SSC (Tier-II) - 2013 (Mock Test Paper - 1) [SOLUTION]

1. (A) ∵ Ratio of diameters of the cylinders
= 3 : 2
⇒ Ratio of radii of the cylinders
= 3 : 2
So, Let the radii of the two cylinders are 3r and 2r
and, Let the heights of the two cylinders are h_1 and h_2.
Now,
Volume of first cylinder
= volume of second cylinder
i.e. $\pi(3r)^2 h_1 = \pi(2r)^2 h_2$

$$\Rightarrow \frac{h_1}{h_2} = \frac{\pi \times 4r^2}{\pi \times 9r^2} = \frac{4}{9} \Rightarrow 4:9$$

2. (B) Difference in votes of candidates
= (100% – 46%) – 46% of the total votes polled
= 8% of the total votes polled
= 3680 votes
So,
Total votes polled (i.e. 100%)

$$= \frac{3680}{8} \times 100 = 46000$$

3. (C) Let C.P. $= x$
⇒ M.P. $= 1.4x$
⇒ S.P. $= 0.75 \times 1.4x = 1.05x$

$$\Rightarrow \%\ \text{Profit} = \frac{(1.05x - x)}{x} \times 100\%$$

$= 5\%$

4. (D) To keep the expenditure (Rs. 608) constant,
If % discount in initial cost of sugar = 5%
⇒ % increases in initial consumption

$$= \left(\frac{5}{100-5}\right) \times 100\%$$

$$= \frac{100}{19}\% = 2 \text{ kg}$$

⇒ Initial consumption (i.e. 100%)
= (2 × 19) kg
= 38 kg
So, Inititial S.P. of sugar

$$= \frac{\text{Rs.}608}{38\,\text{kg}} = \text{Rs. } 16/\text{kg}$$

5. (B) Ratio of the two numbers = 3 : 4
[L.C.M. = 12]
L.C.M. of the two numbers = 48

$$\left\{\frac{48}{12} = 4\right\}$$

So, the two numbers are (3 × 4) & (4 × 4)
(∵ 3 & 4 are co-prime numbers)
i.e. 12 & 16
and so, sum of the two numbers
= 12 + 16
= 28

6. (C) 2A = 3B = 4C = k (let)
So, A : B : C

$$= \frac{k}{2} : \frac{k}{3} : \frac{k}{4}$$

$$= \frac{k}{2} \times 12 : \frac{k}{3} \times 12 : \frac{k}{4} \times 12$$

$$= 6k : 4k : 3k$$

$$= 6 : 4 : 3$$

7. (A) $4^{3.5} : 2^5$

$$= (2^2)^{3.5} : 2^5 = 2^7 : 2^5$$

$$= 2^2 : 1$$

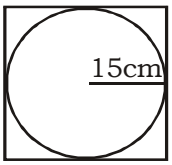
$$= 4 : 1$$

8. (D) Required average price

$$= \frac{(12 \times 30) + (8 \times 40)}{(12 + 8)}$$

= Rs.34/ kg

9. (A)



∵ Perimeter of square = 120 cm
⇒ Each side of the square

$$= \frac{120}{4}\text{ cm} = 30\text{ cm}$$

⇒ Radius of the inscribed greatest possible circle $= \frac{30}{2}\text{ cm} = 15\text{ cm}$

⇒ Area of the circle $= \pi \times (15)^2\,\text{cm}^2$

$$= \frac{22}{7} \times (15)^2\,\text{cm}^2$$

10. (D) Now,
Required ratio =
T.S.A. of one small cubes : T.S.A. of the big cube
= 6 × $(1)^2$: 6 × $(5)^2$
= 1 : 25

11. (D) From both the conditions, we have relation
2.5 km/hr × (t + 6) min
= 3.5 km/hr × (t – 6) min
(where t = actual time in minute)

$\Rightarrow \frac{t+6}{t-6}=\frac{3.5}{2.5} \Rightarrow$ t = 36 minutes

So,
Required distance
= 2.5 km/hr × (36 + 6) minutes
[or, = 3.5 km/hr × (36 – 6) minutes]

$= 1\frac{3}{4}$ km

12. (C) As distance is the same,
So, the required distance (from one side)

$= \frac{\text{Average Speed} \times \text{total time}}{2}$

$= \frac{\left(\frac{2\times 25\times 4}{25+4}\right)\text{km/hr}\times\left(\frac{348}{60}\right)\text{hr}}{2}$

$= \frac{40}{2}$ km = 20 km

13. (D) Volume of cone = $\frac{1}{3}\pi r^2 h$

$\left[\begin{array}{l} r \xrightarrow{+20\%} 1.2r \\ h \xrightarrow{+20\%} 1.2h \end{array}\right]$

