Quantitative Aptitude

Directions (1-5): Solve the given quadratic equations and mark the correct option based on your answer—
(a) x < y
(b) x ≤ y
(c) x = y or no relation can be established between x and y.
(d) x > y
(e) x ≥ y

1. **(i)** $x^2 - 25x + 156 = 0$
   (ii) $y^2 - 21y + 108 = 0$

2. **(i)** 3x + 5y = 18
   (ii) 7x + 8y = 42

3. **(i)** 2x² + 15x + 27 = 0
   (ii) 3y² + 25y − 18 = 0

4. **(i)** 6x² + 29x + 35 =0
   (ii) 20y² + 27y + 9 =0

5. **(i)** x² − 7x − 30 = 0
   (ii) y² + 15y + 50 = 0

Direction (6-10): What number is wrong according to given number series pattern : –

6. 36, 71, 117, 175, 246, 332
   (a) 71   (b) 117   (c) 246
   (d) 175   (e) 332

7. 18, 72, 36, 150, 72, 288
   (a) 72   (b) 288   (c) 150
   (d) 36   (e) 18

8. 25, 31, 44, 63, 93, 135
   (a) 31   (b) 44   (c) 93
   (d) 63   (e) 135

9. 15, 27, 51, 87, 135, 196
   (a) 87   (b) 27   (c) 15
   (d) 51   (e) 196

10. 47, 57, 81, 130, 211, 332
    (a) 57   (b) 130   (c) 211
    (d) 332   (e) 81

Directions (11-15): What should come in place of question mark (?) in the following questions?

11. $5\frac{1}{4} + 7\frac{1}{3} + 4\frac{1}{2} = 3\frac{1}{6} + ? + 5\frac{1}{6}$
    (a) 8   (b) $8\frac{1}{4}$ (c) $8\frac{1}{2}$
    (d) $8\frac{3}{4}$ (e) 9

12. $37\frac{1}{2}\%$ of 300 + $62\frac{1}{2}\%$ of 460 =?
    (a) 350   (b) 400   (c) 420
    (d) 460   (e) 500

13. 75% of 160 + 45% of 300 = ? × 17
    (a) 17.5   (b) 12.5   (c) 25
    (d) 15   (e) 18

14. $28\frac{2}{7} \times 5\frac{8}{11} + ? = 36\frac{1}{9} \times 7\frac{8}{13}$
    (a) 125   (b) 118   (c) 113
    (d) 108   (e) 103

15. $? = \frac{255}{102} \times \frac{272}{204} \div \frac{85}{153}$
    (a) 7   (b) 4   (c) 5
    (d) 6   (e) 9

16. Ratio of numerical value of rate of interest and time period is 4 : 1. Man invested Rs. 2400 and gets Rs. 864 as simple interest. Find the value of X, if man invested Rs. (2400 + X) at same rate of interest on C.I. for two years and get Rs. 814.08 as interest?
    (a) 600 Rs.   (b) 800 Rs.   (c) 400 Rs.
    (d) 200 Rs.   (e) 540 Rs.

17. Ratio of speed of faster train to slower train is 9 : 7 and length of two trains is 120 m and 180 m respectively. If both trains increased their respective speed by 25% and then cross each other in 36 sec running in same direction, then find in what time both trains cross each other running in opposite direction with their usual speed?
    (a) $\frac{64}{6}$ sec   (b) $\frac{58}{6}$ sec   (c) $\frac{52}{6}$ sec
    (d) $\frac{49}{8}$ sec   (e) $\frac{45}{8}$ sec

18. A and B entered into a business with the capital of Rs. (X + 1200) and Rs (X+1500) respectively. After eight months from starting A withdraw half of his investment and B doubled his investment. If at the end of the year A got Rs. 4250 as profit share out of total profit of Rs. 11250, then find three times of initial investment of B ?

(a) Rs 32,400   (b) Rs 30,750   (c) Rs 30,500

(d) Rs 31,500   (e) Rs 31,770

19. Two farmers A and B have mixture of potassium and Urea in the quantity of (θ + 54) kg & (θ + 84) kg respectively. The ratio of potassium and Urea in mixture which farmer A has is 3 : 2, while farmer B has 2 : 1. If 60% and $66\frac{2}{3}$% of their respective mixture farmer A and B used for their field and the remaining mixture of A and B are equal, then find the quantity of potassium in the mixture of farmer B has ?

(a) 60 kg   (b) 120 kg   (c) 90 kg

(d) 100 kg   (e) 75 kg

20. A bag contains seven red balls, 'a' green balls & 'b' yellow balls. If one ball taken out from bag, then probability of being it green is $\frac{5}{16}$, while being it yellow is ¼. Find difference between number of green and yellow balls in that bag?

(a) 1   (b) 0   (c) 2

(d) 4   (e) 3

21. Recently I had gone to a locality called Shadigarh for conducting a survey about the number of married persons in the locality. The population of the locality is 7,200 and $^{11}/_{18}$ th of those are males and the rest females. If 40% of the males are married, find percentage of married females in the locality

(a) $48\frac{1}{7}$%   (b) $52\frac{4}{7}$%   (c) $62\frac{6}{7}$%

(d) $71\frac{1}{7}$%   (e) $64\frac{1}{7}$%

22. In every month Ravindra consumes 25 kg rice and 9 kg wheat. The price of rice is 20% of the price of wheat and thus he spends total Rs. 350 on the rice and wheat per month. If the price of wheat is increased by 20% then what is the percentage reduction of rice consumption for the same expenditure of Rs. 350 ? Given that the price of rice and consumption of wheat is constant :

(a) 36%   (b) 40%   (c) 25%

(d) 24%   (e) 30%

23. 9 taps are fitted to a water tank. Some of them are water taps to fill the tank and the remaining are outlet taps used to empty the tank. Each water tap can fill the tank in 9 hours and each outlet tap can empty it in 9 hours. On opening all the taps, the tank is filled in 9 hours. Find the number of water taps.

