IBPS (CLERK, PO, RRB, SO)

Quantitative Aptitude - Question Papers

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CONTENTS

IBPS CLERK PRELIMINARY

QUANTITATIVE APTITUDE

Directions (Q.1-10) : What should come in place of question mark in the following questions?

1. $(2864 \div 179)^{1/2} + (646 \div 19)^2 = ?^2 + 319$

(A) 841 (B) 29
(C) –29 (D) 1060
(E) –841

2. $\sqrt{\left[(1.8)^2 \times 5 + (1.8) \times (8)^3 - (13.05 \times 16)\right]} = (?)^3$

(A) 81 (B) 27
(C) $\sqrt{18}$ (D) 3
(E) 9

3. 46.7% of 1680 + 23.4% of 675= $(?)^2$ – 906.49

(A) 1849 (B) 1681
(C) 43 (D) 41
(E) –43

4. $\frac{1}{3}$ of 1875 + $\frac{2}{5}$ of 4360 – $\frac{7}{8}$ of 1584 = ?

(A) 980 (B) 982
(C) 985 (D) 983
(E) 882

5. $\frac{1}{7}$ of 1519 + 67.5% of 2040 = ? ÷ 25

(A) 37850 (B) 39850
(C) 37050 (D) 36850
(E) 42850

6. $38\frac{7}{8} + 49\frac{5}{8} = ? - 39\frac{11}{16}$

(A) $126\frac{3}{16}$ (B) $125\frac{3}{16}$
(C) $124\frac{3}{16}$ (D) $128\frac{3}{16}$
(E) $127\frac{3}{16}$

7. 43 × 48 × 5 ÷ ? = 120

(A) 89 (B) 86
(C) 88 (D) 84
(E) 82

8. 22480 ÷ 281 × 34 + ? = 2933

(A) 225 (B) 209
(C) 211 (D) 213
(E) 207

9. (16.6 × 9.8 + 122.32) ÷ 5 = $(?)^2$ + ? + 1

(A) 7 (B) 8
(C) 9 (D) 10
(E) 6

10. 49% of 700 + ? % of 800 = 495

(A) 14 (B) 17
(C) 19 (D) 13
(E) 18

11. A candidate scored 146 marks in Hindi, 139 marks in English, 179 marks in Mathematics, 148 marks in Science and 98 marks in Social Science. What is the average of marks scored by him in all subjects ?

(A) 142 (B) 168
(C) 132 (D) 135
(E) None of these

12. What would be the simple interest obtained on a principal of ₹ 11050 after six years at the rate of 5% per annum ?

(A) ₹ 3320 (B) ₹ 3315
(C) ₹ 3300 (D) ₹ 3350
(E) None of these

13. A 240m-long train crosses a 300m-long platform in 27 sec. What is the speed of the train in km/h ?

(A) 66 km/h (B) 60 km/h
(C) 76 km/h (D) 64 km/h
(E) None of these

14. 16 men can complete a piece of work in seven days. In how many days will 28 men complete the same work ?

(A) 6 days (B) 8 days
(C) 3 days (D) 4 days
(E) None of these

15. The sum of five consecutive even numbers is 380. What is the second number in the ascending order ?

(A) 76 (B) 78
(C) 74 (D) 72
(E) None of these

16. The number of students speaking English and that speaking Hindi are in the ratio of 4: 5. If the number of students speaking English increases by 35% and that speaking Hindi increases by 20%, what will be the new ratio ?

(A) 19 : 20 (B) 7 : 8
(C) 8 : 9 (D) 9 : 10
(E) None of these

17. When an article is sold for ₹ 1171 the loss incurred is 20% less than the profit earned on selling it for ₹ 1378. what should be the selling price of the article to earn a profit of 30% ?

(A) ₹ 1641.9 (B) ₹ 1862.53
(C) ₹ 1565.3 (D) ₹ 1934.23
(E) ₹ 2000

18. A sum of ₹ 18000 is borrowed at 12% pa compounded annually and is paid back in 3 equal annual installments. What is amount of each installment ? (Approximately)

(A) ₹ 6800 (B) ₹ 7500
(C) ₹ 8290 (D) ₹ 7990
(E) ₹ 8750

Directions (Q.19-23) : Find the next number in the following number series **:**

19. 3, 16, 29, 42, 55, 68...?

(A) 77 (B) 71
(C) 81 (D) 83
(E) None of these

20. 1, 2, 6, 21, 88, (?)

(A) 445 (B) 345
(C) 465 (D) 545
(E) None of these

21. 6, 28, 110, 476, 2426,.....?

(A) 14612 (B) 14512
(C) 14412 (D) 14312
(E) 14212

22. 12, 24, 44, 74, 116,.. ?

(A) 164 (B) 172
(C) 178 (D) 184
(E) 196

23. 19, 29, 41, 55, 71, ?

(A) 89 (B) 91
(C) 93 (D) 95
(E) 97

Directions (Q.24-28) : Study the following information carefully answer the questions given below **:**

In an examination (consisting of two papers Physics and Chemistry) total 300 students appeared. Out of that the ratio of boys to girls is 3: 2. The number of boys who passed only in Physics is 25% of the total number of boys and this number is 3/2 of the number of girls who passed only in Chemistry. The number of girls who passed in both the papers is 2/15 of the total number of students and the number of boys who passed in both the papers is 180% of the number of girls who passed in both the papers. None of the candidate failed in both the papers.

24. How many girls are there who passed only in Physics paper ?

(A) 35 (B) 40
(C) 45 (D) 50
(E) 60

25. The number of boys who passed only in Chemistry is what percentage of the total number of students who appeared in the examination ?

(A) 21% (B) 36%
(C) 48% (D) 72%
(E) 84%

26. How many students passed in Physics ?

(A) 192 (B) 197
(C) 201 (D) 203
(E) 207

27. What is the ratio of the number of boys who passed in Chemistry to the number of girls who passed only in Physics ?

(A) 23 : 8 (B) 25 : 11
(C) 27 : 10 (D) 29 : 15
(E) 31 : 16

28. How many students are there who passed at most in one subject ?

(A) 172 (B) 178
(C) 181 (D) 188
(E) 192

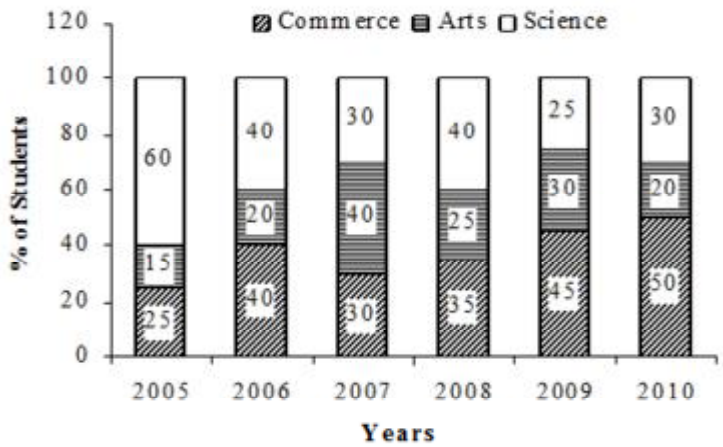
29. The length and the breadth of a rectangle are increased by 15% and 10% respectively. By how much percent is the area of the rectangle increased ?

(A) 22.5% (B) 24%
(C) 26.5% (D) 24.5%
(E) 23.3%

30. A sum of money amounts to Rs.1600 in 3 years and Rs.1680 after 4 years at a compound interest. What is the rate of compound interest per annum ?

(A) 6% pa (B) 5% pa
(C) 10% pa (D) 15% pa
(E) 20% pa

Directions (Q.31–35) : The following graph shows the percentage number of students in three different disciplines (Science, Arts and Commerce) in a certain college for the period 2005 to 2010.



31. The total number of students in Arts discipline in the year 2007 was 300 and that in Commerce discipline in the year 2009 was 405. What was the difference between the total number of students in the year 2009 and the total number of students in the year 2007 ?

(A) 90 (B) 125
(C) 150 (D) 180
(E) 200

32. What is the maximum difference between the numbers of students in Arts discipline for the given period for any two years ?

(A) 20 (B) 25
(C) 30 (D) 35
(E) Data inadequate

33. If the number of students in Arts discipline in the year 2005 and 2009 was equal to 360 each then in year 2009 the number of Commerce students is what percentage of the number of Commerce students in the year 2005 ?

(A) 75% (B) 90%
(C) 120% (D) 125%
(E) None of these

34. If the number of Commerce students in the year 2006 and 2008 is equal to 560 each, what is the ratio of Arts students in the year 2006 to that in 2008 ?

(A) 4 : 5 (B) 5 : 9
(C) 4 : 7 (D) 7 : 10
(E) 9 : 16

35. If the number of Science discipline students in the year 2007 and 2010 was 390 and 450 respectively, then the number of Commerce students is 2007 is what percentage more than the number of Arts students in 2010 ?

(A) 10% (B) 15%

(C) 20% (D) 25%

(E) 30%

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
B	E	C	D	B	D	B	D	A	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	B	E	D	C	D	A	B	C	A
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	B	A	D	A	E	C	D	C	B
31	**32**	**33**	**34**	**35**					
C	E	C	D	E					

SOLUTIONS

1. (B) $(?)^2 + 319 = (2864 \div 179)^{1/2} + (646 \div 19)^2$

$= (16)^{1/2} + (34)^2 = 4 + 1156 = 1160$

Or, $(?)^2 = 1160 - 319 = 841 = 29 \times 29$

$\therefore \quad ? = \sqrt{29 \times 29} = 29$

2. (E) $?^3 = \sqrt{(1.8 \times 1.8 \times 5 + 1.8 \times 512 - 208.8)}$

$= \sqrt{(16.2 + 921.6 - 208.8)}$

$= \sqrt{(937.8 - 208.8)}$

$= \sqrt{729}$

$= ? = \sqrt[3]{(9 \times 9 \times 9)} = 9$

3. (C) $(?)^2 - 906.49 = (46.7 \times 1680)/100 + (23.4 \times 675)/100$

$= 784.56 + 157.95 = 942.51$

Or, $(?)^2 = 942.51 + 906.49 = 1849$

$? = \sqrt{(43 \times 43)} = 43$

4. (D) ? = 1/3 of 1875 + 2/5 of 4360 – 7/8 of 1584

= 1/3 × 1875 + 2/5 × 4360 – 7/8 × 1584

= 625 + 1744 – 7 × 198

= 2369 – 1386 = 983

5. (B) 1/7 of 1519 + 67.5% of 2040 = ? ÷ 25

Or, 1/7 × 1519 + [(67.5 × 2040)/100] = ? ÷ 25

Or, ?/25 = 217 + 1377 = 1594

∴ ? = 1594 × 25 = 39850

6. (D) $38\frac{7}{8} + 49\frac{5}{8} = ? - 39\frac{11}{16}$

$? = 38\frac{7}{8} + 49\frac{5}{8} + 39\frac{11}{16}$

$(38 + 49 + 39) + \left(\frac{7}{8} + \frac{5}{8} + \frac{11}{16}\right)$

$126 + \frac{(14 + 10 + 11)}{16}$

$126\frac{35}{16} = (126 + 2) + \frac{3}{16} = 128\frac{3}{16}$

7. (B) 43 × 48 × 5 ÷ ? = 120

Or, 10320/? = 120

? = 10320/120

= 86

8. (D) 22480 ÷ 281 × 34 + ? = 2933
Or, 80 × 34 + ? = 2933
Or, 2720 + ? = 2933
Or, ? = 2933 – 2720 = 213

9. (A) $(16.6 \times 9.80 + 122.32) \div 5 = ?^2 + ? + 1$
Or, $285/5 = ?^2 + ? + 1$
Or, $?^2 + ? = 57 - 1 = 56$
$= 49 + 7 = (7)^2 + 7$
? = 7

10. (C) 49% of 700 + ? % of 800 = 495
Or, 700 × 49/100 + 800 × ? /100 = 495
Or, 343 + 8 × ? = 495
Or, 8 × ? = 495 – 343
∴ ? = 152/8 = 19

11. (A) Required average marks $= \frac{146 + 139 + 179 + 148 + 98}{5} = \frac{710}{5} = 142$

12. (B) P = ₹ 11050, r = 5%, t = 6 years

$\therefore$ $SI = \frac{PRT}{100} = \frac{11050 \times 5 \times 6}{100} = ₹\ 3315$

13. (E) Total length = 240 + 300 = 540 m

$\therefore$ Speed of the train $= \frac{540}{27} = 20 m/s = 20 \times \frac{18}{5} = 72 km/h$

14. (D) Suppose 28 men complete the same work in x days.
$\Rightarrow$ 28 : 16 :: 7 : x
$\Rightarrow$ 28 × x = 16 × 7
$x = \frac{16 \times 7}{28} = 4$ days

15. (C) Let the five consecutive even numbers be x, (x + 2), (x + 4), (x + 6) and (x + 8).
$\Rightarrow$ 5x + 20 = 380

$\therefore$ $x = \frac{380 - 20}{5} = 72$

$\therefore$ Second number in ascending order = x + 2 = 72 + 2 = 74

16. (D) Quicker Method (4 × 135) / (5 × 120) = 9 : 10
Alternate Method :
Let the number of students speaking English be 4x and the number of students speaking Hindi be 5x
Then, English = (4x × 135)/100 = 5.4x
And, Hindi = (5x × 120)/100 = 6x
Required ratio = 5.4/ 6 = 9/10 = 9 : 10

17. (A) $CP + 5K = SP_1$ (given profit)
$CP - 4K = SP_2$ (Given loss)
Since loss (4K) is 20% less than profit (5K)

$SP_1 - SP_2 = 9K = 1378 - 1171 = 207$

Or $K = 23$

$CP = SP_1 - 5K = 1378 - 5 \times 23 = Rs.\ 1263$

Required SP = 1263 × 130/100 = Rs.1641.9

18. (B) Let each installment be Rs.x.

Then, $18000 = x\{[1/(1+(r/100))] + [1/(1+(r/100))^2] + [1/(1+(r/100))^3]\}$

Or, $18000 = x\{25/28 + (25/28)^2 + (25/28)^3\}$

Or, $18000 = x\,(25/28)\{1 + 25/28 + (25/28)^2\}$

Or, $18000 = 25x/28\{1 + (25/28) + (625/784)\}$

Or, $x = 7494.28 \approx 7500$

19. (C) Here we see next number is come after addition 13 in previous number.

3 + 13 = 16

16 + 13 = 29

29 + 13 = 42

42 + 13 = 55

55 + 13 = 68

68 + 13 = 81

20. (A) The pattern is ×1 + 1, ×2 + 2, ×3 + 3, ×4 + 4

So the missing term is = 88 × 5 + 5 = 445

21. (A) The number is 14612.

× 2 + 16, × 3 + 26, × 4 + 36, × 5 + 46, × 6 + 56 ...

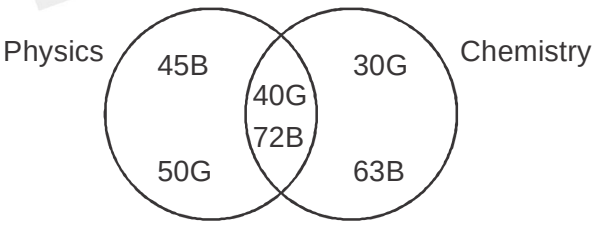
22. (B) The number is 172

+(4 × 3), +(5 × 4), +(6 × 5), +(7 × 6), +(8 × 7) ...

23. (A) The number is 89.

+ 10; + 12; + 14; + 16, + 18...

Directions (24-28) :



Total = 300

Boys : Girls: 3 : 2

Boys = 180, Girls = 120

24. (D) 50

25. (A) Required % = $\frac{63}{300} \times 100 = 21\%$

26. (E) Total students who passed in Physics = 45 + 50 + 40 + 72 = 207

27. (C) Ratio = $\frac{72+63}{50} = \frac{135}{50} = \frac{27}{10} = 27:10$

28. (D) Students who passed at most in one subject = 45 + 50 + 30 + 63 = 188

29. (C) % change in area = 15 + 10 + (15×10)/100

= 25 + 1.5

= 26.5% increase

30. (B) Rate of interest = [(Difference of amount) / (First amount)] ×100
= [(1680 – 1600)/ 1600] × 100
= (80/1600) × 100 = 5% pa

31. (C) Total number of Student in 2007 = $\frac{300 \times 100}{40} = 750$

Total number of Student in 2009 = $\frac{405 \times 100}{45} = 900$

$\therefore$ Difference = 900 – 750 = 150

32. (E) We cannot find maximum difference of arts discipline without knowing exact number of students.

33. (C) $\text{Total}_{2005} = \frac{360 \times 100}{15} = 2400$

$\therefore$ $\text{Total}_{2005} = \frac{360 \times 100}{30} = 1200$

$\therefore$ $\text{Commerce}_{2005} = \frac{25 \times 2400}{100} = 600$

$\therefore$ $\text{Commerce}_{2009} = \frac{45 \times 1200}{100} = 540$

$\therefore$ Required % = $\frac{540 \times 100}{600} = 90\%$

34. (D) $\text{Total}_{2006} = \frac{540 \times 100}{40} = 1400$

$\therefore$ $\text{Arts}_{2006} = \frac{20 \times 1400}{100} = 280$

$\therefore$ $\text{Total}_{2008} = \frac{560 \times 100}{35} = 1600$

$\therefore$ $\text{Arts}_{2008} = \frac{25 \times 1600}{100} = 400$

$\therefore$ Ratio = $\frac{280}{400} = \frac{7}{10} = 7:10$

35. (E) $\text{Total}_{2007} = \frac{390 \times 100}{30} = 1300$

$\therefore$ Commerce = $\frac{30 \times 1300}{100} = 390$

$\therefore$ $\text{Total}_{2010} = \frac{450 \times 100}{30} = 1500$

$\therefore$ Arts = $\frac{20 \times 1500}{100} = 300$

$\therefore$ Required % = $\frac{390 - 300}{300} \times 100 = \frac{9000}{300} = 30\%$

IBPS CLERK MAIN

QUANTITATIVE APTITUDE

Directions (Q.1–5) : What will come in place of the question mark (?) in the following questions?

1. $377 \div 29 \times 15 + 158 = (?)^2 + 128$

(A) 12 (B) 6
(C) 35 (D) 9
(E) None of these

2. $(4 \times 4)^3 \div (512 \div 8)^4 \times (32 \times 8)^4 = (2 \times 2)^{? + 4}$

(A) 8 (B) 12
(C) 6 (D) 14
(E) None of these

3. $(2\sqrt{392} - 21) + (\sqrt{8} - 7^2)$ $(?)^2$

(A) 4 (B) –4
(C) 12 (D) 2
(E) 6

4. $1\frac{1}{4} + 1\frac{1}{6} - 1\frac{1}{8}\ ? + 1\frac{1}{12}$

(A) $\frac{5}{24}$ (B) $\frac{7}{24}$
(C) $\frac{5}{12}$ (D) $\frac{7}{12}$
(E) None of these

5. 75% of 965 = 45% of 835 + ?

(A) 347 (B) 348
(C) 349 (D) 350
(E) None of these

6. 4650.4408 – 1959.9987 – 1550.009 + 1309.9413 + 83.0405 = ? + 213.45

(A) 2738.8659 (B) 2319.9649
(C) 2648.8659 (D) 2638.7859
(E) 2783.7769

7. 123.5% of 3375 – 3452% of 71.5 = ? – of 14641

(A) 7744.945 (B) 7043.945
(C) 7023.945 (D) 7032.945
(E) 7434.945

8. 75530 ÷ 415 × 11 + 3408 ÷ 16 = ? – 5819 ÷ 253

(A) 2298 (B) 3238
(C) 2278 (D) 2238
(E) 2234

9. ? – 194.04 ÷ 2.31 = 0.004 × 0.56 ÷ 0.014 + 1.0026

(A) 85.1616 (B) 85.0126
(C) 85.1826 (D) 84.1836
(E) 85.1626

10. 6.8 × 3.5 + 0.4 × 5.45 + 201.35 = ?

(A) 227.33 (B) 247.33
(C) 257.33 (D) 237.43
(E) None of these

Directions: What approximate value will come in place of question mark (?) in the following questions (You are not expected to calculate the exact value).

11. 1340.0002 ÷ 24.999 × 3.5 × 4 = ?

(A) 760 (B) 750
(C) 850 (D) 950
(E) 700

:

12. 4895.009 – 360.999 – 150.189 × 3 = ?

(A) 4060 (B) 4080
(C) 5080 (D) 5060
(E) 4000

13. $(14)^2 + (29.99)^2 + (18.001)^2$ = ?

(A) 1420 (B) 1450
(C) 1440 (D) 1400
(E) 1320

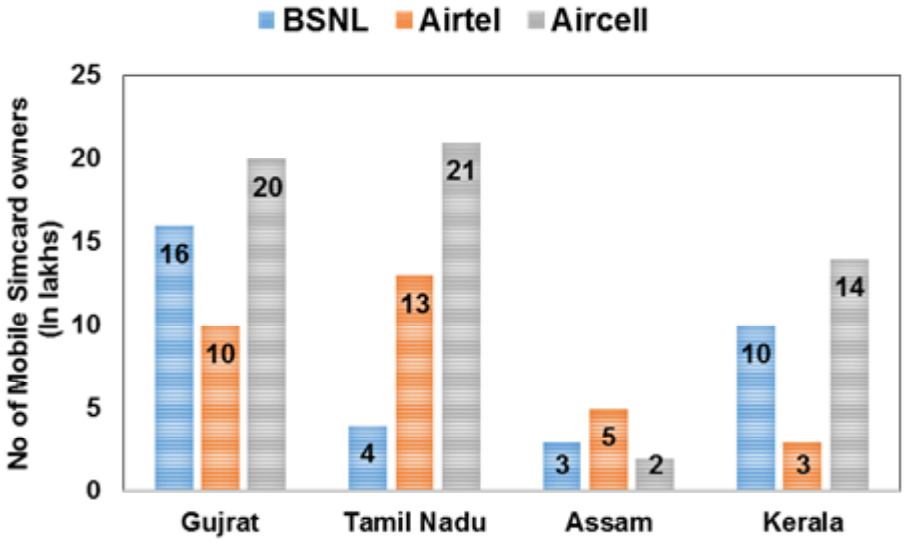
14. (99999 ÷ 999 ÷ 9) × 9.999 = ?

(A) 121 (B) 115
(C) 100 (D) 111
(E) 1300

15. 145% of 1349 + 15.5% of 1319 = ?

(A) 2160 (B) 2260
(C) 1260 (D) 2360
(E) 2560

Direction (16-20) : The number of mobile sim cards in 4 states are given in multiple bar diagrams. Study the diagram and answer the questions.



16. In Assam, the ratio of Aircel sim card and Airtel sim card sold is **:**

(A) 3 : 2 (B) 2 : 5
(C) 5 : 2 (D) 2 : 3
(E) None of these

17. In which state are there the largest number of owners of Airtel sim card ?

(A) Tamil Nadu (B) Gujarat
(C) Kerala (D) Assam
(E) None of these

18. Average of sim card sold in the four states in lakhs is **:**

(A) 30.25 (B) 40.5
(C) 35 (D) 33.75
(E) None of these

19. The difference of BSNL sim card sold in the Gujarat and Assam in lakhs is **:**

(A) 12 (B) 15
(C) 14 (D) 13
(E) None of these

20. Of all the sim cards sold in all the four states, the number of sim cards sold in Gujarat is (approx.).

(A) 40% (B) 38%
(C) 35% (D) 42%
(E) None of these

Directions (21–25) : What should come in place of question mark (?) in the following number series ?

21. 2 26 286 ? 18018 90090 270270

(A) 3088 (B) 2667
(C) 3862 (D) 2574
(E) None of these

22. 358 356 352 344 328 296 ?

(A) 232 (B) 247
(C) 225 (D) 255
(E) None of these

23. 8 ? 30 105 472.5 2598.75 16891.875

(A) 24 (B) 10
(C) 12 (D) 16
(E) None of these

24. 3 4 ? 21 85 110 326

(A) 7 (B) 10
(C) 12 (D) 14
(E) None of these

25. 50000 10000 2500 500 125 ? 6.25

(A) 75 (B) 25
(C) 50 (D) 31.5
(E) None of these

26. If 3 years are subtracted from the present age of Rajesh and the remainder is divided by 12, then the present age of his grandson Narendra is obtained. If Narendra is 4 years younger to Abdul whose age is 10 years, then what is the present age of Rajesh ?

(A) 55 years (B) 65 years
(C) 75 years (D) 85 years
(E) None of these

27. A bike owner buys petrol at Rs.7.50, Rs.8 and Rs.8.50 per liter for three successive years. What approximately is the average cost per liter of petrol if he spends Rs.4000 eachyear ?

(A) Rs.7.98 (B) Rs.8
(C) Rs.8.50 (D) Rs.9
(E) None of these

28. Two numbers A and B are such that the sum of 5% of A and 4% of B is two third of the sum of 6% of A and 8% of B. Find the ratio of A : B.

(A) 2 : 3 (B) 1 : 1
(C) 3 : 4 (D) 4 : 3
(E) None of these

29. The percentage profit earned by selling an item for Rs.2030 is equal to the percentage loss incurred by selling the same item for Rs.1370. At what price should the item be sold to make 25% profit ?

(A) Rs.2225 (B) Rs.2125
(C) Rs.2200 (D) Insufficient Data
(E) None of these

30. In a shop, the profit is 220% of the cost. If the cost increases by 25% but the selling price remains constant, find out approximately what percentage of the selling price is the profit ?

(A) 51% (B) 65%
(C) 61% (D) 150%
(E) None of these

31. If P : Q = 2 : 3, Q : R = 4 : 5 and R : S = 6 : 7, then find the value of P : Q : R : S

(A) 18 : 26 : 30 : 35 (B) 16 : 24 : 30 : 35
(C) 15 : 25 : 30 : 35 (D) 15 : 24 : 30 : 35
(E) None of these

32. A can complete a work in 12 days working 8 hours a day. B can complete the same work in 8 days working 10 hours a day. If both A and B work together, working 8 hours a day, in how many days can they complete the work ?

(A) $5\frac{5}{11}$ (B) $5\frac{6}{11}$
(C) $5\frac{7}{11}$ (D) $5\frac{8}{11}$
(E) None of these

33. A man travelled a distance of 66 km in 9 hours. He travelled partly on foot @ 4 km/hr and partly on bicycle @ 9 km/hr. The distance travelled on foot is **:**

(A) 10 km (B) 12 km
(C) 15 km (D) 22 km
(E) None of these

34. A train 96 m long moving at a speed of 60 km/hr. crosses a train 104 m long coming from opposite direction in 5 seconds. The speed of the second train is

(A) 64km/hr. (B) 74 km/hr.
(C) 84km/hr. (D) 88km/hr.
(E) None of these

35. A sum at simple interests at $15\frac{1}{2}\%$ per annum amounts to Rs.2794.50 after 4 years find the sum.

(A) Rs.1600 (B) Rs.1625
(C) Rs.1700 (D) Rs.1725
(E) None of these

36. Mayank saves Rs.200 at the end of each year and lends the money at 5% compound interest. How much will it become at the end of 3 years.

(A) 660.02 (B) 661.02
(C) 662.02 (D) 663.02
(E) None of these

37. A wheel makes 5000 revolutions in moving a distance of 50 km. Find the radius of the wheel.

(A) 1.59 (B) 1.79
(C) 2.59 (D) 2.89
(E) None of these

38. If the areas of three adjacent faces of a cuboidal box are 143 sq cm, 91 sq cm and 77 sq cm, respectively, find the volume of the box.