After increment,

New vol. $= \frac{1}{3}\pi(1.2r)^2(1.2h)$

$= \frac{1}{3}\pi r^2 h \times 1.728$

So, Required % increase

$= \frac{1.728-1}{1}\times 100\%$
= 0.728 × 100%
= 72.8%

14. (C) % (Fail in Hindi U Fail in English)
= % (Fail in Hindi + % (Fail in English – % (Fail in both Hindi & English)
= 52% + 42% – 17%
= 77%

So,
% (Passed in both the subjects)
= 100% – 77%
= 23%

15. (A) $\frac{6709}{9}$: Remainder = 5

$\Rightarrow$ The required least number = 5

16. (C) $\frac{10.3\times 10.3\times 10.3+1}{10.3\times 10.3-10.3+1}$

$= \frac{(10.3)^3+1^3}{(10.3)^2-(10.3\times 1)+1^2} \quad \left[\therefore \frac{a^3+b^3}{a^2-ab+b^2}=a+b\right]$

= (10.3 +1)
= 11.3

17. (D) Required no. = H.C.F. of (122 – 2) & (243 – 3)
= H.C.F. of 120 + 240
= 120

18. (B) Money left = 100% – (80% + 6% of 20%)
= 100% – 81.2%
= 18.8% of total pocket money

And,
ATQ.
18.8% of total pocket money
= 47 paise

= Rs. $\frac{47}{100}$

So, Total pocket money

(i.e. 100%) = Rs. $\frac{47}{100}\times\frac{100}{18.8}$
= Rs. 2.5

19. (C) Let, r = radius of the circular field
Land portion of the circular field
= Total area of the circular field – Area of the rectangular tank

$\Rightarrow 40000\text{m}^2 = \pi r^2 - (180\times 120)\text{m}^2$

$\Rightarrow \pi r^2 = 61600\ \text{m}^2$

$\Rightarrow r = \sqrt{\frac{61600\times 7}{22}}$ m

$= \sqrt{19600}$ m
= 140 m

20. (B) Total C.I. in 2 years @ 12.5% p.a.
= (12.5%) + (12.5% + 12.5% of 12.5%) of sum

$= 25\% + \frac{12.5}{8}\%$ of sum

$= \frac{212.5}{8}\%$ of sum
= Rs. 510

So,
Total S.I. in 2 years @ 12.5% p.a.
= (2 × 12.5%) of the sum
= 25% of the sum

$= \frac{510\times 8}{212.5}\times 25$
= 480

21. (C)

Let x = initial C.P. of the article.

	C.P.		S.P.
1st condition	x	20% loss →	$0.8x$
2nd condition	x	5% profit →	$0.8x + 100 = 1.05x$

$\Rightarrow 1.05x = 0.8x + 100$

$\Rightarrow \quad x = \frac{100}{0.25} = 400$

22. (D) Total S.I. = (3 ×12)% of the principal amount
= 36% of the principal amount
= Rs. 5400

So, The principle amount (i.e. 100%)

$= \text{Rs. } \frac{5400}{36} \times 100$

= Rs. 15000

23. (C) S.I. in 4 years – S.I. in 2.5 years = S.I. in 1.5 years

$\Rightarrow$ S.I. in 1.5 yrs = Rs. (1067.20 – 1020)
= Rs. 55.2

$\Rightarrow$ S.I. per year = $\text{Rs. } \frac{55.2}{1.5}$ = Rs. 36.8

So,
Principle money = Rs. 1067.2 – Rs. (36.8 × 4)
= Rs. 1067.2 – Rs. 147.2
= Rs. 920

So,
Rate of interest per annum

$= \frac{36.8}{920} \times 100\%$

= 4%

24. (C) $\sqrt{32} - \sqrt{128} + \sqrt{50}$

$= \sqrt{2\times16} - \sqrt{2\times64} + \sqrt{2\times25}$

$= 4\sqrt{2} - 8\sqrt{2} + 5\sqrt{2}$

$= \sqrt{2} = 1.414$

25. (C) Required distance

$= \frac{\text{Average Speed} \times \text{Total Time}}{2}$

$= \frac{\frac{2\times(5+1)(5-1)}{(5+1)+(5-1)} \times 1}{2} \text{ km}$

$= \frac{4.8}{2} \text{ km} = 2.4 \text{ km}$

26. (A) Total % discount on M.P.