(a) 4   (b) 5   (c) 6

(d) Can't be determined   (e) none of these

24. A, B and C together earn Rs. 2700 in 18 days. A and C together earn Rs. 940 in 10 days. B and C together earn Rs. 1520 in 20 days. Find the daily earning of C.

(a) Rs. 20   (b) Rs. 40   (c) Rs. 10

(d) Rs. 50   (e) none of these

25. Weights of two friends Sudhir and Sudhesh are in the ratio of 4 : 1. Sudhir's weight increases by 12% and the total weight of Sudhir and Sudhesh together becomes 50 kg, with an increase of 25%. By what per cent did the weight of Sudhesh increase?

(a) 77%   (b) 75%   (c) 74%

(d) 70%   (e) none of these

26. Ratio of present age of A to that of B is 1 : 3 and one year ago, C is twice as old as A. If B is 21 years older than C, then find present age of B & C together is what percent of present age of A?

(a) 545%   (b) 480%   (c) 500%

(d) 525%   (e) 495%

27. How many 7 letters word can be formed from the word "GATEWAY" such that the vowels occupy the extreme ends?

(a) 72 ways   (b) 720 ways   (c) 180 ways

(d) 360 ways   (e) 144 ways

28. Deepak and Dharam entered into a partnership and invested Rs.40000 and Rs.55000 respectively. After 10 months and 8 months Deepak and Dharam withdraws his amount from the business and after 6 months Veer invested Rs.60000. If at the end of the year difference in the profit share of Deepak and Dharam is Rs.5225, then find profit share of Veer at the end of the year.

(a) Rs.49560   (b) Rs.47025   (c) Rs.48235

(d) Rs.48970   (e) Rs.49255

29. A shopkeeper sells chairs and tables and cost price of a table is Rs.3400 more than cost price of a chair. Shopkeeper marks table and chair 50% and 80% above the cost price respectively and he allowed 25% discount on a chair and 32% discount on a table. If profit earned by shopkeeper on selling a chair is Rs.130 more than profit earned by him on selling a table, then find difference between selling price of a table and a chair.

(a) Rs.3560   (b) Rs.3270   (c) Rs.3340

(d) Rs.3480   (e) Rs.3510

30. There is a rectangular field having breadth 12.5% less than its length. A conical ditch of height 9 m is dug out in the rectangular field and soil taken out from that is spread over the remaining field and thus the height of the field is increased by ′h′ m. Find the value of ′h′ if the ratio of radius of ditch to that of breadth of the field is 2:5 ?

(a) $2\frac{5}{14}$ m   (b) $2\frac{1}{7}$ m   (c) $2\frac{1}{2}$ m

(d) $3\frac{3}{14}$ m   (e) $1\frac{3}{7}$ m

Direction (31-35): The Bar graph shows the no. of Students (in %) enrolled in two different courses out of three different courses for four different years of "Career Power" coaching. Study the graph carefully to answer the following questions.

Total no. of Student = (SSC + Banking +Upsc) Students
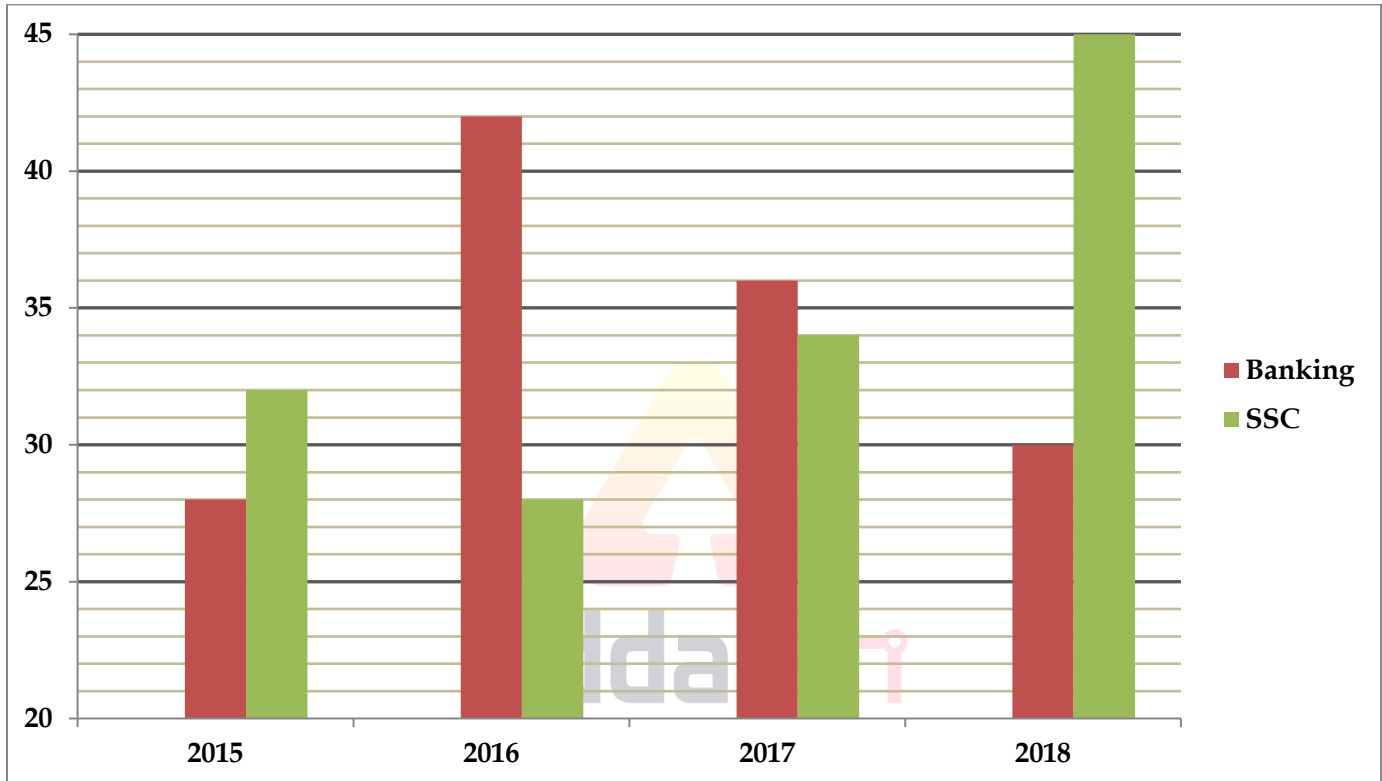
31. If total student in 2015 & 2017 are in ratio of 4:5 and the difference between no. of Upsc students in these two years is 180 then find the difference between no. of Banking students in these two years?

