Section-wise Grand Test – Quantitative Aptitude – SWGTQ-180103

HINTS & SOLUTIONS

ANSWER KEY

1.(5)	11. (1)	21. (2)	31. (4)	41. (2)
2. (3)	12. (1)	22. (1)	32. (1)	42. (3)
3. (5)	13. (2)	23. (4)	33. (2)	43. (4)
4. (1)	14. (3)	24. (5)	34. (2)	44. (5)
5.(5)	15. (1)	25. (3)	35. (4)	45. (1)
6. (1)	16. (3)	26. (2)	36. (2)	46. (2)
7. (4)	17. (3)	27. (3)	37. (3)	47. (3)
8. (4)	18. (3)	28. (1)	38. (5)	48. (2)
9. (4)	19. (3)	29. (4)	39. (2)	49. (5)
10. (3)	20. (4)	30. (3)	40. (1)	50. (3)

HINTS & SOLUTIONS

1.(5) **I.** $5x^2 - 28x + 39$
$5x^2 - 13x - 15x + 39 = 0$
$x(5x - 13) - 3(5x - 13) = 0$
$x = 3, \frac{13}{5}$

II. $2y^2 - 13y + 20 = 0$
$2y^2 - 8y - 5y + 20 = 0$
$2y(y - 4) - 5(y - 4) = 0$
$y = 4, \frac{5}{2}$

No relation

2. (3) **I.** $3x^2 - 13x + 14 = 0$
$3x^2 - 7x - 6x + 14 = 0$
$x(3x - 7) - 2(3x - 7) = 0$
$x = 2, \frac{7}{3}$

II. $2y^2 - 17y + 33 = 0$
$2y^2 - 11y - 6y + 33 = 0$
$y(2y - 11) - 3(2y - 11) = 0$
$y = 3, \frac{11}{2}$

$y > x$

3. (5) **I.** $19x^2 - 2x - 17 = 0$
$19x^2 - 19x + 17x - 17 = 0$
$19x(x - 1) + 17(x - 1) = 0$
$(19x + 17)(x - 1)$
$x = 1, \frac{-17}{19}$

II. $y^2 - y - 156 = 0$
$y^2 - 13y + 12y - 156 = 0$
$y(y - 13) + 12(y - 13) = 0$
$y = 13, -12$

No relation

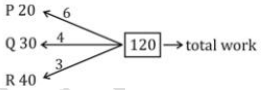
4. (1) **I.** $7x^2 - 22x + 16 = 0$
$7x^2 - 14x - 8x + 16 = 0$
$7x(x - 2) - 8(x - 2) = 0$
$x = 2, \frac{8}{7}$

II. $46y^2 - 35y - 11 = 0$
$46y^2 - 46y + 11y - 11 = 0$
$46y(y - 1) + 11(y - 1) = 0$
$y = 1, \frac{-11}{46}$

$x > y$

5.(5) I. $15x^2 - 20x + 9x - 12 = 0$
$5x(3x - 4) + 3(3x - 4) = 0$
$x = \frac{-3}{5}, \frac{4}{3}$
II. $20y^2 - 25y - 24y + 30 = 0$
$5y(4y - 5) - 6(4y - 5) = 0$
$y = \frac{6}{5}, \frac{5}{4}$
No relation can be established

6. (1) (A + B) → 16 days
(B + C) → 32 days
C → 80 days
$\frac{1}{B} = \frac{1}{32} - \frac{1}{80}$
$\frac{1}{B} = \frac{3}{160}$
$B = \frac{160}{3}$ days.
$\frac{1}{A} = \frac{1}{16} - \frac{3}{160}$
$\frac{1}{A} = \frac{7}{160}$
$A = \frac{160}{7}$ days
$\therefore \frac{7 \times 4}{160} + \frac{12 \times 3}{160} + \frac{x}{80} = 1$
$x = 48$
P → 48 – 28 = 20 days
Q → 48 – 18 = 30 days
R → 48 – 8 = 40 days



If we want to do the work in least possible time then P should start the work because in 3 day they complete total 13 units of work and in 27 days they complete 117 units of work. Remaining 3 unit is completed by P in least time