$= \left(\frac{1}{2}\times0 + \frac{1}{4}\times20 + \frac{1}{4}\times40\right)\%$

= (0 + 5 + 10)%
= 15%

Now,
If C.P. = x
then, M.P. = 20% above C.P.
= $1.2x$

$\Rightarrow$ M.P. after discount = 8.5% of $1.2x$
= $0.85 \times 1.2x$
= $1.02x$

So,

Total gain % = $\frac{1.02x - x}{x} \times 100\%$

$\Rightarrow$ = 0.02 × 100%
= 2%

27. (?) Money spent on article = 25% of total amount

Money spent on cloths
= 10% of remaining (75%) amount
= 7.5% of total amount

$\Rightarrow$ (25% + 7.5%) of total amount + Rs. 531.25 = Total amount – Rs. 8000

$\Rightarrow$ Total (100%) amount – 32.5% of total amount = Rs. 8000 + 531.25
= Rs. 8531.25

$\Rightarrow$ 67.5% of the total amount = Rs. 8531.25

So,
Money spent on clothes
i.e. 7.5% of the total amount

$= \frac{8531.25}{67.5} \times 7.5$

= Rs. 948

28. (D) Required time = $\frac{60\times40}{60-40}$ minutes

$= \frac{2400}{20}$ minutes

= 120 minutes

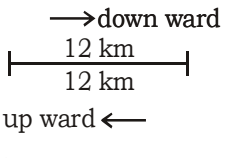
29. (A) Average Speed = $\frac{2\times40\times60}{40+60}$ km/hr

$= \frac{4800}{100}$ km/hr

= 48 km/hr

30. (B)

Total distance covered
= 12 km + 12 km
= 24 km



Total time taken = 3 hours

$\Rightarrow$ Average Speed = $\frac{24}{3}$ = 8 km/hr

Now,

$\Rightarrow \frac{2\times S_{down}\times S_{up}}{S_{down}+S_{up}}$

$\Rightarrow \frac{2\times(S_B+3)(S_B-3)}{(S_B+3)+(S_B-3)}$

$\Rightarrow S_B = 9$ km/hr

(we can find it out from options also)

31. (B) B $\xrightarrow{+60\%}$ A $\Rightarrow A = 1.6B$ ...(i)

C $\xrightarrow{-20\%}$ B $\Rightarrow B = 0.8C$ ...(ii)

From (i) & (ii),

$A = 1.6\ B = 1.6 \times 0.8C$

$\Rightarrow A = 1.28C$

$\Rightarrow$ A : C

1.28 : 1

128 : 100

32 : 25

32. (B) ATQ,

$1352 = x \times (1.04)^2$ (where x $\rightarrow$ sum)

$\Rightarrow x = \frac{1352}{(1.04)^2}$

$= \frac{1352}{1.0816}$

= Rs. 1250

33. (A) $\frac{x^2+y^2+xy}{x^3-y^3} = \frac{1}{x-y}$

$[\because (x^3-y^3) = (x-y)(x^2+y^2+xy)]$

$= \frac{1}{19-18} = \frac{1}{1} = 1$

34. (C) Sum of first 25 natural numbers

i.e. 1 + 2 + 3 + 4 + ... + 25

$= \frac{25\times26}{2}$

$= 25 \times 13$

$\Rightarrow$ Required factor = 13

35. (C) $\left(\sqrt{2}+\frac{1}{\sqrt{2}}\right)^2 = (\sqrt{2})^2+\left(\frac{1}{\sqrt{2}}\right)^2+2\times\sqrt{2}\times\frac{1}{\sqrt{2}}$

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

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

36. (B) i.e. 22 + 24 + 26 + ... + 50

= no. of terms × average

$= \left(\frac{50-22}{2}+1\right)\times\left(\frac{22+50}{2}\right)$

$= 15 \times 36 = 540$

37. (D) $5.\overline{76}-2.\overline{3}$

$= 5\frac{76}{99}-2\frac{3}{9} = \frac{571}{99}-\frac{21}{9}$

$= \frac{571-231}{99} = \frac{340}{99} = 3.\overline{43}$

38. (A) (0.5 × 5 + 0.25 × 0.5 + 0.5 × 4 + 0.5 × 0.75)

= 2.5 + 0.125 + 2 + 0.375

= 5

39. (D) A : B : C

1 : 2 : 3 [Average = $\frac{1+2+3}{3}$ =2]

$\because$ Average = 600 $\Rightarrow$ 2 $\cong$ 600

So,

A	: B	: C
1	: 2	: 3
300	600	900

Now,

A $\xrightarrow{+10\%}$ 300 + 30 = 330 (new value of A)

B $\xrightarrow{-20\%}$ 600 – 120 = 480 (new value of B)

Average $\xrightarrow{+5\%}$ 600 + 30 = 630 (new average)

Now,

$\frac{330+480+\text{new value of C}}{3} = 630$

$\Rightarrow$ new value of C $(630\times3)-(330+480) = 1080$

$\Rightarrow$ Increase in C = 1080 – 900 = 180

40. (C) Weight of new person = (80 – 6 × 3) kg

= (80 – 18) kg

= 62 kg

41. (A) D – A = 3(5000 – 4000)

or, D – A = 3 × 1000 = Rs. 3000

$\Rightarrow$ D – 2750 = Rs. 3000

$\Rightarrow$ D = Rs. (3000 + 2750)