(a) 1218   (b) 1332   (c) 1418

(d) 1224   (e) 1350

32. If total student in 2015 is 8000 and increased at 10% annually for the following years then find in which year the no. of Upsc student was third highest?

(a) 2016   (b) 2018   (c) 2017

(d) none of these   (e) can't be determined

33. For how many year the no. of Upsc student is more than the average of the no. of student of the rest two courses?
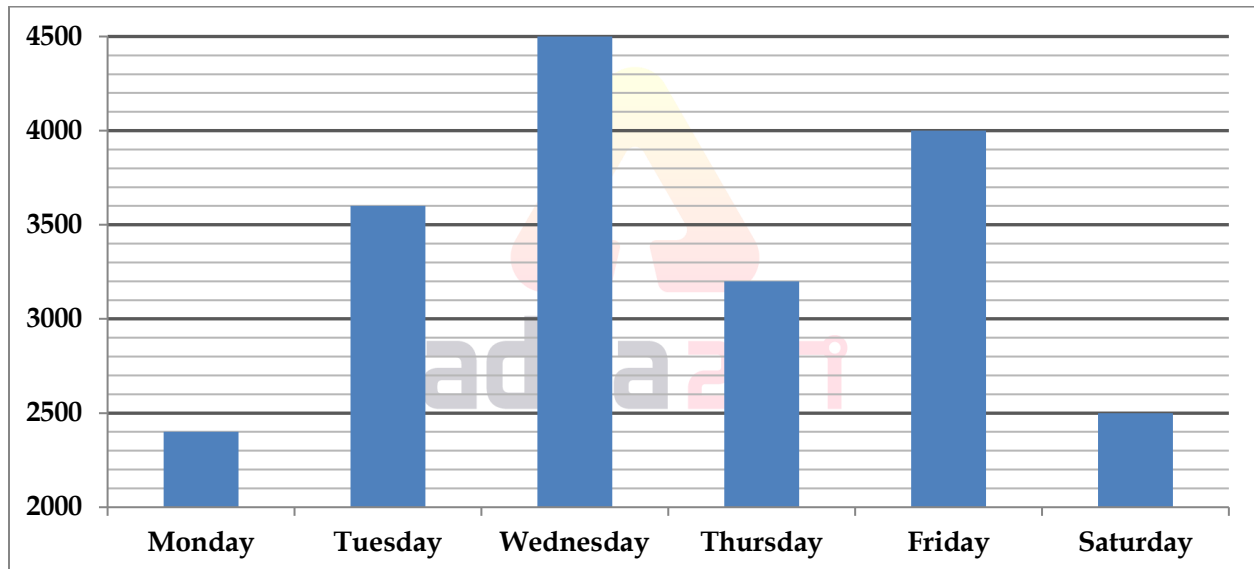
(a) 0   (b) 2   (c) 3

(d) 1   (e) None of these

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TEST SERIES

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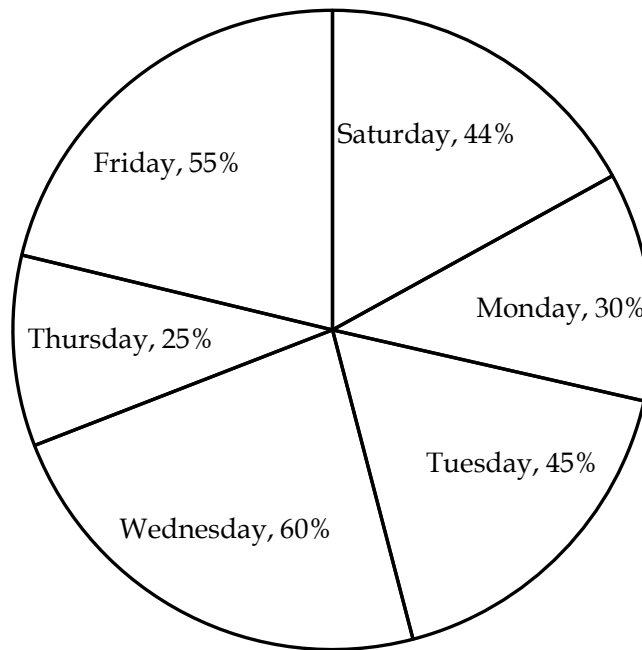
(General Administration)

20 TOTAL TESTS

34. If the total no. of students is constant for all the years then find in which year the difference between no. of upsc students and SSC students is second lowest?
(a) 2015   (b) 2016   (c) 2017
(d) 2018   (e) none of these

35. If the ratio of upsc students in 2015,2017,2018 be 6:3:5 and difference between Banking and SSC students in 2018 Is 300, then find the average no. of SSC students in 2015 and 2017 together?
(a) 590   (b) 640   (c) 240
(d) 190   (e) 410