7. (4) (A + B) → 16 days
(B + C) → 32 days
C → 80 days
$\frac{1}{B} = \frac{1}{32} - \frac{1}{80}$
$\frac{1}{B} = \frac{3}{160}$
$B = \frac{160}{3}$ days.
$\frac{1}{A} = \frac{1}{16} - \frac{3}{160}$
$\frac{1}{A} = \frac{7}{160}$
$A = \frac{160}{7}$ days
$\therefore \frac{7 \times 4}{160} + \frac{12 \times 3}{160} + \frac{x}{80} = 1$
$x = 48$
Tap A → 48 – 44 = 4 days
Tap B → 48 – 42 = 6 days
Ratio of their efficiency $= \frac{1}{4} : \frac{1}{6} = \frac{1}{2} : \frac{1}{3} = 3 : 2$
Required fraction of the work $= \frac{3}{5}$

8. (4) (A – 5) : (B – 5) = 3 : 4 .....(i)
D + E + 10 = 90 .....(ii)
C - 4 = $\frac{1}{2}$E .....(iii)
Current age of C = 27 years
According to equation (iii),
27 – 4 = $\frac{1}{2}$E
E = 46 years
According to equation (iii),
D + 46 + 10 = 90
D = 34 years
∴ Age of D four years ago was 30 years

9. (4) First case,
(Refining for one hr)
Input = 1000 L
Output = $1000 \times \frac{90}{100} = 900L \Rightarrow x = 900L$
Profit = 900 × 30 = 27000
Second case
(Refining for $\frac{1}{2}$ hr).
Input = 900 L
Output y = $900 \times \frac{90}{100} = 810\,L$
Profit = 810 × 50 = Rs. 40500

10. (3) Let the amount of investment with each one be Rs. 400, then
Hari Lal Hari Prasad
$[400(1.1)^2] = [100(1.1)^2] + \left[300 + \frac{300 \times r \times 2}{100}\right]$
$300(1.21) = 300(1 + \frac{2r}{100})$
$1.21 = 1 + \frac{2r}{100}$
$\frac{2r}{100} = 0.21$
r = 10.5%

11. (1) Required ratio $= \frac{15\% \times 11\% \text{of } 150000}{40\% \times 10\% \text{ of } 150000}$
$= 33 : 80$

12. (1) Total females in GAIL and NHPC
$= 25\% \times 16\% \text{ of } 150000 + 10\% \text{ of } 60\%\ 150000$
$= 150000\left(\frac{25 \times 16}{100 \times 100} + \frac{10 \times 60}{100 \times 100}\right)$
$= 1500\,(10)$
$= 15000$
Total employees in BP = 9% of 150000 = 13500
Required percentage $= \frac{15000}{13500} \times 100$
$111\frac{1}{9}\%$

13. (2) Required sum $= (11\% \times 85\% + 37\% \times 62\%)150000$
$= 48435$

14. (3) Total females after resignation in NHPC
$= 10\% \times 60\% \times 150000 - \frac{1}{3} \times 50\% \times 10\% \times 150000$
$= 9000 - \frac{1}{3} \times 7500$
$= 6500$

15. (1) Average of Males employees from NTPC and ONGC
$\frac{\left(\frac{17}{100} \times \frac{65}{100} + \frac{37}{100} \times \frac{62}{100}\right)150000}{2}$
Average of Female employees in GAIL and BHEL
$\frac{(16\% \text{ of } 25\% + 11\% \text{ of } 15\%)150000}{2}$
Required percentage $= \frac{\frac{\left(\frac{17}{100} \times \frac{65}{100} + \frac{37}{100} \times \frac{62}{100}\right)150000}{2}}{\frac{(16\% \text{ of } 25\% + 11\% \text{ of } 15\%)150000}{2}} \times 100$
$\approx 600\%$

16. (3) A → If the no. of days taken by a man and that taken by a woman is 'm' and 'w' respectively, then
$\frac{m}{w} = \frac{1}{3}$

B → $\frac{1}{m} + \frac{1}{c} = \frac{1}{27}$

And

$\frac{1}{c} + \frac{1}{w} = \frac{1}{18}$ where 'c' is the no. of days taken by a child

C → w = 21
hence, the question can be solved using any of the two statements.