= Rs. 5750

42. (B) Required % decrease = $\frac{10}{100+10}\times100\%$

$= \frac{10}{110}\times100\%$

$= 9\frac{1}{11}\%$

43. (D)

List price x $\xrightarrow[(-20\%)]{+20\%\text{ discount}}$ S.P. $0.8x$ = Rs. 24

S.P. after 20% discount i.e. $0.8x = 24$

So,

S.P. after 30% discount i.e. $0.7x = \frac{24}{0.8}\times0.7$

= Rs. 21

44. (B) Required single discount

$= (1 - 0.7 \times 0.8 \times 0.9) \times 100\%$

$= (1 - 0.504) \times 100\%$

$= 0.496 \times 100\%$

$= 49.60\%$

45. (A) Let x = original number of workers

So, ATQ, $22x = 24(x-3)$
or, $22x = 24x - 72$
$\Rightarrow$ $x = 36$

46. (B) The number of days taken by A, B and C to complete the work while working together

$$= \left(\frac{\text{L.C.M. of } 18, 24 \& 36}{\frac{\text{L.C.M.}}{18}+\frac{\text{L.C.M.}}{24}+\frac{\text{L.C.M.}}{36}}\times 2\right) \text{ days}$$

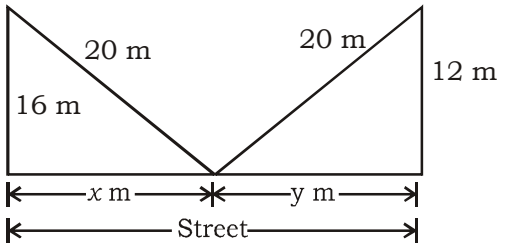
$$= \left(\frac{72}{\frac{72}{18}+\frac{72}{24}+\frac{72}{36}}\times 2\right) \text{days}$$

$$= \left\{\frac{72}{(4+3+2)}\times 2\right\} \text{days}$$

$$= \frac{72\times 2}{9} \text{ days}$$

$= 16$ days

47. (B)



In the given figure,
width of the street
$= (x + y)$

$$= \sqrt{20^2-16^2}+\sqrt{20^2-12^2}$$

$$= \sqrt{144}+\sqrt{256}$$

$= 12 + 16$
$= 28$ m

48. (B) Cost price of each marble @ 20 per rupee

$$= \text{Rs. } \frac{1}{20}$$

Cost price of each marble @ 30 per rupee

$$= \text{Rs. } \frac{1}{30}$$

$\Rightarrow$ Average cost price of each marble

$$= \text{Rs. } \frac{\frac{1}{20}+\frac{1}{30}}{2}$$

[$\because$ no. of marbles are equal]

$$= \text{Rs. } \frac{1}{24}$$

ATQ,
Selling price of each marble @ 25 per rupee

$$= \text{Rs. } \frac{1}{25}$$

$$\left[\because \frac{1}{25} < \frac{1}{24} \text{ in S.P.} < \text{C.P.} \Rightarrow \text{loss}\right]$$

So, % loss $= \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100$

$$= \frac{\frac{1}{25}-\frac{1}{24}}{\frac{1}{24}}\times 100\%$$

$$= \frac{(24-25)\times 24}{600}\times 100\%$$

$= -4\%$
$\Rightarrow$ 4% loss

49. (B) Loss of 20% on one and gain of 20% on other.
$\Rightarrow$ there will be a loss

and loss % $= \frac{(20)^2}{100}\% = 4\%$ loss (on total C.P.)

$\Rightarrow$ C.P. (100%) $\xrightarrow{-4\%}$ S.P. (96%)
$= 12{,}000 \times 2 = 24000$

S.P. (i.e. 96%) = 24000
So, loss in transaction (i.e. 4%)

$$= \frac{24000}{96}\times 4 = 1000$$

$\Rightarrow$ loss of Rs. 1000

50. (D)
$116 - 92 = 24$ Let x = profit when S.P. = 92
i.e. $3x - x = 24$ So, $3x$ = profit when S.P. = 116
$\Rightarrow$ $x = 12$
$\Rightarrow$ When S.P. = 92, Profit = Rs. 12
So, C.P. = 92 – 12 = Rs. 80

51. (C) C.P. of each article = Rs. $\frac{5110}{73}$ = Rs. 70

S.P. of each article = Rs. $\frac{5607}{89}$ = Rs. 63

Here,
S.P. < C.P. $\Rightarrow$ loss

and % loss $= \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100\%$

$$= \frac{63-70}{70}\times 100\%$$

$= -10\%$
$=$ 10% loss

52. (D) C.P. (100%) $\xrightarrow{-5\%}$ S.P. (95%) = Rs. 665
S.P. at 5% loss i.e. 95% of C.P. = Rs. 665
So,
SP at 12% profit i.e. 112% of C.P.