(A) 901 cm^3 (B) 1001 cm^3
(C) 1101 cm^3 (D) 1201 cm^3
(E) None of these

39. A rectangular carpet has an area of 120 sq m and a perimeter of 46 m. Find the length of the diagonal.

(A) 11 m (B) 13 m
(C) 15 m (D) 17 m
(E) None of these

40. If radius of sphere is decreased by 26%, by what percent does its surface area decrease ?

(A) 44% (B) 49%
(C) 42.24% (D) 46.2%
(E) None of these

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
B	C	E	A	B	B	C	D	E	A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	B	A	D	D	B	A	A	D	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	A	C	C	B	C	A	D	B	C
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
B	A	B	C	D	C	A	B	D	C

SOLUTIONS

1. (B) $13 \times 15 + 158 = (?)^2 + 128$

$\Rightarrow \quad (?)^2 = 225$

$\therefore \quad ? = \sqrt{15 \times 15} = 15$

2. (C) $(4 \times 4)^3 \div (512 \div 8)^4 \times (32 \times 8)^4 = (2 \times 2)^{? + 4}$

$= \quad \dfrac{(4^2)^3 \times (4^4)^4 = (4)^{?+4}}{(4^3)^4} = (4)^{? + 4}$

$= \quad \dfrac{4^6 \times 4^{16}}{4^{12}} = (4)^{? + 4}$

$= \quad 4^{10} = 4^{? + 4}$

or, $\quad ? = 6$

3. (E) $?^2 = 2\sqrt{49 \times 8} - 21 + 8 + 49 - 14\sqrt{8} = 14\sqrt{8} - 21 + 57 - 14\sqrt{8} = 36 = 6^2$

$\therefore \quad ? = 6.$

4. (A) $1 + \dfrac{1}{4} + 1 + \dfrac{1}{6} - 1 - \dfrac{1}{8} = ? + 1\dfrac{1}{12}$

$= \quad ? = 1 + \dfrac{1}{4} + 1 + \dfrac{1}{6} - 1 - \dfrac{1}{8} - 1 - \dfrac{1}{12}$

$= \quad \dfrac{1}{4} + \dfrac{1}{6} - \dfrac{1}{8} - \dfrac{1}{12} = \dfrac{6 + 4 - 3 - 2}{24} = \dfrac{5}{24}$

5. (B) $\dfrac{965 \times 75}{100} = \dfrac{835 \times 45}{100} + ?$

$= \quad 723.75 = 375.75 + ?$

$\therefore \quad ? = 723.75 - 375.75 = 348.$

6. (B) $? = (4650.4408 + 1309.9413 + 83.0405) - (1959.9987 + 1550.009 + 213.45)$

$= \quad 6043.4226 - 3723.4577 = 2319.9649$

7. (C) $? = 123.5 \times 33.75 - 34.52 \times 71.5 + \dfrac{4}{11} \times 14641$

$= \quad 4168.125 - 2468.18 + 4 \times 1331$

$= \quad 1699.945 + 5324 = 7023.945$

8. (D) $182 \times 11 + 213 = ? - 23$

or, $\quad ? = 2002 + 213 + 23$

$= \quad 2238$

9. (E) $0.004 \times 40 + 1.0026 = ? - 84$

or, $? = 0.16 + 1.0026 + 84$

$= \quad 85.1626$

10. (A) $23.8 + 2.18 + 201.35 = 227.33$

11. (D) Take nearest values
1340.0002 ÷ 24.999 × 3.5 × 4 = ?
53.6 × 3.5 × 4 = 750 (approx.)

12. (B) Take nearest values
4895.009 – 360.999 – 150.189 × 3 = ? = 4080 (approx.)

13. (A) Take nearest values
$(14)^2 + (29.99)^2 + (18.001)^2 = 196 + 900 + 324 = 1420$ (approx.)

14. (D) Take nearest values
(99999 ÷ 999 ÷ 9) × 9.999 ® 11.12 × 10 = 111 (approx.)

15. (D) $= \frac{145}{100} \times 1349 + \frac{15.5}{100} \times 1319 = 1956.05 + 204.445 = 2160.495 » 2160$

16. (B) Required ratio = 2 : 5

17. (A) It is obvious from the bar diagram.

18. (A) Required average = 121/4 = 30.25 lakhs.

19. (D) Required range = 16 – 3 = 13 lakhs.

20. (B) Required percentage $= \frac{46}{121} \times 100 = 38$.

21. (D) The pattern of the number series is as given below **:**
2 × 13 = 26
26 × 11 = 286
286 × 9 = 2574
2574 × 7 = 18018
18018 × 5 = 90090

22. (A) The pattern of the number series is as given below:
358 – 2 = 356
356 – 4 = 352
352 – 8 = 344
344 – 16 = 328
328 – 32 = 296
296 – 64 = 232.

23. (C) The pattern of the number series is as given below **:**
8 × 1.5 = 12
12 × 2.5 = 30
30 × 3.5 = 105
105 × 4.5 = 472.5

24. (C) The pattern of the number series is as given below **:**
3 + 12 = 4
4 + 23 = 12
12 + 32 = 21
21 + 43 = 85
85 + 52 = 110
110 + 63 = 326

25. (B) The pattern of the number series is as given below :

50000 ÷ 5 = 10000

10000 ÷ 4 = 2500

2500 ÷ 5 = 500

500 ÷ 4 = 125

125 ÷ 5 = 25

25 ÷ 4 = 6.25

26. (C) Narendra's age = (10 – 4) years = 6 years.

Let Rajesh's age x years

Then $\frac{x-3}{12} = 6$

So x – 3 = 72 so x = 75

27. (A) Total quantity of petrol consumed in 3 years = $\left(\frac{4000}{7.50} + \frac{4000}{8} + \frac{4000}{8.50}\right)$ liters

$= 4000\left(\frac{2}{15} + \frac{1}{8} + \frac{2}{17}\right)$ liters

$= \left(\frac{76700}{51}\right)$ liters

Total amount = ₹ (3 × 4000) = ₹ 12000.

$\therefore$ Average cost = ₹ $\left(\frac{12000 \times 51}{76700}\right)$ = ₹ $\frac{6120}{767}$ = ₹ 7.98

28. (D) 5% of A + 4% of B = $\frac{2}{3}$ (6% of A + 8% of B)

$\Rightarrow \quad \frac{5}{100}A + \frac{4}{100}B = \frac{2}{3}\left(\frac{6}{100}A + \frac{8}{100}B\right)$

$\Rightarrow \quad \frac{1}{20}A + \frac{1}{25}B = \frac{1}{25}A + \frac{4}{75}B$

$\Rightarrow \quad \left(\frac{1}{20} - \frac{1}{25}\right)A = \left(\frac{4}{75} - \frac{1}{25}\right)B$

$\Rightarrow \quad \frac{1}{100}A = \frac{1}{75}B$

$\Rightarrow \quad \frac{A}{B} = \frac{100}{75} = \frac{4}{3}$

Required ratio = 4 : 3

29. (B) Let CP = x

Percentage profit earned by selling an item for ₹ 2030

$= \quad \frac{SP - CP}{CP} \times 100$

$= \frac{2030 - x}{x} \times 100$

Percentage loss in incurred by selling the same item for ₹ 1370.

Given that Percentage profit earned by selling an item for ₹ 2030 = Percentage loss incurred selling the same item for 1370.

$\Rightarrow \frac{2030 - x}{x} \times 100 = \frac{x - 1370}{x} \times 100$

$\Rightarrow 2030 - x = x - 1370$

$\Rightarrow 2x = 2030 + 1370 = 3400$

$\Rightarrow x = \frac{3400}{2}$

$\Rightarrow 1700$

Required Selling Price = CP × $\frac{125}{100}$

$= 1700 \times \frac{125}{100} \Rightarrow 1700 \times \frac{5}{4}$

$\Rightarrow 425 \times 5 = 2125$

30. (C) Let the CP = 100

Profit = $\frac{220}{100} \times 100 = 220$

SP = CP + Profit = 100 + 220 = 320

If the cost increase by 25%, New CP = $\frac{125}{100} \times 100 = 125$

Selling Price is constant, hence New SP = 320

Profit = SP – CP = 320 – 125 = 195

Required Percentage = $\frac{195}{320} \times 100$

$\Rightarrow \frac{1950}{32}$

$\approx 61\%$

31. (B) P : Q = 2 : 3

Q : R = 4 : 5 = $\left(4 \times \frac{3}{4} : 5 \times \frac{3}{4}\right)$

$= 3 : \frac{15}{4}$

R : S = 6 : 7 = $\left(6 \times \frac{15}{24} : 7 \times \frac{15}{24}\right)$

$= \frac{15}{4} : \frac{35}{8}$

$= P : Q : R : S = 2 : 3 : \frac{15}{4} : \frac{35}{8}$

$= 16 : 24 : 30 : 35$

$= 8 : 12 : 9$

32. (A) A can complete the work in (12 × 8) hrs. = 96 hrs.

B can complete the work in (8 × 10) hrs. = 80 hrs.

$\therefore$ A's 1 hour's work = $\frac{1}{96}$ and B's 1 hour's work = $\frac{1}{80}$

(A + B)'s 1 hour's work = $\left(\frac{1}{96}+\frac{1}{80}\right)=\frac{11}{480}$

So, both A and B will finish the work in $\frac{480}{11}$ Hrs.

No. of days of 8 hours each = $\left(\frac{480}{11}\times\frac{1}{8}\right)=\frac{60}{11}$ days $=5\frac{5}{11}$ days.

33. (B) Let the distance travelled on foot be x km.

Then, distance travelled on bicycle = (66 – x) km.

So, $\frac{x}{4}+\frac{(66-x)}{9}=9$

$\Rightarrow$ 9x + 4(66 – x) = 9 × 36

$\Rightarrow$ 5x = 60

$\Rightarrow$ x = 12 km

34. (C) Relative speed = (x + 60) km/hr.

$= (x + 60) \times \frac{5}{18}$ m/sec

$= \frac{300+5x}{18}$ m/sec.

Distance covered = (96 + 104) m

= 200 m

$= \frac{200}{\frac{300+5x}{18}} = 5$

= 200 x 18 = 5(300 + 5x)

$\Rightarrow$ x = 84 km/hr.

35. (D) We know that; $\boxed{SI=\frac{P\times R\times T}{100}}$

Let sum be ` x. Then

S.I. = $\frac{x\times 15\frac{1}{2}\times 4}{100}$

S.I. = $\frac{x \times 31 \times 4}{2 \times 100}$

S.I. = $\frac{31x}{50}$

$\Rightarrow$ Amount = ₹ $\left(x + \frac{31x}{50}\right)$ ₹ $\frac{81x}{50}$

Now, $\frac{81x}{50}$ = 2794.50

x = 2794.50 × $\frac{50}{81}$ $\Rightarrow$ 1725

Hence, sum = 1725.

36. (C) We know that

$$\text{Amount} = P\left(1 + \frac{R}{100}\right)^n$$

$$\Rightarrow \quad \text{Amount} = 200 \times \left(1 + \frac{5}{100}\right)^3 + 200 \times \left(1 + \frac{5}{100}\right)^2 + 200 \times \left(1 + \frac{5}{100}\right)$$

$$\Rightarrow \quad \left(200 \times \frac{105}{100} \times \frac{105}{100} \times \frac{105}{100}\right) + \left(200 \times \frac{105}{100} \times \frac{105}{100}\right) + \left(200 \times \frac{105}{100}\right)$$

$$\Rightarrow \quad \left(200 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}\right) + \left(200 \times \frac{21}{20} \times \frac{21}{20}\right) + \left(200 \times \frac{21}{20}\right)$$

$\Rightarrow$ ₹ 662.02

37. (A) Distance covered in 1 revolution

$$= \frac{50 \times 1000}{5000} = 10\text{m}$$

According to the question,

$2\pi r = 10$

$$2 \times \frac{22}{7} \times r = 10$$

$$\therefore \quad r = \frac{10 \times 7}{44} = 1.59 \text{ m}$$

38. (B) lb = 143, bh = 91, lh = 77

$\therefore$ lb × bh × lh = 143 × 94 × 77

$(lbh)^2$ = 143 × 9 × 77

$lbh = \sqrt{143 \times 91 \times 77}$

$= \sqrt{13 \times 11 \times 13 \times 7 \times 11 \times 7}$

= (13 × 11 × 7)

= 1001 cm^3

39. (D) According to the question

$L \times B = 120$

And $2(L + B) = 46$

$L + B = 23$

Now, $(L - B)^2 = (L + B)^2 - 4LB$

$= (23)^2 - 4 \times 120$

$= 529 - 480 = 49$

$L - B = \sqrt{49} = 7$

On solving, $L + B = 23$ and $L - B = 7$

We have,

Diagonal $= \sqrt{15^2 + 8^2} = \sqrt{225 + 8}$

$= \sqrt{289} = 17\text{m}$

40. (C) According to the formula,

Percentage decrease in surface area

$$= \left[2 \times (-26) + \frac{(-26 \times (-26)}{100}\right]\%$$

$$= [-52 + 6.76]\% = -45.24\%$$

IBPS PO PRELIMINARY

QUANTITATIVE APTITUDE

Directions: (1–5) : In each of these questions a number series is given. In each series only one number is wrong. Find out the wrong number.

1. 211, 326, 381, 611, 721, 1066, ?

(A) 1222 (B) 1234
(C) 1241 (D) 1231
(E) 1250

2. 16, 53, 222, 1125, 6770, ?

(A) 46575 (B) 47415
(C) 44575 (D) 47815
(E) 47615

3. 8. 36, 54, 108, 270, 810, ?

(A) 2935 (B) 2735
(C) 2635 (D) 2535
(E) 2835

4. 6, 15, 51, 132, 276, 501,…….. ?

(A) 736 (B) 726
(C) 769 (D) 772
(E) 782

5. 14526, 14518, 14491, 14427, 14302, 14086 ?

(A) 13443 (B) 13573
(C) 13543 (D) 13743
(E) 13473

6. The simple interest accrued on an amount of Rs. 20,500 at the end of four years is ₹ 7,380. What would be the compound interest accrued on the same amount at the same rate of interest at the end of two years ?

(A) ₹ 3856.05 (B) ₹ 4856.05
(C) ₹ 5856.05 (D) ₹ 6856.05
(E) None of these

7. The ratio of the present age of Girish and Abhay is 5 : X. Girish is 8 years younger than Vijay. Vijay‘s age after 8 years will be 36 years. The difference between Abhay‘s and Girish‘s age is the same as the present age of Vijay. What should come in place of X ?

(A) 23 (B) 39
(C) 15 (D) Cannot be determined
(E) None of these

8. Priya's monthly income is two times Shivani's monthly income, Shivani 's monthly income is twenty percent more that Jigyasa's monthly income. Jigyasa's monthly income is ₹ 36,000. What is Priya 's annual income ?

(A) ₹ 10,36,800 (B) ₹ 12,24,800
(C) ₹ 9,36,800 (D) ₹ 10,52,200
(E) None of theses

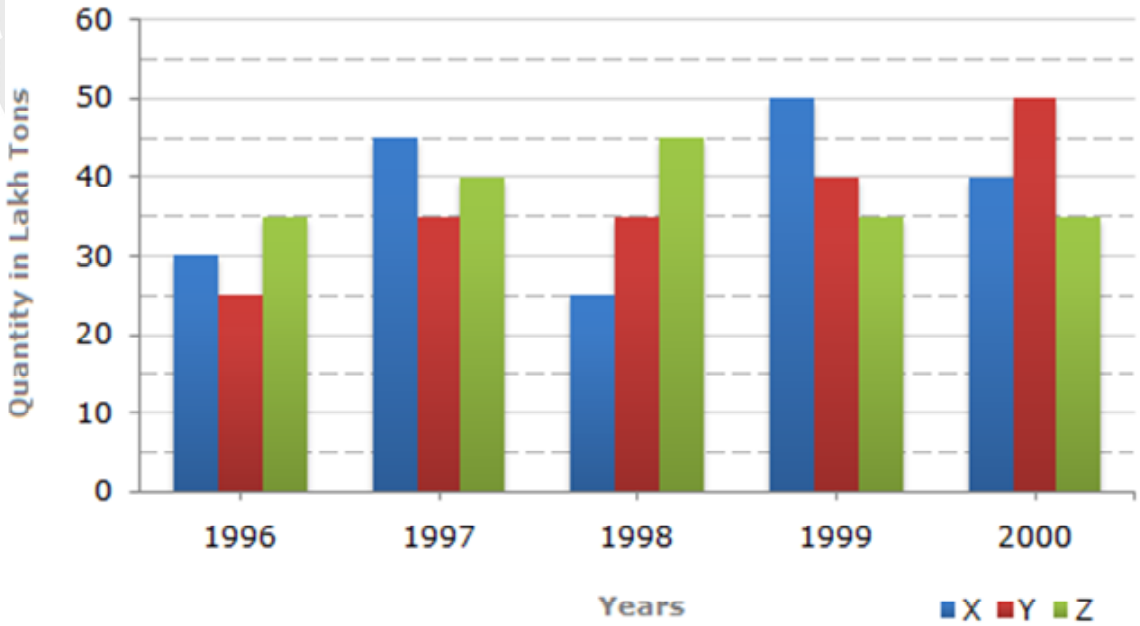
9. An HR Company employees 5600 persons, out of which 40 percent are males and 70 percent of the males are either 28 years or older. How many males are employed in that HR Company who are younger than 28 years ?

(A) 2640 (B) 2160
(C) 1296 (D) 864
(E) None of these

10. Two trains can run at a speed of 30 ms–1 and 20 ms–1 respectively on parallel tracks. When they are running in opposite directions they cross each other in 5 seconds. When they are running in the same direction, a person sitting in the faster train observes that he passes the other train in 34 seconds. What is the ratio of the lengths of the two trains ?

(A) 4 : 3 (B) 3 : 2
(C) 5 : 2 (D) 2 : 3
(E) None of these

Example (11–15) : The bar graph given below shows the data of the production of paper (in lakh tones) by three different companies X, Y and Z over the years. Production of Paper (in lakh tones) by Three Companies X, Y and Z over the Years.



11. For which of the following years, the percentage rise/fall in production from the previous year is the maximum for Company Y ?

(A) 1997 (B) 1998
(C) 1999 (D) 2000
(E) None of these

12. What is the ratio of the average production of company x in the period 1998 to 2000 to the average production of company y in the same period ?
(A) 1 : 1 (B) 15 : 27
(C) 23 : 25 (D) 27 : 29
(E) None of these

13. What is the percentage increase in the production of company y from 1996 to 1999 ?
(A) 30% (B) 45%
(C) 50% (D) 60%
(E) None of these

14. The average production of five years was maximum for which company ?
(A) x (B) y
(C) z (D) x and z both
(E) None of these

15. In which year was the percentage of production of company z to the production of company y the maximum ?
(A) 1996 (B) 1997
(C) 1998 (D) 1999
(E) None of these

Directions (Q. 16–20) : Study the given table carefully to answer the given questions.
Percentage profit or loss is based on the sum of cost price and transportation cost.

Name of goods	Cost price (in ')	Selling price (in `)	Cost of transportation (in ')	Profit (in `)	Loss (in ')	Profit or Loss %
V	40	-	20	-	-	-
W	-	110	0	-	10	-
X	230	-	30	10	-	-
Y	-	300	0	-	-	5 % loss
Z	500	-	50	-	-	10 % profit (of CP)

16. The percentage profit on V is 5%. Then what is its selling price ?
(A) ₹ 63 (B) ₹ 48
(C) ₹ 73 (D) ₹ 83
(E) ₹ 93

17. The selling price of X is what per cent of the cost price of W ?
(A) 250% (B) 275%
(C) 225% (D) 235%
(E) 125%

18. What is the ratio of the loss on Y to that on W ?
(A) 253 : 145 (B) 365 : 255
(C) 825 : 551 (D) 789 : 500
(E) 563 : 258

19. What is the difference between the selling price of Z and that of X ?

(A) ₹ 330 (B) ₹ 294
(C) ₹ 240 (D) ₹ 230
(E) ₹ 350

20. If the loss on V is 5%, then its selling price is what percentage less than the selling price of Z ?

(A) 88.7% (B) 90.5%
(C) 85.7% (D) 92.7%
(E) 95.7%

Directions (21–25) : In each of these questions, two equations are given. You have to solve these equations and find out the values of x and y and Give answer

(A). If $x > y$
(B). If $x \geq y$
(C). If $x < y$
(D). If $x \leq y$
(E). If $x = y$ or relationship cannot be established

21. I. $x^2 + 14x + 48 = 0$
II. $y^2 + 7y + 10 = 0$

22. I. $x = (-11)^2$
II. $y^2 + y - 9900 = 0$

23. I. $x^2 - 5x + 6 = 0$
II. $y^2 - 4y + 3 = 0$

24. I. $x \times 35\% - x/20 = 6$
II. $y^2 = 400$

25. I. $17x^2 - 14x - 43 = -40$
II. $y^2 = 5y + 204$

26. A sum of Rs. 6710 was taken as a loan. This is to be repaid in two equal annual installments. If the rate of interest be 20% compounded annually then the value of each instalment is

(A) ₹ 4320 (B) ₹ 4420
(C) ₹ 4400 (D) ₹ 4420
(E) None of these

27. In a shop, the profit is 440% of the cost. If the cost increases by 25% but the selling price remains constant, find out approximately what percentage of the selling price is the profit ?

(A) 177% (B) 87%
(C) 77% (D) 70%
(E) None of these

28. Virat can cover a distance in 1hr 52 min by covering 2/3 of the distance at 4 kmph And the rest at 5 kmph. the total distance is ?

(A) 8 km (B) 10 km
(C) 18 km (D) 12 km
(E) None of these

29. A bag contains 6 white and 4 red balls. Three balls are drawn at random. What is the probability that one ball is red and the other two are white ?

(A) $\frac{7}{8}$ (B) $\frac{7}{9}$
(C) $\frac{7}{10}$ (D) $\frac{7}{11}$
(E) $\frac{7}{12}$

30. $\frac{\frac{1}{\sqrt{9}}-\frac{1}{\sqrt{11}}}{\frac{1}{\sqrt{9}}+\frac{1}{\sqrt{11}}}+\frac{10+\sqrt{99}}{x}=\frac{1}{3}$, Find the value of x.

(A) 1 (B) 2
(C) 3 (D) 4
(E) 5

Directions (Q. 31–35) : What approximate value should come in place of question mark (?) in the following questions ?

31. 439% of 603 + 67.8% of 1007 = ?

(A) 4175 (B) 3320
(C) 3480 (D) 3610
(E) 3850

32. $\sqrt{3490} \times \sqrt{360} = ?$

(A) 1020 (B) 2001
(C) 1021 (D) 1120
(E) 1200

33. 16.03 × 23.489 – 9.749 × 18.04 = ?

(A) 100 (B) 200
(C) 250 (D) 300
(E) 325

34. 129.003 × 15.987 + 20.04 × 16.96 = ?

(A) 2480 (B) 2040
(C) 2400 (D) 2240
(E) 2400

35. 15.38% of 1467 – 20.012 × 9.97 = ?

(A) 36 (B) 26

(C) 126 (D) 264

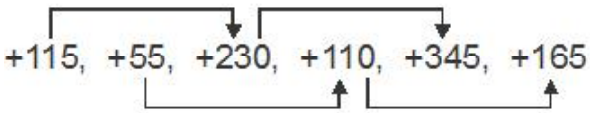
(E) 30

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
D	B	E	B	D	A	E	B	D	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A	C	D	D	A	A	C	D	A	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
C	A	E	B	E	A	C	A	A	B
31	**32**	**33**	**34**	**35**					
C	D	B	A	B					

SOLUTIONS

1. (D) 1231



2. (B) × 3 + 5, × 4 + 10, × 5 + 15.....

3. (E) × 1.5, × 2, × 2.5, × 3.....

4. (B) $+3^2$, $+6^2$, $+9^2$, $+12^2$, $+15^2$

5. (D) $-2^3, -3^3, -4^3, -5^3, -6^3, -7^3$

6. (A) ₹ 3856.05

(7380 x 100)/ (20500 x 4) = 9%

C.I. $= ₹\ 20500\left(1+\frac{9}{100}\right)^2 - 20500$

$= ₹\ 3856.05$

7. (E) None of these

Vijay's present age = 28 yrs.

∴ Girish 's present age = 20 yrs (28 – 8)

∴ Abhay 's present age = 20 + 36 = 56 yrs.

∴ Ratio of the present age of Girish and Abhay = 20 : 56 = 5 : 14

∴ x = 14

8. (B) ₹ 10,36,800

Shivani's monthly income = 36000 × 120/100 = ₹ 43200

Priya's monthly income = 2 × 43200 = 86400

∴ Priya's annual income = 86400 x 12 = ₹ 10,36,800

9. (D) 864

Total = 5600

40% of males = 2240

30% are younger than 28 years = 672

10. (B) Let the length of the faster train and the slower train be 'x' and 'y' respectively.

∴ Speed in the opposite direction = 30 + 20 = 50 ms^{-1}

Speed in the same direction = 30 – 20 = 10ms^{-1}

$$\frac{x+y}{50} = 5$$

∴ x + y = 250 ...(i)

The person passes the length of the slower train in 34 seconds.

$$\frac{y}{5} = 34$$

∴ y = 120m

So, x = 80m

∴ $\text{Ratio} = \frac{120}{80} = \frac{3}{2} = 3:2$

11. (A) 1997

$$1997 = \frac{35 - 25}{25} \times 100 = 40\%$$

In the year 1998 Production for company is same i.e.: 35

$$1999 = \frac{40 - 35}{35} \times 100 = 14.28\%$$

$$2000 = \frac{50 - 40}{40} \times 100 = 25\%$$

12. (C) Average production of company x in the period 1998–2000

$$\left[\frac{1}{3} \times (25 + 50 + 40)\right] = \left(\frac{115}{3}\right) \text{ lakh tons}$$

Average production of company y in the period 1998–2000

$$\left[\frac{1}{3} \times (35 + 40 + 50)\right] = \left(\frac{125}{3}\right) \text{ lakh tons}$$

$$\text{Therefore required ratio} = \frac{\frac{115}{3}}{\frac{125}{3}} = \frac{115}{125} = \frac{23}{25}$$

13. (D) percentage increase in the production y from 1996–1999

$$\left[\left(\frac{40 - 25}{25 \times 100}\right)\right]\% = \left(\frac{15}{25 \times 100}\right)\% = 60\%$$

14. (D) average production (in lakh tons) in five years for the three companies are **:**

$$\text{For company x} = \left[\frac{1}{5} \times (30 + 45 + 25 + 50 + 40)\right] = \frac{190}{5} = 38$$

$$\text{For company y} = \left[\frac{1}{5} \times (25 + 35 + 35 + 40 + 50)\right] = \frac{185}{5} = 37$$

$$\text{For company z} = \left[\frac{1}{5} \times (35 + 40 + 45 + 35 + 35)\right] = \frac{190}{5} = 38$$

Therefore the average production of maximum for both the company's x and z

15. (A) The percentages of production of company z to the production of company z for various years are **:**

$$\text{For 1996} = \left[\left(\frac{35}{25}\right) \times 100\right]\% = 140\%$$

$$\text{For 1997} = \left[\left(\frac{40}{35}\right) \times 100\right]\% = 114.29\%$$

For 1998 = $\left[\left(\frac{45}{35}\right)\times 100\right]\% = 128.57\%$

For 1999 = $\left[\left(\frac{35}{40}\right)\times 100\right]\% = 87.5\%$

For 2000 = $\left[\left(\frac{35}{50}\right)\times 100\right]\% = 70\%$

16. (A) Cost price of V = ₹ 40
Transportation cost = ₹ 20
Total cost price = 40 + 20 = ₹ 60
Profit = 5 %

Selling Price = $60\times\frac{105}{100}$ = ₹ 63

17. (C) Selling price of X = (Cost price + Cost on transportation + profit)
= 230 + 30 + 10 = ₹ 270
Cost price of W = Selling price + Loss = 110 + 10 = ₹ 120

$\therefore$ Required% = $\frac{270\times 100}{120}$ = 225% of the cost price of W.

18. (D) Loss on Y = Cost price of Y – Selling price of Y

= $300\times\frac{100}{95} - 300$ = 315.78 – 300 = ₹ 15.78

Loss on W = ₹ 10
$\therefore$ Reqd ratio = 15.78 : 10 = 789 : 500

19. (A) Selling price of Z = Cost price of Z + Cost on transportation + Profit

= $500 + 50 + 500\times\frac{10}{100}$ = ₹ 600

$\therefore$ Selling price of X = ₹ 270
$\therefore$ Difference = 600 – 270 = ₹ 330

20. (B) Selling price of V = (Cost price + Cost of Transportation) × $\frac{95}{100}$

= $(40 + 20)\times\frac{95}{100}$ = ₹ 57

$\therefore$ Selling price of Z = ₹ 600

$\therefore$ Required % = $\frac{600 - 57}{600}\times 100\% = 90.5\%$ less than selling price of Z.

