(1)^2(-\sin^2\alpha) + 3(1)(-\sin^2\alpha)^2$$

$$\Rightarrow \sin^2\alpha = 1-\sin^6\alpha-3\sin^2\alpha+3\sin^4\alpha$$

$$\Rightarrow 1-4\sin^2\alpha+3\sin^4\alpha-\sin^6\alpha = 0$$

Adding 1 on both sides, we get

$$2-4\sin^2\alpha+3\sin^4\alpha-\sin^6\alpha = 1$$

Hence, option (A) is correct.

18.*A

$$\frac{1}{\sqrt{5}+\sqrt{6}+\sqrt{11}}$$

$$= \frac{1}{(\sqrt{5}+\sqrt{6})+\sqrt{11}} \times \frac{(\sqrt{5}+\sqrt{6})-\sqrt{11}}{(\sqrt{5}+\sqrt{6})-\sqrt{11}}$$

$$= \frac{\sqrt{5}+\sqrt{6}-\sqrt{11}}{2\sqrt{30}}$$

$$= \frac{(\sqrt{5}+\sqrt{6}-\sqrt{11})\times\sqrt{30}}{2(\sqrt{30})^2}$$

$$= \frac{5\sqrt{6}+6\sqrt{5}-\sqrt{330}}{60}$$

Option (A) is correct
***Note that option (D) is similar to (A), so this question has two correct solutions.**

19. B

Let the roots be $\alpha$ and $\alpha^2$.

Given, $\alpha+\alpha^2 = -p$ and $(\alpha)\times(\alpha^2) = q$

$$\Rightarrow \alpha+\alpha^2 = -p \text{ and } \alpha^3 = q$$

$$\Rightarrow (\alpha+\alpha^2)^3 = (-p)^3$$

$\Rightarrow (\alpha)^3 + (\alpha^2)^3 + 3(\alpha)\times(\alpha^2)(\alpha+\alpha^2) = -p^3$

$\Rightarrow p^3 - q(3p-1) + q^2 = 0$

Hence, option (B) is correct.

20. A For $x^2 + mx + 1 = 0$, the roots are $\alpha$ and $\beta$.

$\Rightarrow \alpha + \beta = -m$ and $\alpha.\beta = 1$

For $x^2 + nx + 1 = 0$, roots are $\gamma$ and $\delta$

$\Rightarrow \gamma + \delta = -n$ and $\gamma.\delta = 1$

Given expression =

$(\alpha-\gamma)(\beta-\gamma)(\alpha+\delta)(\beta+\delta)$

$= (\alpha-\gamma)(\beta+\delta)(\beta-\gamma)(\alpha+\delta)$

$= [\alpha\beta + \alpha\delta - \gamma\beta - \gamma\delta][\alpha\beta + \beta\delta - \gamma\alpha - \gamma\delta]$

$= [1 + \alpha.\delta - \gamma\beta - 1][1 + \beta\delta - \gamma\alpha - 1]$

$= (\alpha.\delta - \gamma\beta)(\beta\delta - \gamma\alpha)$

$= 1.\delta^2 - \alpha^2.1 - \beta^2.1 + \gamma^2.1 = (\delta^2 + \gamma^2) - (\alpha^2 + \beta^2)$

$= \left[(\delta+\gamma)^2 - 2\delta.\gamma\right] - \left[(\alpha+\beta)^2 - 2\alpha\beta\right]$

$= \left[(-n)^2 - 2.1\right] - \left[(-m)^2 - 2.1\right] = n^2 - m^2$

Hence, option (A) is correct.

21. C Side of the square $= \sqrt{484}$ cm $= 22$ cm

$\therefore$ Length of the wire = 4 × (22) = 88 cm.

After cutting, longer part $= \frac{3}{4}\times 88 = 66$ cm

shorter part = 88 – 66 = 22 cm.

Radius of the circle thus formed $= \frac{66}{2\pi} = \frac{21}{2}$ cm.

Side of the square formed $= \frac{22}{4} = \frac{11}{2}$ cm

$\therefore$ Area of the circle $= \pi\left(\frac{21}{2}\right)^2 = \frac{693}{2}$ cm$^2$

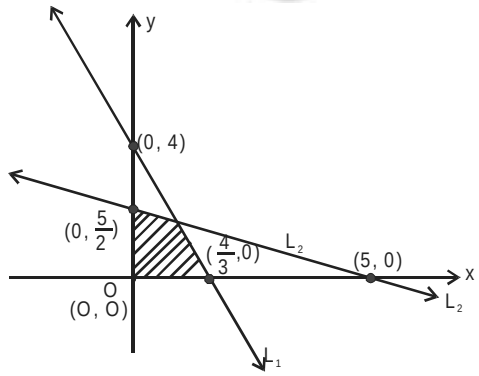
and area of the square $= \left(\frac{11}{2}\right)^2 = \frac{121}{4}$ sq. cm

Therefore, total area enclosed by both

$= \left(\frac{693}{2} + \frac{121}{4}\right)$ sq cm $= 376.75$ cm$^2$

Hence, option (C) is correct.

22. C




Line $L_1$ passes through (0, 4) and $\left(\frac{4}{3}, 0\right)$.

Its equation is $\frac{x}{\frac{4}{3}} + \frac{y}{4} = 1$

$\Rightarrow 3x + y - 4 = 0$ ...(i)

and the equation of line $L_2$ is

$x + 2y - 5 = 0$ ...(ii)

The shaded region includes x-axis (y = 0) and y-axis (i.e. x = 0) as its boundaries and bounds only the positive quadrant of the x-y plane.

$\Rightarrow x \geq 0$ and $y \geq 0$ ...(iii)

For the shaded region,

$y + 3x - 4 \leq 0$ ...(iv)

and $x + 2y - 5 \leq 0$ ...(v)

The bounded region is given by

$3x + y \leq 4,\ x + 2y \leq 5,\ x \geq 0,\ y \geq 0$

Hence, option (C) is correct.

23. B After 6 hours, part of the tank filled by the three pipes

$= \frac{6}{12} + \frac{4}{18} - \frac{6}{36} = \frac{1}{2} + \frac{2}{9} - \frac{1}{6}$

$= \frac{9+4-3}{18} = \frac{10}{18} = \frac{5}{9}$

Remaining part $= 1 - \frac{5}{9} = \frac{4}{9}$

This part is to be filled by A and B together. Further, A and B together can fill in one hour

$= \left(\frac{1}{12} + \frac{1}{18}\right)$part $= \frac{5}{36}^{\text{th}}$ part.

