What is the respective ratio of number of ...

N. Vinaykumar Reddy
Director, IACE, Hyderabad.

MODEL QUESTIONS

Directions (Q.No.1-5): In the following questions, two Equations I and II are given. You have to solve both the equations and give answer.

 a) $x < y$
 b) $x > y$
 c) $x \geq y$
 d) $x \leq y$
 e) Relationship between x and y cannot be established

1. I. $2x^2 + 23x + 63 = 0$
   II. $4y^2 + 19y + 21 = 0$
2. I. $3x^2 + 29x + 56 = 0$
   II. $2y^2 + 15y + 25 = 0$
3. I. $3x^2 + 23x + 44 = 0$
   II. $3y^2 + 20y + 33 = 0$
4. I. $4x^2 - 29x + 45 = 0$
   II. $3y^2 - 19y + 28 = 0$
5. I. $2x^2 - 13x + 21 = 0$
   II. $5y^2 - 22y + 21 = 0$

Directions (Q.No.6-10): Study the following graph carefully to answer the questions that follow

Number of Computers Manufactured and Sold by Various Companies over the Years
(Number in Lakhs)

(Legend: Manufactured, Sold)
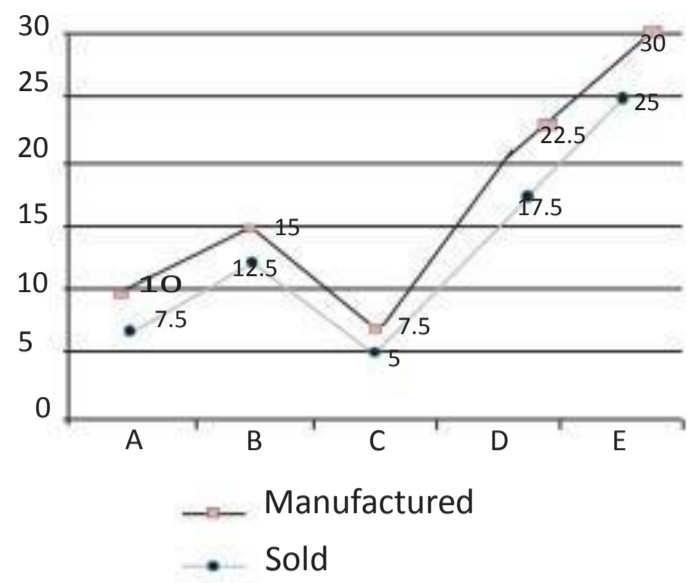
6. What is the respective ratio of the number of computers manufactured by Companies A and C together to the number of computers sold by Companies A and C together?
   a) 4 : 5   b) 14 : 11   c) 8 : 9
   d) 7:5   e) None of these
7. What is the difference between the average number of computers manufactured by all the companies together and the average number of computers sold by all the companies together?
   a) 3500   b) 35000
   c) 350000   d) 3500000
   e) None of these
8. 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
9. The number of computers manufactured by Company D are what percent of the number of computers manufactured by Company E?
   a) 125   b) 112.5
   c) 85   d) 65.25
   e) 75
10. The number of computers manufactured by Company B are approximately, what percent of the number of computers manufactured by all the companies together?
    a) 22   b) 18
    c) 14   d) 26
    e) 32

Directions (Q.No.11-15): Study the following bar graph carefully and answer the questions given below it.

Total Number of Males and Females in Five Difference Organizations

(Legend: Males, Females)
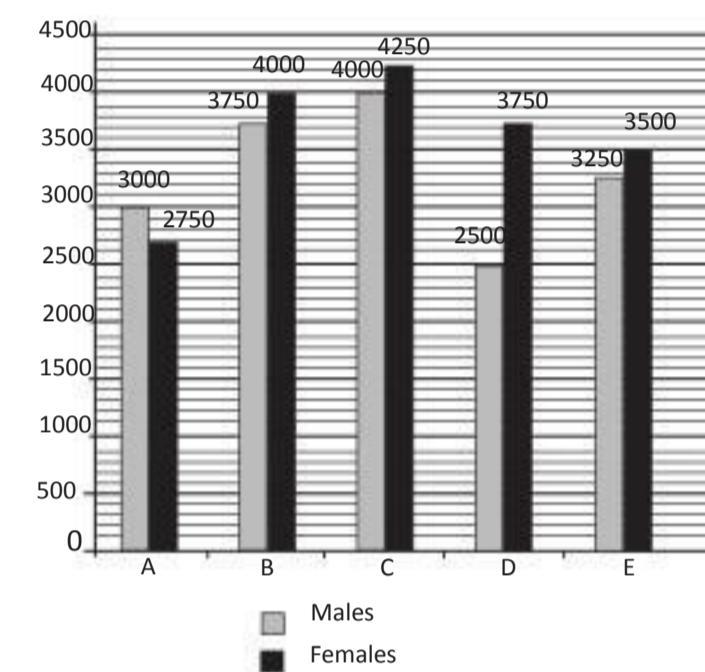
11. what is the average number of females from all the organizations together?
    a) 3800   b) 35500
    c) 3300   d) 3150
    e) None of these
12. The number of males from Organization A is approximately, what percent of the total number of males from all the organizations together?
    a) 18   b) 28
    c) 11   d) 31
    e) 36
13. What is the difference between the total number of females and the total number of males from all the organizations together?
    a) 1500   b) 1750
    c) 1800   d) 2050
    e) None of these
14. What is the respective ratio of number of females from Organization C to the number of females from Organization E?
    a) 14 : 17   b) 17 : 14
    c) 14 : 15   d) 15 : 14
    e) None of these
15. The total number of males from Organizations A and B together are approximately, what percent of the total number of males from Organizations C, D and E together?
    a) 58   b) 75
    c) 69   d) 83
    e) 52