17. (3) A → LCM of 'a' and 'b' is 48

B → $a \times b = 192$

C → $\frac{a}{b} = \frac{4}{3}$

From B and C-

$4x \times 3x = 192$

or, $x^2 = 16$ or, $x = 4$

larger number = $4x = 16$

From A and C-

LCM of $4x$ and $3x$ is 48.

which means, $12x = 48$

or, $x = 4$

larger no. $4x = 16$

The question can be answered using C and either A or B

18. (3) A → ℓ : b = 3 : 2

$2(\ell b + bh + h\ell) = 72$

B → $\ell : h = 1 : 2$

C → $h^3 = 216$

or, $h = 6$

Value of l, b and h can be calculated by using statements A and C together or A and B together
The question can be answered using A and Either B or C.

19. (3) A → $\frac{10a+b}{a+b} = \frac{5}{2}$

B → $a = b - 4$

C → $a^2 + b^2 = 26$

Hence, any two of the three together are sufficient.

20. (4) Let, the four even integers be $x - 3, x - 1, x + 1, x + 3$

A → $\frac{x-3+x-1+x+1+x+3}{4} = 11$

or, $\frac{4x}{4} = 11 \Rightarrow x = 11$

B → $\frac{x+3}{x-3} = \frac{7}{4} \Rightarrow x = 11$

C → $[(x-3) + (x+3)]^2 = [(x-1) + (x+1)]^2$

$\Rightarrow 4x^2 = 4x^2$ (Ambiguous statement)

Hence, Either A or B alone is sufficient.

21. (2) No. of cars sold by Audi in 2nd quarter = $\frac{42}{100} \times 20000 = 8400$
No. of cars sold by Audi in 4th quarter = $8400 + \frac{3}{8} \times 8400 = 11550$
Required sum = $\frac{29+38}{100} \times 25000 + 8400 + 11550 = 36700$

22. (1) No. of Cars sold by Ford in 1st quarter = $\frac{29}{100} \times 25000 = 7250$
No. of cars sold by Ford in 4th quarter = 7250+1750 = 9000
Required % = $\frac{9000}{34000} \times 100$
$= \frac{450}{17} = 26\frac{8}{17}\%$

23. (4) No. of cars sold by Audi in 2nd quarter = $\frac{42}{100} \times 20000 = 8400$
Let total no. of cars sold by Audi in whole year = x
$\therefore 8400 = \frac{28x}{100}$
$x = 30000$
No. of cars sold by Audi in 4th quarter = 30000−20000 = 10000
Required no. of cars = 0.34× 20000 + 10000 = 16800

24. (5) No. of cars sold by ford in 2nd quarter $= \frac{38}{100} \times 25000 = 9500$

Total no. of cars sold by Audi in 1st and 3rd quarter

$= \left(\frac{34+24}{100}\right) \times 20000 = 11600$

Required % $= \frac{11600-9500}{11600} \times 100$

$= 18.10\%$

25. (3) No. of cars sold by audi in quarters 2nd and 3rd

$= \frac{(34+42)}{100} \times 20000$

$=15200$

no. of cars sold by ford in 4th quarter

$= \frac{12}{11} \times \frac{33}{100} \times 25000 = 9000$

no. of cars sold by ford in quarters 3rd and 4th

$= 8250+9000=17250$

Required answer= 17250-15200=2050

26. (2) 2 days' work of Neeraj and Abhimanyu

$= \frac{2}{9} + \frac{2}{9} = \frac{4}{9}$

2 days work of Charu, Anshul and Nipa

$\frac{2}{24} + \frac{2}{9} + \frac{2}{24} = \frac{6+16+6}{72}$

$= \frac{28}{72} = \frac{7}{18}$

Total work done in 4 days $= \frac{4}{9} + \frac{7}{18}$

$= \frac{8+7}{18} = \frac{15}{18}$

Remaining work $= 1 - \frac{15}{18} = \frac{3}{18}$

$= \frac{1}{6}$

27. (3) Work done by all the boys in one day

$= \frac{1}{12} + \frac{1}{15} + \frac{1}{10} + \frac{1}{9} + \frac{1}{12} + \frac{1}{9}$

$= \frac{15+12+18+20+15+20}{180}$

$= \frac{100}{180}$

Time taken by the boys =1.8 days

Work done by Swati, Mansi, Charu and Nipa in one day

$= \frac{1}{10} + \frac{1}{15} + \frac{1}{24} + \frac{1}{24} = \frac{12+8+5+5}{120}$