$\therefore \frac{4}{9}^{\text{th}}$ part will be filled by A and B together in time

$= 3\frac{1}{5}$ h.

$\therefore$ Total time required = 6h + 3h + 12 min

= 9 hrs and 12 min.

Hence, option (B) is correct.

24.* $y = \frac{1}{\{\log_{10}(3-x)\}} + \sqrt{x+7}$

y is defined it:

(i) $\log_{10}(3-x) \neq 0$

$\Rightarrow 3 - x \neq 1 \quad \Rightarrow x \neq 2$

(ii) $3 - x > 0 \quad \Rightarrow x < 3$

(iii) $x + 7 \geq 0 \quad \Rightarrow x \geq -7$

From (i), (ii) and (iii), we get the domain as

$-7 \leq x < 3,\ x \neq 2$

i.e., $x \in [-7, 3) \sim \{2\}$

*** There is a typing error in the given options.**

25. A The angle between $\vec{a}$ and $\vec{b}$ is $\theta$.

$(\vec{a} + 3\vec{b}).(7\vec{a} - 5\vec{b}) = 0$ ...(i)

and $(\vec{a} - 4\vec{b}).(7\vec{a} - 2\vec{b}) = 0$ ...(ii)

From (i),

$(\vec{a}).(7\vec{a}) + (\vec{a}).(-5\vec{b}) + (3\vec{b}).(7\vec{a}) + (3\vec{b})(-5\vec{b}) = 0$

$\Rightarrow 7|\vec{a}|^2\cos 0° - 5|\vec{a}||\vec{b}|\cos\theta + 21|\vec{a}||\vec{b}|\cos\theta - 15|\vec{b}|^2\cos 0° = 0$

$\Rightarrow 7a^2 - 5ab\cos\theta + 21ab\cos\theta - 15b^2 = 0$

$\Rightarrow 7a^2 - 15b^2 + 16ab\cos\theta = 0$ ...(iii)

Similarly, solving the dot product in (2), we get

$7a^2 + 8b^2 - 30ab\cos\theta = 0$ ...(iv)

Subtracting (iii) from (iv),

$23b^2 = 46ab\cos\theta$

$\Rightarrow \frac{b}{2a} = \cos\theta \Rightarrow \cos^2\theta = \frac{b^2}{4a^2}$

$\Rightarrow \sin^2\theta = 1 - \frac{b^2}{4a^2} \Rightarrow \tan^2\theta = 4\left(\frac{a^2}{b^2}\right) - 1$

From equation (iii) and (iv),

$7a^2 - 15b^2 = -16ab\cos\theta$

and $7a^2 + 8b^2 = 30ab\cos\theta$

$\Rightarrow \frac{7a^2 - 15b^2}{7a^2 + 8b^2} = \frac{-16}{30}$

$\Rightarrow \frac{7\left(\frac{a^2}{b^2}\right) - 15}{7\left(\frac{a^2}{b^2}\right) + 8} = \frac{-8}{15}$

$\Rightarrow \frac{a^2}{b^2} = 1$

$\therefore \tan^2\theta = 3 \Rightarrow \tan\theta = \pm\sqrt{3}$

Option (A) has one of the two possible values i.e., $\sqrt{3}$. Hence, option (A) is correct.

26. C

Before the merger,
X Ltd. had number of employees = 4
Y Ltd. had number of employees = 3
Z Ltd. had number of employees = 5
After the merger, there are quarrels amongst the employees of the erstwhile X Ltd, Y Ltd, & Z Ltd. An employee does not quarrel with any of the employees from his parent company.

| Company | X | Y | Z |
|---|---|---|---|
| Employees | 4 | 3 | 5 |

Maximum possible number of quarrels of any employee of X Ltd. with the employees of Y Ltd. & Z Ltd. as given by:
1 × 3 + 1 × 5.
Since there are 4 employees in the merged company, who came from X, the total number of quarrels involving employees of X company = 4 × (1 × 3 + 1 × 5) = 4 × 8 = 32 quarrels ...(i)
Further, employees of Y Ltd. & Z Ltd. will be involved in quarrels with each other. The total number of such quarrels
= 3 × (1 × 5) = 5 × (1 × 3) = 15 quarrels ...(ii)

From (i) and (ii),
total number of quarrels between the employees of three erstwhile companies is = 32 + 15 = 47 quarrels.
Hence, option (C) is correct.

27. C

$\frac{1-c}{1+c} = \frac{1 - \tan\left(\frac{\alpha}{2}\right)\times\tan\left(\frac{\beta}{2}\right)}{1 + \tan\left(\frac{\alpha}{2}\right)\times\tan\left(\frac{\beta}{2}\right)}$

$= \frac{\cos\left(\frac{\alpha}{2}\right)\cos\left(\frac{\beta}{2}\right) - \sin\left(\frac{\alpha}{2}\right)\times\sin\left(\frac{\beta}{2}\right)}{\cos\left(\frac{\alpha}{2}\right)\cos\left(\frac{\beta}{2}\right) + \sin\left(\frac{\alpha}{2}\right)\times\sin\left(\frac{\beta}{2}\right)}$

$= \frac{\cos\left(\frac{\alpha+\beta}{2}\right)}{\cos\left(\frac{\alpha-\beta}{2}\right)}$ ...(i)

Since $\sin\alpha + \sin\beta = a$ and $\cos\alpha + \cos\beta = b$,
squaring and adding up both equations, we get

$\sin^2\alpha + \sin^2\beta + 2\sin\alpha\sin\beta = a^2$

and $\cos^2\alpha + \cos^2\beta + 2\cos\alpha\cos\beta = b^2$

Adding both the equations, we get,

$1 + 1 + 2(\cos\alpha\cos\beta + \sin\alpha\sin\beta) = a^2 + b^2$

$\Rightarrow 2 + 2\{\cos(\alpha - \beta)\} = a^2 + b^2$

$\Rightarrow 1 + \cos(\alpha - \beta) = \frac{a^2 + b^2}{2}$ ...(ii)

Since $\cos\alpha + \cos\beta = b$, ...(iii)
dividing equation (iii) by (ii), we get

$\frac{\cos\alpha + \cos\beta}{1 + \cos(\alpha - \beta)} = \frac{2b}{a^2 + b^2}$

$\Rightarrow \frac{2\cos\frac{(\alpha+\beta)}{2}\times\cos\frac{(\alpha-\beta)}{2}}{2\cos^2\frac{(\alpha-\beta)}{2}} = \frac{2b}{a^2 + b^2}$

$\Rightarrow \frac{\cos\frac{(\alpha+\beta)}{2}}{\cos\frac{(\alpha-\beta)}{2}} = \frac{2b}{a^2 + b^2}$

From equation (i), we get

$\Rightarrow \frac{1-c}{1+c} = \frac{2b}{a^2 + b^2}$

$\therefore$ Option (C) is correct.