Directions (36-40): The following bar graph shows the total number of customers visiting Big Bazar on six different days of a week. And the pie-chart shows the percentage of the females out of the total customers on each day. Read the data carefully and answer the following questions.
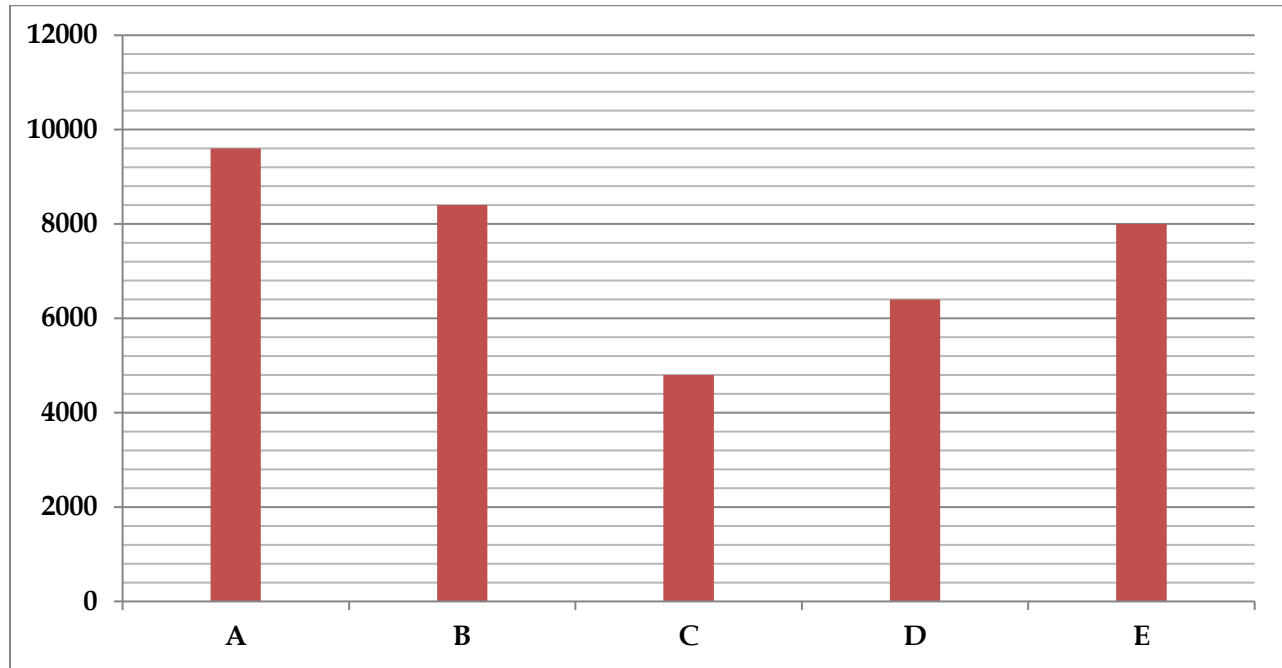
Percentage of female customers out of total

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Pie chart showing: Saturday, 44%; Friday, 55%; Thursday, 25%; Wednesday, 60%; Tuesday, 45%; Monday, 30%

36. The number of male customers on Thursday is what percent of the number of female customers on Tuesday?
(a) $148\frac{1}{9}\%$ (b) $148\frac{4}{27}\%$ (c) $146\frac{4}{27}\%$
(d) $146\frac{1}{9}\%$ (e) $147\frac{2}{27}\%$

37. What is average of the number of male customers on Monday, Wednesday, Friday and Saturday?
(a) 1670   (b) 1660   (c) 1680
(d) 1684   (e) 1690

38. Total number of female customers on Friday and Saturday is approximately what percent more or less than the total number of male customers on Monday and Tuesday?

(a) 11%   (b) 7%   (c) 6%
(d) 10%   (e) 8%

39. Find the difference between the average number of male customers on Tuesday and Friday and the average number of the female customers on Saturday and Wednesday?
(a) 20   (b) 15   (c) 10
(d) 17   (e) 18

40. Find the ratio of the total number of customers on Monday and Saturday together to the total number of male customers on Friday and Wednesday together?
(a) 49 : 24   (b) 49 : 30   (c) 49 : 32
(d) 49 : 34   (e) 49 : 36

Direction (41 – 45): Given below bar graph shows total number of complain registered in five police stations in one year and table shows percentage of complains resolved. Read the data carefully and answer the questions.

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Police stations	Percentage of complains resolved
A	25%
B	30%
C	15%
D	12.5%
E	40%

41. Find the average number of complains unresolved in police stations A, C, and E?
(a) 5400   (b) 5480   (c) 5360
(d) 5460   (e) 5456

42. Total complain resolved in police station B is what percent less than total complain resolved in police station A & D together?
(a) 17.25%   (b) 15.25%   (c) 12.25%
(d) 21.25%   (e) 27.25%

43. Total number of complains resolved in police stations B & E how much more than total complains unresolved in police station C?
(a) 1640   (b) 1620   (c) 1610
(d) 1660   (e) 1680

44. Find the ratio of total complains resolved in police stations A & D together to total complains unresolved in police station B?
(a) 90 : 149   (b) 80 : 147   (c) 80 : 149
(d) 80 : 143   (e) 147 : 80

45. Total complains unresolved in police station B is what percent more than total complains unresolved

in police station E?
(a) 21.5%   (b) 22.5%   (c) 23.5%
(d) 29.5%   (e) 32.5%

Direction (46-50): In the given questions, two quantities are given, one as **'Quantity 1'** and another as **'Quantity 2'**. You have to determine relationship between two quantities and choose the appropriate option:
(a) Quantity 1 > Quantity 2
(b) Quantity 1 ≥ Quantity 2
(c) Quantity 2 > Quantity 1
(d) Quantity 2 ≥ Quantity 1
(e) Quantity 1 = Quantity 2 or Relation cannot be established

46. **Quantity 1:** Find the speed of train (in m/s) if the train takes 20 sec to completely cross another train coming from opposite direction of twice the length & speed both as that of first train. The first train can cross a platform 100 m long in 30 sec.
Quantity 2: Find the speed of train (in m/s) if the train overtakes another train running at a speed of 20 m/s in 70 sec while the latter train can cross a platform of same length in 25 sec. Length of first train is 60% less than that of latter train. (latter train is

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faster)

47. Quantity 1: Find the number of blue balls in the bag if the probability of getting a red ball when 3 balls are drawn at random from the bag having 15 balls is $\frac{45}{91}$. If there would be no blue balls, this probability would be $\frac{5}{11}$. The bag contains red, blue & green color balls and the blue balls are minimum in the bag.

Quantity 2: Find the number of blue balls in the bag if the bag contains 'x' red balls & 'y' blue balls such that $x^2 - 3x - 10 = 0$ and probability of drawing 2 red balls from the bag at random is $\frac{2}{9}$.