Sol. (21–25) :

21. (C) x = – 8, – 6, y = –5, –2 ; x < y

22. (A) x = 121, y = –100, 99 ; x > y

23. (E) x = 3, 2 y = 3, 1 ; No Relation

24. (B) x = 20 y = ± 20 y = –12, 17 ; No Relation

25. (E) x = 1, –3/17

26. (A) Present worth of ₹ x due T years hence is given by

$$\text{Present Worth (PW)} = \frac{x}{\left(1+\frac{R}{100}\right)^{T}}$$

Let x be the annual payment

Then, present worth of x due 1 year hence + present worth x due 2 years hence

$$\Rightarrow \quad \frac{x}{\left(1+\frac{20}{100}\right)^{1}} + \frac{x}{\left(1+\frac{20}{100}\right)^{2}} = 6710$$

$$\Rightarrow \quad \frac{x}{\left(\frac{6}{5}\right)^{1}} + \frac{x}{\left(\frac{6}{5}\right)^{2}} = 6710$$

$$\frac{55x}{36} = 6710$$

$$\Rightarrow \quad x = 4392.$$

27. (C) Let the CP = 100

$$\text{Profit} = \frac{440}{100} \times 100 = 320$$

SP = CP + Profit = 100 + 440 = 540

$$\text{If the cost increase by 25\%, New P} = \frac{125}{100} \times 100 = 125$$

Seeling Price is constant, hence New SP = 540

Profit = SP – CP = 540 – 125 = 415

$$\text{Required Percentage} = \frac{415}{540} \times 100$$

$$\Rightarrow \quad \frac{4150}{54}$$

≈ 77%.

28. (A) Let total distance = D

$$\text{Distance travelled at 4 kmph speed} = \left(\frac{2}{3}\right)D$$

$$\text{Distance travelled at 5 kmph speed} = \left(1-\frac{2}{3}\right)D \Rightarrow \frac{1}{3}D$$

Total time = 1 hr 52 min $\Rightarrow$ (60 + 52) min $\Rightarrow \left(\frac{112}{60}\right)$hr $\Rightarrow \left(\frac{56}{30}\right)$hr $\Rightarrow \left(\frac{28}{15}\right)$hr

We know, Time = $\frac{\text{Distance}}{\text{Speed}}$

Total time = $\frac{28}{15} = \frac{\frac{2}{3}D}{4} + \frac{\frac{1}{3}D}{5}$

$\Rightarrow \quad \frac{28}{15} = \frac{2D}{12} + \frac{D}{15}$

$\Rightarrow \quad \frac{28}{15} = \frac{14D}{60}$

$\Rightarrow$ 112 = 14D

$\Rightarrow$ D = 8 km.

29. (A) Let S be the sample space. Then,

n(S) = number of ways of drawing 3 balls out of 10,

$= \quad {}^{10}C_3 = \frac{(10 \times 9 \times 8)}{(3 \times 2 \times 1)} = 120$

LET E = event of drawing 1 red and 2 white balls

n (E) = Number of ways of drawing 1 red and 2 white balls

$= \quad ({}^5C_1 \times {}^7C_2) = \left(5x \frac{7 \times 6}{2 \times 1}\right) = 105$

$= \quad P(E) = \frac{n(E)}{n(S)} = \frac{105}{120} = \frac{7}{8}$

30. (B) Let $\left[\frac{\frac{1}{\sqrt{9}} - \frac{1}{\sqrt{11}}}{\frac{1}{\sqrt{9}} + \frac{1}{\sqrt{11}}}\right] + \left[\frac{10 + \sqrt{99}}{x}\right] = \frac{1}{3}$

$\Rightarrow \quad \left[\frac{\sqrt{11} - \sqrt{9}}{\sqrt{11} + \sqrt{9}}\right] + \left[\frac{10 + \sqrt{99}}{x}\right] = \frac{1}{3}$

$\Rightarrow \quad \left[\frac{\left(\sqrt{11} - \sqrt{9}\right)\left(\sqrt{11} - \sqrt{9}\right)}{\left(\sqrt{11} + \sqrt{9}\right)\left(\sqrt{11} + \sqrt{9}\right)}\right] + \left[\frac{10 + \sqrt{99}}{x}\right] = \frac{1}{3}$

$\Rightarrow \quad \left[\frac{\left(\sqrt{11} - \sqrt{9}\right)^2}{11 - 9}\right] + \left[\frac{10 + \sqrt{99}}{x}\right] = \frac{1}{3}$

$$\Rightarrow \quad \left[\frac{11-2\sqrt{11}\sqrt{9}+9}{2}\right]+\left[\frac{10+\sqrt{99}}{x}\right]=\frac{1}{3}$$

$$\Rightarrow \quad \frac{\left(10-\sqrt{99}\right)\left(10+\sqrt{99}\right)}{x}=\frac{1}{3}$$

$$\Rightarrow \quad \frac{(100-99)}{x}=\frac{1}{3}$$

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

$$\Rightarrow \quad x \Rightarrow 3.$$

31. (C) $? \approx \frac{440 \times 600}{100} + \frac{68 \times 1000}{100}$

$= 2640 + 680 = 3320.$

32. (D) $? = \sqrt{3490} \times \sqrt{360} = \approx 59 \times 19$

$= 1121 \approx 1120$

33. (B) $? \approx 16 \times 23.5 - 9.75 \times 18s$

$= 376 - 175 = 201 \approx 200$

34. (A) $? \approx 129 \times 16 + + 20 \times 17$

$= 2064 + 340 = 2404 \approx 2400$

35. (B) $? \approx \frac{15.4 \times 1470}{100} - 20 \times 10$

$= 226.4 - 200 = 26.4 \approx 26$

IBPS PO MAIN

QUANTITATIVE APTITUDE

Directions (1–5) : What approximate value should come in place of the question mark (?) in the following questions? (Note: You are not expected to calculate the exact value.)

1. Simplify 646643 × 9999 = ?

(A) 6865863357 (B) 6665863357
(C) 6465783357 (D) 6665863357
(E) None of these

2. 9999 ÷ 999 ÷ 99 ÷ 9 = ? / 100

(A) 1 (B) 2
(C) 3 (D) 4
(E) 5

3. The largest 4 digit number exactly divisible by 82 is = ?

(A) 8822 (B) 9988
(C) 9822 (D) 9922
(E) 9982

4. The difference of the squares of two consecutive even integers is divisible by which of the following integers = ?

(A) 2 (B) 3
(C) 4 (D) 5
(E) 5

5. Which of the following numbers will completely divide $(4^{61} + 4^{62} + 4^{63} + 4^{64})$?

(A) 3 (B) 5
(C) 10 (D) 11
(E) 15

Directions (6–10) : What should come in place of the question mark (?) in the following number series ?

6. 23 27 36 52 77 113 ?

(A) 145 (B) 162
(C) 172 (D) 282
(E) 362

7. 841 961 1369 1681 1849 2209 ?

(A) 2099 (B) 2189
(C) 2809 (D) 2251
(E) 3249

8. 18 27 54 135 405 1417.5 ?

(A) 3670 (B) 5760
(C) 5670 (D) 5370
(E) 6760

9. 9 35 138 549 2192 8763 ?

(A) 35046 (B) 35956
(C) 35856 (D) 45956
(E) 45856

10. 298 421 667 1036 1528 2143 ?

(A) 2881 (B) 3891
(C) 3881 (D) 4881
(E) 4561

11. What will be the least number which when doubled will be exactly divisible by 18,21,30,36 ?

(A) 196 (B) 630
(C) 1250 (D) 2250
(E) None of these

12. In the first 10 overs of a cricket game, the run rate was only 2.3. What should be the run rate in the remaining 50 overs to reach the target of 263 runs ?

(A) 3.5 (B) 4.8
(C) 4.5 (D) 3.8
(E) 5.00

13. A takes twice as much time as B or thrice as much time as C to finish a piece of work. Working together, they can finish the work in 3 days. B can do the work alone in:

(A) 4 (B) 6
(C) 8 (D) 9
(E) None of these

14. On selling 15 balls at Rs.540, there is a loss equal to the cost price of 9 balls. The cost price of a ball is:

(A) 50 (B) 60
(C) 70 (D) 80
(E) 90

15. A train travelling at a speed of 63 mph enters a tunnel $4\frac{1}{2}$ miles long. The train is $\frac{3}{4}$ mile long. How long does it take for the train to pass through the tunnel from the moment the front enters to the moment the rear emerges ?

(A) 2 min (B) 3 min
(C) 4 min (D) 5 min
(E) 6 min

16. The present ages of three persons in proportions 3 : 5 : 7. Six years ago, the sum of their ages was 57. Find their present ages (in years).

(A) 9, 15, 21 (B) 11, 17, 21
(C) 9, 17, 21 (D) 9, 21, 23
(E) None of these

17. A vessel is filled with liquid, 4 parts of which are water and 7 parts syrup. How much of the mixture must be drawn off and replaced with water so that the mixture may be half water and half syrup ?

(A) 3/13 (B) 5/14
(C) 3/14 (D) 5/13
(E) 5/17

18. A man complete a journey in 8.5 hours. He travels first half of the journey at the rate of 24 km/hr. and second half at the rate of 27 km/hr. Find the total journey in km.

(A) 276 km. (B) 234 km.
(C) 226 km. (D) 222 km.
(E) 216 km.

19. A person borrows ₹ 6000 for 3 years at 5% p.a. simple interest. He immediately lends it to another person at $3\frac{1}{4}$ p.a. for 3 years. Find his gain in the transaction per year.

(A) 37.5 (B) 36.6
(C) 35.6 (D) 33.7
(E) 31.5

20. A rectangular park 48 m long and 40 m wide has two concrete crossroads running in the middle of the park and rest of the park has been used as a lawn. If the area of the lawn is 1584 sq. m, then what is the width of the road ?

(A) 1 m (B) 1.25 m
(C) 1.5 m (D) 2 m
(E) 4 m

21. A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. The time required by the first pipe is:

(A) 5 hr. (B) 7 hr.
(C) 10 hr. (D) 12 hr.
(E) 15 hr.

22. Salaries of Ravi and Sumit are in the ratio 3: 4. If the salary of each is increased by ₹ 3000, the new ratio becomes 35: 42. What is Sumit's salary ?

(A) ₹ 7, 000 (B) ₹ 8, 000
(C) ₹ 9, 000 (D) ₹ 10, 000
(E) None of these

23. Ajay bought 12 kg of dal at the rate of ₹ 11.50 per kg and 8 kg at the rate of ₹ 10 per kg. He mixed the two and sold the mixture at the rate of ₹ 1 per kg. What was his total gain in this transaction?

(A) ₹ 25.50 (B) ₹ 26.50
(C) ₹ 27.50 (D) ₹ 27
(E) ₹ 28.50

24. A shopkeeper sells one transistor for Rs.770 at a gain of 10% and another for ₹ 970 at a loss of 3%. His total gain or loss percent is:

(A) $5\frac{15}{17}$ % loss (B) $5\frac{15}{17}$ % gain
(C) $6\frac{2}{3}$ % gain (D) 7 %
(E) None of these

25. A car travelling with $\frac{5}{8}$ of its actual speed covers 42 km in 1 hr 40 min 48 sec. Find the actual speed of the car.

(A) 25 kmph (B) 27 kmph
(C) 35 kmph (D) 45 kmph
(E) None of these

26. A conical vessel, whose internal radius is 21 cm and height 50 cm, is full of liquid. The contents are emptied into a cylindrical vessel with internal radius 10 cm. Find the height to which the liquid rises in the cylindrical vessel.

(A) 9.5 cm^3 (B) 13.5 cm^3
(C) 12.5 cm^3 (D) 11.5 cm^3
(E) 10.5 cm^3

27. How many words can be formed from the letters of the word 'DIRECTOR' So that the vowels are always together ?

(A) 1860 (B) 1950
(C) 2040 (D) 2160
(E) None of these

28. In how many ways, a committee of 5 members can be selected from 6 men and 5 ladies, consisting of 3 men and 2 ladies ?

(A) 50 (B) 100
(C) 200 (D) 400
(E) None of these

29. In a simultaneous throw of pair of dice. Find the probability of getting the total more than 7 ?

(A) $\frac{3}{17}$ (B) $\frac{5}{12}$
(C) $\frac{7}{13}$ (D) $\frac{7}{19}$
(E) None of these

30. A bag contains 6 white and 4 black balls. 2 balls are drawn at random. Find the probability that they are of same color ?

(A) $\frac{3}{7}$ (B) $\frac{5}{9}$

(C) $\frac{7}{15}$ (D) $\frac{7}{19}$

(E) None of these

Direction (Questions 31 to 35) : The following table shows the number of new employees added to different categories of employees in a company and also the number of employees from these categories who left the company every year since the foundation of the Company in 1995.

Year	Managers		Technicians		Operators		Accountants		Peons	
	New	Left	New	Left	New	Left	New	Left	New	Left
1995	760	-	1200	-	880	-	1160	-	820	-
1996	280	120	272	120	256	104	200	100	184	96
1997	179	92	240	128	240	120	224	104	152	88
1998	148	88	236	96	208	100	248	96	196	80
1999	160	72	256	100	192	112	272	88	224	120
2000	193	96	288	112	248	144	260	92	200	104

31. What is the difference between the total number of Technicians added to the Company and the total number of Accountants added to the Company during the years 1996 to 2000 ?

(A) 54 (B) 68

(C) 78 (D) 82

(E) 88

32. What was the total number of Peons working in the Company in the year 1999 ?

(A) 1312 (B) 968

(C) 1088 (D) 1192

(E) None of these

33. For which of the following categories the percentage increase in the number of employees working in the Company from 1995 to 2000 was the maximum ?

(A) Managers (B) Technicians

(C) Operators (D) Accountants

(E) Peons

34. What is the pooled average of the total number of employees of all categories in the year 1997 ?

(A) 1325 (B) 1195

(C) 1265 (D) 1235

(E) 1335

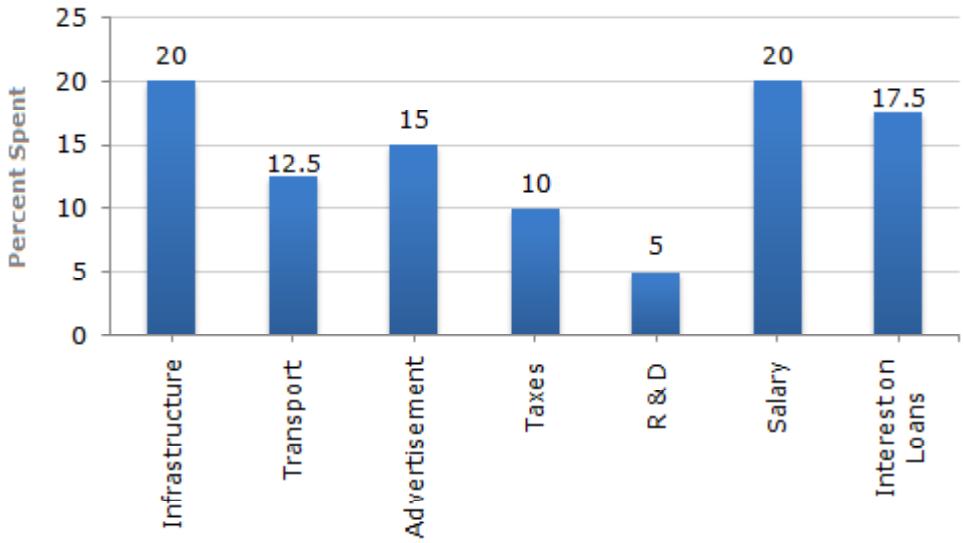
35. During the period between 1995 and 2000, the total number of Operators who left the Company is what percent of total number of Operators who joined the Company ?

(A) 19% (B) 21%

(C) 27% (D) 29%

(E) None of these

Percentage Distribution of Total Expenditure of a Company



36. The total amount of expenditures of the company is how many times of expenditure on research and development ?

(A) 7 (B) 12
(C) 18 (D) 20
(E) 25

37. If the expenditure on advertisement is 2.10 crores then the difference between the expenditure on transport and taxes is ?

(A) Rs.1.25 crores (B) Rs.95 lakhs.
(C) Rs.65 lakhs (D) Rs.35 lakhs
(E) None of these

38. What is the ratio of the total expenditure on infrastructure and transport to the total expenditure on taxes and interest on loans ?

(A) 5:4 (B) 8:7
(C) 9:7 (D) 13:11
(E) 15:17

39. If the interest on loans amounted to Rs.2.45 crores then the total amount of expenditure on advertisement, taxes and research and development is ?

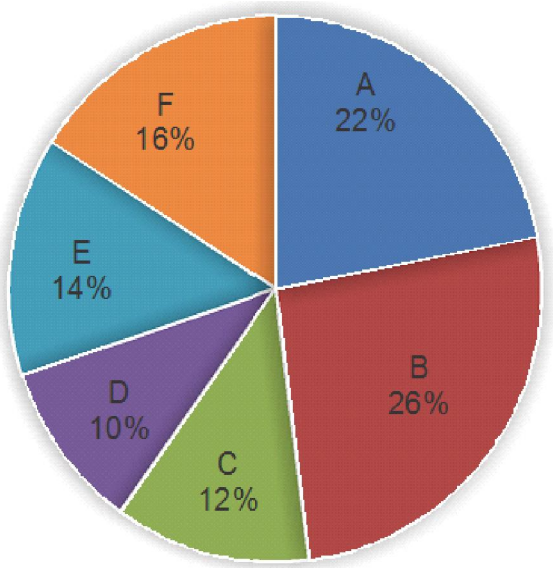
(A) Rs.7 crores (B) Rs.5.4 crores
(C) Rs.4.2 crores (D) Rs.3 crores
(E) None of these

40. The expenditure on the interest on loans is by what percent more than the expenditure on transport ?

(A) 5% (B) 10%
(C) 20% (D) 40%
(E) None of these

Direction (Questions 41 to 45): The following pie chart provides information about the revenue generated by six companies A, B, C, D, E and F as a percentage of the total paper market (in Rs.) in the year 2007. These are the only six companies producing paper in the market.

Percentage Distribution



41. If the revenue generated by company D is Rs. 650 crores, then find the revenue generated by company B.

(A) ₹ 1180 (B) ₹ 1290
(C) ₹ 1560 (D) ₹ 1690
(E) ₹ 1850

42. What is the angle subtended by company A at the center of the circle in the above pie chart ?

(A) 68.2° (B) 79.2°
(C) 80.6° (D) 85.7°
(E) None of these

43. By what percentage the revenue generated by company F more than the revenue generated by company D ?

(A) 35% (B) 40%
(C) 45% (D) 50%
(E) 60%

44. If the revenue generated by company E increases by 15% in the year 2008, then find the percentage increase in the revenue generated by these six companies in the year 2008 assuming that all the other companies except E generated the same revenue as they did in the year 2007.

(A) 2.1% (B) 3.2%
(C) 4% (D) 5%
(E) None of these

45. Which of the following is true ?

(A) In the year 2007 the ratio of the revenue generated by company E to the revenue generated by company B is less than the ratio of the revenue generated by company A to the revenue generated by company D.

(B) In the year 2007 the absolute difference between the revenue generated by company F and B is greater than the absolute difference between the revenue generated by company A and E.

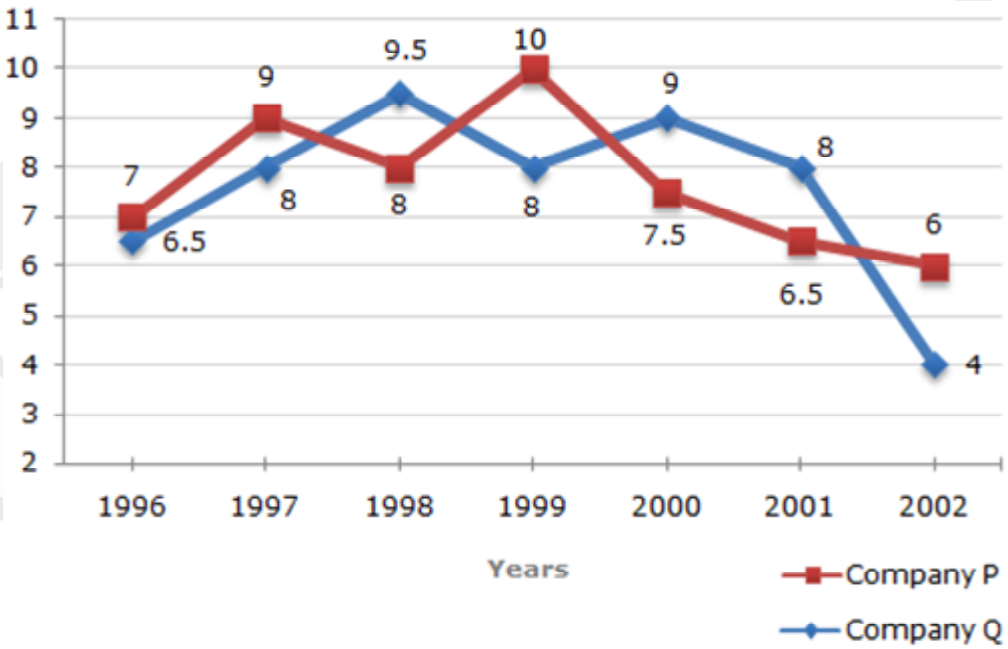
(C) Only (B)

(D) Neither (A) nor (B)

(E) None of these

Direction (Ques. 46 to 50) : Two different finance companies declare fixed annual rate of interest on the amounts invested with them by investors. The rate of interest offered by these companies may differ from year to year depending on the variation in the economy of the country and the banks rate of interest. The annual rate of interest offered by the two Companies P and Q over the years are shown by the line graph provided below.

Annual Rate of Interest Offered by Two Finance Companies over the Years.



46. A sum of ₹ 4.75 lakhs was invested in Company Q in 1999 for one year. How much more interest would have been earned if the sum was invested in Company P ?

(A) ₹ 10500 (B) ₹ 14, 250

(C) ₹ 11, 750 (D) ₹ 19500

(E) None of these

47. If two different amounts in the ratio 8:9 are invested in Companies P and Q respectively in 2002, then the amounts received after one year as interests from Companies P and Q are respectively in the ratio ?

(A) 2:3 (B) 3:4

(C) 6:7 (D) 4:3

(E) 5:3

48. In 2000, a part of ₹ 30 lakhs was invested in Company P and the rest was invested in Company Q for one year. The total interest received was ₹ 2.43 lakhs. What was the amount invested in Company P ?

(A) ₹ 9 lakhs (B) ₹ 11 lakhs
(C) ₹ 12 lakhs (D) ₹ 18 lakhs
(E) ₹ 20 lakhs

49. An investor invested a sum of ₹ 12 lakhs in Company P in 1998. The total amount received after one year was re-invested in the same Company for one more year. The total appreciation received by the investor on his investment was ?

(A) ₹ 2, 96,200 (B) ₹ 2, 42,200
(C) ₹ 2, 15,600 (D) ₹ 2, 16,000
(E) ₹ 2, 25,600

50. An investor invested ₹ 5 lakhs in Company Q in 1996. After one year, the entire amount along with the interest was transferred as investment to Company P in 1997 for one year. What amount will be received from Company P, by the investor ?

(A) ₹ 5, 94,550 (B) ₹ 5, 80,425
(C) ₹ 5, 77,800 (D) ₹ 5, 77,500
(E) ₹ 5, 87,960

ANSWER KEY

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

SOLUTIONS

1. (C) Although it is a simple question, but the trick is to save time in solving this. Rather than multiplying it we can do as follows:
646643 $\times$ (10000 – 1) = 6466430000 – 646643 = 6465783357.

2. (A) $9999 \times \frac{1}{999} \times \frac{1}{99} \times \frac{1}{9} = \frac{x}{100}$

$x = 1.1$

or $x = 1.$

IInd Method :-

Let $10000 \times \frac{1}{1000} \times \frac{1}{100} \times \frac{1}{10} = \frac{x}{100}$

$\Rightarrow \frac{1}{100} = \frac{x}{100}$

$\Rightarrow 0.01 = \frac{x}{100}$

$\Rightarrow x = 1.$

$\Rightarrow \frac{1}{100} = \frac{x}{100}$

$\Rightarrow 0.01 = \frac{x}{100}$

$\Rightarrow x = 1.$

3. (D) Largest 4-digit number = 9999

$$\begin{array}{r} 113 \\ 82\overline{)9999} \\ -82 \\ \hline 179 \\ -164 \\ \hline 159 \\ -82 \\ \hline 77 \end{array}$$

Required number = (9999 – 77)
= 9922.

4. (C) Let the two consecutive even integers be 2n and (2n + 2). Then,
$(2n + 2)^2 = (2n + 2 + 2n)(2n + 2 - 2n)$
= 2(4n + 2)
= 4(2n + 1), which is divisible by 4.

5. (C) $(4^{61} + 4^{62} + 4^{63} + 4^{64}) \Rightarrow 4^{61} \times (1 + 4 + 4^2 + 4^3) \Rightarrow 4^{61} \times 85$
$\Rightarrow 4^{60} \times (4 \times 85)$
$\Rightarrow (4^{60} \times 340)$, which is divisible by 10.

6. (B) The given number series is based on the following pattern**:**

$23 + 2^2 = 27$

$27 + 3^2 = 36$

$36 + 4^2 = 52$

$52 + 5^2 = 77$

$77 + 6^2 = 113$

$\therefore$ $113 + 7^2 = ? \Rightarrow 113 + 49 \Rightarrow 162.$

7. (C) The given number series is based on the following pattern:

$841 = 29 \times 29$

$961 = 31 \times 31$

$1369 = 37 \times 37$

$1681 = 41 \times 41$

$1849 = 43 \times 43$

$2209 = 47 \times 47$

$\therefore$ $53 \times 53 = 2809$

Here, the numbers are formed by squaring the **prime numbers greater than 23.**

8. (C) The given number series is based on the following pattern:

$18 \times 1.5 = 27$

$27 \times 2 = 54$

$54 \times 2.5 = 135$

$135 \times 3 = 405$

$405 \times 3.5 = 1417.5$

$\therefore$ $? = 1417.5 \times 4 \Rightarrow 5670$

9. (A) The given number series is based on the following pattern:

$9 \times 4 - 1$	=	$36 - 1$	$\Rightarrow$	35
$35 \times 4 - 2$	=	$140 - 2$	$\Rightarrow$	138
$138 \times 4 - 3$	=	$552 - 3$	$\Rightarrow$	549
$549 \times 4 - 4$	=	$2196 - 4$	$\Rightarrow$	2192
$2192 \times 4 - 5$	=	$8768 - 5$	$\Rightarrow$	8763
$8763 \times 4 - 6$	=	$35052 - 6$	$\Rightarrow$	35046

10. (A) The given number series is based on the following pattern:

$298 + 1 \times 123 = 421$

$421 + 2 \times 123 = 667$

$667 + 3 \times 123 = 1036$

$1036 + 4 \times 123 = 1528$

$1528 + 5 \times 123 = 2143$

$\therefore$ $2143 + 6 \times 123 = ? \Rightarrow 2881$

11. (B)

2	18	21	30	36
3	9	21	15	18
3	3	7	5	6
	1	7	5	2

L.C.M, of 12, 18, 21, 30 $\Rightarrow 2 \times 3 \times 3 \times 7 \times 5 \times 2$

$\Rightarrow$ 1260

Required number = $\frac{1260}{2} \Rightarrow 630$.

12. (B) Required run rate = $\left(\frac{263-(2.3\times 10)}{50}\right) \Rightarrow \frac{240}{50} \Rightarrow 4.8$

13. (D) Suppose A, B and C take x, $\frac{x}{2}$ and $\frac{x}{3}$ Days respectively to finsih the work.

Then, $\left(\frac{1}{x}+\frac{2}{x}+\frac{3}{x}\right)=\frac{1}{3}$

$\Rightarrow$ $\frac{6}{x}=\frac{1}{3}$

$\Rightarrow$ x = 18.

So, B takes (18/2) = 9 days to finish the work.

14. (E) (C.P. of 15 balls) – (S.P. of 15 balls) = (C.P. of 9 balls)

$\Rightarrow$ C.P. of 6 balls S.P. of 15 balls = ₹ 540.

C.P. of 540 balls = $\frac{540}{6} \Rightarrow$ ₹ 90.

15. (D) Total distance covered = $\left(\frac{9}{2}+\frac{3}{4}\right)$ miles

$= \frac{21}{4}$ Miles

$\therefore$ Time taken = $\left(\frac{21}{4\times 63}\right)$Hrs. $= \frac{1}{12}$Hrs.

$= \left(\frac{1}{12}\times 60\right)$min.

= 5 min.

16. (A) Let their present ages be 3x, 5x and 7x years respectively.

Then, (3x – 6) + (5x – 6) + (7x – 6) = 57

$\Rightarrow$ 15x = 75

$\Rightarrow$ x = 3.

$\therefore$ Their present ages are 3x = 9 years, 5x = 15 years and 7x = 21 years

17. (C) Suppose the vessel initially contains 8 liters of liquid.

Let *x* liters of this liquid be replaced with water.