$= \text{Rs. } \frac{665}{95} \times 112$

$= \text{Rs. } 784$

53.(C) Less by $\frac{(10)^2}{100}\%$ = i.e. less by 1%

54. (B) $\frac{2+\sqrt{3}}{2-\sqrt{3}} = \frac{2+\sqrt{3}}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}} = \frac{(2+\sqrt{3})^2}{2^2-(\sqrt{3})^2}$

$= \frac{4+3+4\sqrt{3}}{4-3} = \frac{7+4\times1.732}{1}$

$= 7 + 6.928 = 13.928$

55. (C) $\sqrt{2+\sqrt{7-2\sqrt{10}}}$

$= \sqrt{2+\sqrt{(\sqrt{5})^2+(\sqrt{2})^2-2(\sqrt{5})(\sqrt{2})}}$

$= \sqrt{2+\sqrt{(\sqrt{5}-\sqrt{2})^2}}$

$= \sqrt{2}+\sqrt{5}-\sqrt{2} = \sqrt{5}$

56. (B) Required number + 0.01 = 1.1

$\Rightarrow$ Required number = 1.1 – 0.01 = 1.09

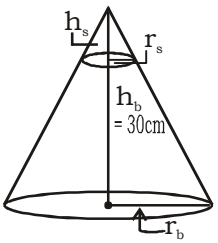
57. (B) $n+\frac{2}{3}n+\frac{1}{2}n+\frac{1}{7}n = 97$

or, $n\left(\frac{42+28+21+6}{42}\right) = 97$

$\Rightarrow n = \frac{97\times42}{97}$

$\Rightarrow n = 42$

58. (D)



here, $\left[\because \frac{r_b}{r_s} = \frac{h_b}{h_s}\right]$

Volume of small cone = $\frac{\text{vol. of big cone}}{27}$

i.e. $\frac{1}{3}\pi(r_s)^2(h_s) = \frac{\frac{1}{3}\pi(r_b)^2(h_b)}{27}$

or, $(r_s)^2(h_s) = \frac{(r_b)^2(h_b)}{27}$

$\Rightarrow \frac{(r_b)^2(h_b)}{(r_s)^2(h_s)} = 27$

or, $\frac{r_b \times r_b \times h_b}{r_s \times r_s \times h_s} = \frac{3\times3\times3}{1\times1\times1}$

or, $\frac{h_b}{h_s} = \frac{3}{1}$ $\Rightarrow h_s = \frac{h_b}{3} = \frac{30}{3} = 10$ cm

$\Rightarrow$ The required height above the base

= (30 – 10) cm

= 20 cm

59. (A) (8.5% + 6.25%) of C.P. = Rs. 590

i.e. 14.75% of C.P. = Rs. 590

So, C.P. (i.e. 100%) = Rs. $\frac{590}{14.75}\times100$

= Rs. 4000

60. (A) Let C.P. = x

So, M.P. = 25% of x

$= \frac{125}{100}x$

and S.P. = Price after discount of 12.5% on M.P.

$= \frac{87.5}{100}\times\frac{125}{100}x$

$= \frac{7}{8}\times\frac{5}{4}x = \frac{35}{32}x$

So, % profit = $\frac{\frac{35}{32}x - x}{x}\times100\%$

$= \frac{75}{8}\% = 9\frac{3}{8}\%$

61. (C)

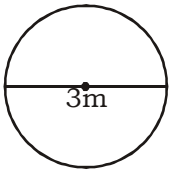
C.P. 100 $\xrightarrow{+20\%,\ +20}$ S.P. 120 $\xrightarrow{-4\%\text{ discount}}$ M.P.

= 96% of MP

96% of M.P. = 120

So, M.P. (i.e. 100%) = $\frac{120}{96}\times100 = 125$

62. (B)



Circumference of wheel = πd

$= \left(\frac{22}{7}\times3\right)$m

$\Rightarrow$ Distance covered in 1 minute

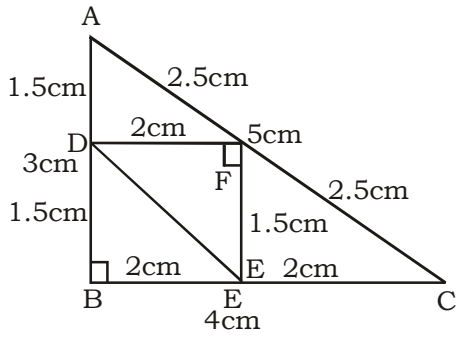
$= 28\times\frac{22}{7}\times3$m

= 264 m

So, Time taken by wheel to cover a distance of 5.280 km (or, 5280 m)

$= \frac{5280}{264}$ minute = 20 minutes

63. (C)



Sides are 3, 4 and 5 cm

$\Rightarrow$ Triangle ABC is a right angled triangle where $\angle B = 90^\circ$.

Now, D, E and F are mid points of the sides AB, BC and CA respectively.