$= \frac{30}{120} = \frac{1}{4}$

Time taken by Swati, Mansi, Charu and Nipa = 4 days

Desired difference = 4 - 1.8 = 2.2 days

28. (1) Aniket one day work with 120% efficiency

$= \frac{1}{12} \times \frac{120}{100} = \frac{1}{10}$

Gopal one day work with 5/6 of his efficiency

$= \frac{5}{6} \times \frac{1}{10} = \frac{1}{12}$

2 days'work $= \frac{1}{10} + \frac{1}{12} = \frac{11}{60}$

10 days's work starting with Aniket $= \frac{55}{60}$

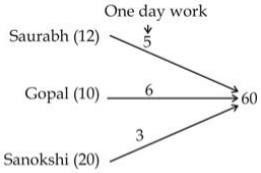
Remaining work $= 1 - 55/60 = \frac{5}{60} = \frac{1}{12}$

Time taken by Aniket to complete the

remaining work $= \frac{\frac{1}{12}}{\frac{1}{10}} = \frac{10}{12} = \frac{5}{6}$

Total time taken $= 10\frac{5}{6}$ days

29. (4) Let the total work to be done is '60' units.



Time taken by Saurabh $= \frac{25\% \times 60}{5} = 3$ days

Time taken by Gopal $= 10\% \times \frac{60}{6} = 1$ days

Time taken by Sonakshi $= 65\% \times \frac{60}{3} = 13$ days

Total time taken $= 3 + 1 + 13 = 17$ days

Or

Time taken by saurabh to do 25% of work

= 25% × 12 days = 3 days

Time taken by Gopal to do 10% of work = 10% of 10 days = 1 day

Time taken by Sonakshi to do 65% of work = 65% × 20 days = 13 days

Total time taken = 3 + 1 + 13 = 17 days

30. (3) 25% of the work is done in 5 days.

Then, total work will be done in 20 days.

Efficiency/day $= \frac{1}{20}$

Remaining 75% of the work has to be done in 10 days (15 – 5 days).

Total work will be done in $10 \times \frac{100}{75}$ days with the same efficiency.

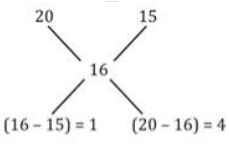
New Efficiency/day $= \frac{1}{10} \times \frac{100}{75} = \frac{3}{40}$

Percentage increase in efficiency to do the work in time $= \frac{\frac{3}{40} - \frac{1}{20}}{\frac{1}{20}} \times 100$

$= \frac{\frac{1}{40}}{\frac{1}{20}} \times 100$

$= 50\%$

31. (4)



Required Ratio = 1 : 4

32. (1) $2P = P\left(1 + \frac{r}{100}\right)^5$

$\left(1 + \frac{r}{100}\right)^5 = 2$

$\left(1 + \frac{r}{100}\right)^{5 \times 3} = (2)^3$

$\left(1 + \frac{r}{100}\right)^{15} = 8$

Required time = 15 years

33. (2) Let CP of Horse = x Rs.

Let CP of carriage = (40000 – x)Rs.

$\frac{110x}{100} + \frac{95}{100}(40000 - x) = \frac{101}{100} \times 40{,}000$

$110x + 95 \times 40000 - 95x = 40{,}000 \times 101$

$15x = 40{,}000 \times 101 - 95 \times 40{,}000$

$x = 16000$ Rs.

34. (2) In 6 days part of the work done by
A = $\frac{6}{8} = \frac{3}{4}$
during 2 days, prt of the work destroyed by B = $\frac{2}{3}$
work done = $\frac{3}{4} - \frac{2}{3} = \frac{9-8}{12} = \frac{1}{12}$
Remaining work = $1 - \frac{1}{12} = \frac{11}{12}$
$\therefore$ Required no of days = $\frac{11}{12} \times 8$
$= 7\frac{1}{3}$ days.