Quantity of water in new mixture = $\left(4-\frac{4x}{11}+x\right)$ liters

Quantity of syrup in new mixture = $\left(7-\frac{7x}{11}\right)$ liters

$\therefore$ $\left(4-\frac{4x}{11}+x\right)=\left(7-\frac{7x}{11}\right)$

$\Rightarrow$ $7x + 44 = 77 - 7x$

$\Rightarrow$ $14x = 33$

$\Rightarrow$ $x = \frac{33}{14}$

So, part of the mixture replaced = $\frac{33}{14} \times \frac{1}{11} = \frac{3}{14}$

18. (E) We know that

$$\boxed{\text{Time} = \frac{\text{Distance}}{\text{Speed}}}$$

$\therefore$ $\frac{\frac{1}{2}x}{24} + \frac{\frac{1}{2}x}{27} = 8.5$

$\Rightarrow$ $\frac{x}{24} + \frac{x}{27} = 17$

$\Rightarrow$ $17x = 216 \times 17$

So, $x = 216$ km.

19. (A) $\text{S.I.} = \frac{P \times R \times T}{100}$

$\therefore$ Gain in 2 years = $\left(\frac{6000 \times \frac{13}{4} \times 3}{100}\right) - \left(\frac{6000 \times 5 \times 3}{100}\right)$

$\Rightarrow$ ₹ (975 – 900)

$\Rightarrow$ ₹ 75.

Gain in 1 year = ₹ $\frac{75}{2}$ $\Rightarrow$ ₹ 37.5

20. (E) Area of the park = (48 $\times$ 40) m^2 = 1920 m^2.

Area of the lawn = 1584 m^2.

$\therefore$ Area of the crossroads = (1920 - 1584) m^2 = 336 m^2.

Let the width of the road be x meters. Then,

$48x + 40x - x^2 = 336$

$\Rightarrow$ $x^2 - 88x + 336 = 0$

$(x - 84)(x - 4) = 0$

$x = 4$ m. (This is valid answer)

21. (E) Suppose, first pipe alone takes x hours to fill the tank.

Then, second and third pipes will take (x – 5) and (x – 9) hours respectively to fill the tank.

$\therefore$ $\frac{1}{x} + \frac{1}{(x-5)} = \frac{1}{(x-9)}$

$\Rightarrow$ $\frac{x - 5 + x}{x(x-5)} = \frac{1}{(x-9)}$

$\Rightarrow$ $(2x - 5)(x - 9) = x(x - 5)$

$\Rightarrow$ $x^2 - 18x + 45 = 0$

$\Rightarrow$ $x = 15$. [Negative $x = 3$]

22. (C) Let the original salaries of Ravi and Sumit be Rs. 3x and Rs. 4x respectively.

Then, $\frac{3x + 3000}{4x + 3000} = \frac{35}{42}$

$\Rightarrow$ $42(3x + 3000) = 35(4x + 3000)$

$\Rightarrow$ $14x = 21{,}000$

$\Rightarrow$ $x = 1500$

Sumit's present salary = $(4x + 3000)$ = ₹ $(6000 + 3000)$ = ₹ 9, 000.

23. (C) Cost price of 20 kg = ₹ $(15 \times 11.50 + 10 \times 10)$ = ₹ 272.5

Sell price of 20 kg = ₹ (25×12) = ₹ 300

Profit = ₹ $(300 - 272.50)$ = ₹ 27.5

24. (B) C.P. of 1st transistor = ₹ $\left(\frac{100}{110} \times 770\right)$ = ₹ 700.

C.P. of 2nd transistor = ₹ $\left(\frac{100}{97} \times 970\right)$ = ₹ 1000

So, total C.P. = ₹ $(700 + 1000)$ = ₹ 1700.

Total S.P. = ₹ $(770 + 970)$ = ₹ 1740.

$\therefore$ Gain % = $\left(\frac{100}{1700} \times 100\right)\% = 5\frac{15}{17}\%$

25. (C) Time taken = 1 hr 40 min 48 sec = 1 hr $40\frac{4}{5}$ min = $1\frac{51}{75}$ hrs = $\frac{126}{75}$ hrs.

Let the actual speed be *x* km/hr.

Then, $\frac{5x}{8} \times \frac{126}{75} = 42$

$\Rightarrow$ $x = \left(\frac{42 \times 8 \times 75}{5 \times 126}\right) = 35 \text{ km/hr.}$

26. (E) Volume of the liquid in the cylindrical vessel = Volume of the conical vessel = $\frac{1}{3} \Pi r^2 h$

$\Rightarrow$ $\left(\frac{1}{3} \times \frac{22}{7} \times 21 \times 21 \times 50\right) \text{cm}^3$

$\Rightarrow$ $22 \times 7 \times 3 \times 50 \text{ cm}^3$

Let the height of the liquid in the vessel be h.

Then, $\frac{22}{7} \times 10 \times 10 \times h = \left(\frac{22 \times 7 \times 3 \times 50}{7}\right)$

or $h = \left(\frac{7 \times 3 \times 50}{10 \times 10}\right) \Rightarrow 10.5 \text{ cm}^3$.

27. (D) In the given word, we treat the vowels IEO as one letter.
Thus, we have DRCTR (IEO).
This group has 6 letters of which R occurs 2 times and others are different.

Number of ways of arranging these letters = $\frac{6!}{2!} = \frac{6 \times 5 \times 4 \times 3 \times 2 \times 1}{2 \times 1} \Rightarrow 360.$

Now 3 vowels can be arranged among themselves in 3! = 3 $\times$2 $\times$1 = 6 ways.
Required number of ways = (360 $\times$6) = 2160.

28. (C) (3 men out 6) and (2 ladies out of 5) are to be chosen.

Required number of ways = ${}^{6}C_{3} \times {}^{5}C_{2} \Rightarrow \left(\frac{6 \times 5 \times 4}{3 \times 2 \times 1}\right) \times \left(\frac{5 \times 4}{2 \times 1}\right) \Rightarrow 200.$

29. (B) Here n(S) = (6 × 6) = 36
Let E = event of getting a total more than 7
= {(2, 6), (3, 5), (3, 6), (4, 4), (4, 5), (4, 6), (5, 3), (5, 4), (5, 5), (5, 6), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)}

$\therefore$ $P(E) = \frac{n(E)}{n(S)} \Rightarrow \frac{15}{36} \Rightarrow \frac{5}{12}$

30. (C) Let S be the sample space.

Then n(S) = no of ways of drawing 2 balls out pf (6 + 4) = ${}^{10}C_{2} = \left(\frac{10 \times 9}{2 \times 1}\right) = 45.$

Let E = event of getting both balls of same colour
n (E) = no. of ways (2 balls out of 6) or (2 balls out of 4)

$\Rightarrow$ $({}^{6}C_{2} + {}^{4}C_{2}) \Rightarrow \left(\frac{6 \times 5}{2 \times 5}\right) + \left(\frac{4 \times 3}{2 \times 1}\right) \Rightarrow (15 + 6) \Rightarrow 21.$

$\therefore$ $P(E) = \frac{n(E)}{n(S)} \Rightarrow \frac{21}{45} \Rightarrow \frac{7}{15}$

31. (E) Required difference
= (272 + 240 + 236 + 256 + 288) - (200 + 224 + 248 + 272 + 260)
= 88.

32. (D) Total number of Peons working in the Company in 1999
= (820 + 184 + 152 + 196 + 224) – (96 + 88 + 80 + 120)
= 1192.

33. (A) **Number of Managers working in the Company:**
In 1995 = 760.
In 2000= (760 + 280 + 179 + 148 + 160 + 193) - (120 + 92 + 88 + 72 + 96)
= 1252.
$\therefore$ Percentage increase in the number of Managers

$$\left[\frac{(1252 - 760)}{760} \times 100\right]\% = 64.74\%$$

Number of Technicians working in the Company:

In 1995 = 1200.

In 2000 = (1200 + 272 + 240 + 236 + 256 + 288) – (120 + 128 + 96 + 100 + 112)

= 1936.

∴ Percentage increase in the number of Technicians

$$\left[\frac{(1936 - 1200)}{1200} \times 100\right]\% = 61.33\%$$

Number of Operators working in the Company:

In 1995 = 880.

In 2000 = (880 + 256 + 240 + 208 + 192 + 248) - (104 + 120 + 100 + 112 + 144)

= 1444.

∴ Percentage increase in the number of Operators

$$= \left[\frac{(1444 - 880)}{880} \times 100\right]\% = 64.09\%$$

Number of Accountants working in the Company:

In 1995 = 1160.

In 2000 = (1160 + 200 + 224 + 248 + 272 + 260) – (100 + 104 + 96 + 88 + 92)

= 1884.

∴ Percentage increase in the number of Accountants

$$\left[\frac{(1884 - 1160)}{1160} \times 100\right]\% = 62.41\%$$

Number of Peons working in the Company:

In 1995 = 820.

In 2000 = (820 + 184 + 152 + 196 + 224 + 200) – (96 + 88 + 80 + 120 + 104)

= 1288.

∴ Percentage increase in the number of Peons

$$\left[\frac{(1288 - 820)}{820} \times 100\right]\% = 57.07\%$$

Clearly, the percentage increase is maximum in case of Managers.

34. (B) Total number of employees of various categories working in the Company in 1997 are:

Managers = (760 + 280 + 179) – (120 + 92) = 1007.

Technicians = (1200 + 272 + 240) – (120 + 128) = 1464.

Operators = (880 + 256 + 240) – (104 + 120) = 1152.

Accountants = (1160 + 200 + 224) – (100 + 104) = 1380.

Peons = (820 + 184 + 152) – (96 + 88) = 972.

∴ Pooled average of all the five categories of employees working in the Company in 1997

$$= \frac{1}{5} \times x\ (1007 + 1464 + 1152 + 1380 + 972)$$

$$= \frac{1}{5} \times (5975)$$

= 1195.

35. (D) Total number of Operators who left the Company during 1995 – 2000
= (104 + 120 + 100 + 112 + 144)
= 580.
Total number of Operators who joined the Company during 1995 – 2000
= (880 + 256 + 240 + 208 + 192 + 248)
= 2024.

$\therefore$ Required Percentage = $\left(\frac{580}{2024} \times 100\right)\% = 28.66\% \approx 29\%$

36. (D) Let the total expenditures be Rs. x.
Then, the expenditure on Research and Development (R & D)
= ₹ (5% of x)

= $₹ \left(\frac{5}{100} \times x\right)$

= $₹ \left(\frac{x}{20}\right)$

$\therefore$ Ratio of the total expenditure to the expenditure on R & D

= $\left(\frac{x}{x/20}\right)$

= $\left(\frac{20}{1}\right)$

Then, the total expenditure is 20 times the expenditure of Research and Development.

37. (D) Let the total expenditure be Rs. x crores.

Then, 15 % of x = 2.10 $\Rightarrow$ x = $\left(\frac{2.10 \times 100}{15}\right) = 14.$

$\therefore$ Total expenditure = ₹ 14 crores
And so, the difference between the expenditures on transport and taxes
= Rs. [(12.5 – 10) % of 14] crores
= Rs. [2.5% of 14] crores
= Rs. 0.35 crores
= Rs. 35 lakhs

38. (D) Let the total amount of expenditures be Rs. x.
Then, the total expenditure on infrastructure and transport
= Rs. [(20 + 12.5) % of *x*]
= Rs. [32.5% of *x*]

= $₹ \left(\frac{32.5x}{100}\right)$

And total expenditure on taxes and interest on loans
= ₹ [(10 + 17.5) % of x]
= ₹ [27.5% of x]

$= \quad ₹ \left(\frac{27.5x}{100}\right)$

$\therefore \quad$ Required ratio $= \left(\frac{32.5x/100}{27.5x/100}\right) = \frac{13}{11}$

39. (C) Let the total expenditure be Rs. x crores.
Then, 17.5% of x = 2.45 $\Rightarrow$ x = 14.
$\therefore$ Total expenditure = Rs. 14 crores.
And so, the total expenditure on advertisement, taxes and Research and Development
= ₹ [(15 + 10 + 5) % of 14] crores
= ₹ [30% of 14] crores
= ₹ 4.2 crores.

40. (D) Let the total amount of expenditures be ₹ x.
Then, the expenditure on interest on loans = ₹ (17.5% of x) = ₹ $\left(\frac{17.5}{100}x\right)$
and the expenditure on transport = ₹ (12.5% of x) = ₹ $\left(\frac{12.5}{100}x\right)$
$\therefore$ Difference between the two expenditures = ₹ $\left(\frac{17.5x}{100} - \frac{12.5x}{100}\right)$
$= \quad ₹ \left(\frac{5x}{100}\right)$
and so, the required percentage = $\left(\frac{5x/100}{12.5x/100} \times 100\right)\% = 40\%$

41. (D) Revenue generated by comapny D :
$\Rightarrow \quad \left(\frac{26}{10} \times 650\right) \Rightarrow ₹ 1690.$

42. (B) Angle subtended at the centre :
$\Rightarrow \quad \left(\frac{22}{100} \times 360°\right)$
$\Rightarrow \quad 79.2°$

43. (E) Required percentage :
$\Rightarrow \quad \left(\frac{16 - 10}{10}\right) \times 100$
$\Rightarrow \quad 60\%$

44. (A) Required percentage increase = $\left[\frac{1.15 \times 0.14 + 0.86 - 1}{1}\right] \times 100$
$\Rightarrow \quad 2.1\%$

45. (C) **Option (A):**
Ratio of the revenue generated by company E to the revenue generated by company B=0.538
Ratio of the revenue generated by company D to the revenue generated by company A=0.454
So, statement in option (A) is false.

Option (B):

The absolute difference between the revenue generated by company F and B is 10% of the total revenue.

The absolute difference between the revenue generated by company A and E is 8% of the total revenue.

So, statement in option (B) is true.

46. (E) Difference = ₹ [(10% of 4.75) – (8% of 4.75)] lakhs

= ₹ (2% of 4.75) lakhs

= ₹ 0.095 lakhs

= ₹ 9500.

47. (D) Let the amounts invested in 2002 in Companies P and Q be ₹ 8x and ₹ 9x respectively.

Then, interest received after one year from Company P = ₹ (6% of 8x)

$= ₹ \frac{48}{100}x$

and interest received after one year from Company Q = ₹ (4% of 9*x*)

$= ₹ \frac{36}{100}x$

$\therefore$ Required ratio $= \frac{\left(\frac{48}{100}x\right)}{\left(\frac{36}{100}x\right)} = \frac{4}{3}$

48. (D) Let ₹ x lakhs be invested in Company P in 2000, the amount invested in Company Q in 2000 = ₹ (30 - x) lakhs.

Total interest received from the two Companies after 1 year

= ₹ [(7.5% of x) + {9% of (30 – x)}] lakhs

$= ₹ \left[2.7 - \left(\frac{1.5x}{100}\right)\right]$ Lakhs

$\therefore \quad \left[2.7 - \left(\frac{1.5x}{100}\right)\right] = 2.43 \Rightarrow x = 18.$

49. (E) Amount received from Company P after one year (i.e., in 199) on investing ₹ 12 lakhs in it

= ₹ [12 + (8% of 12)] lakhs

= ₹ 12.96 lakhs.

Amount received from Company P after one year on investing ₹ 12.96 lakhs in the year 1999

= ₹ [12.96 + (10% of 12.96)] lakhs

= ₹ 14.256.

Appreciation received on investment during the period of two years

= ₹ (14.256 – 12) lakhs

= ₹ 2.256 lakhs

= ₹ 2, 25,600.

50. (B) Amount received from Company Q after one year on investment of ₹ 5 lakhs in the year 1996

= ₹ [5 + (6.5% of 5)] lakhs

= ₹ 5.325 lakhs.

Amount received from Company P after one year on investment of ₹ 5.325 lakhs in the year 1997

= ₹ [5.325 + (9% of 5.325)] lakhs

= ₹ 5.80425 lakhs

= ₹ 5, 80,425.

RRB CLERK PRELIMINARY

QUANTITATIVE APTITUDE

Directions (1–10) : What should come in the place of the question mark (?) in the following questions ?

1. $4 \times 5^2 - 3^2 \times 7 + 6^2 = ? + 24$

(A) 7^2 (B) 8^2

(C) 9^2 (D) 4^2

(E) None of these

2. $4\frac{7}{8} - 2\frac{1}{2} + 1\frac{3}{4} = ?$

(A) $4\frac{5}{8}$ (B) $3\frac{7}{8}$

(C) $8\frac{1}{4}$ (D) $3\frac{1}{4}$

(E) None of these

3. 25% of 420 – ?% of 140 = 77

(A) 25 (B) 36

(C) 20 (D) 40

(E) None of these

4. $800 \div 32 + 11 = (?)^2$

(A) 49 (B) 7

(C) 36 (D) 64

(E) None of these

5. $25^{2.7} \times 5^{4.2} \div 5^{6.4} = 25^{(?)}$

(A) 1.7 (B) 3.2

(C) 1.6 (D) 3.6

(E) None of these

6. $\frac{2}{7}$ of $\frac{5}{6}$ of ? = 200

(A) 480 (B) 420

(C) 729 (D) 840

(E) None of these

7. $\sqrt{441-41} \times 42 \div 7 = ?$

(A) 20 (B) 60
(C) 180 (D) 120
(E) None of these

8. $\frac{?}{\sqrt{25}} = \frac{15 \times 4 - 40}{2}$

(A) 20 (B) 45
(C) 25 (D) 50
(E) None of these

9. $4\frac{1}{5} \times 4\frac{2}{7} \div 3\frac{1}{3} = ?$

(A) $2\frac{2}{5}$ (B) $4\frac{3}{8}$
(C) $4\frac{2}{5}$ (D) $6\frac{1}{8}$
(E) None of these

10. $(656 \div 164)^2 = \sqrt{?}$

(A) 4 (B) 16
(C) 64 (D) 256
(E) None of these

Directions (11–13) : What will come in the place of question mark (?) in the following number series ?

11. 311 300 278 245 201 146 ?

(A) 70 (B) 90
(C) 80 (D) 110
(E) None of these

12. 17 22 32 47 67 92 ?

(A) 112 (B) 132
(C) 111 (D) 122
(E) None of these

13. 3 123 183 213 228 235.5 ?

(A) 238.25 (B) 239.25
(C) 275.50 (D) 238.50
(E) None of these

14. Seema sold a mobile phone at the cost of Rs. 1,950 at a loss of 25%. At what cost will she have to sell it to get a profit of 30% ?

(A) Rs. 3,300 (B) Rs. 2,600
(C) Rs. 2,535 (D) Rs. 3,380
(E) None of these

15. The ratio between the speed of a car and a train is 15 : 22 respectively. If the speed of train is 35 kmph more than that of the car, what is the speed of the car ?

(A) 75 kmph (B) 110 kmph
(C) 85 kmph (D) Cannot be determined
(E) None of these

16. Out of the fractions $\frac{9}{31}, \frac{3}{17}, \frac{6}{23}, \frac{4}{11}$ and $\frac{7}{25}$, which is the largest fraction ?

(A) $\frac{9}{31}$ (B) $\frac{3}{17}$
(C) $\frac{6}{23}$ (D) $\frac{4}{11}$
(E) None of these

17. What wil come in place of both the question marks (?) in the following question ?

$$\frac{23}{?} = \frac{?}{92}$$

(A) 56 (B) 54
(C) 44 (D) 46
(E) None of these

18. The salary of a man increases by 20% every year in the month of January. His salary was 5,000 in the month of February in the year 2009. What will be his salary in the month of February in the year 2011 ?

(A) Rs. 7,200 (B) Rs. 6,200
(C) Rs. 7,800 (D) Rs. 6,800
(E) None of these

19. In how many different ways can the letters of word 'FINISH' can be arranged ?

(A) 80 (B) 120
(C) 60 (D) 720
(E) None of these

20. The simple interest accrued on a certain principal in 5 years at the rate of 12 p.c.p.a. is Rs. 1,536. What amount of the simple interest would one get if one invests Rs. 1,000 more than the previous principal for 2 years and at the same rate p.c.p.a. ?

(A) Rs. 845.40 (B) Rs. 614.40
(C) Rs. 2,136 (D) Rs. 1,536
(E) None of these

21. If 3 men or 9 boys can finish a piece of work in 21 days. In how many days can 5 men and 6 boys together do the same piece of work ?

(A) 12 days (B) 8 days
(C) 14 days (D) Cannot be determined
(E) None of these

22. In a test, Rajesh got 112 marks which Is 32 more than the passing marks. Sonal got 75% marks which is 70 more than the passing marks. What is the minimum passing percentage of the test ?

(A) 35 (B) 45
(C) 40 (D) 30
(E) None of these

23. Twenty five percent of Reena's yearly income is equal to seventy five percent of Anubhav's monthly income. If Anubhav's yearly income is Rs. 2,40,000 what is Reena's monthly Income?

(A) Rs. 60,000 (B) Rs. 12,000
(C) Rs. 5.200 (D) Cannot he determined
(E) None of these

24. If Rs. 5,075 is to be divided among 29 people, how much amount will each person get ?

(A) Rs. 195 (B) Rs. 165
(C) Rs. 155 (D) Rs. 175
(E) None of these

25. What Is the value of 72% of two–fifth of 450 ?

(A) 648.4 (B) 129.6
(C) 324.2 (D) 162.6
(E) None of these

26. What is the compound interest accrued on a sum of Rs. 1,800 at the rate of 4 p.c.p.a. in 2 years ?

(A) Rs. 146.88 (B) Rs. 1,946.88
(C) Rs. 156.84 (D) Rs. 1,846.84
(E) None of these

27. The area of a square is 225 sq.cm. Which is equal to the area of a rectangle. The length of the rectangle is 16 cm. more than the breadth of the rectangle. What is the respective ratio between the side of the square and the breadth of the rectangle ?

(A) 3 : 5 (B) 5 : 3
(C) 5 : 4 (D) 4 : 5
(E) None of these

28. The ratio between the angles of a quadrilateral is 3 : 5 : 9 : 1 respectively. What is the value of two-third of the total sum of the smallest and the second largest angles together ?

(A) 60 (B) 90
(C) 80 (D) 120
(E) None of these

Directions (29–30) : In the following number series only one nubmber is **wrong**. Find out the **wrong** one.

29. 217 216 212 203 187 126

(A) 216 (B) 212
(C) 203 (D) 187
(E) 151

30. 11 16 23 29 37 46 56

(A) 16 (B) 23
(C) 29 (D) 37
(E) 46

Directions (31–35) : What **approximate** value should come in place of the question mark (?) in the following questions ? (You are not expected to calculate the exact value)

31. 970% of 14 + 310% of 143 = ?

(A) 240 (B) 225
(C) 270 (D) 300
(E) 320

32. 25.8% of 235.9 x 3.96 = ?

(A) 280 (B) 210
(C) 200 (D) 250
(E) 300

33. $3\frac{2}{9} \times 9\frac{7}{5} \div 7\frac{1}{6} = ?$

(A) 10 (B) 20
(C) 30 (D) 5
(E) 15

34. 23 x 17.5 + 63.774 – 321.3 ÷ 52.6 = ?

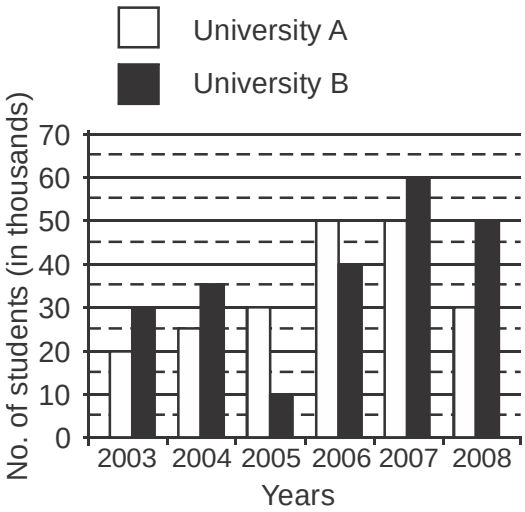
(A) 460 (B) 520
(C) 600 (D) 400
(E) 370

35. 236.56 ÷ 18.29 x 9.87 = ?

(A) 127 (B) 152
(C) 182 (D) 210
(E) 240

Directions (36–40) : Study the following graph carefully to answer the questions that follow **:**

Number of Students Passed (in thousands)
From Two Universities Over the Years



36. What is the respective ratio between the number of students passed from University 'A' in the year 2007 and the number of students passed from University B in the year 2004 ?

(A) 5 : 4 (B) 4 : 5
(C) 7 : 10 (D) 10 : 7
(E) None of these

37. What is the difference between the total number of students passed from both the Universities in the year 2007 together and the total number of students passed in the year 2005 from both the universities together ?

(A) 70,000 (B) 37,000
(C) 7,000 (D) 3,700
(E) None of these

38. What Is the sum of students passed, from University 'B' in years 2003, 2005 and 2006 together?

(A) 80,000 (B) 8,000
(C) 8,00,000 (D) 75,000
(E) None of these

39. Number of students passed from University 'B' in the year 2008 is **approximately** what percent of the total number of students passed from University A over the years ?

(A) 30 (B) 25
(C) 20 (D) 35
(E) 40

40. What is the respective ratio between the number of students passed in years 2007, 2008 and 2005 from University A ?

(A) 5 : 3 : 2 (B) 3 : 5 : 5
(C) 5 : 3 : 3 (D) 5 : 1 : 1
(E) None of these

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
A	E	C	E	C	D	D	D	E	D
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	D	B	D	A	D	D	A	E	E
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
E	C	E	D	B	A	B	C	E	B
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
C	D	D	A	A	D	A	A	B	C

SOLUTIONS

1. (A) $4 \times 25 - 9 \times 7 + 36 = ? + 24$

$\Rightarrow \quad ? = 100 - 63 + 36 - 24$

$= 49 = 7^2$

2. (E) $? = 4 + \frac{7}{8} - 2 - \frac{1}{2} + 1 + \frac{3}{4}$

$= 3 + \left(\frac{7}{8} - \frac{1}{2} + \frac{3}{4}\right)$

$= 3 + \left(\frac{7 - 4 + 6}{8}\right) = 3 + \frac{9}{8} = 4\frac{1}{8}$

3. (C) $\frac{420 \times 25}{100} - \frac{140 \times ?}{100} = 77$

$\Rightarrow \quad 105 - 1.4 \times ? = 77$

$\Rightarrow \quad 1.4 \times ? = 105 - 77 = 28$

$\Rightarrow \quad ? = \frac{28}{1.4} = 20$

4. (E) $(?)^2 = \frac{800}{32} + 11$

$= 25 + 11 = 36$

$\therefore \quad ? = \sqrt{36} = 6$

5. (C) $(5^2)^{2.7} \times 5^{4.2} \div 5^{6.4} = (5^2)^?$

$\Rightarrow \quad \frac{5^{5.4} \times 5^{4.2}}{5^{6.4}} = 5^{2\,?}$

$\Rightarrow \quad 5^{5.4 + 4.2 - 6.4} = 5^{2\,?}$

$\Rightarrow \quad 5^{3.2} = 5^{2\,?}$

$\Rightarrow \quad 2? = 3.2$

$\Rightarrow \quad ? = \frac{3.2}{2} = 1.6$

6. (D) $? \times \frac{5}{6} \times \frac{2}{7} = 200$

$\Rightarrow \quad ? = \frac{200 \times 6 \times 7}{5 \times 2} = 840$

7. (D) $? = \frac{\sqrt{400} \times 42}{7}$

$= 20 \times 6 = 120$

8. (D) $\frac{?}{5} = \frac{60 - 40}{2}$

$\Rightarrow$ $? = 5 \times 10 = 50$

9. (E) $? = \frac{21}{5} \times \frac{30}{7} \times \frac{3}{10} = \frac{27}{5} = 5\frac{2}{5}$

10. (D) $\sqrt{?} = \left(\frac{656}{164}\right)^2 = 16$

$\Rightarrow$ $? = 16 \times 16 = 256$

11. (C) The pattern of the number series is :

$311 - 1 \times 11 = 300$

$300 - 2 \times 11 = 278$

$278 - 3 \times 11 = 245$

$245 - 4 \times 11 = 201$

$201 - 5 \times 11 = 146$

$146 - 6 \times 11 = \boxed{80}$

12. (D) The pattern of the number series is :

$17 + 1 \times 5 = 22$

$22 + 2 \times 5 = 32$

$32 + 3 \times 5 = 47$

$47 + 4 \times 5 = 67$

$67 + 5 \times 5 = 92$

$92 + 6 \times 5 = \boxed{122}$

13. (B) The pattern of the number is :

$3 + 120 = 123$

$123 + 60 = 183$

$183 + 30 = 213$

$213 + 15 = 228$

$228 + 7.5 = 235.5$

$235.5 + \frac{7.5}{2} = 235.5 + 3.75$

$= \boxed{239.25}$

14. (D) Let the CP of the mobile phone be Rs. *x*.