28. C

We know,

$\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$ ...(A)

Since $a\sin^{-1}x = c + b\cos^{-1}x$ (given)

$\Rightarrow \frac{a}{b}\sin^{-1}x = \frac{c}{b} + \cos^{-1}x$ ...(i)

$\Rightarrow b\cos^{-1}x = a\sin^{-1}x - c$

$\Rightarrow \frac{b}{a}\cos^{-1}x = \sin^{-1}x - \frac{c}{a}$ ...(ii)

Adding equation (i) and (ii), we get

$$\frac{a}{b}\sin^{-1}x+\frac{b}{a}\cos^{-1}x=(\sin^{-1}x+\cos^{-1}x)+\frac{c}{b}-\frac{c}{a}$$

$$=\left(\frac{\pi}{2}\right)+c\left\{\frac{1}{b}-\frac{1}{a}\right\}\text{ ...(Using A)}$$

$$=\left(\frac{\pi}{2}\right)+\frac{c(a-b)}{ab}$$

$$=\frac{\pi ab+2c(a-b)}{2ab}$$

Hence, option (C) is the correct answer.

29. A

$$\frac{2\sin\theta}{1+\sin\theta+\cos\theta}=\frac{4\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{1+2\sin\frac{\theta}{2}\cos\frac{\theta}{2}+2\cos^2\frac{\theta}{2}-1}$$

$$=\frac{4\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{2\cos\frac{\theta}{2}\left\{\sin\frac{\theta}{2}+\cos\frac{\theta}{2}\right\}}$$

$$\Rightarrow k=\frac{2\sin\frac{\theta}{2}}{\left(\sin\frac{\theta}{2}+\cos\frac{\theta}{2}\right)}\quad\ldots(i)$$

Now,

$$\frac{1-\cos\theta+\sin\theta}{1+\sin\theta}$$

$$=\frac{1-1+2\sin^2\frac{\theta}{2}+2\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{\left(\sin\frac{\theta}{2}+\cos\frac{\theta}{2}\right)^2}$$

$$=\frac{2\sin\frac{\theta}{2}\left(\sin\frac{\theta}{2}+\cos\frac{\theta}{2}\right)}{\left(\sin\frac{\theta}{2}+\cos\frac{\theta}{2}\right)^2}$$

$$=\frac{2\sin\frac{\theta}{2}}{\left(\sin\frac{\theta}{2}+\cos\frac{\theta}{2}\right)}\quad\ldots(ii)$$

As equation (i) and (ii) are same, the value is equal to k Hence, option (A) is correct.

30. A

Probability that Sumit actually sees a Shark, given that he claimed to have seen one,

$$=\frac{P(\text{He actually sees the shark \& reports truth})}{P(\text{He claims of seeing a shark})}$$

$$=\frac{P(\text{sees the shark})\times P(\text{reports truth})}{\left(\begin{array}{l}P(\text{sees the shark})\times P(\text{reports truth})\\+P(\text{doesn't see})\times P(\text{reports false})\end{array}\right)}$$

$$=\frac{\frac{1}{8}\times\frac{1}{6}}{\frac{1}{8}\times\frac{1}{6}+\frac{7}{8}\times\frac{5}{6}}=\frac{\frac{1}{48}}{\frac{36}{48}}=\frac{1}{36}$$

Hence, option (A) is correct.

31. A,D

Correct Matches are:

A. Kumar Mangalam Birla-Aluminium & Copper-Ernst & young Entrepreneur Award 2005-Grasim.

D. Kalanithi Maran-Voice and radio products-CNBC Business Excellence Award 2005-Sun TV.

32. B,C,D

Correct Matches are:

B. Rana Kapoor-Rabobank-Start-up Entrepreneur Award 2005-Yes Bank.

C. Jagdish Khattar-IGNIS-Gurgaon-Maruti

D. Azim Premji-Integrated Business Solution-Faraday Medal-Wipro

33. A,D

Correct Matches are:

A. Namibia-Diamonds-Windhoek-Dollar

D. Nigeria-Oil-Abuja-Naira

34. A,B,D

Correct Matches are:

A. Sir Walter Scott-Ivnhoe-The Life of Napolean Bonaparte-Scotland

B. Cervantes-Don Quixote-Novelas Ejemplares-Spain

D. Dr. Zhivago-My sister life-Russia

35. A,B

Correct Matches are:

A. L.N. Mittal-ISPAT International-Gopalpur SEZ-Steel Industry

B. Warren Buffet-Berkshire Hathaway Inc-Omaha-Bill & Melinda Gates Foundation

36. C

Correct Match is:

C. EscortsLtd-Faridabad-Tractors-Rajan Nanda

37. A

Correct Matches are:

A. Dr Reddy's-Betapharm-Generic drugs-Germany.

38. B,C

Correct Matches are:

A. B.V. Rao-Poultry Farming

B. C.K Prahalad-Management Science

C. John kurien-Fishries Economy

D. Kiran karnik-Information Technology & Software

39. A,D

Correct Matches are:

A. My Presidential Years - R Venkatraman

B. The Hindu way of life - S Radhakrishnan

C. Voice of Conscience - V. V. Giri

D. Without Fear or Favour - N Sanjiva Reddy.

40. A

B. Port Blair is the largest town and a municipal council in Andaman's district in the Andaman Islands and the capital of the Andaman and Nicobar Islands union territory of India. It lies on the east coast of South Andaman Island and is the main entry point to the islands.

C. The photosphere is the zone from which the sunlight we see is emitted. The outermost layer of the sun is the corona. Only visible during eclipses, it is a low-density cloud of plasma with higher transparency than the inner layers.

41. D

A. Acquired Immune Deficiency Syndrome (AIDS or Aids)

B. Petrology is a field of geology, which focuses on the study of rocks and the conditions by which they form.

C. A diverging (concave lens) always form virtual image. Convex lens is used for magnifying glass.

42. C

A. Crossing the Floor- In politics, crossing the floor is to vote against party lines, especially where this is considered unusual or controversial.
Statement B and D are incorrect.