Here,

FE || AB and DF ||BC

Also, In $\Delta DEF, \angle F = 90^\circ$

$\Rightarrow$ ΔDEF is a right angled triangle.

So, also, from mid point theorem,

$$FE = \frac{1}{2}AB = 1.5 \text{ cm}$$

& $$DF = \frac{1}{2}BC = 2 \text{ cm}$$

So, Area of $\Delta DEF = \frac{1}{2}\times 2 \times 1.5 = \frac{3}{2}\text{cm}^2$

64. (C)

	l	*b*	*h*	**Volume**
Externally	3.3 m	2.6 m	1.1 m	
	330 m	260 cm	110 cm	9438000 cm^3
Internally	320 m	250 cm		8000000 cm^3

$\Rightarrow$ Internal height $= \dfrac{8000000 \text{ cm}^3}{(320\times 250)\text{ cm}^2}$

$= \dfrac{8000000 \text{ cm}^2}{80000 \text{ cm}^2}$

= 100 cm

$\Rightarrow$ thickeness of the bottom

= (110 – 100) cm

= 10 cm

= 1 dm

65. (A) $\sqrt{8} + 2\sqrt{32} - 3\sqrt{128} + 4\sqrt{50}$

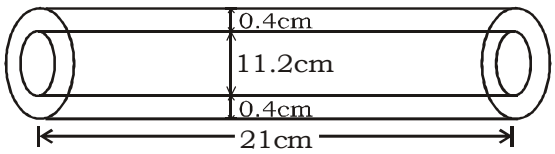
$= \sqrt{2\times 4} + 2\sqrt{2\times 16} - 3\sqrt{2\times 64} + 4\sqrt{2\times 25}$

$= 2\sqrt{2} + 8\sqrt{2} - 24\sqrt{2} + 20\sqrt{2}$

$= 6\sqrt{2}$ = 6 × 1.414

= 8.484

66. (C)



Volume of metal

= External vol. of cylindrical tube – Internal vol. of cylindrical tube

=

$$\pi(r_{ex})^2 h - \pi(r_{in})^2 h = \pi h\{(r_{ex})^2 - (r_{in})^2\}$$

$$= \pi h\left\{\left(\frac{12}{2}\right)^2 - \left(\frac{11.2}{2}\right)^2\right\}$$

$$= \frac{22}{7}\times 21\times(36 - 31.36)$$

= 22 × 3 × 4.64

= 306.24 cm^3.

67. (B) $1 \div [1 + 1 \div \{1 + 1 \div (1 + 1 \div 2)\}]$

$$= 1\div\left[1+1\div\left\{1+1\div\left(1+\frac{1}{2}\right)\right\}\right]$$

$$= 1\div\left[1+1\div\left\{1+1\times\left(\frac{2}{3}\right)\right\}\right]$$

$$= 1\div\left[1+1\div\left\{\frac{5}{3}\right\}\right]$$

$$= 1\div\left[1+\frac{3}{5}\right]$$

$$= 1\div\frac{8}{5}$$

$$= 1\times\frac{5}{8} = \frac{5}{8}$$

68. (C)

$x - y$	= 3
$x^2 + y^2$	= 369
$(y + 3)^2 + y^2$	= 369
$y^2 + 6y + 9 + y^2$	= 369
$2y^2 + 6y - 360$	= 0
$y^2 + 3y - 180$	= 0
$y^2 + 15y - 12y - 180$	= 0
$(y + 15)(y - 12)$	= 0

$y = 12, -15$

$x = 15$

Sum of numbers = 12 + 15 = 27

69. (B) L.C.M. for 4, 6, 10 & 15 = 60

N will be in form of N = 60n + 2

Now,

least six digit number of form 60 n (i.e. divisible by 60)

= 100020

So,

⇒ least six digit number of form N
= 100020 + 2
= 100022

⇒ Sum of digits of N = 1 + 0 + 0 + 0 + 2 + 2
= 5

70. (D) Given fractions are proper.
Diff. beetween N & D of every fraction = 1
∴ The fraction with greatest N or D is largest.

Ans : $\frac{7}{8}$

71. (?) $2\frac{3}{4} \div 1\frac{5}{6} \div \frac{7}{8} \times \left(\frac{1}{3}+\frac{1}{4}\right) + \frac{5}{7} \div \frac{3}{4}$ of $\frac{3}{4}$

$= \frac{\frac{11}{4}}{\frac{11}{6}} \div \frac{7}{8} \times \frac{7}{12} + \frac{5}{7} \div \frac{3}{4} \times \frac{3}{4}$

$= \frac{6}{4} \times \frac{8}{7} \times \frac{7}{12} + \frac{5}{7} \times \frac{16}{9}$