48. Quantity 1: Find the value of $(a + b - c)^2$ if $(a + b)^2 = 25 = b^2 + c^2$; a < b < c & a, b, c ∈ N

Quantity 2: Find the value of $(a + b - c)^2$ if $a : b = 1 : 1$; a is 40% less than c and average of b & c is 4.

49. Quantity 1: In what time (min) the tank will be filled completely if all the pipes are opened simultaneously. There are 3 pipes of which 2 are inlet and other is outlet. If there is only 1 inlet (which is the most efficient), then tank will be filled by both the pipes in 30 min. The inlet pipes alone take 10 & 12 min respectively to fill the tank. All pipes are opened till tank is filled.

Quantity 2: In what time (min) the tank will be filled completely if all the pipes are opened simultaneously. Pipe A, B & C alone can fill the tank in 15, 12 & 10 min respectively. Pipes are opened in a pair for a minute & no pipe works for more than 2 min continuously. (consider minimum time taken)

50. Quantity 1: Curved surface area of sphere is 616 sq.m. Find curved surface area of cylinder (sq.m.) if the sphere is melted to form a cylinder of height $\frac{28}{3}$ m.

Quantity 2: Curved surface area of sphere is 616 sq.m. Find curved surface area of cylinder (sq.m.) if the cylinder can completely fit inside the sphere such that top & bottom of cylinder lies on surface of sphere. Radius of cylinder = 7 m.

SOLUTIONS

1. (e): (i) $x^2 - 25x + 156 = 0$
$x^2 - 13x - 12x + 156 = 0$
$x = 13, 12$
(ii) $y^2 - 21y + 108 = 0$
$y^2 - 12y - 9y + 108 = 0$
$y = 12, 9$
$x \geq y$

2. (d): (i) $3x + 5y = 18$
(ii) $7x + 8y = 42$
Multiple (i) × 7 and (ii) × 3
21x + 35y = 126
21x + 24y = 126

On solving above equations
y = 0
x = 6
x > y

3. (c): $(i) 2x^2 + 15x + 27 = 0$
$2x^2 + 9x + 6x + 27 = 0$
$x = -\frac{9}{2}, -3$
$(ii) 3y^2 + 25y - 18 = 0$
$3y^2 + 27y - 2y - 18 = 0$
$y = -9, \frac{2}{3}$
∴ No relation can be established between x and y

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4. (a): (i) $6x^2 + 29x + 35 = 0$
$6x^2 + 15x + 14x + 35 = 0$
$x = -\frac{5}{2}, -\frac{7}{3}$
(ii) $20y^2 + 27y + 9 = 0$
$20y^2 + 15y + 12y + 9 = 0$
$y = -\frac{3}{5}, -\frac{3}{4}$
$\therefore y > x$

5. (d): (i) $x^2 - 7x - 30 = 0$
$x^2 - 10x + 3x - 30 = 0$
$x = 10, -3$
(ii) $y^2 + 15y + 50 = 0$
$y^2 + 10y + 5y + 50 = 0$
$y = -10, -5$
$x > y$

6. (e): Patter is :

+35, +46, +58, +71, +85

+11　+12　+13　+14

So, Wrong number is $-$ 332
Right number should be = 246 + 85 = 331

7. (c): Pattern is $-$
18×4=72,
72 ÷2=36,
36 ×4=144,
144 ÷2=72
72 ×4=288
So wrong number is $-$ 150

8. (b): Pattern is $-$
25+(2^2 + 2)=31
31+(3^2 + 3)=43
43 +(4^2 + 4)=63,
63 +(5^2 + 5)=93,
93 +(6^2 + 6)=135
So, wrong number is $-$ 44

9. (e): Pattern is $-$
15+(13×1-1)=27
27+(13×2-2)=51
51+(13×3-3)=87
87+(13×4-4)=135
135+(13×5-5)=195
Wrong number is 196

10. (a): 47+3^2=56
56+5^2=81
81+7^2=130
130+9^2=211
211+11^2=332

Wrong number is 57

11. (d): $5\frac{1}{4} + 7\frac{1}{3} + 4\frac{1}{2} = 3\frac{1}{6} + ? + 5\frac{1}{6}$
$(5 + 7 + 4) + \left(\frac{1}{4} + \frac{1}{3} + \frac{1}{2}\right) - 3 - 5 - \frac{1}{6} - \frac{1}{6} = ?$
$8 + \frac{1}{4} + \frac{1}{2} + \frac{1}{3} - \frac{1}{3} = ?$
$? = 8 + \frac{2+4}{8} = 8\frac{3}{4}$

12. (b): $37\frac{1}{2}\%$ of $300 + 62\frac{1}{2}\%$ of $460 = ?$
$? = \frac{75}{200} \times 300 + \frac{125}{200} \times 460$
$= \frac{225}{2} + \frac{575}{2} = 400$

13. (d): $75\% \times 160 + 45\% \times 300 = ? \times 17$
$? \times 17 = \frac{3}{4} \times 160 + \frac{9}{20} \times 300$
$? = \frac{120+135}{17} = \frac{255}{17} = 15$

14. (c): $28\frac{2}{7} \times 5\frac{8}{11} + ? = 36\frac{1}{9} \times 7\frac{8}{13}$
$\frac{198}{7} \times \frac{63}{11} + ? = \frac{325}{9} \times \frac{99}{13}$
$? = 275 - 162$
$? = 113$

15. (d): $? = \frac{255 \times 272 \times 153}{102 \times 204 \times 85} = 6$

16. (b): Let man invested at the rate of 4x % per annum and for the period of time is x yr
ATQ$-$
$2400 \times \frac{4x \times x}{100} = 864$
$4x^2 = \frac{864}{24}$
$4x^2 = 36$
$x^2 = 9 \Rightarrow x = 3$
So, Rate of interest = 4 × 3 = 12% per annum
Time of period = 3 years.
Equivalent C.I. of two year at the rate of 12% per annum
$= 12 + 12 + \frac{12 \times 12}{100}$
$= 25.44\%$
$(2400 + X)\frac{25.44}{100} = 814.08$
$610.56 + 0.2544X = 814.08$
$0.2544X = 203.52$
X = 800 Rs.