43. C,D
A. It was founded by Dr. Verghese Kurien and Dr. Amrita Patel is the current Chairman of the National Dairy Development Board, Anand.
B. Dabur is well known for Ayurvedic medicine, Hamdard is world largest producer of unani medicine.

44. B,D
A. Only the transparent section of the eyes called cornea is taken out and not the full eye ball.
C. IC chips are usually made of silicon, not chromium.

45. B,C,D
A. Mercury, Gallium, Francium are metals and are liquid at room temperature

46. B,C
A. Chandraupta ruled from 322 BC-298 BC not 324 to 301 B.C.
D. On April 28, 1916, the Home Rule League was set up with its headquarters at Pune. Tilak went on a whirlwind tour of the country, appealing to everybody to unite under the banner of Home Rule League.

47. A,B
C. Special Olympics 2005 took place during 2-9 July 2005 at Glasgow
D. Australia was the champion in the Sultan Azlan Shah Hockey tournament in 2005

48. B
A. Three scientists shared the Nobel Prize in physics in the year 2005.
C. The flow of heat by conduction occurs via collisions between atoms and molecules in the substances and the subsequent transfer of kinetic energy not potential energy.
D. Madam Curie was born in Poland not in France.

49. B,C,D
A Sand dunes occur throughout the world, from coastal and lakeshore plains to arid desert regions.

50. A,D
B. Dogri and Gojri are two languages of Jammu & Kashmir.
C. Surajkund mela, from 1st to 15th February rural India basks in the warmth of admiration at Surajkund mela village that lies some 8 km from South Delhi.

51. C,D
A. Only mercury and venus are inferior planets.
B. All planets cannot be seen at night.

52. A,B,D
Only C is the false statement.

53. C,D
A. The Montagu-Chelmsford Reforms were reforms introduced by the British Government in India to introduce self-governing institutions gradually to India.
B. Warren Hastings (December 6, 1732 - August 22, 1818) was the first governor-general of British India, from 1773 to 1786. He was famously impeached in 1787 for corruption, and acquitted in 1795. He remained in India untill 1874 is the wrong statement rest part of the statement is correct.

54. A,D
B. The Satpura Range is a range of hills in central India. The range rises in eastern Gujarat state near the Arabian Sea coast, running east through Maharashtra and Madhya Pradesh to Chhattisgarh.
C. The Himalaya range runs for about 2,400 km, from Nanga Parbat (Pakistan) in the west to Namche Barwa (Tibet) in the east.

55. D
Statements A, B and C are incorrect, only D is correct.

56. D
A. Statement is not clear, till now Eight persons of Indian origin have been honoured, Nobel Prize.
B. Hargobind Khorana (born 1922), a person of Indian origin, shared the 1968 Nobel Prize in Physiology or Medicine for his work on genes.
C. Three person of indian origin won Nobel Prize for Literature. These are Rudyard Kipling, Literature, 1907. Rabindranath Tagore, Literature, 1913 and Sir Vidiadhar Surajprasad Naipaul, Literature, 2002.

57. A,D
The words 'perverse' and 'perverted' are correctly used in A. The words 'rebelling' and 'revolting' have also been used correctly in D. This meaning fits in the context of both the sentences.B is incorrect because 'effluence' has been used incorrectly with 'indigence'.C is incorrect because 'purposely' has been misplaced in the sentence.

58. B,C,D
Options B,C & D are correct .Corps & corpse, 'grisly & grizzly & infamous & notorious have been used correctly. Illusion & allusion have been used incorrectly, fit in accurately when interchanged between options i & ii .

59. A,D
Options A & D are correct. In B, the usage of the word 'rebel' makes the sentence inconsistent and unclear. In option C 'overlook' and'oversee' make sense only if they are interchanged between options i & ii.

60. C,D
Sentences C and D are incorrect. In sentence C it should have been "The Huns,who were Mongolian, invaded Gaul in 461 A. D." In D, there is an unclear pronoun reference. The sentence should be "Because of her interest in economic development, Senator Martin sometimes neglects the environment."

61. A,B,D
In sentence A - Pronoun 'they' should be used to refer to the subject of the clause; them is used to refer to the object of the clause. In sentence B 'he' should be used as it refers to only one person. Sentence D is incorrect because of the dangling modifier error.

62. B,C,D
Murrey means dark purplish - red colour. Thus a similar relationship cannot be established between murrey and black, like the one between magenta (purplish red) and red. So, A is incorrect. Inter (to bury) and Exhume (to dig out) are opposite actions of each other. Piebald (varied) and Homogeneous (uniform) also share a relationship of being opposites. Effete (barren) and Fructuous (productive) share the same relationship as that of Chapfallen (dejected) and Effervescent (excited) i.e. that of being opposites. Selenology is the study of moon, whereas Epistemology is the study of (human) knowledge. Thus B, C and D are valid analogies.

63. A,B,C,D
A Polyglot knows several Languages. A Polyphagous feeds on several kind of foods. Hence, there is a relation between them. Escutcheon and Scutcheon are synonyms (both meaning a shield) and so are Fabulist and Liar (both meaning a person concealing the truth). Scurvy is a disease caused by the lack of Vitamin C whereas Kwashiorkor is a disease caused by lack of Protein (caused primarily due to a high carbohydrate diet). Apothecary is a person skilled in manufacturing and/or selling Drugs whereas a Cruciverbalist is a person who is skilled in solving crosswords. Hence all are valid analogies.

64. D
Growth cannot be described as luxurious. Hence sentence D contains inappropriate usage of the word 'luxuriously'.

65. A Prophecy is a noun and not a verb. Hence, sentence A contains inappropriate usage of the word.

66. A Moribund means dying and is the only word that fits in the context of both the sentences as languages cannot be sycophantic or garrulous.

67. C Soporific is a word that can be used both as a noun and as an adverb. In the first sentence it is used as an adverb to qualify the nature of the tone. In the second sentence it is used as a noun to mean a sleep inducing medication.

68. B To qualify the pronoun in the first sentence and the noun in the second sentence an adjective is required. Only puerile is an adjective among the given options. 'Puerile' means 'childishly foolish; immature or trivial. The first meaning fits in sentence (ii). The second meaning fits in sentence (i). Hence, option (B) is the correct answer.

69. D None of the options fit in both the sentences

70. A,B Hypallage and rantipole have been spelt correctly. Correct spelling for (C) is intaglio and for (D) is isagoge.

71. D Only panegyric has been spelt correctly. The correct spellings for (A), (B) and (C) are polyphagism, ciguatera and maquette respectively.