$= 1 + \frac{80}{63} = \frac{143}{63}$

72. (A) $x = \frac{\sqrt{3}+1}{\sqrt{3}-1} = \frac{(\sqrt{3}+1)^2}{2} = \frac{3+1+2\sqrt{3}}{2} = 2+\sqrt{3}$

$y = \frac{(\sqrt{3}-1)^2}{3-1} = \frac{3+1-2\sqrt{3}}{2} = 2-\sqrt{3}$

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

$= 2[2^2 + (\sqrt{3})^2] = 2[4+3] = 14$

73. (C) H.C.F. × L.C.M. = 7 × 140
= 980
= 1st no. × 2nd no.
(between 20 & 45)
= 28 × 35

So,

Sum of the numbers = 28 + 35
= 63

74. (A) Present age of son = x yrs.
Present age of father = $3x + 3$ yrs
After 3 years, son = $x + 3$ yrs
Father = $3x + 3 + 3$
= $3x + 6$ yrs

ATQ,

$3x + 6 = 2(x + 3) + 10$
$3x + 6 = 2x + 6 + 10$
$3x - 2x = 10$
$x = 10$

Father's present age = 3 × 10 + 3
= 33 yrs

75. (C) A B C ⟵ Let the three co-prime numbers
ATQ, A × B = 551 and B × C = 1073
And ∵ 19 × 29 = 551 and 29 × 37 = 1073
⇒ A = 19, B = 29 and C = 37
⇒ Sum of three nos. = 19 + 29 + 37 = 85

76. (A) No. of boys = x

Constribution by each = Rs. $\frac{x}{4}$

Total contribution = $x \times \frac{x}{4}$

$x \times \frac{x}{4} = 400$
$x^2 = 1600$
$x = 40$

77. (C) $2\pi r_1 - 2\pi r_2 = 132$

$(r_1 - r_2) = \frac{132}{2\pi}$

$= \frac{132 \times 7}{2 \times 22} = 21$ m

Width of the path = $(r_1 - r_2)$ = 21 m

78. (B) Side of the rhombus = 10 m
Height = 5 m
Area = b × h = 105 = 50 sq. m.

79. (C) D. of the circle = 21 cm

Rad. = $\frac{21}{2}$ cm

Area of the biggest circle = $\pi \times \left(\frac{21}{2}\right)^2$

$\frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} = \frac{1386}{4} = 346.5$ sq. cm

80. (?) $\frac{l}{2(l+b)} = \frac{5}{16}$

$10l + 10b = 16l$
$10b = 6l$

$\frac{l}{b} = \frac{10}{6} = \frac{5}{3}$

$l : b = 5 : 3$

81. (C)

Alloy 'A'
Gold : Copper
5 : 3
Total (5 + 3 = 8)
or, (5 × 2) + (3 × 2) = 16

Alloy 'B'
Gold : Copper
5 : 11
Total (5 + 1 = 16)

to equalise

[L.C.M. of 8 & 16 = 16 unit of each alloy]

The ratio of gold and copper in the alloy C

$$= \frac{(5\times 2)+5}{(3\times 2)+11} = \frac{15}{17}$$

$\Rightarrow$ 15 : 17

82. (C) A = B + 120 = C – 120

A = x (say)

B = x – 120

C = x + 120

A + B + C = 561

$x + (x - 120) + (x + 120) = 561$

$3x = 561$

$$x = \frac{561}{3} = 187$$

B's share = 187 – 120 = 67

83. (A)

In 17 kg 500 gm of Alloy

Copper : Zinc
5 : 2

$\frac{5}{7}$ × 17500 gm, 12500 gm, $\frac{2}{7}$ × 17500 gm 5000 gm

Now,

When 1.250 kg (or 1250 gm) of zinc is mixed in 17 kg 500 gm of alloy.

then, in the new mixed,

amount of zinc = (5000 + 1250) gm
= 6250 gm

So, In new mixture, ratio of copper & zinc
= 12500 gm : 6250 gm
= 2 : 1

84. (A)

	Re 1		50 p		25 p
Respective values	13	:	11	:	7
So, Respective no. of coins	(13 × 1)		(11 × 2)		(7 × 4)

Total no. of coins in 1 set = 13 + 22 + 28
= 63 coins

Total no. of sets of coins = $\frac{378}{63}$ coins
= 6 set

$\Rightarrow$ No. of 50 paise coins = 22 × 6
= 132 coins

85. (C)

	Rs. 500	Required Sum
Rate of Interest	12%	10%
S.I. after 4 years	480	480

S.I. is same

$$\Rightarrow \frac{\text{Rs. 500}}{\text{Required Sum}} = \frac{10\%}{12\%}$$

$$\Rightarrow \frac{\text{Rs. 500}}{\text{Required Sum}} = \frac{5}{6}$$

$$\Rightarrow \text{Required sum} = \text{Rs. } \frac{500}{5}\times 6 = \text{Rs. } 600$$