$\therefore$ $\frac{x \times 75}{100} = 1950$

$\Rightarrow$ $x = \frac{1950 \times 100}{75}$

$= \text{Rs. } 2600$

$\therefore$ Required selling price

$= \frac{2600 \times 130}{100} = \text{Rs. } 3{,}380$

15. (A) Let the speed of the car be 15x kmph and that of train be 22x kmph.

$\therefore$ $22x - 15x = 35$

$\Rightarrow$ $7x = 35$

$\Rightarrow$ $x = \frac{35}{7} = 5$

$\therefore$ Speed of the car = $15 \times 5 = 75$ kmph.

16. (D) Decimal equivalent of each fraction ;

$\frac{9}{31} = 0.29$; $\frac{3}{17} = 0.18$

$\frac{6}{23} = 0.26$; $\frac{4}{11} = 0.36$;

$\frac{7}{25} = 0.28$

$\therefore$ The largest fraction = $\frac{4}{11}$

17. (D) $\frac{23}{?} = \frac{?}{92}$

$\Rightarrow$ $?^2 = 23 \times 92$

$\therefore$ $? = \sqrt{23 \times 23 \times 4}$

$= 2 \times 23 = 46$

18. (A)

Person's salary in the month of February, 2011

$= 5000 \left(1 + \frac{20}{100}\right)^2$

$= 5000 \times \frac{6}{5} \times \frac{6}{5}$

= Rs. 7200

19. (E) The word FINISH consists of 6 letters in which letter 'I' comes twice.

$\therefore$ Required number of arrangements = $\frac{6!}{2!}$

$= \frac{6 \times 5 \times 4 \times 3 \times 2 \times 1}{1 \times 2} = 360$

20. (E) **Case I**

$\text{Principal} = \frac{\text{S.I.}}{\text{Time} \times \text{Rate}}$

$= \frac{1536 \times 100}{5 \times 12} = \text{Rs. } 2560$

Case II

$\text{S.I.} = \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \frac{3560 \times 2 \times 12}{100} = \text{Rs. } 854.40$

21. (E) $\because$ 3 men $\equiv$ 9 boys

$\therefore$ 1 man $\equiv$ 3 boys

$\therefore$ 5 man + 6 boys

$\equiv$ (5 × 3 + 6) boys = 21 boys

$\therefore$ $M_1D_1 = M_2D_2$

$\Rightarrow$ $9 \times 21 = 21 \times D_2$

$\Rightarrow$ $D_2 = \frac{9 \times 21}{21} = 9$ days

22. (C) Let the total marks of the exam be *x*.

Passing marks = 112 – 32 = 80

$\therefore$ $\frac{x \times 75}{100} = 80 + 70 = 150$

$\Rightarrow$ $x = \frac{150 \times 100}{75} = 200$

If the minimum pass percentage be y, then

$\therefore$ y% of 200 = 80 $\Rightarrow$ y = 40

23. (E) Let Reena's monthly income be Rs. x.

$\therefore$ $12x \times \frac{1}{4} = \frac{240000}{12} \times \frac{75}{100}$

$\Rightarrow$ $x = \frac{240000 \times 75 \times 4}{12 \times 12 \times 100}$ = Rs. 5000

24. (D) Amount recieved by each person = Rs. $\left(\frac{5075}{29}\right)$ = Rs. 175

25. (B) 72% of $\frac{2}{5}$ of 450

$= \frac{72}{100} \times \frac{2}{5} \times 450 = 129.6$

26. (A) $CI = P\left[\left(1+\frac{R}{100}\right)^T - 1\right]$

$= 1800\left[\left(1+\frac{4}{100}\right)^2 - 1\right]$

$= 1800\left(\frac{676}{625} - 1\right)$

$= \frac{1800 \times 51}{625}$ = Rs. 146.88

27. (B) If the breadth of rectangle be *x* cm, then it's length = (x + 16)cm

$\therefore$ $x(x + 16) = 225 = 9 \times 25$

$\therefore$ $x = 9$ cm

Side of the square = $\sqrt{225}$ = 15 cm

Required ratio = 15 : 9 = 5 : 3

28. (C) $3x + 5x + 9x + x = 360°$

$\Rightarrow$ $18x = 360°$

$\Rightarrow \quad x = 20°$

$\therefore \quad \frac{2}{3}$ of $(x + 5x)$

$= 6 \times 20 \times \frac{2}{3} = 80$

29. (E) The pattern of the number series is **:**

$217 - 1^2 = 216$

$216 - 2^2 = 212$

$212 - 3^2 = 203$

$203 - 4^2 = 187$

$187 - 5^2 = 162 \neq \boxed{151}$

30. (B) The pattern of the number series is **:**

$11 + 5 = 16$

$16 + 6 = 22 \neq \boxed{23}$

$22 + 7 = 29$

$29 + 8 = 37$

31. (C) $? \approx \frac{14 \times 1000}{100} + \frac{43 \times 300}{100}$

$\approx 140 + 129 \approx 269$

$\therefore$ Required answer = 270

32. (D) $? = \frac{236 \times 26 \times 4}{100} \approx 245.44$

$\therefore$ Required answer = 250

33. (D) $? = 3 \times 10 \div 7 = 4.3$

$\therefore$ Required answer = 5

34. (A) $? \approx 23 \times 17.5 + 64 - 321 \div 53$

$\approx 402.5 + 64 - 6 \approx 460$

35. (A) $? \approx 240 \div 18 \times 10 \approx 133$

$\therefore$ Required answer = 127

36. (D) Required answer = 50 : 35 = 10 : 7

37. (A) Required difference = [(50 + 60) – (30 + 10)] thousand = 70,000

38. (A) Required number of students = (30 + 10 + 40) thousand = 80000

39. (B) Total number of students passed from university A

= (20 + 25 + 30 + 50 + 50 + 30)

thousand = 205 thousand

$\therefore$ Required percentage = $\frac{50}{205} \times 100 \approx 25$

40. (C) Reqiured ratio = 50 : 30 : 30 = 5 : 3 : 3

RRB CLERK MAIN

QUANTITATIVE APTITUDE

Direction (1–5) : What will come in place of the question mark (?) in the given questions ?

1. $285 \times 25 + 156 = (?)^2 + (15)^2$

(A) 84 (B) 86
(C) 76 (D) 92
(E) None of these

2. $[(1120 \div 4) \times 7.5] \div 15 = ?$

(A) 160 (B) 140
(C) 120 (D) 130
(E) None of these

3. $(45 \times 25 \times 8) + (22 \times 12 \times 8) = ? \times 6$

(A) 1792 (B) 1856
(C) 1752 (D) 1852
(E) None of these

4. $(3375 \div 15) + (744 \div 24) = \sqrt{?} + 248$

(A) 24 (B) 8
(C) 64 (D) 16
(E) None of these

5. $(7)^{5.2} \div (49)^{0.8} \times (343)^2 = (7)^{5 + ?}$

(A) 4.1 (B) 4.6
(C) 4.9 (D) 5.2
(E) None of these

Direction (6–10) : What approximate value should come in place of the question mark (?) in the following question ?

(**Note :** You are not expected to calculate the exact value.)

6. $21.003 \times 39.998 - 209.91 = 126 \times ?$

(A) 5 (B) 4
(C) 3 (D) 2
(E) 6

7. $1440.0003 \div 23.999 \times 2.5 \times 3 = ?$

(A) 450 (B) 500
(C) 420 (D) 360
(E) 520

8. 3995.009 – 290.999 – 129.989 × 2 = ?

(A) 3410 (B) 3445
(C) 3435 (D) 3465
(E) 3530

9. $(15)^2 + (19.99)^2 + (24.001)^2$ = ?

(A) 1250 (B) 1200
(C) 1300 (D) 1120
(E) 1160

10. (99999 ÷ 999 ÷ 9) × 99.99 = ?

(A) 1250 (B) 1000
(C) 1050 (D) 1220
(E) 1110

Direction (11–15) : What will come in place of the question mark (?) in the following number series ?

11. 2, 8, 20, 44, 92, (?)

(A) 185 (B) 188
(C) 278 (D) 192
(E) None of these

12. 15, 31, 64, 131, (?)

(A) 292 (B) 272
(C) 266 (D) 255
(E) None of these

13. 17 52 158 477 (?)

(A) 1442 (B) 1433
(C) 1435 (D) 1456
(E) None of these

14. 442 530 626 730 842 (?)

(A) 962 (B) 912
(C) 1120 (D) 981
(E) None of these

15. 1 2 5 16 65 (?)

(A) 326 (B) 362
(C) 332 (D) 340
(E) None of these

16. Arman sold his laptop at a loss of 8%. If he had been able to sell it at a gain of 12%, he would have fetched Rs 12000 more than it did. What was the cost price of laptop ?

(A) Rs 48,000 (B) Rs 56,000
(C) Rs 60,000 (D) Rs 64,000
(E) Rs 72,000

17. A certain number of women can do a work in 50 days. If there were 20 women more It could have been finished in 5 days less. How many women are there ?

(A) 120 (B) 140
(C) 160 (D) 180
(E) 200

18. Five alarms start to ring together and ring at the intervals of 3, 4, 6, 11 and 12 seconds respectively. How many will they ring together in one hour, excluding the one at the start ?

(A) 24 times (B) 25 times
(C) 26 times (D) 27 times
(E) 28 times

19. What is the number which, when added to the terms of the ratio 19 : 31 makes the new ratio 9 : 13 ?

(A) 4 (B) 9
(C) 8 (D) 7
(E) None of these

20. A persons sells one houses for Rs 75 lakhs, making a profits of 25%. He sells another house at a loss of 20%, and the whole he makes neither profit nor loss. What is the cost of second house ?

(A) 50 lakhs (B) 60 lakhs
(C) 75 lakhs (D) 90 lakhs
(E) None of these

21. Ravi and Raj invested in the ratio of 4 : 3 in a business. If 16% of the total profit goes to charity and Ravi's share if profit is Rs 816, what is the amount of total profit ?

(A) Rs 1200 (B) Rs 1400
(C) Rs 1500 (D) Rs 1700
(E) None of these

22. The average of the first and second of three numbers is 12 more than the average of the second and the third fo these numbers. What is the difference between the first and the third of these three numbers ?

(A) 6 (B) 12
(C) 24 (D) 36
(E) 18

23. A Person completes journey by using three different type of vehicles. He complete first part with speed of 10 knph, second part of the second part at the speed of 12 kmph and third part at the speed of 15 kmph. If the distance travelled by each vehicles is equal then what is the average speed of that person throughout the journey ?

(A) 12 kmph (B) 12.5 kmph
(C) 13 kmph (D) 13.5 kmph
(E) None of these

24. If the ratio of the ages of A and B at present is 7 : 4. After 12 years the ratio of their ages will be 10 : 7, what is the present age of B ?

(A) 12 years (B) 14 years
(C) 16 years (D) 18 years
(E) 20 years

25. If a shopkeeper sells 1/3rd of total stock of sugar at a profit of 15%, half of total stock at a profit of 8% and remaining part at a profit of 12%. If the total profit he gains is Rs 605 then what was the original value of the commodity ?

(A) Rs 5400 (B) Rs 5500
(C) Rs 5600 (D) Rs 5750
(E) None of these

26. In what time will a sum of money will become 5 times it's value if simple interest is 16% per annum ?

(A) 12 years (B) 16 years
(C) 20 years (D) 25 years
(E) 32 years

27. An amount of money grows up to Rs 3840 in 2 years and up to Rs 4800 in 3 years on compound interest. What is the amount ?

(A) Rs 2420 (B) Rs 2457.6
(C) Rs 2650.5 (D) Rs 2800
(E) None of these

28. The respective ratio between the present ages of Yogesh, Vinod & Kamal is 3 : 4 : 5. If the average of their present ages if 28 years then what would be the sum of the ages of Yogesh and Yogesh and Vinod together after 5 years ?

(A) 45 years (B) 55 years
(C) 52 years (D) 59 years
(E) None of these

29. Sum of area of a circle and a rectagle is equal to 1166 sq.cm. The diameter of the circle is 28 cm. What is the sum of the circumference of the circle and the perimeter of the rectangle if the length of the rectangle is 25 cm ?

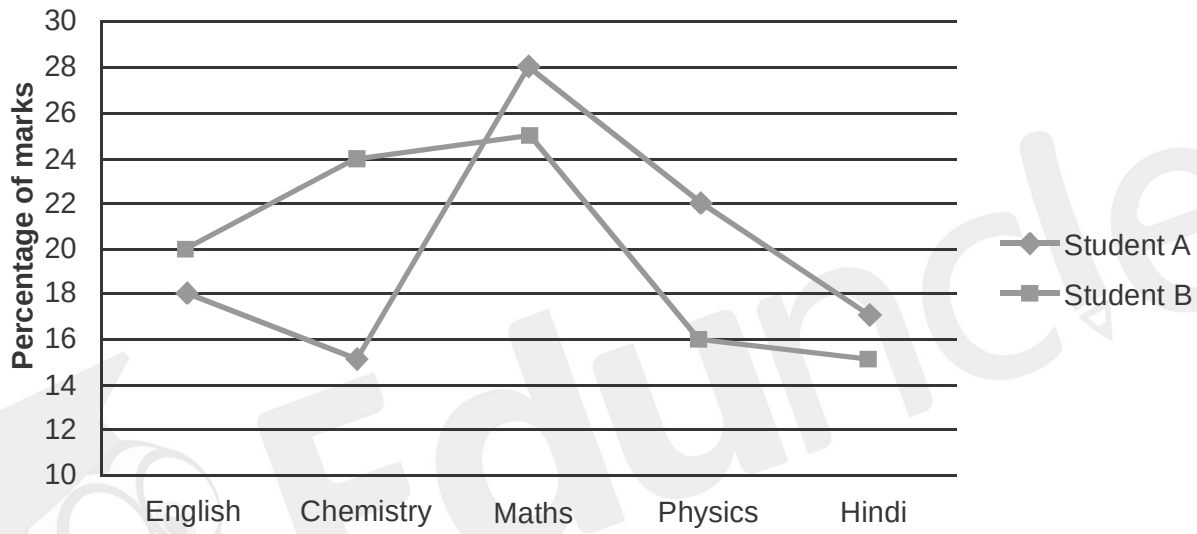
(A) 186 cm (B) 182 cm
(C) 184 cm (D) Cannot be determined
(E) None of these

30. A 320 metre long metro moving with an average speed of 120 km/hr crosses a platform in 24 seconds. A woman crosses the same platform in 4 minutes. Waht is the speed of woman in metre/second ?

(A) 2.4 (B) 1.5
(C) 1.6 (D) 2.0
(E) None of these

Direction (31–35) : In the following Line charts percentage distribution of marks scored by two students A and B in five subjects are given.
Both the students scored 500 each, and then answer the following questions.

Maximum marks is 200 in each paper and pass marks is 80



31. What is the difference between marks they got in Maths ?

(A) 5 (B) 8
(C) 12 (D) 15
(E) None of these

32. What is the ratio of marks scored in Chemistry by both the students A and B respectively ?

(A) 3 : 5 (B) 5 : 3
(C) 5 : 8 (D) 8 : 5
(E) None of these

33. What is the average marks Student B scored in Physics, Chemistry, English and Maths ?

(A) 102 (B) 104.5
(C) 106.25 (D) 96.75
(E) 98

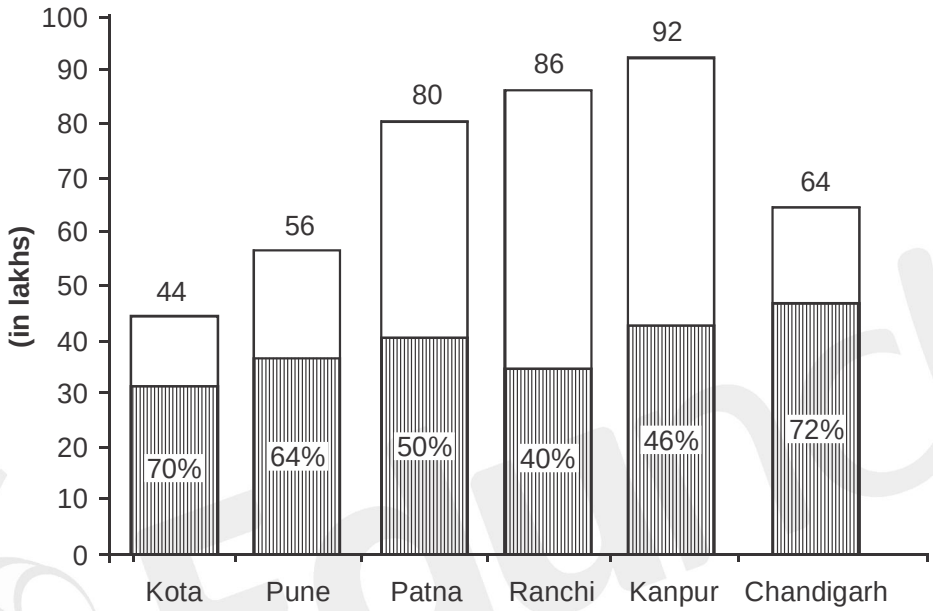
34. What is the ratio of number of subjects in which A and B failed where total marks for marks for each paper is 200 and pass marks is 80 ?

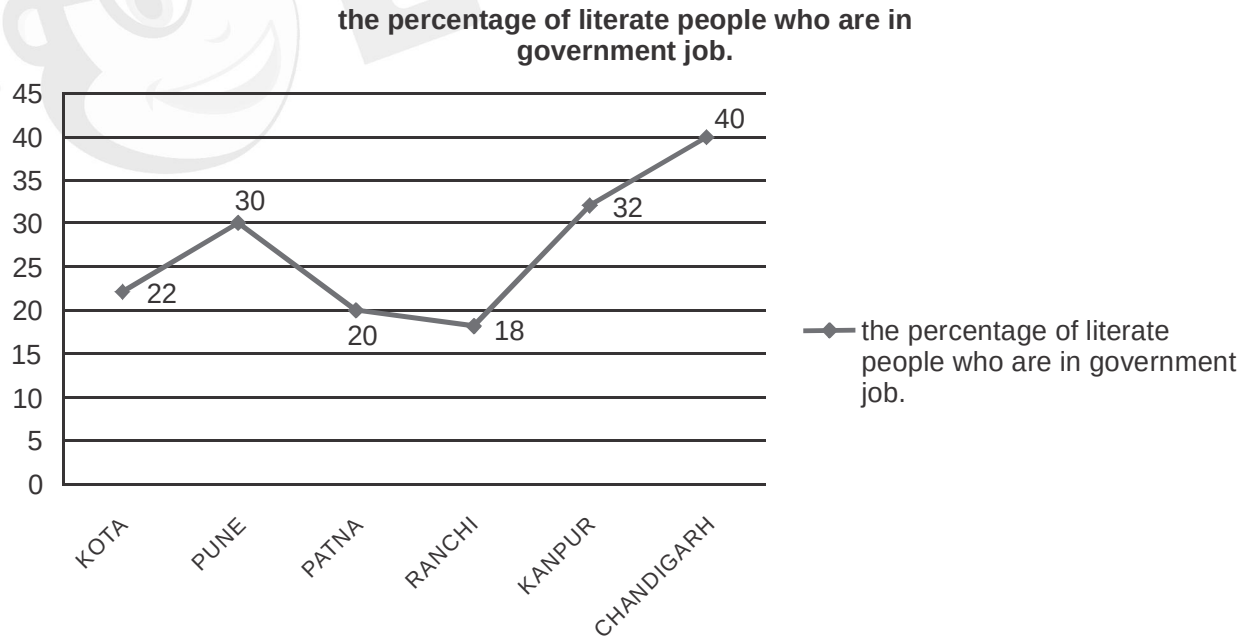
(A) 1 : 2 (B) 2 : 1
(C) 2 : 3 (D) 3 : 2
(E) 1 : 1

35. If the percentage marks distribution is same but Students A scores total 600 marks, then what he would have scored in Chemistry ?

(A) 75 (B) 80
(C) 85 (D) 90
(E) 100

Direction (36–40) : Following sub–divided graph shows the population of six cities (in lakhs) and the percentage of literate people in each city. Answer the following question based on these graphs.





36. What is the number of people in Kota who are literate and in government jobs ?

(A) 660000 (B) 677600
(C) 67000 (D) 925600
(E) None of these

37. What is the number of people in Kanpur who are literate but not in government jobs ?

(A) 2877760 (B) 276000
(C) 256000 (D) 2876000
(E) None of these

38. What is the total number of the literate people in all six cities ?

(A) 230.46 lakhs (B) 231.42 lakhs
(C) 221.44 lakhs (D) 229.44 lakhs
(E) None of these

39. What is the total number of literate people in Kota ad Pune together ?

(A) 65.60 lakhs (B) 64.64 lakhs
(C) 68.64 lakhs (D) 66.25 lakhs
(E) None of these

40. What is the percentage of people in Patna who are in government jobs ?

(A) 80% (B) 50%
(C) 40% (D) 20%
(E) 10%

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
A	B	D	C	B	A	A	B	B	E
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	C	C	A	A	C	D	D	C	C
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	C	A	C	B	D	B	D	B	D
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	C	C	E	D	B	A	D	B	E

SOLUTIONS

1. (A) $285 \times 25 + 156 = (?)^2 + (15)^2$

$7821 = (?)^2 + 225$

$(?)^2 = 7056$ – – –> 84

2. (B) $[(1120 \div 4)] \times 7.5 \div 15$ – – –> $2100 \div 15 = 140$

3. (D) $(45 \times 25 \times 8) + (22 \times 12 \times 8) = ? \times 6$

$9000 + 2112 = ? \times 6 = 1852$

4. (C) $(3375 \div 15) + (744 \div 24) = \sqrt{?} + 248$

$225 + 31 = \sqrt{?} + 248$

$\sqrt{?} = 8$ – – –> $? = 64$

5. (B) In case of multiplication power adde but in case of division power substracted

$7^{5.2 + 6 - 1.6}$ – – –> $7^{9.6}$

$7^{?} = 7^{9.6 - 5 = 4.6}$

6. (A) Take neraest values

$21.003 \times 39.998 - 209.91 = 126 \times ?$

$630 = 126 \times ?$

$? = 5$ (approx)

7. (A) Take nearest values

$1440.0003 \div 23.999 \times 2.5 \times 3 = ?$

$60 \times 2.5 \times 3 = 450$ (approx)

8. (B) Take nearest values

$3995.009 - 290.999 - 129.989 \times 2 = ?$

$= 3445$ (approx)

9. (B) Take nearest values

$(15)^2 + (19.99)^2 + (24.001)^2$

$= 225 + 400 + 576 = 1200$ (approx)

10. (E) Take nearest values

$(99999 \div 999 \div 9) \times 99.99$ ——> 11.12×100

$= 1110$ (approx)

11. (B) The pattern is = +6 +12 +24 +48

So the missing term is = 92 + 96 = 188

12. (C) The pattern is $15 \times 2 + 1 = 31$, $31 \times 2 + 2 = 64$, $64 \times 2 + 3 = 131$,

So the missing term is = $131 \times 2 + 4 = 266$

13. (C) The pattern is = $17 \times 3 + 1 = 52$, $52 \times 3 + 2 = 158$,

$158 \times 3 + 3 = 477$

So the missing term is = $477 \times 3 + 4 = 1435$

14. (A) The pattern is $21^2 + 1$, $25^2 + 1$, $27^2 + 1$, $29^2 + 1$,

So the missing term is = $31^2 + 1 = 962$

15. (A) The pattern is 1 × 1 + 1 = 2, 2 × 2 + 1 = 5, 5 × 3 + 1 = 16,
16 × 4 + 1 = 65,
So the missing term is = 65 × 5 + 1 = 326

16. (C) Let cost price be 'X' Rs.
ATQ,
(100 + 12)% of X – (100 – 8)% of X = 12000
Or, (112 – 92)% of X = 12000

$$20 \times \frac{X}{100} = 12000$$

$$\therefore \quad \text{Cost price } X = \frac{12000}{20} \times 100 = 60000 \text{ Rs.}$$

17. (D) Let original no. of women be X
According to formula,
$M_1\ D_1\ W_2 = M_2\ D_2\ W_1$
X × 50 = (x + 20) × 45
(50 – 45) × X = 900

$$\text{Original no. of women} = \frac{900}{5} = 180 \textit{ women}.$$

18. (D) LCM of 3, 4, 6, 11, 12 is equal to 132.
So the alarms will ring together after 132 seconds.

$$\therefore \quad \text{In 1 hour they will ring} = \frac{60 \times 60}{132} = \frac{3600}{132} = 27.27 \text{ i.e.}$$

they will ring together 27 times.

19. (C) $\frac{19 + x}{31 + x} = \frac{9}{13}$
19 × 13 + 13 × x = 31 × 9 + 9 × x
13x – 9x = 279 – 247

$$\therefore \quad x = \frac{32}{4} = 8$$

20. (C) Let the cost price of second house be 'X' Rs.

$$\text{Now, CP of First house} = 75 \times \frac{100}{125} = 60 \textit{ lakh}$$

$$\text{SP of second house} = X \times \frac{80}{100} = 4 \times \frac{x}{5} \text{ ₹}$$

Since, In No profit no loss condition
Total Sp = Total CP

$$75 + \frac{4x}{5} = 60 + x$$

$$x - \frac{4x}{5} = 75 - 60 = 15$$

X = 75 lakhs.

21. (D) Let the total profit be Rs 100.

Since, 16% goes on charity. So rest amount is (100 – 16) = 84

$\therefore$ Raghav's share = $\frac{84}{10-7} \times 4$ = Rs 4

But Raghav got Rs 816.

$\therefore$ Actual profit = $816 \times \frac{100}{48} = 1700$

22. (C) Let the number be x, y and z.

$\therefore \quad \frac{x+y}{2} = \frac{y+z}{2} + 12$

$\Rightarrow \quad \frac{x+y}{2} = \frac{y+z+24}{2}$

$\Rightarrow \quad x + y = y + z + 24$

$\Rightarrow$ Difference, $x - z = 24$

23. (A) Average speed = $\frac{3 \times 10 \times 12 \times 15}{120+150+180} = \frac{5400}{450}$ = 12 *kmph*

24. (C) Let their present age be x and y.

$$\frac{x}{y} = \frac{7}{4}$$

$\Rightarrow \quad 4x = 7y$ ...(i)

After 12 years

$$\frac{x+12}{y+12} = \frac{10}{7}$$

$\Rightarrow \quad 7x + 84 = 10y + 120$

$\Rightarrow \quad 7x - 10y = 36$ ...(ii)

We get, 28, y = 16

25. (B) $\frac{1}{3} \times 15x + \frac{1}{2} \times 8x + \frac{1}{6} \times 12x = 605 \times 100$

$5x + 4x + 2x = 605 \times 100$

$11x = 605 \times 100$

$x = 5500$

26. (D) Time = $\frac{n-1}{r} \times 100 = \frac{5-1}{16} \times 100$

$= \frac{4}{16} \times 100 = 25$ years

27. (B) Sum = $3840 \times \left(\frac{3840}{4800}\right)^2 = 3840 \times \frac{16}{25}$ = Rs. 2457.6

28. (D) Let the present ages of Yogesh, Vinod and Kamal be 3x, 4x and 5x years respectively.