72. B,D The correct combinations are

| | |
|---|---|
| Agent | Burning-Glass |
| Garpon | Caravan |
| Gyanyima | Market |
| Norbu | Guide |

Hence the correct choices are B and D

73. A,D From the passage only statements A and D are correct. Statement B is incorrect because the pass was delivered to them after 3 days.

74. A,B,C,D Satement A is not mentioned in the passage. It only states that the visitors received tea made in European fashion. Statement B is incorrect because the passage mentions that during the second visit 'the Garpon' insisted the visitors to stay put for a few more days. C is an incorrect statement because it was the agent who was astonished to witness the simplicity in the lifestyle of the author and his friends. (paragraph 4). The last paragraph reveals that mountain Gurla Mandhata was reflected in the waters of Lake Mansarovar. Hence, all four statements are incorrect.

75. A Statement A is the only correct statement. The last lines of the passage reveal that "the biggest market .....Gyanyima." Statement B is incorrect because the return gift included flour and not cheese. Statement C is not mentioned in the passage. Statement D is incorrect as the Garpon administers five districts. Hence, only A is correct.

76. A,B,D There is no mention of Statement C in the passage. The remaining statements are correct.

77. A,B,C,D Paragraph 6 reveals that "Printing with movable letters began in China in the middle of the 12th century" So, A is incorrect. It cannot be inferred that 'numerical knowledge and ability' , were the main concerns. There were other concerns like co-ordination, history, printing, war, technology etc. So, B is incorrect. C is incorrect because paragraph 7 mentions "new mathematical theories". D is not mentioned in the passage. So, all the statements are incorrect.

78. A,B,D A and B are clearly mentioned in the passage. D can be inferred from paragraph 2.

79. A,B,C The combinations are

| | |
|---|---|
| Astronomy | Tabriz |
| Abacus | Clerk |
| Literacy | Almanac |
| History | Propaganda |

Thus the correct answers are A, B, C.

**For questions 80 to 85:**

**The information given in the question is vague and insufficient to solve the question. However, in exams, it is advisable to look through the questions and its options to chalk out some additional information which might be helpful in solving problems. We have attempted the same in the following solution:**

From information 7, the occupant of room number 103 owns 12 cars and he donated to 8 institutions. Then from information 3, the occupant of room number 102 must be having 24 cars. From information 6, the occupant of room number 104 must be having 'z' number of cars and donated to y number of institutions, where $4z < y$. From information 9, the occupant of room number 105 owns 8 cars and if the businessman from Canada donated to 'x' number of institutions, then the occupant of room number 105 must have donated to $(x - 2)$ number of institutions.

From information 10, the residents of Canada, England and Brazil are staying in alternate rooms in that order, starting from left. Though room numbers of residents of Canada, England and Brazil can also be 102, 104 and 106 respectively. But from question 80 we can conclude that room numbers are 101, 103, and 105 respectively as room number 106 is not given to Brazilian businessman.

Although the nationality of the occupant of room number 106 is not known from the information given, it can be found out to be Germany from the options of the 3rd question in the set.

We can compile the following table now and answer all questions.

| **Room No** | 101 | 102 | 103 | 104 | 105 | 106 |
|---|---|---|---|---|---|---|
| **Nationality** | Canada | Uruguay | England | Argentina | Brazil | (Germany) |
| **Number of Cars** | | 24 | 12 | 4 | 8 | 16 |
| **Number of Institutions in which they have donated** | x | | 8 | 18 | x-2 | 24 |

80. D Room number 105

81. C 18

82. D Germany

83. D Germany

84. B Uruguay

85. B 12

**For questions 86 to 89:**

The following table can be made after observing the rules:

| INPUT | lemon | apple | choco | college | girl | dream | room | book | calf | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| **STEP-1** | 3 | 2 | 1 | 4 | 5 | 6 | 9 | 8 | 7 | **Rule-1** |
| **STEP-2** | 1 | 2 | 3 | 6 | 5 | 4 | 7 | 8 | 9 | **Rule-2** |
| **STEP-3** | 9 | 1 | 2 | 8 | 3 | 4 | 7 | 5 | 6 | **Rule-3** |
| **STEP-4** | 2 | 9 | 1 | 8 | 3 | 4 | 6 | 7 | 5 | **Rule-4** |
| **STEP-5** | 1 | 9 | 2 | 4 | 3 | 8 | 5 | 7 | 6 | **Rule-2** |
| **STEP-6** | 6 | 1 | 9 | 7 | 2 | 8 | 5 | 3 | 4 | **Rule-3** |
| **STEP-7** | 9 | 1 | 6 | 7 | 2 | 8 | 4 | 3 | 5 | **Rule-1** |
| **STEP-8** | 6 | 1 | 9 | 8 | 2 | 7 | 5 | 3 | 4 | **Rule-2** |
| **STEP-9** | 4 | 6 | 1 | 3 | 9 | 7 | 5 | 2 | 8 | **Rule-3** |
| **STEP-10** | 1 | 4 | 6 | 3 | 9 | 7 | 8 | 5 | 2 | **Rule-4** |
| **STEP-11** | 6 | 4 | 1 | 7 | 9 | 3 | 2 | 5 | 8 | **Rule-2** |
| **STEP-12** | 8 | 6 | 4 | 5 | 1 | 3 | 2 | 9 | 7 | **Rule-3** |
| **STEP-13** | 4 | 6 | 8 | 5 | 1 | 3 | 7 | 9 | 2 | **Rule-1** |
| **STEP-14** | 8 | 6 | 4 | 3 | 1 | 5 | 2 | 9 | 7 | **Rule-2** |
| **STEP-15** | 7 | 8 | 6 | 9 | 4 | 5 | 2 | 1 | 3 | **Rule-3** |

86. A,B,D From the table, STEP 10 is:

| **STEP-10** | 1 | 4 | 6 | 3 | 9 | 7 | 8 | 5 | 2 |
|---|---|---|---|---|---|---|---|---|---|
| | **lemon** | **college** | **dream** | **choco** | **calf** | **room** | **book** | **girl** | **apple** |

So Step 10 is option (C).
Hence, the right options are (A), (B) and (D).

87. A,C,D From the table, STEP 8 is:

| **STEP-8** | 6 | 1 | 9 | 8 | 2 | 7 | 5 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| | **dream** | **lemon** | **calf** | **book** | **apple** | **room** | **girl** | **choco** | **college** |

So option (B) can be the output. Hence, the right options are (A), (C) and (D).