86. (C) Decrease in rate of interest

$$= 8\% - 7\frac{3}{4}\%$$

$$= 8\% - \frac{31}{4}\% = \frac{1}{4}\%$$

Now, ATQ,

$\frac{1}{4}$% of capital = Rs. 61.50

$\Rightarrow$ Total capital (i.e. 100%)
= Rs. 61.50 × 4 × 100
= Rs. 24600

87. (B) Total ages of 40 students = 40 × 15
= 600 yrs

Let the average age of 10 new students = x yrs.

$$\frac{600+10x}{50} = 15.2$$

$600 + 10x = 15.2 \times 50$

$600 + 10x = 760$

$$x = \frac{760-600}{10}$$

$$= \frac{160}{10} = 16 \text{ yrs.}$$

88. (B) $T_1 = \frac{24}{6} = 4$ hrs, $T_2 = \frac{24}{8} = 3$ hrs,

$T_3 = \frac{24}{12} = 2$ hrs.

$$\text{Average speed} = \frac{24+24+24}{4+3+2}$$

$$= \frac{72}{9} = 8 \text{ km/h}$$

89. (C) Let the average of 8 innings = x

Total runs = $8x$

$\frac{8x+100}{9} = x + 9$

$9x + 81 = 8x + 100$

$x = 19$

New average = x + 9 = 19 + 9 = 28

90. (B) Radius of the shot put ball = 7 cm

Height of the cylinder = $\frac{7}{3}$ cm

Volume of the shot put = Volume of the cylinder

$$\frac{4}{3}\pi\times 7^3 = \pi\times R^2\times\frac{7}{3}$$

$$R^2 = \frac{\frac{4}{3}\pi\times 7^3\times\frac{3}{7}}{\pi}$$

$$R = \sqrt{4\times 7^2} = 2\times 7$$

$$= 14 \text{ cm}$$

$$d = 2R = 2\times 14$$

$$= 28 \text{ cm}$$

91. (B) Let the initial area of the rectangle = xy sq. unit

$$\text{New area} = \frac{90}{100}x\times\frac{110}{100}y$$

$$= \frac{99}{100}xy \text{ sq. unit}$$

$$\text{Change in area} = xy - \frac{99}{100}xy$$

$$= \frac{xy}{100}$$

$$\% \text{ change in area} = \frac{\frac{xy}{100}}{xy}\times 100 = 1\%$$

92. (D) $h = 1+\frac{25}{100}\text{ m} = \frac{5}{4}\text{ m}$

Total area of the wet surface

= Area of the cistern without top

$= 2[lb + bh + lh] - lb$

$$= 2\left[6\times 4+4\times\frac{5}{4}+6\times\frac{5}{4}\right]-24$$

$$= 2\left[24+5+\frac{30}{4}\right]-24$$

$$= 2\left[\frac{29\times 4+30}{4}\right]-24$$

$$= 2\times\frac{146}{4}-24$$

$= 73 - 24$

$= 49 \text{ m}^2$.

93. (D) Total no. of late arrivals of trains

$= 114 + 31 + 5$

$= 150$

94. (C) Total no. of late departures of trains

$= 82 + 5 + 3$

$= 90$

95. (C) Required % $= \frac{(114+31+5)}{1400}\times 100\%$

$$= \frac{150}{1400}\times 100\% = 10.7\%$$

96. (B) Required punctuality $= \frac{1250+1400}{1400+1490}\times 100\%$

$$= \frac{2650}{2890}\times 100\%$$

$= 91.7\%$

97. (C)
$$\begin{array}{r} x - y = w + z + 6 \\ x + y = w - z - 3 \\ \hline 2x = 2w + 3 \end{array}$$

$$2x - 2w = 3$$

$$x - w = \frac{3}{2} = 1.5$$

98. (A) $\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\ldots\left(1-\frac{1}{n}\right)$

$$\frac{1}{2}\times\frac{2}{3}\times\frac{3}{4}\times\ldots\ldots\frac{n-1}{n}$$

$$= \frac{1}{n}$$

99. (C) $(\sqrt[3]{3.5}+\sqrt[3]{2.5})\{(\sqrt[3]{3.5})^2-\sqrt[3]{8.75}+(\sqrt[3]{2.5})^2\}$

$= (\sqrt[3]{3.5})^3+(\sqrt[3]{2.5})^3$

[by using $(a + b)(a^2 - ab + b^2) = a^3 + b^3$]

$= 3.5 + 2.5$

$= 6$

100. (A) Total CP = CP + repairing charge

$= 1200 + 200$

= Rs. 1400

SP = Rs. 1680

$$\% \text{ of profit} = \frac{(1680-1400)\times 100}{CP}$$

$$= \frac{280\times 100}{1400} = 20\%$$

SSC (Tier-II) - 2013 (Mock Test Paper - 1) (ANSWER SHEET)

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