SOLUTIONS

1. a;
From I,
$2x^2 + 23x + 63 = 0$
$\Rightarrow 2x^2 + 14x + 9x + 63 = 0$
$\Rightarrow 2x (x + 7) + 9 (x + 7) = 0$
$\Rightarrow (2x + 9) (x + 7) = 0$
$\Rightarrow x = \frac{-9}{2}$ or -7
From II,
$4y^2 + 19y + 21 = 0$
$\Rightarrow 4y^2 + 12y + 7y + 21 = 0$
$\Rightarrow 4y (y + 3) + 7 (y + 3) = 0$
$\Rightarrow (4y + 7) (y + 3) = 0$
$\Rightarrow y = \frac{-7}{4}$ or -3
Hence, $x < y$

2. e;
From I,
$3x^2 + 29x + 56 = 0$
$\Rightarrow 3x^2 + 21x + 8x + 56 = 0$
$\Rightarrow 3x (x + 7) + 8 (x + 7) = 0$
$\Rightarrow (3x + 8) (x + 7) = 0$
$\Rightarrow x = \frac{-8}{3}$ or -7
From II,
$2y^2 + 15y + 25 = 0$
$\Rightarrow 2y^2 + 10y + 5y + 25 = 0$
$\Rightarrow 2y (y + 5) + 5 (y + 5) = 0$
$\Rightarrow (y + 5) (2y + 5) = 0$
$\Rightarrow y = -5$ or $\frac{-5}{2}$
Hence, relationship between x and y

cannot be established.

3. d;
From I.
$3x^2 + 23x + 44 = 0$
$\Rightarrow 3x^2 + 12x + 11x + 44 = 0$
$\Rightarrow 3x (x + 4) + 11 (x + 4) = 0$
$\Rightarrow (3x + 11) (x + 4) = 0$
$\Rightarrow x = \frac{-11}{3}$ or -4
From II. $3y^2 + 20y + 33 = 0$
$\Rightarrow 3y^2 + 11y + 9y + 33 = 0$
$\Rightarrow y (3y + 11) + 3 (3y + 11) = 0$
$\Rightarrow (3y + 11) (y + 3) = 0$
$\Rightarrow y = \frac{-11}{3}$ or -3
Hence, $x \leq y$

4. e;
From I.
$4x^2 - 29x + 45 = 0$
$\Rightarrow 4x^2 - 20x - 9x + 45 = 0$
$\Rightarrow 4x (x - 5) - 9 (x - 5) = 0$
$\Rightarrow (4x - 9) (x - 5) = 0$
$\Rightarrow x = \frac{9}{4}$ or 5
From II.
$3y^2 - 19y + 28 = 0$
$\Rightarrow 3y^2 - 12y - 7y + 28 = 0$
$\Rightarrow 3y (y - 4) - 7 (y - 4) = 0$
$\Rightarrow (3y - 7) (y - 4) = 0$
$\Rightarrow y = \frac{7}{3}$ or 4
Hence, relationship between x and y cannot be established

5. c;
From I.
$2x^2 - 13x + 21 = 0$
$\Rightarrow 2x^2 - 7x - 6x + 21 = 0$
$\Rightarrow x (2x - 7) - 3(2x - 7) = 0$
$\Rightarrow (x - 3) (2x - 7) = 0$
$\Rightarrow x = \frac{7}{2}$ or 3
From II.
$5y^2 - 22y + 21 = 0$
$\Rightarrow 5y^2 - 15y - 7y + 21 = 0$
$\Rightarrow 5y(y - 3) - 7 (y - 3) = 0$
$\Rightarrow (5y - 7) (y - 3) = 0$
$\Rightarrow y = \frac{7}{5}$ or 3
Hence, $x \geq y$

6. d;
Required ratio
$= (10 + 7.5) : (7.5 + 5.0)$
$= 17.5 : 12.5 = 7 : 5$

7. c;
Required difference
$\frac{(10 + 15 + 7.5 + 22.5 + 30)}{5} = 17$
$\frac{(7.5 + 12.5 + 5 + 17.5 + 25)}{5} = 13.5$
$= 17 - 13.5 = 3.5$ lakh $= 350000$

8. a;
Required percent
$= \frac{12.5 \times 100}{15} = 83.33\%$

9. e;
Required percent
$= \frac{22.5}{30} \times 100 = 75\%$

10. b;
Required per cent
$\frac{15 \times 100}{(10 + 15 + 7.5 + 22.5 + 30)} = \frac{1500}{85}$
$= 17.64 \approx 18\%$

11. e;
Required average
$\frac{(2750 + 4000 + 4250 + 3750 + 3500)}{5}$
$\frac{18250}{5} = 3650$

12. a;
Required percentage
$\frac{3000 \times 100}{(3000 + 3750 + 4000 + 2500 + 3250)}$
$\frac{3000 \times 100}{16500}$
$= 18.18 \approx 18\%$

13. b;
Required difference
$= 18250 - 16500$
$= 1750$

14. b;
Required ratio
$= \frac{4250}{3500} = 17:14$

15. c;
Required percentage $= 2$
$\frac{6750 \times 100}{9750}$
$= 69.23 \approx 69\%$