88. A,B,C,D By observing the table, none of the arrangement in the options will fall between STEP 11 to 15.

89. C, D By checking the options, Rule-1 is applied in options (C) and (D).

90. D By checking the options.
**Option(A):** If Dilip observed the other three actors' helmets were 2 silver-plated and 1 copper-plated, then he could tell his helmet colour i.e., Gold. But he did not give the right answer. So option (A) is the correct statement.
**Option (B):** Bimal knows that Chris and Dilip cannot tell their helmets' colour. If Bimal observed the helmet colour of Aslam, then he could tell his helmet colour i.e., Gold. But he did not give the right answer. So option (B) is the correct statement.
**Option (C):** Chris knows that Dilip cannot tell his helmet colour. If Chris observed the other two actors' helmets which were of 1 silver plated and one copper or both silver plated, then he can identify his helmet colour as Gold. But he did not give right answer.
So option (C) is the correct statement.
**Option (D):** None of the statements is wrong. So option (D) is answer.

91. A,B,C,D By checking the options, the following table can be made.

| | Option -A | Option -B | Option -C | Option -D |
|---|---|---|---|---|
| **No. of Units of Product-1** | 2 | 2 | 2 | 2 |
| **No. of Units of Product-2** | 14 | 14 | 10 | 14 |
| **No. of Units of Product-3** | 2 | 4 | 8 | 4 |
| **No. of Units of Product-4** | 6 | 4 | 4 | 4 |
| **No. of Units of Product-5** | 2 | 2 | 2 | 2 |
| **Cost** | 1960 | 1980 | 1960 | 1980 |
| **No. of points** | 26000 | 26000 | 26000 | 26000 |
| **No. of Penalty points** | 20000 | 10000 | 20000 | 10000 |

Hence, (A), (B), (C) and (D) are the right options.

**For questions 92 to 96:**

92. A,B,D **Statement A: Correct**

| | 2001 | 2002 | 2003 |
|---|---|---|---|
| Wipro | 0.1164 | 0.1189 | 0.1348 |
| Tata Steel | 0.156 | 0.1489 | 0.1495 |

**Statement B: Correct**

| | 2001 | 2003 |
|---|---|---|
| Indo Rama | 0.0111 | 0.0076 |
| Arvind Mills | 0.0316 | 0.0236 |
| Raymond | 0.0372 | 0.0389 |
| Century Enka | 0.00744 | 0.00811 |
| Steel Authority | 0.58412 | 0.5846 |
| Tata Steel | 0.1717 | 0.1909 |
| Rashtriya Ispat | 0.076 | 0.0636 |
| Ispat Industries | 0.0083 | 0.0086 |

**Statement C: Incorrect**

| | 2001 | 2002 | 2003 |
|---|---|---|---|
| R & D expenditure of Tata Steel as a percentage of sales | 0.117 | 0.096 | 0.152 |
| Percentage of R & D expenditure to sales as iron and steel sector as a whole | 0.134 | 0.115 | 0.105 |

**Statement D: Correct** as 5 companies show decline.

| | 2002 | 2003 |
|---|---|---|
| Ranbaxy | 0.4646 | 0.225 |
| Dr.Reddy Lab | 0.727 | -0.004 |
| Cipla Ltd. | 0.3167 | 0.1206 |
| Glaxosmithkline | 0.0472 | 0.0375 |
| Wipro | 0.1115 | 0.1608 |
| Infosys | 0.3698 | 0.3913 |
| Videocon | 0.5332 | –0.275 |
| Bharat Electronics | 0.1257 | 0.291 |

93. A,C **Statement A: Correct**

| Sectors | Required Percentage |
|---|---|
| Textiles | 8.31% |
| Pharmaceuticals | 7.77405% |
| Electronics | 7.7704% |
| Iron and Steel | 9.64% |

**Statement B: Incorrect** (Ispat Industries will be ranked lowest.)

| Companies | Required Percentage |
|---|---|
| Indo Rama | 1.4% |
| Arvind Mills | 6.57216% |
| Raymond Ltd. | 16.23188% |
| Century Enka Ltd. | 3.69979% |
| Ranbaxy | 6.0099% |
| Dr. Reddy's | 8.03519% |
| Cipla | 4.64081% |
| GlaxoSmithkline | 11.19163% |
| Wipro | 15.85% |
| Infosys | 46.31% |
| Videocon | 1.4714% |
| Bharat electronics | 14.62058% |
| Steel Authority | 18.04016% |
| Tata Steel | 11.58125% |
| Rashtriya Ispat Nigam | 7.83028% |
| Ispat Industries limited | 1.18076% |

**Statement C: Correct**

| Companies | Required Percentage |
|---|---|
| Indo Rama | 0 |
| Arvind Mills | 0 |
| Raymond Ltd. | 0 |
| Century Enka Ltd. | 0 |
| Ranbaxy | 5.54753% |
| Dr. Reddy's | 5.95794% |
| Cipla | 3.35% |
| GlaxoSmithkline | 0.33417% |
| Wipro | 0.43017% |
| Infosys | 0.57604% |
| Videocon | 0 |
| Bharat electronics | 4.6225% |
| Steel Authority | 0.30077% |
| Tata Steel | 0.09665% |
| Rashtriya Ispat Nigam | 0.0714286% |
| Ispat Industries limited | 0 |

**Statement D: Incorrect**
Wipro did not make the highest profit as Indo Rama Synthetic Ltd. has made a higher growth than Wipro in the year 2001-2003.

94. B,C,D

**Statement A: Correct**
By observation.
**Statement B:** (Incorrect as the percentage is minimum for Electronics sector.)

| Sectors | Required Percentage |
|---|---|
| Textiles | 8.31% |
| Pharmaceuticals | 7.77405% |
| Electronics | 7.7704% |
| Iron and Steel | 9.64% |

**Statement C: Incorrect**
It is incorrect as for no company, the required percentage is greater than 20%.

**Statement D: Incorrect**
In the year 2002, the ratio of total profits to total sales is –0.02880 and in the year 2001, the given ratio is –0.0260.

95. B,C

**Statement A: Incorrect**
Because in the year 2002-2003, Cipla Ltd. had a 100% decline in the R & D expenditure.

**Statement B: Correct**

| Company | Ratio |
|---|---|
| Ranbaxy | 0.0541 |
| Dr. Reddy's | 0.0696 |
| GlaxoSmithKline | 0.0033501 |
| Infosys | 0.00565 |
| Bharat Electrical | 0.04655 |
| Steel Authority of India Limited | 0.0028 |
| Tata Steel | 0.00124 |

The ratio was highest for Dr. Reddy's.