17. (e): Let speed of faster train be 9x m/s and speed of slower train be 7x m/s
When both train increased their speed by 25%
New speed of faster train
$= 9x \times \frac{125}{100} = 11.25x$ m/s
New speed of slower train
$= 7x \times \frac{125}{100} = 8.75x$ m/s
ATQ$-$

$(11.25x - 8.75x) = \frac{120+180}{36}$

$2.5x = \frac{300}{36} \Rightarrow x = \frac{10}{3}$

Usual speed of slower train

$= 7 \times \frac{10}{3} = \frac{70}{3} \, \text{m/s}$

Usual speed of faster train $= 9 \times \frac{10}{3} = \frac{90}{3} \, \text{m/s}$

Relative speed $= \frac{70+90}{3} = \frac{160}{3} \, \text{m/s}$

Required time $= \frac{(120+180)\times 3}{160} = \frac{900}{160} = \frac{45}{8}$ sec.

18. (d): Ratio of profit share of A and B

$= \left[(X+1200)8 + \left(\frac{X+1200}{2}\right) \times 4 \right] : [8(X+1500) + (2X+3000) \times 4]$

$= (10X + 12000) : (16X + 24000)$

$\frac{(10X+12000)}{(16X+24000)} = \frac{4250}{(11250-4250)}$

$\frac{(10X+12000)}{(16X+24000)} = \frac{17}{28}$

$280X - 272X = 408000 - 336000$

$8X = 72000 \Rightarrow X = 9000$ Rs.

B initial investment $= 9000 + 1500 = $ Rs 10500

Three times of B investment

$= 10500 \times 3 = 31500$ Rs.

19. (b): Total potassium farmer A has

$= (\theta + 54) \times \frac{3}{5} \, \text{kg}$

Total urea farmer A has $= (\theta + 54) \times \frac{2}{5} \, \text{kg}$

Total potassium farmer B has $= (\theta + 84) \times \frac{2}{3} \, \text{kg}$

Total Urea farmer B has $= (\theta + 84) \times \frac{1}{3} \, \text{kg}$

ATQ–

$(\theta + 54) \times \frac{40}{100}$

$= (\theta + 84) \times \frac{1}{3}$

$\theta = 96 \, \text{kg}$

Quantity of potassium in mixture of farmer B

$= (96 + 84) \times \frac{2}{3} = 120 \, \text{kg}$

20. (a): ATQ–

$\frac{a}{7+a+b} = \frac{5}{16}$

$16a = 35 + 5a + 5b$

$11a - 5b = 35 \, \dots(i)$

Also,

$\frac{b}{7+a+b} = \frac{1}{4}$

$4b = 7 + a + b$

$3b - a = 7 \, \dots(ii)$

From (i) and (ii) we get

a = 5 and b = 4

Required difference = 5 – 4 = 1

21. (c): No. of males $= \frac{11}{18} \times 7200 = 4400$

No. of males married $= \frac{40}{100} \times 4400 = 1760$

No. of females married = 1760

Required percentage $= \frac{1760}{2800} \times 100 = 62\frac{6}{7}\%$

22. (a):

Rice   Wheat

25   9

$\times x$ $\times 5x$

$\overline{25x}$ $\overline{45x}$

$70x = 350$

$\Rightarrow x = 5$

Hence the price of rice = Rs. 5 per kg

Price of wheat = Rs. 25 per kg

Now, the price of wheat = Rs. 30 per kg

Let the new amount of rice be M kg, then

$M \times 5 + 9 \times 30 = 350$

$M = 16$

Hence % decrease in amount of rice

$= \frac{25-16}{25} \times 100 = 36\%$

23. (b): Let the number of water taps is **n**

Number of Outlet taps is (9 – **n**)

Water taps can fill the tank in 1 hour $= \frac{n}{9}$

Outlet taps can empty the tank in 1 hour $= \frac{(9-n)}{9}$

Resultant of all 9 taps $= \frac{n}{9} - \frac{9-n}{9} = \frac{2n-9}{9}$

All these 9 taps can fill the tank in 9 hour so

$1 = \frac{2n-9}{9} \times 9$

$1 = 2n - 9$

$10 = 2n$

$n = 5$

Number of water taps = 5

24. (a): $A + B + C = \frac{2700}{18}$

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A + B + C = 150 _____ (1)

A + C = $\frac{940}{10}$

A + C = 94 _____ (2)

From (1) and (2)

B = 56

B + C = $\frac{1520}{20}$

B + C = 76 _____ (3)

C = 20

25. (a): Let the Sudhir's weight is 4n

And Sudhesh's weight is n

$\frac{125}{100} \times (4n + n) = 50$

$1.25 \times 5n = 50$

n = 8

Sudhir's weight = 32 kg

Sudhesh's weight = 8 kg

After increase Sudhir's weight = 1.12 × 32

= 34.84 kg

Sudhesh's weight = 50 – 34.84 = 14.16 kg

Required percentage = $\frac{14.16 - 8}{8} \times 100 = \frac{6.16}{8} \times 100$

= 77%

26. (e): Let present age of A = x

So, present age of B = 3x

Let present age of C = y

ATQ

$y - 1 = 2(x - 1)$

$y = 2x - 1$

And

$3x - 2x + 1 = 21$

$x = 20$

So, 3x = 60

And 2x – 1 = 39

Required% = $\frac{39 + 60}{20} \times 100 = 495\%$

27. (d): In word "GATEWAY", there are four consonants (G, T, W & Y) and three vowels (A, A & E). Vowels can occupy extreme ends in three ways [i.e, (AE) (AA) & (EA)].

And remaining five places can be filled in 5! ways.

So, required number of ways = 5! × 3 = 360 ways

28. (b): Profit sharing ratio of Deepak, Dharam & Veer

= 40000 × 10 : 55000 × 8 : 60000 × 6

= 10 : 11 : 9

Let profit share of Dharam, Deepak and Veer is 11p, 10p and 9p respectively.