35. (4) In 15 seconds,
distance travelled by First car
$= 15 \times 36 \times \frac{5}{18} = 150$ m
Distance travelled by second car = $15 \times 48 \times \frac{5}{18} = 200$
$\therefore$ Required distance = $\sqrt{(150)^2 + (200)^2} = 250$ m

36. (2) Quantity I:
ΔABC is an equilateral triangle.
$\therefore \angle ACB = 60°$
$\therefore$ Angle subtended by arc AB at the center of the semi-circle is 60°.
AC = radius of semi-circle = edge of equilateral triangle = 15 cm.
Area of shaded region = $\frac{1}{6}$ Area of circle – Area of ΔABC
$= \frac{1}{6} \times \frac{22}{7} \times 15^2 - \frac{\sqrt{3}}{4} \times 15^2 \approx 20.43$ cm²
Quantity II > Quantity I

37. (3) Quantity I:
Time taken by the express train to cross the bridge = $\frac{\text{Length of express train + Length of bridge}}{\text{Speed of express train}}$
$= \frac{700 + 100}{100 \times \frac{5}{18}}$
= 28.8 sec
Quantity II:
Maximum time taken by the express train to cross the passenger train = $\frac{\text{Sum of maximum lengths of trains}}{\text{Sum of speeds of trains}}$
$= \frac{700 + 500}{(100 + 50) \times \frac{5}{18}}$
= 28.8 sec
$\therefore$ Time $\leq$ 28.8 sec
Quantity I $\geq$ Quantity II

38. (5) Quantity I:
Let the quantity of milk and water in the vessel B be 5x and 4x liters respectively
And, capacity of vessel B be 9x liters.
$\frac{\text{Quanity of water in third vessels}}{\text{Quanity of milk in third vessels}} = \frac{2}{3}$
$\Rightarrow \frac{30 + 4x}{45 + 5x + 10} = \frac{2}{3}$
$\Rightarrow x = 10$
Capacity of vessel B = 9x = 90 liters
Quantity I = Quantity II

39. (2) 8 men complete the work in 10 days. So, 1 man will complete the same work in 80 days.
Efficiency of 5 women = Efficiency of 4 men
5W = 4M
Ratio of efficiencies:
$\frac{M}{W} = \frac{5}{4}$
Let, a man does 5 units and a woman does 4 units of work per day
& total units of work are 400 units.
Quantity I:
8 days' work of 4 men and 3 women = 8 × (4 × 5 + 3 × 4) = 256 units
Remaining work = 400 – 256 = 144 units
2 women left. So, there are 4 men and 1 woman now.
Per day work of 4 men and 1 woman = 4 × 5 + 1 × 4 = 24 units
No. of day required to complete the remaining work = 144/24 = 6 days
Total time = 8 + 6 = 14 days
Quantity II:
2 days' work of 5 women and 6 men working alternately = 5 × 4 + 6 × 5 = 50 units
16 days' work = $50 \times \frac{16}{2} = 400$ units
No work left after 8 rotations (16 days), so the work is completed in 16 days.
Quantity II > Quantity I

40. (1) Let, probability of rain for exactly three days = x.
& probability of rain for exactly four days = probability of rain for exactly five days = y
Let d be the number of rainy days in the week.
Now, sum of all probabilities:
P(d<3) + P(d=3) + P(d=4) + P(d=5) + P(d>5) = 1
0.35 + x + y + y + 0.15 = 1
x + 2y = 0.5 .....(i)
P(d=3) > 0.2
x > 0.2 .....(ii)
From equations (i) and (ii):
2y < 0.3
y < 0.15 .....(iii)
From equations (i) and (iii):
x + y > 0.35
Quantity I:
Probability of rain for either exactly three or exactly four days in the week
= P(d=3) + P(d=4)
= x + y
> 0.35
Quantity II:
Probability of rain for more than four days in the week
= P(d=5) + P(d>5)
= y + 0.15
< 0.3
Quantity I > Quantity II

41. (2) Selling Price of item E = $CP \times \frac{(100 + \%\text{Markup})}{100} \times \frac{(100 - \%\text{Discount})}{100}$
$= 625 \times \frac{\left(100 + 24\frac{4}{9}\right)}{100} \times \frac{\left(100 - 16\frac{2}{3}\right)}{100}$
= Rs.650
Profit/kg = SP – CP = 650 – 625 = Rs.25
Total Profit = 13 × 25 = Rs.325