**Statement C: Correct**
During the year 2001-2003, in terms of sales growth, the best performer in the Pharmaceutical sector was Ranbaxy which had a 79.55% growth and no company had a growth rate greater than any company in the Iron and Steel sector.

**Statement D: Incorrect**
Arvind Mills in the year 2001-2002 and Indo Rama Synthetic Ltd. in the year 2002-2003 have greater percentage decline than Videocon in any of the given years.

96. A,B,C,D

| Statement | 2001 | 2002 | 2003 |
|---|---|---|---|
| A | 0.02779 | 0.01976 | 0.0196 |
| B | 0.156096 | 0.14891 | 0.1495 |
| C | 0.12161 | 0.11612 | 0.1119 |
| D | 0.2247 | 0.0883 | 0.0869 |

The values in the statements A, B, C and D for the given three years when plotted closely resemble in the figure.

**For questions 97 to 100:**

97. A,B

**Statement A: Correct**
From graphs, we can conclude that the vote share of Democrats and Labour party in 1998 is greater than their combined vote share in 2002.

**Statement B: Correct**
Number of seats lost by Democrats in 2002 elections
= (33.53 x 5.01 – 25.48 x 6.20)
= 168 – 158 = 10
Number of seats gained by the Republicans in 2002 = (7.9 x 6.2 – 6 x 5.01) = 49 – 30 = 19.

**Statement C: Incorrect**
Independents gained the most in terms of vote share but in terms of the number of seats, labour gained the most over the 2000 election as they increased their seats from 105 in 2000 election to 165 in 2002 election.

**Statement D: Incorrect.**
In the year 2002 as well as in the year 1996, 70% of Independants and Labour are eligible to form the government as their share in the seats won is greater than 50% in each of the years.

98. C,D

**Statement A: Correct**
The percent increase in seats obtained by the Liberals and Labour together in 2002 over the year 1998 is 11.39% and the percentage increase in the vote share obtained by these parties during the same period is 1.34%.

**Statement B: Correct**
By observation, Labour party showed the greatest percentage increase in the vote share obtained in the year 2000 over the year 1998 across all the parties.

**Statement C: Incorrect**
Because in 2000 elections, three parties namely Independents, Democrats and Liberal faced a decline in the vote share, whereas in 1998 four parties (excluding democrats) faced decline.

**Statement D: Incorrect**
Highest jump in the percentage of seats obtained by any party (Independents in 2000 over the year 1998) = (38.72 – 32.98) = 5.74%

Highest jump in the percentage of vote share obtained by any party (Democrats in 1998 over the year 1996) = (25.69 – 20.29) = 5.4%

99. B,C

**Statement A: Incorrect**
Vote share of Labour and Liberal party taken together in the year 1996
= 28.8 + 1.97 = 30.77
Vote share of Labour and Liberal party taken together in the year 1998
= 25.82 + 1.75 = 27.57
$\therefore$ Loss of vote share = 3.2%

Number of seats won by Labour and Liberal in the year 1996 = 143
Number of seats won by Labour and Liberal in the year 1998 = 158
$\therefore$ Gain is 15 seats.

**Statement B: Correct**
Democrats, Republicans and 35% of the Independents could have formed the government in two elections 1998 and 2000.

**Statement C: Correct**
By observation, we find that no party increased its vote share in every succeeding elections.

**Statement D: Incorrect**
In 1996, vote share of the Republicans and Democrats = (20.29 + 6.12) = 26.41%

In 2000, vote share of the Republicans and Democrats = (23.75 + 5.4) = 29.15%
In 1996, percentage of seats of the Republicans and Democrats = (29.61 + 5.88) = 35.49%
In 2000, percentage of seats of the Republicans and Democrats = (33.53 + 6.00) = 39.53%.
Difference in the vote share = 2.74%
Difference in the percentage of the seats = 4.04%

100. A,C

**Statement A: Incorrect**
Percentage of seats obtained by Democrats and Labour together in years 1996, 1998, 2000 and in 2002 were 55.49%, 59.29%, 54.45% and 52.09% respectively. In 2002, they lost only 2.36% but in 2000 elections, they lost 4.84%. Hence, (A) is incorrect.

**Statement B: Correct**
Vote share of the Liberals and Republicans together in the year 1998 = 6.91%.
Vote share of the Liberals and Republicans together in the year 2000 = 6.88%.
Number of seats obtained by the Liberals and Republicans together in the year 1998 = 44.
Number of seats obtained by the Liberals and Republicans together in the year 2000 = 34.

**Statement C: Incorrect**
Difference in the number of seats won by Independents in 2000 and 1998 = +6
Difference in the number of seats won by Labour in 2000 and 1998 = –43
Difference in the number of seats won by Republican in 2000 and 1998 = –4
Difference in the number of seats won by Liberals in 2000 and 1998 = –6
Difference in the number of seats won by Democrats in 2000 and 1998 = –22

**Statement D: Correct**
Number of seats won by Labour party in the year 1996 = 132
Number of seats won by Labour party in the year 1998 = 148
Number of seats won by Labour party in the year 2000 = 105
Number of seats won by Labour party in the year 2002 = 165

**For questions 101 and 102:**

101. A, D

**Statement A: Correct**

| | Gap | Rank |
|---|---|---|
| North America | -7.3 | 6 |
| Latin America | 9.9 | 3 |
| Central and Eastern Europe | 11.6 | 2 |
| Western Europe | -1.4 | 5 |
| Africa | 14.4 | 1 |
| Asia | 2.6 | 4 |

Rank of Central and Eastern Europe is second.

**Statement B: Incorrect** (The highest percentage change in exports was highest in the year 2000.)

| Year | Average Annual Percentage Change |
|---|---|
| 1997 | 5.03333333 |
| 1998 | - 3.85 |
| 1999 | 4.716 |
| 2000 | 18 |
| 2001 | -3.61666 |
| 2002 | 3.5666 |
| 2003 | 16.5 |

**Statement C: Incorrect (Rank of Asia is third)**

| | Gap | Rank |
|---|---|---|
| North America | 0.2 | 5 |
| Latin America | -1.5 | 4 |
| Central and Eastern Europe | -5.9 | 2 |
| Western Europe | 2.5 | 6 |
| Africa | -10.6 | 1 |
| Asia | -1.7 | 3 |

**Statement D: Correct**
The lowest change (whether increase or decrease) is observed in year 1998 at –0.45.

| Year | Average Annual Percentage Change |
|---|---|
| 1997 | 6.98333 |
| 1998 | -0.45 |
| 1999 | 0.51666 |
| 2000 | 13.1 |
| 2001 | -3.4 |
| 2002 | -2.9333 |
| 2003 | 16.1833 |

102. C,D

**Statement A: Incorrect**
North American regions average annual percentage change in exports is 2.25 is less than the average annual percentage change in exports of Latin America which is 6.3.