ATQ

$11p - 10p = 5225$

$p = 5225$

So, $9p = 5225 \times 9 = Rs. 47025$

29. (b): Let cost price of a chair be Rs. 100x.

So, cost price of a table = Rs. (100x + 3400)

Now, mark price of a chair = 100x × $\frac{180}{100}$ = Rs. 180x

And mark price of a table = (100x + 3400) × $\frac{150}{100}$

= Rs. (150x + 5100)

Now, selling price of a chair = 180x × $\frac{75}{100}$ = Rs. 135x

And selling price of a table = (150x + 5100) × $\frac{68}{100}$

= Rs. (102x + 3468)

ATQ,

(135x – 100x) – [(102x + 3468) – (100x + 3400)]= 130

⇒ 35x – [2x + 68] = 130

⇒ 33x = 198

x = 6

Required difference = (102x + 3468) – 135x

= 3468 – 33x

= 3468 – 198

= Rs. 3270

30. (a): Let the length and breadth of the rectangular field be 40x m and 35x m respectively

Area of the field= 1400x² m²

Radius of the conical ditch=14x m

Volume of the soil taken out= $\frac{1}{3}\pi r^2 h$ = 1848x² m³

Area of base of conical ditch= πr^2 =616x² m²

Remaining area of the field=784x² m²

ATQ

784x² × h =1848x²

h= $\frac{33}{14}$ m = $2\frac{5}{14}$ m

31. (d): Let the total no. of students in 2015 and 2017 be 4x and 5x respectively.

Given $\left(4x \times \frac{40}{100} - 5x \times \frac{30}{100}\right) = 0.1x = 180$

x=1800

then no. of banking students in 2017

= 9000 × $\frac{36}{100}$ = 3240

no. of banking students in 2015

= 7200 × $\frac{28}{100}$ = 2016

Difference = (3240 – 2016) = 1224

32. (b): No. of upsc students in 2015

= $\left(8000 \times \frac{40}{100}\right)$ = 3200

No. of upsc students in 2016

= $\left(8000 \times \frac{110}{100} \times \frac{30}{100}\right)$ = 2640

No. of upsc students in 2017

$= \left(8000 \times \frac{110}{100} \times \frac{110}{100} \times \frac{30}{100}\right) = 2904$

No. of upsc students in 2018

$= \left(8000 \times \frac{110}{100} \times \frac{110}{100} \times \frac{110}{100} \times \frac{1}{4}\right) = 2662$

As it can be seen that in 2018 the no. of Upsc student was third highest.

33. **(d):** Let total no. of students in 2015,2016,2017,2018 be a, b, c ,d respectively

For 2015,

no. of Upsc students $= a \times \frac{40}{100} = 0.4a$

average of Banking and SSC students

$= \frac{0.28a + 0.32a}{2} = 0.3a$

For 2016,

no. of Upsc students $= a \times \frac{30}{100} = 0.3a$

average of Banking and SSC students

$= \frac{0.42a + 0.28a}{2} = 0.35a$

For 2017,

no. of Upsc students $= a \times \frac{30}{100} = 0.3a$

average of Banking and SSC students

$= \frac{0.36a + 0.34a}{2} = 0.35a$

For 2018

no. of Upsc students $= a \times \frac{25}{100} = 0.25a$

average of Banking and SSC students

$= \frac{0.30 + 0.45a}{2} = 0.375a$

So there is one year i.e. 2015 in which no. of Upsc students is more than average of Banking and SSC students together.

34. **(c):** Let the total no. of students be x for all of the given year, then

For 2015

Difference between upsc and SSC students

$= (0.4x - 0.32x) = 0.08x$

For 2016

Difference between upsc and SSC students

$= (0.30x - 0.28x) = 0.02x$

For 2017

Difference between upsc and SSC students

$= (0.34x - 0.30x) = 0.04x$

For 2018

Difference between upsc and SSC students

$= (0.45x - 0.25x) = 0.20x$

As it can be seen that difference between no. of upsc students and SSC students is second lowest is in 2017.

35. **(e):** Let the total no. of students in 2018 be x

Then ATQ

$(.45x - .30x) = 300$

X=2000 and no. of upsc students in 2018 = 500

So no. of upsc students in 2015 and 2017 will be 600 and 300 respectively

So no. of SSC students in 2015$= \left(\frac{600}{40} \times 32\right) = 480$

no. of SSC students in 2017$= \left(\frac{300}{30} \times 34\right) = 340$

average no. of SSC students in 2015 and 2017 together$= \frac{480 + 340}{2} = 410$

BILINGUAL

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36. **(b):** Required % $= \frac{3200 \times \frac{75}{100}}{3600 \times \frac{45}{100}} \times 100$

$= \frac{4000}{27} \% = 148 \frac{4}{27} \%$

37. **(a):** Required average $= \frac{1}{4}\left(2400 \times \frac{70}{100} + 4500 \times \frac{40}{100} + 4000 \times \frac{45}{100} + \frac{2500 \times 56}{100}\right)$

$= \frac{1}{4}(1680 + 1800 + 1800 + 1400) = 1670$

38. **(d):** Required 5

$= \frac{\left(2400 \times \frac{70}{100} + \frac{3600 \times 55}{100}\right) - \left(4000 \times \frac{55}{100} + \frac{2500 \times 44}{100}\right)}{\left(2400 \times \frac{70}{100} + 3600 \times \frac{55}{100}\right)} \times 100$

$= \frac{3660 - 3300}{3660} \times 100 \approx 10\%$

39. **(c):** Required difference $= \frac{1}{2}\left(4500 \times \frac{60}{100} + 2500 \times \frac{44}{100}\right) - \frac{1}{2}\left(3600 \times \frac{55}{100} + \frac{4000 \times 45}{100}\right)$

$= 1900 - 1890 = 10$

40. **(e):** Required ratio $= \frac{2400 + 2500}{\left(\frac{40 \times 4500}{100} + 4000 \times \frac{45}{100}\right)}$