42. (3) Cost Price of item D = $MP \times \frac{100}{(100 + \%\text{Markup})}$
$= 700 \times \frac{100}{\left(100 + 33\frac{1}{3}\right)}$
= Rs.525
Original Selling Price = $MP \times \frac{(100 - \%\text{Discount})}{100}$
$= 700 \times \frac{\left(100 - 8\frac{4}{7}\right)}{100}$
= Rs.640
Original Profit = SP – CP = 640 – 525 = Rs.115
New Selling Price = $MP \times \frac{(100 - \%\text{Discount})}{100} \times \frac{(100 - \%\text{Discount})}{100}$
$= 700 \times \frac{\left(100 - 8\frac{4}{7}\right)}{100} \times \frac{\left(100 - 6\frac{1}{4}\right)}{100}$
= Rs.600
New Profit = SP – CP = 600 – 525 = Rs.75
% Decrease in Profit = $\frac{(115 - 75)}{115} \times 100 = 34\frac{18}{23}\%$

43. (4) Cost price of item A = $\frac{1}{2}$ × Marked price of item C = Rs.440

Marked price of item A = $\frac{4}{5}$ × Marked price of item D = Rs.560

Selling Price of item A = MP × $\frac{(100 - \%\text{Discount})}{100}$

= $560 \times \frac{\left(100 - 7\frac{1}{7}\right)}{100}$

= Rs.520

Profit/kg = SP – CP = 520 – 440 = Rs.80

Quantity Sold = $\frac{\text{Total Profit}}{\text{Profit/kg}} = \frac{1000}{80} = 12.5\text{kg}$

44. (5) Cost Price of pure item C = MP × $\frac{100}{(100 + \%\text{Markup})}$

= $880 \times \frac{100}{\left(100 + 22\frac{2}{9}\right)}$

= Rs.720

Cost Price/kg of the mixture

= $\frac{\text{Total Cost Price}}{\text{Total Quantity}} = \frac{5 \times 480 + 15 \times 720}{5 + 15}$ = Rs.660

New Discount = $11\frac{4}{11}\%$ + 10% of $11\frac{4}{11}\%$ = 12.5%

New Selling price = = MP × $\frac{(100 - \%\text{Discount})}{100}$

= $880 \times \frac{(100 - 12.5)}{100}$

= Rs.770

New Profit % = $\frac{\text{New Selling Price} - \text{New Cost Price}}{\text{New Cost Price}} \times 100$

= $\frac{770 - 660}{660} \times 100$

= $16\frac{2}{3}\%$

45. (1) Selling Price of item B

= CP × $\frac{(100 + \%\text{Markup})}{100} \times \frac{(100 - \%\text{Discount})}{100}$

= $780 \times \frac{\left(100 + 23\frac{1}{13}\right)}{100} \times \frac{\left(100 - 6\frac{1}{4}\right)}{100}$

= Rs.900

1kg of item B is spoiled out of total 15 kg, so only 14kg is available for sale.

Total Profit = Total Selling Price – Total Cost Price

= 14 × 900 – 15 × 780

= 12600 – 11700

= Rs.900

46. (2) $? = 326 \times 14 - 12 \times 88 + (49)^2$

$= 4564 - 1056 + 2401$

$= 6965 - 1056 = 5909$

47. (3) $\frac{45}{7} \times 266 + 630 = 7985 - ? - 5200$

or, $1710 + 630 = 2785 - ?$

$\therefore ? = 2785 - 2340 = 445$

48. (2) $124\sqrt{?} + 876 = \frac{3}{4}$ of $840 + 742$

or $124\sqrt{?} + 876 = 630 + 742$

or $124\sqrt{?} = 1372 - 876$

or, $\sqrt{?} = \frac{496}{124} = 4$

$\therefore ? = 4^2 = 16$

49. (5) 70% of $1680 + \frac{?}{100}$ of 1750

= 55% of 2820 – 886

or, $\frac{70}{100} \times 1680 + \frac{?}{100} \times 1750 = \frac{55}{100} \times 2820 - 886$

or, $1176 + 17.5 \times ? = 1551 - 886 = 665$

or, $17.5 \times ? = 665 - 1176$

$\therefore ? = \frac{-511}{17.5} = -29.2$

50. (3) $6^3 \times 3^4 \div 9^3 + (?)^2 = 7^2$

or, $216 \times \frac{81}{729} + (?)^2 = 7^2$

or, $24 + (?)^2 = 7^2$

or, $(?)^2 = 49 - 24 = 25$

$? = \sqrt{25} = 5$