**Statement B: Incorrect**

| Regions | Average Annual Percentage Change |
|---|---|
| North America | 10.9 |
| Latin America | 9.375 |
| Central and Eastern Europe | 1.7 |
| Western Europe | 3.45 |
| Africa | 1 |
| Asia | 4.15 |

Africa region experienced the lowest average annual percentage change in imports as compared to other regions.

**Statement C: Correct**
In the year 1999-2000 Central and Eastern European region experienced a jump of 26.1 which is the highest across all companies in any of the given years.

**Statement D: Correct**
In the year, 2000-2001 Asian region suffered the maximum slump which is 30.1 and it is the highest across all companies in any of the given years.

**For questions 103 to 106:**

103. A,C

**A. Correct**

Growth rate of female population during 2005-2010 = (3360 – 3189) / 3189 × 100 = 5.4%

Growth rate of male population during 2010-2015 = (3569 – 3403) / 3403 × 100 = 4.88%

**B. Incorrect**

Growth rate of population of high income countries during 2005-2010 = 17 / 980 × 100 = 1.73%.

Growth rate of male population in East Asia and Pacific during 2010-2015 = 36 / 1001 × 100 = 3.59%.

**C. Correct**

Growth rate of male population in low income countries during 2005-2010 = (1438 – 1330) /1330 × 100 = 8.12%

Growth rate of female population in low income countries during 2005-2010 = (1400 – 1294) /1294 × 100 = 8.19%

**D. Incorrect**

Growth rate of world population during 2005-2010 = (6764 – 6418) / 6418 × 100 = 5.39%

Growth rate of world population during 2010-2015 = (7096 – 6764) / 6764 × 100 = 4.90%

104. A,B,D

**A. Incorrect**

Share of high income countries in total world population in 2005 = 980 / 6418 × 100 = 15.27%

Share of high income countries in total female population in 2005 = 497 / 3189 × 100 = 15.58%

**B. Incorrect**

Share of Europe and Central Asia in total male population in 2005 = 229 / 3230 × 100 = 7.09%

Share of Europe and Central Asia in total male population in 2010 = 229 / 3403 × 100 = 6.73%

Share of Europe and Central Asia in total male population in 2015 = 230 / 3569 × 100 = 6.44%

**C. Correct**

Share of middle income countries in total female population in 2015 = 1512 /3528 × 100 = 42.86%

Share of low income countries in total world population in 2010 = 2838 /6764 × 100 = 41.96%

**D. Incorrect**

Share of South Asia in total female population in 2015 = 821/3528 × 100 = 23.27%

Share of South Asia in total world population in 2010 = 1581/6764 × 100 = 23.37%

105. A

**A. Correct**

Share of high income countries in total female population in 2005 = 497/3189 × 100 = 15.58%

Share of high income countries in total female population in 2010 = 505/3360 × 100 = 15.03%

Share of high income countries in total female population in 2015 = 511/3528 × 100 = 14.48%

Share of high income countries in total male population in 2005 = 483/3230 × 100 = 14.95%

Share of high income countries in total male population in 2010 = 491/3403 × 100 = 14.43%

Share of high income countries in total male population in 2015 = 497/3569 × 100 = 13.92%

**B. Incorrect**

Growth rate of population of high income countries during 2010-2015 = (1008 – 997) / 997 × 100 = 1.10%

Growth rate of world population during 2010-2015 = (7096 – 6764) / 6764 × 100 = 4.91%

**C. Incorrect**

Share of South Asia's females in total world population in 2005 = 715 / 6418 × 100 = 11.14%

Share of South Asia's females in total world population in 2015 = 821 / 7096 × 100 = 11.56%

Share of South Asia's females in total female population in 2005 = 715 / 3189 × 100 = 22.42%

Share of South Asia's females in total female population in 2015 = 821 / 3528 × 100 = 23.27%

Growth rate of Share of South Asia's female in total world population during 2005-2015 = (11.56–11.14)/ 11.14 × 100 = 3.77%

Growth rate of Share of South Asia's female in total female population during 2005-2015 = (23.27–22.42)/ 22.42 × 100 = 3.79%

**D. Incorrect**

Growth rate in population of middle income countries during 2010-2015 = (3040 – 2928) / 2928 × 100 = 3.82%

Growth rate in population of middle income countries during 2005-2010 = (2928 – 2814) /2814 × 100 = 4.05%

Growth rate in population of high income countries during 2005-2010 = (997 – 980) / 980 × 100 = 1.73%

Growth rate in population of high income countries during 2010-2015 = (1008 – 997)/997 × 100 = 1.10%

106. A,C

**A Incorrect**

Share of South Asia in total world population in 2005 = 1470/6418 × 100 = 22.90%

Share of South Asia in total world population in 2015 = 1684/7096 × 100 = 23.73%

Share of low income countries in total world population in 2005 = 2624/6418 × 100 = 40.88%

Share of low income countries in total world population in 2015 = 3048/7096 × 100 = 42.95%

(23.73–22.90) < (42.95 – 40.88)

**B. Correct**

Share of high income countries in total female population in 2010 = 505/3360 × 100 = 15.02%

Share of high income countries in total female population in 2015 = 511/3528 × 100 = 14.48%

Share of high income countries in total world population in 2010 = 997/6764 × 100 = 14.73%

Share of high income countries in total world population in 2015 = 1008/7096 × 100 = 14.20%

**C. Incorrect**

Growth rate of female population in East Asia and Pacific region during 2010–2015 = (1001–963)/963 × 100 = 3.94%

Average annual growth rate = 3.94/5 = 0.79%

Growth rate of female population in South Asia region during 2010-2015 = (821–769)/769 × 100 = 6.76%

Average annual Growth rate = 1.35%

**D. Correct**

Growth rate of female population in Europe and Central Asia during 2005-2015 = 1/248 × 100 = 0.40%

Growth rate of male population in Europe and Central Asia during 2005–2015 = 1/229 × 100 = 0.43%.