Now, (3x + 4x + 5x)/3 = 28

$\rightarrow$ 12x = 84

$\rightarrow$ x = 84/12 = 7

So, required Sum = (3x + 4x + (5 + 5) years

= (7x + 10) years

= (7 × 7 + 10) years

= 59 years

29. (B) Area of the circle = $\frac{22}{7} \times (14)^2 = 616\ cm^2$

Area of the rectangle = 1166 – 616 = 550 cm^2

Breadt of rectangle = $\frac{550}{25} = 22\ cm$

So, required sum = $2 \times \frac{22}{7} \times 14 + 2(25 + 22) = 182\ cm$

30. (D) Let the length of the platform be x metres, Then,

Speed of metro train = 120 kmph = $120 \times \frac{5}{18} = \frac{100}{3} m/s$

$\Rightarrow$ $320 + x = \frac{100}{3} \times 24$

$\Rightarrow$ $x = 800 - 320 = 480m$

Required speed of women = $\frac{480}{4 \times 60} = 2m/s$

31. (D) A scored in maths = $500 \times \frac{28}{100} = 140$

B scored in maths = $500 \times \frac{25}{100} = 125$

$\therefore$ Difference = 140 – 125 = 15

32. (C) Required ratio = $\frac{15}{24} = \frac{5}{8} = 5 : 8$

33. (C) Average marks = $\frac{80 + 120 + 125 + 100}{4} = 106.25$

34. (E) Score of A and B in all subjects individually

Subject	A's Score	B's Score
English	90	100
Chemistry	75	120
Maths	140	125
Physics	110	80
Hindi	85	75

Hence, A failed in chemistry and B failed in hindi

Ratio = 1 : 1

35. (D) Scored in Chemistry [If tota score is = 600]
Score of A = 15% of 600

$$= 15 \times \frac{600}{100} = 90$$

36. (B) Number of literate people in Kota
= (44 × 70)/ 100 = 30.8 lakhs
Number of literate people got government job
= (30.8 × 22) / 100 = 677600

37. (A) Number of literate people in Kanpur
= (92 × 46) / 100 = 42.32 lakhs
Number of literate people got government job
= (42.32 × 32) / 100 = 13.5424
Number of literate people not got government job
= 42.32 – 13.5424 = 28.7776 lakhs = 2877760

38. (D) Total literate people in all six cities
= 30.80 + 35.84 + 40 + 34.40 + 42.32 + 46.08 = 229.44 lakhs

39. (B) Literate people in Kota and Pune
= [(44 × 70) / 100] + [(56 × 64) / 100] = 30.80 + 35.84 = 66.64 lakhs

40. (E) Number of government job in Patna
= (80 × 50 × 20) / (100 × 100) = 8
% required = (8/80) × 100 = 10%

RRB PO PRELIMINARY

QUANTITATIVE APTITUDE

Directions (1–5) : What **approximate** value should come in place of the question mark (?) in the following questions ? (**Note :** you are not expected to calculate the exact value.)

1. 18.505% of 550.010 = ?

(A) 135 (B) 85
(C) 100 (D) 120
(E) 90

2. 969.69 + 996.96 + 966.66 = ?

(A) 2560 (B) 2870
(C) 2930 (D) 2390
(E) 2900

3. $\sqrt{1599}$ = ?

(A) 40 (B) 45
(C) 35 (D) 30
(E) 50

4. 24.996 × 13.005 × 17.080 = ?

(A) 6225 (B) 5525
(C) 5405 (D) 5875
(E) 6025

5. 8599.999 ÷ 420.002 × 14.996 = ?

(A) 250 (B) 325
(C) 275 (D) 300
(E) 350

Directions (6–10) : In the following number series only one number is **wrong**. Find out the **wrong** number.

6. 5 348 564 689 716 780 788

(A) 716 (B) 788
(C) 348 (D) 689
(E) 780

7. 4444 2224 1114 556 281.5 142.75 73.375

(A) 2224 (B) 281.5
(C) 1114 (D) 556
(E) 142.75

8. 4.5 16 25 33 38.5 42 43.5

(A) 33 (B) 38.5
(C) 42 (D) 43.5
(E) 25

9. 6 49 305 1545 6196 18603 37218

(A) 6196 (B) 49
(C) 305 (D) 1545
(E) 18603

10. 8 5 6.5 11 26 68 207.5

(A) 68 (B) 6.5
(C) 11 (D) 26
(E) 207.5

11. 2 men can complete a piece of work in 6 days. 2 women can complete the same piece of work in 9 days, whereas 3 children can complete the same piece of work in 8 days. 3 women and 4 children worked together for 1 day. If only men were to finish the remaining work in 1 day, how many total men would be required ?

(A) 4 (B) 8
(C) 6 (D) Cannot be determined
(E) None of these

12. What will be the **approximate** difference in the simple and compound interest accured on an amount of ₹ 2600 at the rate of 15 p.c. p.a. at the end of three years ?

(A) ₹ 167 (B) ₹ 194
(C) ₹ 202 (D) ₹ 172
(E) ₹ 184

13. A 320 metre long train crosses a platform thrice its lenght in 40 second. What is the speed of the train in km/hour ?

(A) 120.6 (B) 115.2
(C) 108.4 (D) Cannot be determined
(E) None of these

Directions (14–15) : Study the following information carefully to answer the questions that follow**:**

A committee of five members is to be formed out of 4 students. 3 teachers and 2 sports coaches. In how many ways can the committee be formed if –

14. the committee should consist of 2 students. 2 teachers and 1 sports coach ?

(A) 25 (B) 64
(C) 9 (D) 36
(E) None of these

15. any five people can be slected ?

(A) 126 (B) 45
(C) 120 (D) 24
(E) None of these

16. In how many different ways can the letters of the word 'LEASE' be arranged ?

(A) 240 (B) 120
(C) 25 (D) 60
(E) None of these

17. The digit in the unit's place of a three digit number is thrice the digit in the ten's place and the digit in the hundred's place is two–third of the digit in the ten's place. If the sum of the three digits of the number is 14. What is the three digit number ?

(A) 932 (B) 239
(C) 326 (D) cannot be determined
(E) None of these

18. The ratio of the present ages of Meena and Fiona is 16 : 13 respectively Four years ago the respectively ratio of their ages was 14 : 11. What will be Fiona's age four years from now ?

(A) 28 years (B) 32 years
(C) 26 years (D) 36 years
(E) None of these

19. The cost of building a fence around a circular field is ₹ 7,700 at the rate of ₹ 14 per foot. What is the area of the circular field ?

(A) 24062.5 sq.ft. (B) 23864.4 sq.ft.
(C) 24644.5 sq.ft. (D) Cannot be determined
(E) None of these

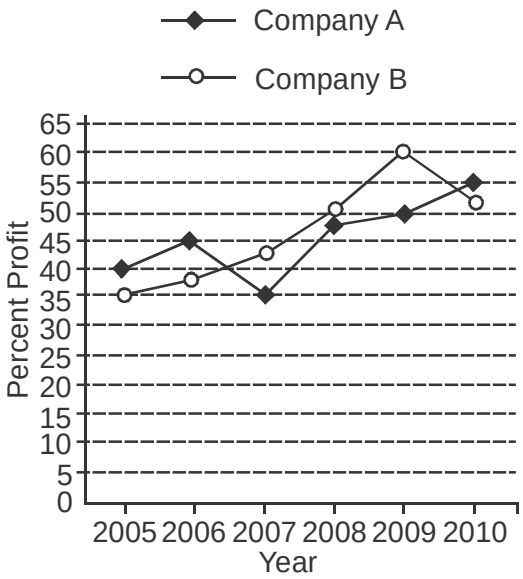
20. Gina invests ₹48,000 to start a business. Four months later Shrayon joins her by investing ₹62,000 and another two months later Deepika joins them both by investing ₹80,000. At the end of one year the business earns a profit of ₹20,661. What is Deepika's share in the profit ?

(A) ₹ 7,668 (B) ₹ 6,603
(C) ₹ 7,240 (D) ₹ 6,390
(E) None of these

Directions (21 - 25) : Study the following graph carefully to answer the questions:

Percentage Profit Earned by Two Companies Over the Years

$$\text{Percent profit} = \frac{(\text{Income} - \text{Expenditure}) \times 100}{\text{Expenditure}}$$



21. In the income of company A in the year 2006 was ₹ 6.425 lakhs, what was it's expenditure in that year ?

(A) ₹ 4.7 lakhs (B) ₹ 5.2 lakhs
(C) ₹ 4.5 lakhs (D) ₹ 3.8 lakhs
(E) None of these

22. If the expenditure of company A in the year 2005 was ₹ 3.6 lakhs, what was the amount of profit earned by it in that year ?

(A) ₹ 2.52 lakhs (B) ₹ 2.46 lakhs
(C) ₹ 1.44 lakhs (D) ₹ 1.31 lakhs
(E) None of these

23. What is the **approximate** average percent profit earned by it in that year ?

(A) 57 (B) 36
(C) 41 (D) 53
(E) 45

24. If in the year 2009 incomes of both the companies A and B were the same, what was the respective ratio of their expenditures in that year ?

(A) 7 : 5 (B) 16 : 15
(C) 23 : 21 (D) Cannot be determined
(E) None of these

25. What is the percentage increase in percent profit of company B in the year 2008 from the previous year ? (rounded off to two digits after decimal)

(A) 17.65 (B) 19.25
(C) 16.55 (D) 15.75
(E) None of these

Directions (26–30) : Study the following table carefully to answer the questions that follow **:**

Number of Employees Promoted to the Post of Manager in Six Different Banks over the Years

Bank / Year	L	M	N	O	P	Q
2005	48	46	52	44	37	39
2006	50	47	50	32	44	46
2007	46	40	50	42	38	35
2008	38	48	36	51	35	39
2009	32	44	46	45	48	40
2010	52	39	47	41	46	43

26. What is the average number of employees promoted by bank O over all the years together ?

(A) 44 (B) 39.5

(C) 35 (D) 42.5

(E) 46

27. What is the total number of employees who got promoted by in all the banks together in the year 2008 ?

(A) 234 (B) 243

(C) 266 (D) 282

(D) None of these

28. What is the percentage increase in the number of employees promoted by Bank Q in 2006 from the previous year ? (rounded off to two digits after decimal)

(A) 16.23 (B) 15.84

(C) 17.95 (D) 18.68

(E) None of these

29. Number of employees promoted by Bank P in the year 2009 forms **approximately** what percent of the total number of employees promoted by all the banks together in that year ?

(A) 30 (B) 9

(C) 14 (D) 19

(E) 25

30. What is the respective ratio of total number of employees promoted by Bank M in the years 2006 and 2010 together to the total number of employees promoted by Bank L from the same years?

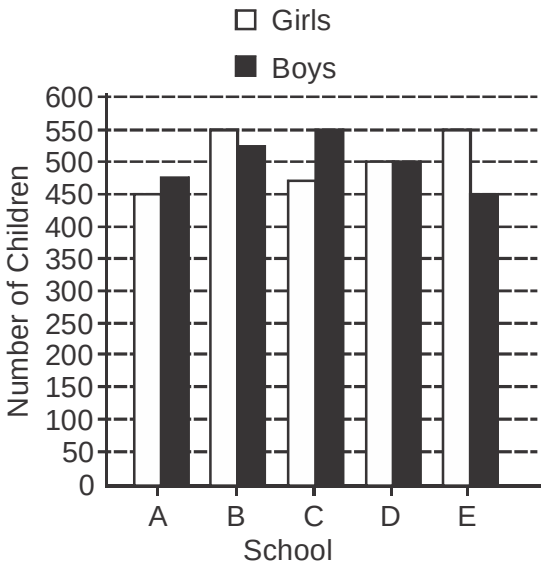
(A) 41 : 63 (B) 43 : 51

(C) 47 : 53 (D) 45 : 61

(E) None of these

Directions (31–35) : Study the following graph carefully to answer the questions that follow :

Number of Girls and Boys Participating in a Rally From Five Different Schools



31. What is the total number of girls participating in the rally from schools A and C together ?

(A) 825 (B) 875

(C) 950 (D) 975

(E) None of these

32. The number of boys participating in the rally from school B is what percent of the total number of the children participating in the rally from that school ? (Rounded off to two digits after decimal.)

(A) 48.84 (B) 47.37

(C) 49.28 (D) 46.46

(E) None of these

33. The number of girls participating the rally from school E is **aaproximately** what percent of the the number of the boys participating in the rally from the same school ?

(A) 81 (B) 106

(C) 122 (D) 98

(E) 114

34. What is the respective ratio of total number of girls participating in the rally from schools D and E together to the total number of boys participating in the rally from schools A and B together?

(A) 23 : 18 (B) 43 : 35

(C) 41 : 38 (D) 21 : 20

(E) None of these

35. What is the average number of girls participating in the rally from all the schools together ?

(A) 500 (B) 480

(C) 525 (D) 495

(E) None of these

Direction (36–40) : Study the following table carefully to answer the questions that follow **:**

Percentage of marks obtained by six students in five different subjects in A school examination

Subject / Student	English (50)	Maths (100)	Science (150)	Hindi (50)	Social Students (75)
P	66	89	80	78	84
Q	58	79	64	82	60
R	62	77	74	84	88
S	72	67	84	74	68
T	70	81	70	76	64
U	64	83	60	88	70
Note : Figures in the brackets indicate maximum marks for each subject.					

36. What is the **approximate** overall percentage of marks obtained by U in all the subjects together?

(A) 75 (B) 71

(C) 79 (D) 82

(E) 87

37. If in order to pass the examination a minimum of 109.5 marks are required in Science. how many students pass in the examination ?

(A) None (B) Two

(C) One (D) Three

(E) None of these

38. What are the average marks obtained by all the students together in Hindi ?

(A) $39\frac{1}{6}$ (B) $40\frac{1}{6}$

(C) $41\frac{1}{3}$ (D) $44\frac{1}{3}$

(E) None of these

39. What is the average percentage of marks obtained by all the students together in English ?

(A) 61 (B) 63

(C) 65 (D) 68

(E) 59

40. What are the total marks obtained by S in all the subjects together ?

(A) 317 (B) 309

(C) 323 (D) 348

(E) None of these

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
C	C	A	B	D	A	D	E	C	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	E	B	D	A	D	B	E	A	D
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
E	C	E	B	A	D	E	C	D	B
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
E	A	C	D	E	B	D	B	C	A

SOLUTIONS

1. (C) $? \approx \frac{550 \times 19}{100} \approx \frac{10450}{100} \approx 104.5$

$\therefore$ Required number = 100

2. (C) $? \approx 970 + 997 + 967 \approx 2934$

$\therefore$ Required number = 2930

3. (A) $? = \sqrt{1599} \approx \sqrt{1600} \approx 40$

4. (B) $? \approx 25 \times 13 \times 17 \approx 5525$

5. (D) $? \approx \frac{8600}{420} \times 15 \approx 307$

$\therefore$ Required answer = 300

6. (A) The pattern of the number series is :

$5 + 7^3 = 5 + 343 = 348$

$348 + 6^3 + 348 + 216 = 564$

$564 + 5^3 = 564 + 125 = 689$

$689 + 4^3 = 689 + 64 = 753$, not $\boxed{716}$

$753 + 3^3 = 753 + 27 = 780$

7. (D) The pattern of the number series is :

$\frac{4444}{2} + 2 = 2224$

$\frac{2224}{2} + 2 = 1114$

$\frac{1114}{2} + 2 = 559$, not $\boxed{556}$

$\frac{559}{2} + 2 = 281.5$

8. (E) The pattern of the number series is :

$4.5 + 11.5 = 16$

$16 + 9.5 = 25.5$, not $\boxed{25}$

$22..5 + 7.5 = 33$

$33 + 5.5 = 38.5$

9. (C) The pattern of the number series is :

$6 \times 7 + 1 \times 7 = 49$

$49 \times 6 + 2 \times 6 = 306$, not $\boxed{305}$

$306 \times 5 + 3 \times 5 = 1545$

$1545 \times 4 + 4 \times 4 = 6196$

$6196 \times 3 + 5 \times 3 = 18603$

10. (C) The pattern of the number series is :

$8 \times 0.5 + 1 = 5$

$5 \times 1 + 1.5 = 6.5$

$5 \times 1 + 1.5 = 6.5$

$6.5 \times 1.5 + 2 = 9.75 + 2 = 11.75$, not $\boxed{11}$

$11.75 \times 2 + 2.5 = 23.5 + 2.5 = 26$

$26 \times 2.5 + 3 = 68$

11. (B) 2×6 men $\equiv$ 18 women $\equiv$ 24 children

2 men $\equiv$ 3 women $\equiv$ 5 children

3 women + 4 children $\equiv$ 4 men part of work done in 1 day 4 men $= \frac{1}{3}$

$\therefore$ Remaining $\frac{2}{3}$ work will be finished by 8 men in 1 day.

12. (E) $A = P\left[\left(1+\frac{R}{100}\right)^{T} - 1\right]$

$= 2600\left[\left(1+\frac{15}{100}\right)^{3} - 1\right] = 2600 \times 0.5209 = \text{Rs. } 1354$

Simple interest $= \frac{P \times R \times T}{100} = \frac{2600 \times 15 \times 3}{100} = \text{Rs. } 1170$

$\therefore$ Difference = Rs. (1354 – 1170) = Rs. 184

13. (B) Speed of train $= \frac{\text{Length of (train + platform)}}{\text{Time Taken}}$

$= \left(\frac{320 + 3 \times 320}{40}\right)$ metre/second = 32 metre/second

$= \left(\frac{32 \times 18}{5}\right)$ kmph = 115.2 kmph

14. (D) Required number of combinations

$\Rightarrow$ ${}^{4}C_{2} \times {}^{3}C_{2} \times {}^{2}C_{1}$

$= \frac{4 \times 3}{1 \times 2} = \frac{3 \times 2}{1 \times 2} \times 2 = 36$

15. (A) Required number of combinations

$\Rightarrow$ ${}^{9}C_{5} = \frac{9 \times 8 \times 7 \times 6 \times 5}{1 \times 2 \times 3 \times 4 \times 5} = 126$

16. (D) The world LEASE consists of 5 letters in which E comes twice.

$\therefore$ Number of arrangements $= \frac{5!}{2!}$

$= \frac{5 \times 4 \times 3 \times 2 \times 1}{2 \times 1} = 60$

17. (B) Let the ten's digit be *x*.

$\therefore$ Unit's digit = 3x

Hundres's digit = $\frac{2x}{3}$

$\therefore$ $x + 3x + \frac{2x}{3} = 14$

$\Rightarrow$ $3x + 9x + 2x = 14x \times 3$

$\Rightarrow$ $14x = 14 \times 3 \Rightarrow x = 3$

$\therefore$ Number = 239

18. (E) Let the present ages of Meena and Fiona be 16x and 13x years respectively. According to the question.

$$\frac{16x - 4}{13x - 4} = \frac{14}{11}$$

$\Rightarrow$ $176x - 44 = 182x - 56$

$\Rightarrow$ $182x - 176x = 56 - 44$

$\Rightarrow$ $6x = 12 \Rightarrow x = 2$

$\therefore$ Fiona's age after four years = 13x + 4

= 13 × 2 + 4 = 30 years

19. (A) Circumference of circular plot = $\frac{7700}{14}$ = 550 feet

$\therefore$ $2\pi r = 550$

$\Rightarrow$ $r = \frac{500}{2\pi} = \frac{550 \times 7}{2 \times 22} = 87.5$ feet

$\therefore$ Area = $\frac{22}{7} \times 87.5 \times 87.5 = 24062.5$ sq. feet.

20. (D) Ratio of the profits of Gina, Shrayon and Deepika

= 48000 × 12 : 62000 × 8 : 80000 × 6

= 48 × 12 : 62 × 8 : 80 × 6 = 36 : 31 : 30

Sum of ratios = 36 + 31 + 30 = 97

$\therefore$ Deepika's share = Rs. $\left(\frac{30}{97} \times 20661\right)$

= Rs. 6,390

21. (E) $45 = \left(\frac{6.425 - E}{E}\right) \times 100$

$\Rightarrow$ $145\ E = 642.5$

$\Rightarrow$ $E = \frac{642.5}{145}$ = Rs. 4.43 lakhs

22. (C) $40 = \left(\frac{1 - 3.6}{3.6}\right) \times 100$

$\Rightarrow$ $40 \times 3.6 = 100\ I - 360$

$\Rightarrow$ $144 + 360 = 100\ I$

$\Rightarrow$ I = Rs. 5.0 lakhs

$\therefore$ Proft = 5.04 – 3.6

= Rs. 1.44 lakhs

23. (E) Averafe percent profit earned by company A

$$= \frac{40 + 45 + 35 + 47.5 + 50 + 55}{6} = \frac{272.5}{6} = 45$$

24. (B) $50 = \left(\frac{I - E_1}{E_1}\right) \times 100$

$\Rightarrow$ $150\ E_1 = 100\ I$ ...(i)

$60 = \left(\frac{I - E_2}{E_2}\right) \times 100$

$\Rightarrow$ $160\ E_2 = 100\ I$ ...(ii)

$\therefore$ $\frac{150}{160}\ \frac{E_1}{E_2} = 1$

$\Rightarrow$ $\frac{E_1}{E_2} = \frac{160}{150} = \frac{16}{15}$

25. (A) Required percentage $= \frac{50 - 42.5}{42.5} \times 100 = 17.65$

26. (D) Average number of employees promoted by bank O

$$= \frac{44 + 32 + 42 + 51 + 45 + 41}{6} = \frac{225}{6} = 42.5$$

27. (E) Required number of promoted employees in 2008

= 38 + 48 + 36 + 51 + 35 + 39 = 247

28. (C) Required percentage $= \frac{46 - 39}{39} \times 100 = 17.95$

29. (D) Total number of employees promoted in 2009

= 32 + 44 + 46 + 45 + 48 + 40 = 225

$\therefore$ Required percentage $= \frac{48}{225} \times 100 = 19$

30. (B) Required ratio = (47 + 39) : (50 + 52)

= 86 : 102 = 43 : 51

31. (E) Required number of girls = 450 + 475 = 925

32. (A) Required percentage $= \left(\frac{525}{525 + 550}\right) \times 100 = 48.84$

33. (C) Required percentage $= \frac{550}{450} \times 100 \approx 122$

34. (D) Required ratio = (500 + 550) : (475 + 525)

= 1050 : 1000 = 21 : 20

35. (E) Required average number of girls

$$= \frac{450 + 550 + 475 + 500 + 550}{5} = \frac{2525}{5} = 505$$

36. (B) Total marks obtaibed by U

$$= \frac{50 \times 64}{100} + 83 + \frac{60}{100} \times 150 + \frac{88 \times 50}{100} + \frac{75 \times 70}{100}$$

$$= 32 + 83 + 90 + 44 + 52.5 = 301.5$$

$\therefore$ Required percentage of marks $= \frac{301.5}{425} \times 100 \approx 71$

37. (D) x% of 150 = 109.5

$\therefore$ $x = \frac{109.5 \times 100}{150} = 73$

$\therefore$ Three students P, R and S passed.

38. (B)

Average of percentage in Hindi

$$= \frac{78 + 82 + 84 + 74 + 76 + 88}{6} = \frac{482}{6} = \frac{241}{3}$$

$\therefore$ Required average $= \frac{241}{3}\%$ of 5

$$= \frac{50 \times 241}{300} = \frac{241}{6} = 40\frac{1}{6}$$

39. (C) Average percentage of marks in English

$$= \frac{66 + 58 + 62 + 72 + 70 + 64}{6} = \frac{392}{6} = 65$$

40. (A) Total marks obtained by S

$$= \frac{50 \times 72}{100} + 67 + \frac{150 \times 84}{100} + \frac{50 \times 74}{100} + \frac{68 \times 75}{100}$$

$$= 36 + 67 + 126 + 37 + 51 = 317$$

RRB PO MAIN

QUANTITATIVE APTITUDE

Directions (1–5) : In each of the following questions a number series is given which has only one wrong number. You have to find out the wrong number.

1. 7.25 47.5 87.5 157.5 247.5 357.5 487.5

(A) 357.5 (B) 87.5
(C) 157.5 (D) 7.5
(E) 47.5

2. 13 16 21 27 39 52 69

(A) 21 (B) 39
(C) 27 (D) 52
(E) 16

3. 1500 1581 1664 1749 1833 1925 2016

(A) 1581 (B) 1664
(C) 1833 (D) 1925
(E) 1749

4. 66 91 120 153 190 233 276

(A) 120 (B) 233
(C) 153 (D) 276
(E) 190

5. 1331 2197 3375 4914 6859 9261 12167

(A) 4914 (B) 6859
(C) 9261 (D) 2197
(E) 12167

Directions (6–10) : Each of the questions below consists of a quetlon and two statement numbered I and II are given below it, You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and

Give answer (A) : if the data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question.

Give answer (B) : if the data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient answer the question.

Give answer (C) : if the data either in Statement I alone or in statement II alone are sufficient to answer the question.

Give answer (D) : if the data in both the Statements I and II are not sufficient to answer the question.

Give answer (E) : if the data in both the statements I and II together are necessary to answer the question.

6. What is the ratio of the number of freshers to the number of seniors in a college ?

I. The ratio of males and females in the college is 2 : 3.

II. There are 1125 female freshers in the college.

7. What is Nidhi's age ?

I. Nidhi is 3 times younger to Rani.

II. Surekha is twice the age of Rani and the sum of their ages is 72 years.

8. What is the ratio of the total number of girls to the total number of boys in the school ?

I. The ratio of the total number of boys to the total number of girls, last year was 4 : 5.

II. There are 3500 students in the school out of which 60% are boys.

9. What is mr. Mehta's present income ?

I. Mr. Mehta's income increases by 10% every year.

II. His income will increase by Rs. 2500 this year.

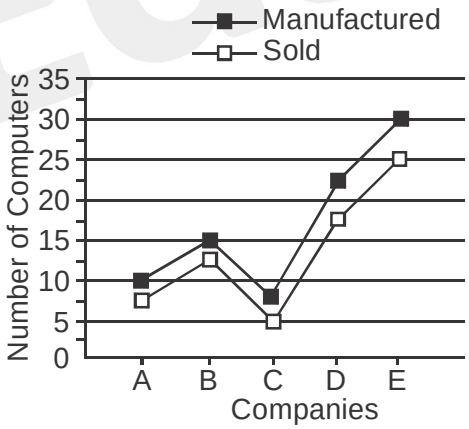
10. What is the speed of the bus ?

I. The bus covers a distance of 80 kms. in 5 hrs.

II. The bus covers a distance of 160 kms. in 10 hrs.

Directions (11–15) : Study the following graph carefully to answer the questions that follow **:**

Number of computer manufactured and sold by Various Companies in a year (Number in Lakhs)



11. What is the respective ratio of the number of computers manufactured by companies A and C together to the number of computers sold by companies A and C together ?

(A) 4 : 5 (B) 14 : 11

(C) 8 : 9 (D) 7 : 5

(E) None of these

12. What is the difference between the average number of computers manufactured by all the comp anies together and the average number of computers sold by all the companies together ?

(A) 3,500 (B) 35,000

(C) 3,50,000 (D) 35,00,000

(E) None of these

13. The number of computers sold by company B are what per cent of the number of computers manufactured by company B ? (rounded off to two digits after decimal)

(A) 83.33 (B) 120
(C) 78.83 (D) 106.54
(E) None of these

14. The number of computers manufactured by company D are what per cent of the number of computers manufactured by company E ?

(A) 125 (B) 112.5
(C) 85 (D) 65.25
(E) 75

15. The number of computers manufacturd by company B are **approximately** what per cent of the number of computers manufactured by all the companies together ?

(A) 22 (B) 18
(C) 14 (D) 26
(E) 32

Directions (16–20) : Study the table carefully to answer the questions that follow **:**

Percentage of Marks Obtained by Different Students in Different Subjects

	SUBJECTS							
Students	**Hindi (150)**	**Eng (150)**	**Math (150)**	**S.Sc. (125)**	**Physics (75)**	**Chem. (75)**	**Bio (75)**	**Sanskrit (50)**
Ankita	60	64	67	59	70	65	68	70
Bakul	75	95	92	87	84	74	90	77
Chaitanya	93	71	76	74	79	62	64	82
Deepali	66	56	70	66	71	64	72	58
Gauri	62	75	62	88	78	80	74	64
Himani	58	60	64	54	70	62	72	66

16. How many marks did Himani get in all the subjects together ?

(A) 505 (B) 496
(C) 525 (D) 601
(E) None of these

17. What are the average marks obtained by all students together in Physics ?

(A) 75.33 (B) 56.5
(C) 64.25 (D) 48.88
(E) None of these

18. How many Students have scored the highest marks in more than one subject ?

(A) Three (B) Two
(C) One (D) None
(E) None of these

19. Marks obtained by Ankita in Sanskrit are what per cent of marks obtained by Gauri in the same Subject ? (rounded off to two digits after decimal)

(A) 91.43 (B) 94.29
(C) 103.13 (D) 109.38
(E) None of these

20. Who has scored the highest marks in all the subjects together ?

(A) Chaitanya (B) Himani
(C) Deepali (D) Gauri
(E) None of these

Directions (21–25) : Study the following table and answer the questions given below **:**

Export of Electronic Goods From India (in Rs. Crore)

Year	Total Exports	Electronic Goods
2001	5,143	552
2002	5,403	624
2003	5,426	717
2004	5,999	653

21. **Approximately,** what per cent of the total exports were electronic goods in 2003 ?