$= \frac{4900}{3600} = 49 : 36$

41. **(c):** Total complains unresolved in police stations A

$= 9600 \times \frac{75}{100} = 7200$

Total complains unresolved in police stations C

$= 4800 \times \frac{85}{100} = 4080$

Total complains unresolved in police stations E

$= 8000 \times \frac{60}{100} = 4800$

Required average $= \frac{7200+4080+4800}{3} = 5360$

42. (d): Total complain resolved in police station B

$= 8400 \times \frac{30}{100} = 2520$

Total complain resolved in police station A & D

$= 9600 \times \frac{25}{100} + 6400 \times \frac{1}{8}$

$= 2400 + 800 = 3200$

Required percentage $= \frac{3200 - 2520}{3200} \times 100$

$= \frac{680}{3200} \times 100 = 21.25\%$

43. (a): Total number of complains resolved in police stations B & E

$= = 8400 \times \frac{30}{100} + 8000 \times \frac{40}{100}$

$= 2520 + 3200$

$= 5720$

Total complains unresolved in police station C

$= 4800 \times \frac{85}{100} = 4080$

Required difference $= 5720 - 4080$

$= 1640$

44. (b): Total complains resolved in police stations A & D

$= 9600 \times \frac{25}{100} + 6400 \times \frac{1}{8}$

$= 2400 + 800$

$= 3200$

Total complains unresolved in police station B

$= 8400 \times \frac{70}{100} = 5880$

Required ratio $= \frac{3200}{5880}$

$= 80 : 147$

45. (b): Total complains unresolved in police station B

$= 8400 \times \frac{70}{100} = 5880$

Total complains unresolved in police station E

$= 8000 \times \frac{60}{100} = 4800$

Required percentage $= \frac{5880 - 4800}{4800} \times 100$

$= \frac{1080}{4800} \times 100$

$= 22.5\%$

46. (c): Quantity 1: let speed & length of first train be 'x' m/s & 'l' m respectively.

ATQ, $\frac{l+2l}{x+2x} = 20 = \frac{l}{x}$

$l = 20x$ ………………..(i)

$\frac{l+100}{x} = 30$

From (i) $20x + 100 = 30x$

$x = 10$ m/s

Quantity 2: let speed & length of first train be 'x' m/s & 'l' m respectively.

Length of second (latter) train = 2.5l m

ATQ, $\frac{l+2.5l}{20-x} = 70$ ………………(i)

$\frac{2.5l+2.5l}{20} = 25$

$l = 100$ m

putting in (i)

$20 - x = \frac{3.5l}{70}$

$x = 15$ m/s

clearly, quantity 1 < quantity 2

TEST SERIES

ENGLISH

FCI 2021

ASST. GENERAL MANAGER

(General Administration)

20 TOTAL TESTS

47. (c): Quantity 1: let there are 'x' red balls & 'y' blue balls

ATQ, $\frac{x_{C_1} \times 15 - x_{C_2}}{15_{C_3}} = \frac{45}{91}$

$\frac{x(15-x)(14-x) \times 3 \times 2}{15 \times 14 \times 13 \times 2} = \frac{45}{91}$

$x(15 - x)(14 - x) = 450$

on solving, x = 5 (can also be found by checking values of x starting from 1)

new probability (no blue balls)

$\frac{5_{c_1} \times 10 - y_{c_2}}{15 - y_{c_3}} = \frac{5}{11}$

$\frac{5 \times (10-y)(9-y) \times 3 \times 2}{(15-y)(14-y)(13-y) \times 2} = \frac{5}{11}$

Possible values of y = 1, 2, 3, 4 (blue balls are minimum)

On checking values, y = 4

Blue balls = 4

Quantity 2: $x^2 - 5x + 2x - 10 = 0$

x = 5, -2 (neglecting negative value of x)

ATQ, $\frac{5_{c_2}}{5 + y_{c_2}} = \frac{2}{9}$

$\frac{5 \times 4}{(5+y)(4+y)} = \frac{2}{9}$

On solving y = 5 (blue balls)

clearly, quantity 1 < quantity 2

48. (e): Quantity 1: a + b = 5 (since a,b > 0)

$b^2 + c^2 = 5^2$ (this is Pythagorean triplet)

b = 3, c = 4 (since b<c)

a = 2

required value $= (2 + 3 - 4)^2 = 1$

quantity 2: a : c = 3 : 5

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a : b : c = 3 : 3 : 5

b + c = 8

a = 3, b = 3, c = 5

required value = $(3 + 3 - 5)^2 = 1$

clearly, Quantity 1 = Quantity 2

49. (a): Quantity 1:

1 min work of outlet pipe = $\frac{1}{10} - \frac{1}{30} = \frac{1}{15}$ unit

Time taken by outlet pipe to empty the tank

= 15 min

1 min work of all 3 pipes = $\frac{1}{10} + \frac{1}{12} - \frac{1}{15} = \frac{7}{60}$ unit

Required time to fill the tank = $\frac{60}{7}$ min = $8\frac{4}{7}$ min

Quantity 2: efficiency = A < B < C

The combination of two pipes will be AB, BC & AC

(these can be in any order)

3 min work for pipes in any order

= $2\left(\frac{1}{15} + \frac{1}{12} + \frac{1}{10}\right) = \frac{1}{2}$ unit

Required time to fill the tank = 3 + 3 = 6 min (since

order of pipes doesn't affect time taken)

Clearly, Quantity 1 > Quantity 2

50. (c): let radius of sphere be 'r' m

$4\pi r^2 = 616$

r = 7 m

Quantity 1: let radius of cylinder be 'R' m

ATQ, $\frac{4}{3}\pi \times (7)^3 = \pi \times R^2 \times \frac{28}{3}$

R = 7 m

Required CSA of cylinder = $2\pi Rh$

= $2 \times \frac{22}{7} \times 7 \times \frac{28}{3} = 410.67 \, m^2$

Quantity 2: the cylinder is completely inside sphere & its surface lies on surface of sphere

Which means height of cylinder = 2r = 14 m

Required CSA of cylinder = $2\pi Rh$

= $2 \times \frac{22}{7} \times 7 \times 14 = 616 \, m^2$

Clearly, Quantity 1 < Quantity 2

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