(A) 13% (B) 19%
(C) 21% (D) 23%
(E) None of these

22. The percentage fall in electronic goods exports in 2004 from 2003 was nearly

(A) 12% (B) 15%
(C) 9% (D) 14%
(E) 16%

23. If the electronic goods are not expected in the year 2002, then what are the total exports of that year ?

(A) 4770 (B) 4780
(C) 4790 (D) 4760
(E) None of these

24. Percentage growth of electronic goods exports in the period of 2002 to 2003 exceeded the percentage growth of the total exports over the same period **approximately** by

(A) 13.5 (B) 12.5
(C) 15.5 (D) 11.5
(E) 14.5

25. Over the 4 years period from 2001 to 2004, the electronic exports rose by **nearly**

(A) 16.3% (B) 15.3%
(C) 14.3% (D) 18.3%
(E) 20.3%

26. How much part of a day is 45 minutes ?

(A) $\frac{1}{42}$ (B) $\frac{1}{24}$

(C) $\frac{1}{32}$ (D) $\frac{1}{48}$

(E) None of these

27. What will be the greater of two numbers whose product is 640, if the sum of the two numbers, exceeds their difference by 32 ?

(A) 45 (B) 50

(C) 55 (D) 40

(E) None of these

28. Samir drove at the speed of 45 kmph. from home to a resort. Returning over the same route, he got stuck in traffic and took an hour longer, also he could drive only at the speed of 40 kmph. How many kilometres did he drive each way ?

(A) 250 kms. (B) 300 kms.

(C) 310 kms. (D) 275 kms.

(E) None of these

29. 20 boys and 25 girls form a group of social workers. During their membership drive, the same number of boys and girls joined the group (e.g. if 7 boys joined, 7 girls joined). How many members does the group have now, if the ratio of boys to girls is 7: 8 ?

(A) 75 (B) 65

(C) 70 (D) 60

(E) None of these

30. Vaishali spent Rs. 31,897 on the air conditioner for her home, Rs. 38,789 on buying plasma television and the remaining 23% of the total amount she had as cash with her. What was the total amount ?

(A) Rs. 74,625 (B) Rs. 86,750

(C) Rs. 91,800 (D) Cannot be determined

(E) None of these

Directions (31–35) : What **approximate** value will come in place of the question mark (?) in the following questions ?

31. (47% of 1442 – 36% of 1412) ÷ 63 = ?

(A) 4 (B) 5

(C) 3 (D) 6

(E) 1

32. $(\sqrt{7921} - \sqrt{2070.25}) \times \frac{1}{4} = ?$

(A) 11 (B) 14

(C) 15 (D) 9

(E) 13

33. (341789 + 265108) ÷ (8936 – 3578) = ?

(A) 150 (B) 113
(C) 135 (D) 100
(E) 125

34. 29% of 725 = 60% of 315 + ?

(A) 28 (B) 3C
(C) 15 (D) 18
(E) 21

35. 1595 ÷ 25 × 36.5 = ?

(A) 2459 (B) 2329
(C) 2359 (4) 2429
(E) 2349

Directions (36–40) : Study the table carefully to answer the questions that follow **:**

STATES

Years	A		B		C		D		E		F	
	App	Quld	App	Quld	App	Quld	App	Quld	App	Quld	App	Quld
2001	1567	124	1745	156	1684	150	1440	165	1564	162	1886	142
2002	1678	110	1897	178	1550	178	1390	172	1575	188	1764	186
2003	1785	156	1674	162	1754	210	1364	114	1510	214	1738	194
2004	1630	234	1986	154	1806	186	1478	138	1654	196	1644	182
2005	1805	256	2107	193	1666	198	1560	189	1690	180	1680	176
2006	1922	234	2080	245	1884	254	1672	193	1432	206	1572	222
2007	1790	198	2095	220	1728	202	1778	195	1864	216	1444	218

36. **Approximately** what is the percentage of candidates qualified over appeared from all the six states together in 2006 ?

(A) 13 (B) 21
(C) 27 (D) 32
(E) 39

37. **Approximately** what is the average number of candidates qualified from State D over the given years ?

(A) 132 (B) 116
(C) 84 (D) 141
(E) 167

38. Percentage of candidates qualified over appeared in 2004 is the highest for which of the following states ?

(A) B (B) D
(C) A (D) F
(E) None of these

39. Percentage of candidates qualified over apeared from State B is the lowest during which of the following years ?

(A) 2007 (B) 2004
(C) 2001 (D) 2002
(E) None of these

40. The number of candidates qualified form State C in 2002 and 2005 together is what percent of the number of candidates appreared from State F in 2003 and 2004 together ? (rounded off to two digits after decimal)

(A) 10.65 (B) 12.44
(C) 14.86 (D) 11.12
(E) None of these

ANSWER KEY

1	2	3	4	5	6	7	8	9	10
E	C	C	B	A	D	E	B	E	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	C	A	E	B	E	B	A	D	E
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	C	B	E	D	C	D	E	A	C
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
C	A	B	E	B	A	E	C	B	D

SOLUTIONS

1. (E) The given number series is based on the following pattern **:**

487.5 – 357.5 = 130

357.5 – 247.5 = 110

247.5 – 157.5 = 90

157.5 – 87.5 = 70

87.5 – 47.5 = 40

87.5 – 37.5 = 50

37.5 – 7.5 = 30

Clearly, 47.5 is the wrong number.

It should be replaced by 37.5.

2. (C) The given number series is based on the following pattern :

13 + 3 = 16

16 + 5 = 21

21 + 7 = 28 ≠ 27

29 + 11 = 39

39 + 13 = 52

52 + 17 = 69

Clearly, 27 is the wrong numbr.

It should bw replaced by 28.

3. (C) The given number series is based on the following pattern :

1500 + 81 = 1581

1581 + 83 = 1664

1664 + 85 = 1749

1749 + 87 = 1836 ≠ 1833

1836 + 89 = 1925

1925 + 91 = 2016

Clearly, 1833 is the wrong number.

It Wiouid be replaced by 1836.

4. (B) The given number series is based on the following pattern :

66 + 25 = 91

91 + 29 = 120

120 + 33 = 153

153 + 37 = 190

190 + 41 = 231 ≠ 233

Clearly, 233 is the wrong number.

It should be replaced by 231.

5. (A) The given number series is based on the following pattern **:**

11 x 11 x 11 = 1331

$13 \times 13 \times 13 = 2197$

$15 \times 15 \times 15 = 3375$

$17 \times 17 \times 17 = 4913 \neq \boxed{4914}$

$19 \times 19 \times 19 = 6859$

Clearly, 4914 is the wrong number.

It should be replaced by 4913.

6. (D) The given data are inadequate.

7. (E) From statement II,

If the age of Rani = x years, then

Surekha's age = 2x years

$\therefore \quad x + 2x = 72$

$\Rightarrow \quad 3x = 72$ years

$\Rightarrow \quad x = \frac{72}{3} = 24$ years

$\therefore$ Rani's age = 24 years

As per the given information in statement I, Nidhi's age can be determined.

8. (B) Statement I Is superfluous.

From statement II,

Number of boys in the school $= 3500 \times \frac{60}{100} = 2100$

Numbar of boys in the school $= \frac{3500 \times 60}{100} = 2100$

Requirad ratio = 2100 : 1400 = 3 : 2

9. (E) Let Mr. Mehta's present Income be Rs. x.

From statements I and II,

10% of x = 2500

$\Rightarrow \quad x \times \frac{10}{100} = 2500$

$\Rightarrow \quad x = 2500 \times 10 =$ Rs. 25000

10. (C) From statement I,

Speed of the bus $= \frac{\text{Distance covered}}{\text{Time Taken}} = \frac{80}{5} = 16$ kmph

As per the information in statement II, the speed of the bus can also be determined.

11. (D) Number of computers manufactured by companies A and C together

= (10 + 7.5) lakh = 17.5 lakhs)

Number of computers sold by companies A and C together

= (7.5 + 5) lakh = 12.5 lakhs

$\therefore$ Required ratio = 17.5 : 12.5 = 7 : 5

12. (C) Average number of computers manufactured by all the companies together

$$= \left(\frac{10 + 15 + 7.5 + 22.5 + 30}{5}\right) \text{lakhs}$$

$$= \left(\frac{85}{5}\right) \text{ lakhs} = 17 \text{ lakhs}$$

Average number of computers sold by all the companies together

$$= \left(\frac{7.5 + 12.5 + 5 + 17.5 + 25}{5}\right) \text{lakhs}$$

$$= \left(\frac{67.5}{5}\right) \text{lakhs} = 13.5 \text{ lakhs}$$

$\therefore$ Required difference

= (17 – 13.5) lakhs = 3.5 lakhs = 3,50,000

13. (A) Required percentage

$$= \frac{12.5}{15} \text{ x } 100 = 83.33\%$$

14. (E) RequIred percentage = $\frac{22.5}{30} \times 10 = 75\%$

15. (B) Number of computer. manufactured by all the companies together = 85 lakhs

Number of computers manufactured by company B = 15 lakhs

$\therefore$ Required percentage

$$= \frac{15}{85} \times 100 = 17.65 \approx 18$$

16. (E) Marks obtained by Himani **:**

Hindi $\rightarrow 250 \times \frac{58}{100} = 87$

English $\rightarrow 250 \times \frac{60}{100} = 90$

Maths $\rightarrow 250 \times \frac{64}{100} = 96$

Social Science $\rightarrow \frac{125 \times 54}{100} = 67.5$

Physics $\rightarrow \frac{75 \times 70}{100} = 52.5$

Chemistry $\rightarrow \frac{75 \times 60}{100} = 40$

Biology $\rightarrow \frac{75 \times 72}{100} = 54$

Sanskrit $\rightarrow \frac{50 \times 66}{100} = 33$

$\therefore$ Total marks obtained = 87 + 90 + 96 + 67.5 + 52 + 5 + 40 + 54 + 33 = 520

17. (B) Average percentage of marks obtained In Physics

$$= \frac{70 + 84 + 79 + 71 + 78 + 70}{6}$$

$$= \frac{452}{6}\% = \frac{452}{600}$$

$\therefore$ Required average marks obtained = 56.5

18. (A) Students who have scored the highest marks in more than one subject, are **:**
Chaitanya (Hindi and Sanskrit) Bakul (English, Maths, Physics and Biology)
Gauri (social science and Chemistry)

19. (D) Marks obtained by Ankita in Sanskrit $= \frac{70 \times 50}{100} = 35$

Marks obtained by Gauri in Sanskrit $= \frac{50 \times 64}{100} = 32$

$\therefore$ Required percentage $= \frac{35}{32} \times 100 = 109.38$

20. (E) It is obvious from the table.
Bakul scored the highest marks in all the subjects together.

21. (A) Required percentage

$$= \frac{717}{5426} \times 100 = 13.21 \approx 13\%$$

22. (C) The fall in electronic goods exports in 2004 from 2003
= 717 – 653 = Rs. 64 crore

$\therefore$ Percentage fall $= \frac{64}{171} \times 100 \approx 9\%$

23. (B) Total exports in the year 2002 = 5404 – 624 = Rs. 4780 crore.

24. (E) Percentage growth of electronic goods exports in the period of 2002 to 2003

$$= \frac{717 - 624}{624} \times 100 = \frac{9300}{624} = 14.9\%$$

Percentage growth of the total exports in the period of

$$2002 \text{ to } 2003 = \frac{5426 - 5404}{5404} \times 100$$

$$= \frac{24}{5404} \times 100 = 0.40\%$$

$\therefore$ Required difference = 14.5%

25. (D) Required percentage growth $= \frac{653 - 552}{552} \times 100$

$$= \frac{10100}{552} = 18.3\%$$

26. (C) 1 day = 24 hours = 24 × 60 minutes

$\therefore$ Required part = $\frac{45}{24 \times 60} = \frac{1}{32}$

27. (D) Let one of the numbers be x.

$\therefore$ Second number = $\frac{640}{x}$

According to the question, $x = \frac{640}{x} = x - \frac{640}{x} + 32$

$\Rightarrow 2 \times \frac{640}{x} = 32$

$\Rightarrow 32x = 2 \times 640$

$\Rightarrow x = \frac{2 \times 640}{32} = 40$

$\therefore$ Second number = $\frac{640}{x} = \frac{640}{40} = 16$

$\therefore$ Large number = 40

28. (E) Let the required distance be *x* km.

According to the question,

$$\frac{x}{40} - \frac{x}{45} = 1$$

$\Rightarrow \frac{9x - 8x}{360} = 1$

$\Rightarrow \frac{x}{360} = 1 \quad \Rightarrow \quad x = 360$ km.

29. (A) Let x boys and x girls joined the group.

According to the question,

$$\frac{20 + x}{25 + x} = \frac{7}{8}$$

$\Rightarrow 160 + 8x = 175 + 7x$

$\Rightarrow 8x - 7x = 175 - 160$

$\Rightarrow x = 15$

$\therefore$ New number of members

$= 20 + x + 25 + x = 45 + 2x = 45 \div 2 \times 15 = 75$

30. (C) Let the total amount be Rs. x.

Percentage of amount spent = 100 – 23 = 77%

$\therefore$ 77% of x = Rs. (31897 + 38789) = 70686

$\Rightarrow x \times \frac{77}{100}$

$\Rightarrow \frac{70686 \times 100}{77} = $ Rs. 91800

31. (C) $? = \left(1442 \times \frac{47}{100} - \frac{1412 \times 36}{100}\right) \div 63$

$= (677.74 - 508.32) \div 63$

$= \frac{169.42}{63} \approx 2.69 \approx 3$

32. (A) $? = \left(\sqrt{7921} - \sqrt{2070.25}\right) \times \frac{1}{4}$

$= (89 - 45.5) \times \frac{1}{4}$

$= \frac{43.5}{4} = 10.875 \approx 11$

33. (B) $? = (341789 + 265108) \div (8936 - 3578)$

$= 606897 \div 5358 = 113.27 \approx 113$

34. (E) $\frac{725 \times 29}{100} = \frac{315 \times 60}{100} + ?$

$\Rightarrow \quad 210.25 = 189 + ?$

$\Rightarrow \quad ? = 210.25 - 189$

$= 21.25 \approx 21$

35. (B) $1595 \div 25 \times 36.5 = \frac{1595}{25} \times 36.5 = 2328.7 \approx 2329$

36. (A) Number of candidates appeared from all the six states together in 2006

$= 1922 + 2080 + 1884 + 1672 + 1432 + 1572 = 10562$

Number of candidates qualified in 2006

$= 234 + 245 + 254 + 193 + 206 + 222 = 1354$

$\therefore$ Required percentage $= \frac{1354}{10562} \times 100 = 12.8 \approx 13$

37. (E) Average number of candidates qualified from state D over the given years

$$= \frac{165 + 172 + 114 + 138 + 189 + 193 + 195}{7}$$

$$= \frac{116}{7} = 116.57 \approx 167$$

38. (C) It is obivous from the table.

percentage of candidates qualified over appeared from state A

$$= \frac{234}{1630} \times 100 = 14.35$$

39. (B) It is obvious from the table.

Percebntage of qualified candidates over appeared candidates **:**

Year 2001 $\rightarrow \frac{156}{1745} \times 100 \approx 9$

Year 2004 $\rightarrow \frac{154}{1986} \times 100 \approx 8$

40. (D) Number of candidates qualified from state C in 2002 and 2005 together
$= 178 + 198 = 376$
Number of candidates appeared from state F in 2003 and 2004 together
$= 1738 + 1644 = 3382$

$\therefore$ Required percentage $= \frac{376}{3382} \times 100 = 11.12$

IBPS SO

QUANTITATIVE APTITUDE

1. In a Primary School, the average weight of male students is 65.9 kg and the average weight of female students is 57 kg. If the average weight of all students (both male and female) is 60.3 kg and the number of male students in the school is 66, then what is the number of female students in the school ?

(A) 154 (B) 162
(C) 168 (D) 180
(E) 112

Directions (2–6) : What approximate value will come in place of question mark (?) in the given questions ? (You are not expected to calculate exact value.)

2. 105.27% of 1200.11 + 11.80% of 2360.85 = 21.99% of ? + 1420.99

(A) 500 (B) 240
(C) 310 (D) 550
(E) 960

3. 0.98% of 7824 + 4842 ÷ 119.46 – ? = 78

(A) 30 (B) 60
(C) 40 (D) 50
(E) 70

4. $(41.99^2 - 18.04^2) - ? = 13.11^2 - 138.99$

(A) 4004 (B) 1200
(C) 1720 (D) 8432
(E) 1410

5. $24.96^2 / (34.11 + 20.05) + 67.96 + 89.11 = ?$

(A) 884 (B) 546
(C) 252 (D) 424
(E) 170

6. $\sqrt{(2025.11)} \times \sqrt{(256.04)} + \sqrt{(399.95)} \times \sqrt{(?)} = 33.98 \times 40.11$

(A) 1682 (B) 1024
(C) 1582 (D) 678
(E) 1884

Directions (7–11) : Study the following information carefully to answer the questions.

There are 3 engineering specialisations offered by college A, namely Computer Science, Electrical and Mechanical and two management specialisations namely HR and Marketing. The total number of students studying Engineering specialisations is 2/3rd of the total number of students studying in college A.

The total number of students studying Computer Science Engineering is 32% of the total number of students studying Engineering applications. The total number of students Mechanical Engineering is 2400 which is 600 more than the total number of students studying Computer Science Engineering.

The total number of students studying Marketing is 112 more than the number of students studying HR.

7. Total number of students studying Marketing specialisation is what percent of the total number of students studying Mechanical Engineering ?

(A) $64\frac{1}{3}$ (B) $60\frac{11}{12}$

(C) $62\frac{2}{3}$ (D) $61\frac{1}{3}$

(E) $63\frac{2}{3}$

8. What is the average number of students studying Computer Science Engineering, Electrical Engineer and Marketing together ?

(A) 1896 (B) 1542

(C) 1484 (D) 1496

(E) 1562

9. What is the total number of students in college 'A' ?

(A) 7800 (B) 8000

(C) 7200 (D) 8437

(E) 8800

10. What is the respective ratio between total number of students studying Mechanical and Electrical Engineering together and the number of students studying Marketing ?

(A) 34 : 13 (B) 34 : 11

(C) 35 : 13 (D) 31 : 15

(E) 31 : 12

11. The respective ratio between the total number of female students and the total number of male students studying Engineering specialisations is 3 : 4. The total number of female students studying management specialisations is half of the total number of female students studying engineering specialisations. What is the total number of male students studying management specialisations ?

(A) 1800 (B) 1206

(C) 1300 (D) 1500

(E) 1600

12. Shashi had a sum of money. Two-third of the total money he invested in scheme A for 6 years and rest of the money he invested in scheme B for 2 years. Scheme A offers simple interest at a rate of 12% per annum and scheme B offers compound interest (compounded annually) at a rate of 10% per annum If the total sum obtained from both the schemes is ₹ 2805, what was the total amount invested by him in scheme A and scheme B together ?

(A) ₹ 1500 (B) ₹ 5100
(C) ₹ 1000 (4) ₹ 2000
(E) ₹ 1464

13. The radius of a cylinder is 5 m more than it's height. If the curved surface area of the cylinder is 792 m^2. What is the volume of the cylinder ? (in m^3)

(A) 5712 (B) 5244
(C) 5544 (D) 5306
(E) 5462

Directions (14–18) : Study the table and answer the given questions.

Total Exports of Six Countries over' Five Years (in ₹ crore)

Year → Country ↓	1998	1999	2000	2001	2002
P	20	40	60	45	90
Q	30	25	15	50	100
R	50	55	70	90	65
S	45	60	20	15	25
T	60	50	55	100	110
U	24	40	60	75	120

Note : Profit = Exports – Imports

14. What was the profit of all countries together in year 2002 if the total imports of all the countries together was ₹ 385 crore ?

(A) 125 (B) 160
(C) 280 (D) 240
(E) 200

15. If the respective ratio of export to import in country S and country U is 1 : 2 and 4 : 1 in the year 1998, then what is the total imports of country U and S together in that particular year ? (in ₹crore)

(A) 52 (B) 22
(C) 36 (D) 96
(E) 44

16. If the export of country P in the year 2003 is 20% more than the total exports of country Q in 2001 and export of country T in 2000 together, then what was the profit of P in the year 2003 if it's imports were ₹ 92 crore for that year ? (in ₹ crore)

(A) 10 (B) 58
(C) 22 (D) 46
(E) 34

17. By what percent the average export of country T over all the given years more than the average export of country R over all the given years ?

(A) $13\frac{7}{11}\%$ (B) $9\frac{1}{11}\%$

(C) $13\frac{5}{7}\%$ (D) $4\frac{7}{11}\%$

(E) $12\frac{1}{7}\%$

18. What is the percent increase in the exports of all the countries together in the year 1999 to 2001? (*Rounded off to two digits after decimal*)

(A) 88.99 (B) 72.39

(C) 38.89 (D) 62.89

(E) 40.60

19. A started with an investment of ₹ 28,000. After 2 months, B joins with ₹ 20,000 and after another two months C joins with ₹ 18,000. At the end of 10^{th} month from start of the business, if B withdraws ₹ 2,000 and C withdraws ₹ 2,000 what is the respective ratio in which profit should be distributed among A, B and C at the end of the year ?

(A) 12 : 7 : 5 (B) 12 : 9 : 5

(C) 12 : 6 : 3 (D) 14 : 7 : 5

(E) 11 : 9 : 7

20. A dealer marked the price of an item 40% above the cost price. Once he gave successive discounts of 20% and 25% to a particular customer. As a result, he incurred a loss of ₹ 448. At what price did he sell the item to the mentioned customer ?

(A) ₹ 2416 (B) ₹ 2352

(C) ₹ 2268 (D) ₹ 2152

(E) ₹ 2578

Directions (21–25) : What should come in place of question mark (?) in the following number series ?

21. 13 13 19 43 103 ?

(A) 221 (B) 227

(C) 223 (D) 217

(E) 239

22. 27 13 12 16.5 ? 75

(A) 31 (B) 29

(C) 37 (D) 33

(E) 35

23. 17 19 42 132 ? 2690

(A) 532 (B) 544

(C) 528 (D) 536

(E) 512

24. 25 29 67 217 ? 4501

(A) 927 (B) 877
(C) 885 (D) 911
(E) 893

25. 21 38 59 84 113 ?

(A) 138 (B) 152
(C) 134 (D) 146
(E) 148

26. The respective ratio between Parul's present age and Rohit's present age is 7 : 5. The sum of their ages 5 years from now will be 94. After how many years, Rohit's age will be equal to Parul's present age ?

(A) 21 (B) 7
(C) 14 (D) 18
(E) 24

27. 35kg of a type of sandal powder (type A) which costs ₹ 614 per kg was mixed with certain amount of another type of sandal powder (type B), which costs ₹ 695 per kg. Then the mixture was sold at ₹ 767 per kg and 18% profit was gained. What was the amount of type B sandal powder in the mixture ?

(A) 24 kg (B) 28kg
(C) 32kg (D) 36kg
(E) 20kg

Directions (28–32) : In the given questions, two equations numbered I and II are given, Solve both the equations and mark the appropriate answer.

(A) $x > y$
(B) $x \geq y$
(C) $x < y$
(D) Relationship between x and y cannot be determined
(E) $x \leq y$

28. I. $6x^2 + 25x + 24 = 0$
II. $12y^2 + 13y + 3 = 0$

29. I. $12x^2 - x - 1 = 0$
II. $20y^2 - 41y + 20 = 0$

30. I. $l0x^2 + 33x + 27 = 0$
II. $5y^2 + 19y + 18 = 0$

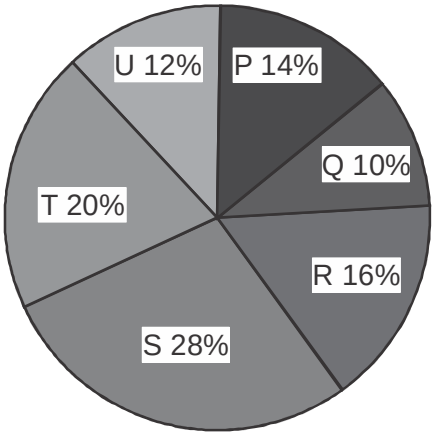
31. I. $15x^2 - 29x - 14 = 0$
II. $6y^2 - 5y - 25 = 0$

32. I. $3x - 22x + 7 = 0$

II. $y^2 - 20y + 91 = 0$

Directions (33–37) : Refer to the pie-chart and the table and answer the given questions.

Distribution of Total Number of Cellular Phones (Both Nokia and Samsung) Sold by Six Stores in October



Store	Respective Ratio of Number of Nokia Cellular Phone Sold to the Number of Samsung Cellular Phone Sold
P	4 : 3
Q	3 : 1
R	5 : 4
S	7 : 6
T	1 : 4
U	11 : 10

33. What is the average number of Nokia cellular phones sold by stores P, R, S and T together ?

(A) 1007 (B) 1048

(C) 3908 (D) 1006

(E) 996

34. Number of Nokia cellular phones sold by store R is what percent more than the total number of Samsung cellular phones sold by stores P and Q together ?

(A) $23\frac{1}{17}\%$ (B) $19\frac{5}{17}\%$

(C) $20\frac{3}{17}\%$ (D) $17\frac{11}{17}\%$

(E) $4\frac{24}{119}\%$

35. What is the central angle corresponding to total number of cellular phones (both Nokia and Samsung) sold by store S ?

(A) 99.2° (B) 93.6°

(C) 100.8° (D) 97.4°

(E) 101.2°

36. What is the respective ratio between number of Nokia cellular phones sold by store S and total number of Samsung cellular phones sold by stores T and U together ?

(A) 43 : 72 (B) 49 : 76

(C) 43 : 76 (D) 49 : 72

(E) None of these

37. Total number of cellular phones (both Nokia and Samsung) sold by stores Q increased by 15% from October to November and total number of cellular phones (both Nokia and Samsung) sold by store T increased by 5% from October to November. What was the total number of cellular phones sold by stores Q and T together in November ?

(A) 3540 (B) 3720

(C) 3640 (D) 3420

(E) 3880

38. Ashok left from place A (towards place B) at 8 am and Rahul left from place B (towards place A) at 10 am The distance between place A and place B is 637 km. If Ashok and Rahul are travelling at a uniform speed of 39 km/h and 47 km/h respectively, at what time will they meet ?

(A) 5 : 30 pm (B) 4 : 30 pm

(C) 5 : 00 pm (D) 4 : 00 pm

(E) 3 : 30 pm

Directions (39–43) : In each of the given questions, one question and two statements numbered I and II are given. You have to decide whether the data given in both the statements are sufficient to answer the question or not. Read both the statements and give answer.

(A) if the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.

(B) if the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.

(C) if the data either in statement I alone or in statement II alone are sufficient to answer the question.

(D) if the data in both statements I and II together are not sufficient to answer the question.

(E) if the data in both the statements I and II together are necessary to answer the question.

39. By how many years is Rasika younger than her brother Sunil ?

I. Ratio between Rasika's present age and Sunil's age after four years is 5 : 7 respectively.

II. Ratio between Rasika's age four years ago and Sunil's present age is 2 : 3 respectively.

40. What is the quantity of milk in 80 litres of mixture of milk and water ?

I. If 8 litres of mixture is replaced by equal quantity of water the ratio of milk and water in the mixture becomes 27 : 13 respectively.

II. If 16 litres of mixture is replaced by equal quantity of milk, the ratio of milk and water in the mixture becomes 4 : 1 respectively.

41. Neeraj invested certain amount in schemes A and B for 2 years in the ratio of 3 : 5 respectively. The schemes A and B offer compound interest compound annually and simple interest respectively. What is the amount invested in scheme A ?

I. Rate of interest offered by scheme A is 20% per annum and the rate of interest offered by scheme B is 25% less than that offered by scheme A.

II. Amount of interest accrued from scheme B is more than the amount of interest accrued from scheme A by ₹ 900.

42. Two friends X and Y start running towards each other at the same time from points A and B respectively and meet after 135 minutes. At what speed is X running ?

I. Point B is 45 km away from point A and speed of X is 150% of the speed of Y.

II. Distance covered by Y was 18 km.

43. What is the cost of painting two adjacent walls of a hall having no door or window at ₹ 450 per m^2 ?

I. Length and breadth are in the ratio of 3 : 2 respectively.

II. Perimeter of the hall is 50 m and height is one-fourth of the perimeter.

44. The speed of the boat in still water is 5 times the speed of the current. It takes 1.1 hours to row to point B from point A downstream. The distance between point A and point B is 13.2 km. How much distance will it cover in 312 minutes upstream ?

(A) 43.2 km (B) 48 km

(C) 41.6 km (D) 44.8 km

(E) 40 km

45. 24 men can complete a piece of work in 15 days. 2 days after the 24 men started working, 4 men left the work. How many more days will the remaining men now take to complete the remaining work ?

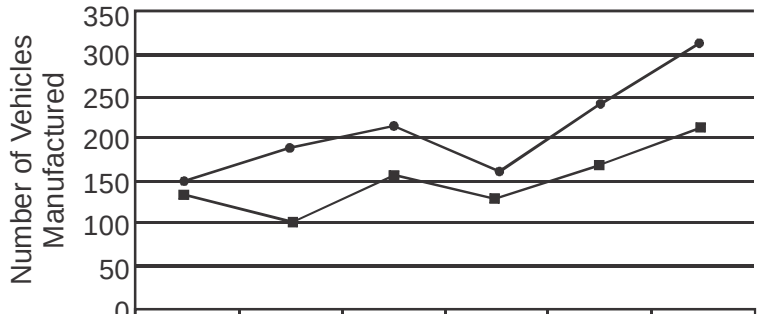
(A) $15\frac{3}{5}$ (B) $16\frac{4}{5}$

(C) $11\frac{2}{5}$ (D) $10\frac{4}{5}$

(E) $14\frac{1}{5}$

Directions (46–50) : Study the following graph and answer the given questions.

Number of Vehicles Manufactured By Two Companies during Six Years (in thousands)



	2008	2009	2010	2011	2012	2013
Company P	150	190	220	160	240	310
Company Q	130	100	160	120	180	210

46. What is the difference between total number of vehicles manufactured by company P in 2010, 2011 and 2013 together and company Q in 2011, 2012 and 2013 together ? (in thousands)

(A) 120 (B) 210
(C) 100 (D) 270
(E) 180

47. What is the average number of vehicles manufactured by company Q over six years ? (in thousands)

(A) 170 (B) 150
(C) 90 (D) 60
(E) 130

48. What is the percentage decrease in number of vehicles manufactured by company from 2010 to 2011 ?

(A) $45\frac{3}{11}\%$ (B) $33\frac{3}{11}\%$
(C) $26\frac{6}{19}\%$ (D) $27\frac{3}{11}\%$
(E) $33\frac{4}{11}\%$

49. Out of the number of vehicles manufactured by company P in 2012, 15000 pieces were found defective and out of the number of vehicles manufactured by company Q in 2013, 10000 pieces were found defective. What is the respective ratio of non-defective vehicles manufactured by company P in 2012 and Q in the 2013 ?

(A) 9 : 8 (B) 11 : 4
(C) 3 : 8 (D) 5 : 8
(E) 7 : 4

50. In year 2014, there was an increase of 30% in number of vehicles manufactured by company P as compared to vehicles manufactured by same company in the year 2009. What is the total number of vehicles manufactured by the same company in the year 2014 ?

(A) 247 (B) 297
(C) 211 (D) 310
(E) 283

ANSWER KEY

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

SOLUTIONS

1. (E) Average weight of male students = 65.9 kg
Average weight of female students = 57.0 kg
Average weight of total students = 60.3 kg
Let the total number of students = x.

$$\text{Then, } = \frac{65.9 \times 66 + (x - 66) \times 57}{x} = 60.3$$

$= 65.9 \times 66 + 57x - 57 \times 66 = 60.3x$

$= (65.9 - 57) \times 66 = 3.3x = 8.9 \times 66 = 3.3x \quad \Rightarrow \quad 178 = x$

$\therefore$ Number of female students = 178 – 66 = 112

2. (D) 105.27% of 1200.11 + 11.80% of 2360.85 = 21.99% of ? + 1420.99

$\Rightarrow$ 105% of 1200 + 12% of 2360 = 22% of ? + 1421

$\Rightarrow$ 1260 + 283.2 = 0.22 × ? + 1421

$\Rightarrow$ 0.22 × ? = 122.2

$$\Rightarrow \quad ? = \frac{122.2}{0.22} = 555.45 \simeq 550$$

3. (C) 0.98% of 7824 + 4842 ÷ 119.46 – ? = 78

$\Rightarrow$ 1% of 7824 + 4842 ÷ 120 – 78 = ?

$\Rightarrow$? = 78.24 + 40.35 – 78 = 40.59 $\simeq$ 40

4. (E) $(41.99^2 - 18.04^2) - ? = 13.11^2 - 138.99$

$\Rightarrow$ $(42^2 - 18^2) - ? = (13)^2 - 139$

$\Rightarrow$ $\{(42 + 18)(42 - 18)\} - ? = 169 - 139$

$\Rightarrow$ $\{60 \times 24\} - ? = 30$

$\Rightarrow$ $1440 - ? = 30$

$\Rightarrow$ $? = 1410$

5. (E) $24.96^2 / (34.11 + 20.05) + 67.96 + 89.11$

$$= \frac{25^2}{54.16} + 67.96 + 89.11 = \frac{625}{54} + 67.96 + 89.11$$

$= 11.5 + 68 + 89 = 168.5 \approx 170$

6. (B) $\sqrt{(2025.11)} \times \sqrt{(256.040} + \sqrt{(399.95)} \times \sqrt{?} = 33.98 \times 40.11$

$\Rightarrow$ $\sqrt{(2025)} \times \sqrt{(256)} + \sqrt{400} \times \sqrt{?} = 34 \times 40$

$\Rightarrow$ $45 \times 16 + 20 \times \sqrt{?} = 34 \times 40$

$\Rightarrow$ $720 + 20 \times \sqrt{?} = 1360$

$\Rightarrow$ $20 \times \sqrt{?} = 1360 - 720 \quad \Rightarrow \quad 20 \times \sqrt{?} = 640$

$? = (32)^2 = 1024$

Direction (7–11) :

The total number of students in Mechanical engineering = 2400

$\therefore$ The total number of the students in computer science engineering

= 2400 – 600 = 1800

Let, total number of students in engineering application = x

According to the question,

$$x \times 32\% = 1800 \quad \Rightarrow \quad x \times \frac{32}{100} = 1800$$

$$\Rightarrow \quad x = \frac{1800 \times 100}{32} = 5625$$

$\therefore$ Total number of students in engineering applications = 5625

Again, let Total number of students in college *A* = *y*

According to the question,

Total number of srtudents in college A $\times \frac{2}{3}$ = Total number of students in engineering application

$$\Rightarrow \quad y \times \frac{2}{3} = 5625 \quad \Rightarrow \quad y = \frac{3 \times 5625}{2} = 8437.5 \approx 8437]$$

So, total number of students in college A = 8437

Now, total number of students in management specification

= 8437 – 5625 = 2812

Let, total number of students in HR = *a*

Then, total number of students in Marketing = a + 112

$\therefore$ $a + (a + 112) = 2812 \quad \Rightarrow \quad 2a + 112 = 2812$

$\Rightarrow \quad 2a = 2700$

$\Rightarrow \quad a = 1350$

So, total number of students in HR = *a* = 1350

and total number of students in Marketing = *a* + 112 = 1350 + 112 = 1462

7. (B) Required percentage $= \frac{\text{Students in Marketing}}{\text{Students in Mechanical}} \times 100\%$

$$= \frac{1462}{2400} \times 100\% = \frac{1462}{24}\% = \frac{731}{12}\% = 60\frac{11}{12}\%$$

8. (E) Total number of students in Computer Science Engineering = 1800

Total number of students in Marketing = 1462

Total number of students in Electrical Engineering = 5625 – 1800 = 2400 = 1425

$\therefore$ Required average $= \frac{1800 + 1462 + 1425}{3}$

$$= \frac{4687}{3} = 1562.333 \approx 1562$$

9. (D) Total number of students in college *A* = 8437

10. (A) Required ratio = $\frac{\text{Total number of students in (Mechanical + Electrical)}}{\text{Total number of students in Marketing}}$

$= \frac{2400 + 1425}{1462} = \frac{3825}{1462}$

$= \frac{225 \times 17}{86 \times 17} = \frac{225}{86} = \frac{34.61}{13.23} \approx \frac{34}{13}$

$= 34 : 13$

11. (E) Number of female students in engineering

$= \frac{3}{3+4} \times 5625 = \frac{3}{7} \times 5625 = 2410.71 \approx 2410$

$\therefore$ Number of male students in engineering = 5625 – 2410 = 3215

$\therefore$ Number of female students in management = $\frac{2410}{2}$ = 1205

Total number of students in management = 2812

$\therefore$ Number of male students in management = 2812 – 1205

= 1607 ≈ 1600

12. (B) Let Shashi had sum of ₹ P.

Then, $\frac{2}{3}P \times \frac{12 \times 6}{100} + \frac{1}{3}P\left(1 + \frac{10}{100}\right)^2 - \frac{1}{3}P = 2805$

$= \frac{48P}{100} + \frac{1}{3}P\left(\frac{121}{100}\right) - \frac{1}{3}P = 2805$

$= \frac{48P}{100} + \frac{121P - 100P}{300} = 2805 = \frac{144P + 21P}{300} = 2805$

$\Rightarrow \frac{165P}{300} = 2805$

$\Rightarrow P = \frac{2805 \times 300}{165}$

$\Rightarrow$ P = 17 × 300

$\Rightarrow$ P = ₹ 5100

13. (C) Let height be x m

Then, Radius = (x + 5) m

Curve surface area of cylinder = $2\pi rh$

$792 = 2 \times \frac{22}{7} \times (x + 5) \times x \quad \Rightarrow \quad \frac{396 \times 7}{22} = x^2 + 5x$

$126 = x^2 + 5x$

$x^2 + 5x - 126 = 0$

$x^2 + 14x - 9x - 126 = 0$

$x(x + 14) - 9(x + 14) = 0$

$(x - 9)(x + 14) = 0$

$x = 9, x = -14$ m

We have to take height, x = 9 m because height can't be negative.

So leaving the value of x = –14

$\therefore$ Height = 9 m and radius = 9 + 5 = 14 m

Hence, volume = $\pi r^2 h = \frac{22}{7} \times 14 \times 14 \times 9 = 44 \times 126 = 5544\ m^3$

Direction (14–18) :

Year → Country ↓	1998	1999	2000	2001	2002
P	20	40	60	45	90
Q	30	25	15	50	100
R	50	55	70	90	65
S	45	60	20	15	25
T	60	50	55	100	110
U	24	40	60	75	120

14. (A) Given, import of all countries = ₹ 385 crore

Now, Export of all countries = 90 + 100 + 65 + 25 + 110 + 120 = 510 = ₹ 510 crore

∴ Profit all countries together = 510 – 385 = 125 = ₹ 125 crore

15. (D) For country S, import = $45 \times \frac{2}{1}$ = ₹ 90 crore

For country U, import = $24 \times \frac{1}{4}$ = ₹ 6 crore

Thus, the total import of country U and S together

= 90 + 6 = ₹ 96 crore

16. (E) Total export of country Q in 2001 = ₹ 50 crore

Total export of country T in 2001 = ₹ 55 crore

∴ Together total export = 50 + 55 = ₹ 105 crore

∴ Total export of country P in 2003

$= 105 \times \frac{120}{100}$ = ₹ 126 crore

Given, import of country P in 2003 = ₹ 92 crore

∴ Profit of country P in year 2003 = Export – Import

= 126 – 92 = ₹ 34 crore

17. (A) Average export of country T = $\frac{60 + 50 + 55 + 100 + 110}{5} = \frac{375}{5} = 5$

Average export of country R = $\frac{50 + 55 + 70 + 90 + 65}{5} = \frac{330}{5} = 66$

∴ Required percentage = $\frac{9}{66} \times 100 = \frac{150}{11} = 13\frac{7}{11}$

18. (C)

1999	2001
40	45
25	50
55	90
60	15
50	100
40	75
270	375

∴ Difference = 375 – 270 = 105

∴ Percentage growth = $\frac{105}{\text{Total export in 1999}} \times 100$

$= \frac{105}{270} \times 100 = \frac{350}{9} = 38.89$

19. (A)

	A	B	C
	28000 × 12	20000 × 8 + 18000 × 2	18000 × 6 + 16000 × 2
	28 × 12	196	140
Ratio	12 :	7 :	5

20. (B) Let the cost price of the item be 100.

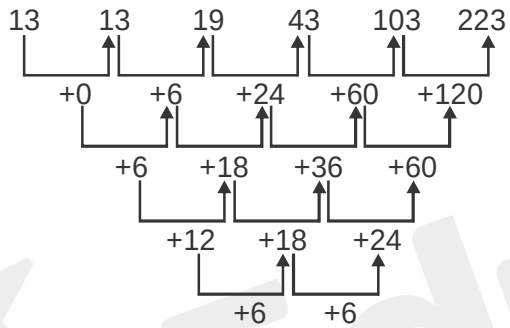
$$\underset{\text{CP}}{100} \xrightarrow{40\%\uparrow} \underset{\text{MP}}{140} \xrightarrow{20\%\downarrow} 112 \xrightarrow{25\%\downarrow} \underset{\text{SP}}{84}$$

$\therefore$ Loss = 16% and Loss = ₹ 448

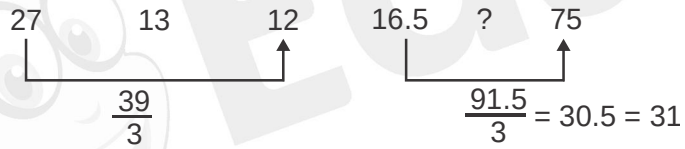
$\therefore$ $CP = \frac{448 \times 100}{16}$ = ₹ 2800

$\therefore$ $SP = \frac{2800 \times 84}{100}$ = ₹ 2352

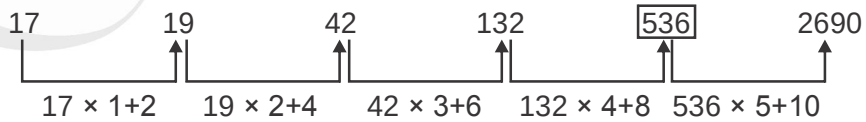
21. (C)



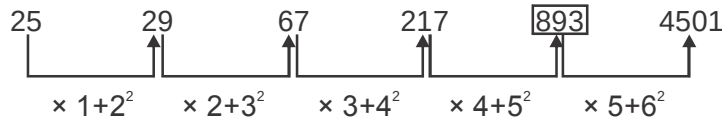
22. (A)



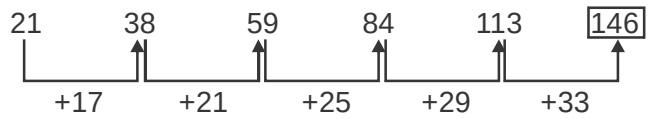
23. (D)



24. (E)



25. (D)



26. (C) Let present age of Parul = 7x

and present age of Rohit = 5x

Total age after 5 years from now, 7x + 5x + 10 = 94

$\Rightarrow$ 12x = 84

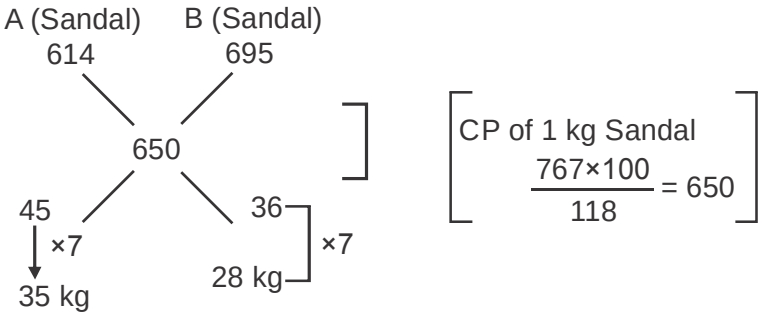
$\Rightarrow$ x = 7

Therefore, Parul's present age = 7 × 7 = 49 year

and Rohit's present age = 5 × 7 = 35 year

Hence, after 14 years, Rohit's age will be equal to the Rahul's present age.

27. (B)



So, answer is 28 kg.

28. (C) I. $6x^2 + 25x + 24 = 0$

$D = \sqrt{b^2 - 4ac}$

$D = \sqrt{625 - 4 + 24 \times 6} = \sqrt{49} = 7$

$x_1 = \frac{-b + 7}{12} = \frac{-25 + 7}{12} = \frac{-18}{12} = -\frac{3}{2}$

$x_2 = \frac{-b - 7}{12} = \frac{-25 - 7}{12} = \frac{-32}{12} = -\frac{8}{3}$

$x_2 = \frac{-3}{2}, \frac{-8}{3}$

II. $12y^2 + 13y + 3 = 0$

$y_1 = \frac{-13 + \sqrt{169 - 144}}{24} = \frac{-13 + 5}{24} = \frac{-8}{24} = \frac{-1}{3}$

$y_2 = \frac{-13 - \sqrt{169 - 144}}{24} = \frac{-18}{24} = \frac{-3}{4}$

$y = \frac{-1}{3}, \frac{-3}{4} \Rightarrow x < y$

29. (C) I. $12x^2 - x - 1 = 0$

$x_1 = \frac{-b + \sqrt{D}}{2a} = \frac{1 + \sqrt{1 - 4 \times 12 \times -1}}{24}$

$= \frac{1 + 7}{24} = \frac{8}{24} = \frac{1}{3}$

$x_2 = \frac{-b - \sqrt{D}}{2a}$

$x_2 = \frac{1 - 7}{24} = \frac{-6}{24} = \frac{-1}{4}$

$x = \frac{1}{3}, -\frac{1}{4}$

II. $20y^2 - 41y + 20$

$y_1 = \frac{41 + \sqrt{1681 - 1600}}{40}$

$y_2 = \frac{41 - \sqrt{1681 - 1600}}{40}$

$y_1 = \frac{41+9}{40} = \frac{50}{40}$, $y_2 = \frac{32}{40}$

$y = \frac{5}{4}, \frac{4}{5} \quad \Rightarrow \quad x < y$

30. (B) I. $10x^2 + 33x + 27 = 0$

$x_1 = \frac{-33+\sqrt{b^2-4ac}}{2a} = \frac{-33+\sqrt{1089-4\times10\times27}}{20}$

$x_2 = \frac{-33-\sqrt{b^2-4ac}}{2a}$

$x_2 = \frac{-33-\sqrt{1089-1080}}{20}$

$x_1 = \frac{-33+3}{20}$, $x_2 = \frac{-33-3}{20}$

$x_1 = \frac{-30}{20}$, $x_2 = \frac{-36}{20} = \frac{-9}{5}$, $x = \frac{-3}{2}, \frac{-9}{5}$

II. $5y^2 + 19y + 18 = 0$

$y_1 = \frac{-19+\sqrt{361-4\times18\times5}}{10}$

$y_2 = \frac{-19-\sqrt{361-360}}{10}$

$y_1 = \frac{-19+1}{10}$

$y_2 = \frac{-19-1}{10} = \frac{-18}{10} = \frac{-9}{5} = \frac{-20}{10} = -2$

$y = \frac{-9}{5}, -2 \quad \Rightarrow \quad x \geq y$

31. (D) I. $15x^2 - 29x - 14 = 0$

$x_1 = \frac{29+\sqrt{841+60\times14}}{30}$

$= \frac{29+41}{30} = \frac{70}{30}$

$x_2 = \frac{29-\sqrt{1681}}{30}$

$x_2 = \frac{29-41}{30} = \frac{-12}{30}$

$x = \frac{7}{3}, \frac{-2}{5}$

II. $6y^2 - 5y - 25 = 0$

$y_1 = \frac{5+\sqrt{25-4\times6\times-25}}{12} = \frac{5+\sqrt{625}}{12} = \frac{30}{12}$

$$y_2 = \frac{5 - \sqrt{25 - 4 \times 6 \times -25}}{12} \quad \Rightarrow \quad y_2 = \frac{5 - \sqrt{625}}{12} = \frac{-20}{12}$$

$$y = \frac{5}{2}, \frac{-5}{3}$$

So, relationship between x and y can't be determined.

32. (E) I. $3x^2 - 22x + 7 = 0$

$3x^2 - 21x - x + 7 = 0$

$x(3x - 1) - 7(3x - 1) = 0$

$(3x - 1)(x - 7) = 0$

$x = \frac{1}{3}, 7$

II. $y^2 - 20y + 91 = 0$

$y^2 - 13y - 7y + 91 = 0$

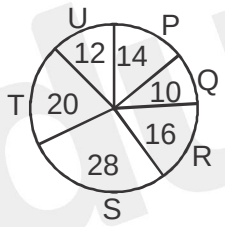
$y(y - 7) - 13(y - 7) = 0$

$(y - 13)(y - 7) = 0$

$y = 13, 7 \quad \Rightarrow \quad y \geq x$

Direction (33–37) :

33. (A) Question based on pie–chart



Total Number = 11200

Store	Nokia / Samsung
P	4 : 3
Q	3 : 1
R	5 : 4
S	7 : 6
T	1 : 4
U	11 : 10

Total % of ($P + R + S + T$) together = 78%

Number of Nokia sold by store

$$P = \frac{4}{7} \times 14 \times \frac{11200}{100} = 8 \times \frac{11200}{100} = 896$$

Number of Nokia sold by store

$$R = \frac{5}{9} \times 16 \times \frac{11200}{100} = \frac{80 \times 112}{9} = 996$$

Number of Nokia sold by store

$$S = \frac{7}{13} \times \frac{28}{100} \times 11200 = 14 \times 112 = 1688 \text{ approx}$$

Number of Nokia sold by store = $\frac{1}{5} \times \frac{20}{100} \times 11200 = 448$

Total Nokia phone sold by

(P + R + S + T) = 896 + 996 + 1688 + 448 = 4028

$\therefore$ Required average = $\frac{4028}{4} = 1007$

34. (E) Samsung phone sold by store

$$P = \frac{3}{7} \times \frac{14}{100} \times 11200 = 672$$

Samsung phone sold by store Q = $\frac{1}{4} \times \frac{10}{100} \times 11200 = 280$

Total Samsung sold by (P + Q) = 672 + 280 = 952

Total Nokia Phone sold by R = 996

Difference = 996 – 952 = 44

Required percentage,

$$= \frac{44}{952} \times 100 = \frac{44 \times 25}{238} = \frac{22 \times 25}{119}$$

$$= \frac{550}{119} = 4\frac{24}{119}$$

35. (C) We know, 100% = 360°

So, 1 = 3.6°

So, 28% = 28 × 3.6 = 100.8°

36. (E) Number of Nokia phones sold by store S = 1688 (approx)

Total Number of Samsung phone sold by store T

$$= \frac{4}{5} \times \frac{20}{100} \times 11200 = 1792$$

Total Number of Samsung phone sold by store U

$$= \frac{10}{21} \times \frac{12}{100} \times 11200 = 640$$

$\therefore$ Required ratio

= 1688 : (1792 + 640)

= 1688 : 2432 = 211 : 304

37. (C) Total Number of cellular phones sold by stores Q in october

$$= \frac{10}{100} \times 11200 = 1120$$

Sold in November = $1120 \times \frac{115}{100} = 1288$

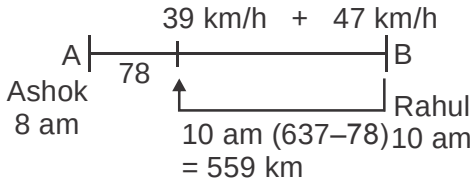
Total Number of cellular phones sold by T in October

$$= \frac{20}{100} \times 11200 = 2240$$

Sold in Novemver = $2240 \times \frac{105}{100} = 2352$

Total phone sold = 2352 + 1288 = 3640

38. (B)



Time taken

$$= \frac{\text{Total distance to cover}}{\text{Relative velocity}} = \frac{559}{86} = 6.5\text{h}$$

$\therefore$ Meeting time = 10 am + 6.5h. = 4 : 30pm

39. (E) Rasika's present age : (Sunil's present age + 4)

= 5 : 7 …(i)

Rasika's age – 4 : Sunil's present age = 2 : 3 …(ii)

$$\frac{R}{S+4} = \frac{5}{7}$$

$7R = 55 + 20$

$7R - 5S = 20$ …(i)

$$\frac{R-4}{S} = \frac{2}{3}$$

$3R - 12 = 2S$

$3R = 2S + 12$ …(ii)

By solving Eqs. (i) and (ii), we get

$R = 20$

and $S = 24$

$\therefore$ Rasika is 4 years younger than her brother Sunil.

40. (C) **By Statement – I**

M : W = 27 : 13

So, in 80 litres of mixture contain

Quantity of milk = $\frac{27}{40} \times 80 = 54$ litres

Water = $\frac{13}{40} \times 80 = 26$ litres

By Statement – II

If 16 litres of mixture replaced by equal quantity of milk. Then in new mixture

Quantiy of milk = $\frac{4}{5} \times 80 = 64$ litres

Quantiy of Water = $\frac{1}{5} \times 80 = 16$ litres

Again by statement–I Before mixing water,

Milk is 54 litres and water is 18 litres

Statement–II Before mixing milk

Milk is 48 litres and water is 16 litres

Ratio of milk to water in mixture, = 3 : 1

Quantity of milk = $\frac{3}{4}$ × 80 = 60 litres

Concept Ratio of milk to water is always same in the mixture. it doesn't depend on quantity of mixture drawn.

41. (E) Neeraj → A (3x) compounded annually (2 years) 20%; B (5x) Simple interest (2 years)

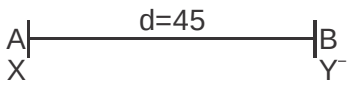
$$= \frac{5x \times 15 \times 2}{100} - \left\{3x\left(1+\frac{20}{100}\right)^{2} - 3x\right\} = 900$$

$$= \frac{3x}{2} - \left\{3x \times \frac{36}{25} - 3x\right\} = 900 = \frac{3x}{2} - \left\{\frac{108x - 75x}{25}\right\} = 900$$

$$= \frac{75x - 66x}{50} = 900 = 9x = 900 \times 50 = ₹\ 5000$$

Amount invested in scheme *A* = 3 × 5000 = 15000

42. (A)



Total time taken = 2h 15min

Let speed of y be S km/h

Speed of x be 1.5 S km/h.

Total time taken = $\frac{\text{Total distance}}{\text{Total speed}}$

$$2\frac{1}{4} = \frac{45}{2.5\ S} \Rightarrow \frac{9}{4} = \frac{45}{2.5\ S} \Rightarrow = S = \frac{45}{2.5} \times \frac{4}{9}$$

$\therefore$ Speed of x = 1.5 S = 1.5 × $\frac{45}{25}$ × $\frac{4}{9}$ = 12 km/h

43. (E)

Length : Breadth = 3 : 2 (22.5 : 15)

↓

3x.2x

$$\text{Height} = 50 \times \frac{1}{4} = 12.5$$

Perimeter = 2 (3x + 2x) = 50

$\Rightarrow$ x = 5

So, area of two any adjacent walls = $b \times h + l \times h = h\ (l + b)$

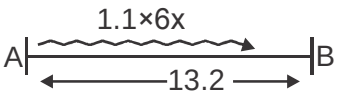
Total cost of painting on wall = 12.5 × 25 × 450 = ₹ 140625

44. (C) Let speed of current be x.

Then, speed of boat be 5x.

Total speed in downstream = x + 5x = 6x

Total speed in upstream = 5x – x = 4x = 8 km



$1.1 \times 6x = 13.2 \quad \Rightarrow \quad x = 2$

Required Distance covered = Time × Speed

$= \frac{26}{5} \times 8 = 5.2 \times 8 = 41.6$ km

45. (A) $\frac{\text{Work}}{\text{man} \times \text{days}} = \frac{\text{Remaining work}}{\text{men} \times \text{days}}$

$\frac{W}{24 \times 13} = \frac{W}{20 \times D}$

$20 \times D = 24 \times 13$

$D = \frac{24 \times 13}{20} = \frac{78}{5} = 15\frac{3}{5}$ days.

46. (E) Total Number of vehicles produced by *P* in 2010, 2011 and 2013 = 690

Produced by Q in year 2011, 2012 and 2013 = 510

Difference = 690 – 510 = 180 thousands

47. (B) Average Number of vehicles by company

$Q = \frac{130 + 100 + 160 + 120 + 180 + 210}{6}$

$= \frac{900}{6} = 150$ thousands

48. (C) Total number of vehicles in 2010 = 380

Total number of vehicles produced in 2011 = 280

Percentage Decrease

$= \frac{100}{380} \times 100 = \frac{500}{19} = 26\frac{6}{19}\%$

49. (A) Total vehicles produced by *P* in 2012 = 240 thousand

Defective = 15 thousands

Non–defective = 225 thousands

Total vehicles produced by Q in 2013 = 210 thousand

Defectives = 10000

Non–defective = 200 thousand

Ratio = 225 : 200 = 9 : 8

50. (A) Number of vehicles produced by *P* in the year 2009 = 190

Number of veihcles produced in 2014

$= 190 \times \frac{130}{100} = 247$