

# BOOKS



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## Solutions

### S1. Ans.(b)

Sol.

| <u>ARTS</u>  | <u>Engg.</u>                  |
|--|-------------------------------|
| GBTU = $247 \times 12 = 2964$                        | GBTU = $273 \times 12 = 3276$ |
| CCSU = $247 \times 17 = 4199$                        | CCSU = $273 \times 15 = 4095$ |
| Total students = $2964 + 4199 + 3276 + 4095 = 14534$ |                               |

### S2. Ans.(d)

Sol.

| <u>Neelkanth</u>  | <u>ARTS</u>            |
|---|------------------------|
| Engg : $273 \times 12$                                      | HBTI : $247 \times 14$ |
| Arts : $247 \times 15$                                      | CCSU : $247 \times 17$ |
| Desired ratio = $\frac{6981}{7657} \approx \frac{573}{569}$ |                        |

### S3. Ans.(c)

Sol. For ARTS Graduates

$$\text{Avg (HBTI + GBTU + Neelkanth + Amity)} = \frac{247 \times (14 + 12 + 15 + 8)}{4}$$

Engg. Graduates

$$\text{Avg. (Top 5 colleges)} = \frac{273 \times 76}{5}$$

$$\text{Desired difference} = |3025.75 - 4149.6| = 1123.85$$

### S4. Ans.(b)

Sol. Engg. Students added to Amity University from Galgotia =  $\frac{1}{3} \times 14 \times 273 = 1274$

$$\text{New central angle for Galgotia} = \frac{3822 - 1274}{27300} \times 360 = \frac{2548}{27300} \times 360 = 33.6^\circ$$

Total student of Engg. In Amity =  $273 \times 17 + 1274 = 5915$

$$\text{Central angle for Amity} = \frac{5915}{27300} \times 360 = 78^\circ$$

$$\text{Desired difference} = 78^\circ - 33.6^\circ = 44.4^\circ$$

### S5. Ans.(a)

Sol. Failed Engg. Students =  $\frac{1}{4} \times 27300 = 6825$

Two-third of Arts student who passed =  $\frac{2}{3} \times \frac{4}{5} \times 24700 \approx 13174$

$$\text{Difference} = 13174 - 6825 = 6349$$

### S6. Ans.(a)

Sol. CP =  $24 \times 48 = \text{rs } 1152$

$$\text{SP} = 8 \times 48 \times \frac{110}{100} + 16 \times 48 \times \frac{120}{100} = \text{Rs. } 1344$$

$$\text{Profit \%} = \frac{192}{1152} \times 100 = 16\frac{2}{3}\%$$



**S7. Ans.(a)****Sol.** Let SP of each car = Rs x

For Car 1

$$C = x \times \frac{100}{110} = \frac{10}{11}x$$

For Car 2

$$C = x \times \frac{100}{93} = \frac{100x}{93}$$

$$\text{Total C} = 100x \left[ \frac{1}{110} + \frac{1}{93} \right] = \frac{203 \times 100x}{110 \times 93}$$

$$\text{Gain} = 2x - \frac{203 \times 100x}{110 \times 93} = \frac{(2 \times 110 \times 93 - 20300)x}{110 \times 93} = \frac{160x}{110 \times 93}$$

$$\text{Gain\%} = \frac{160x}{203x \times 100} \times 100 = \frac{160}{203}\%$$

**S8. Ans.(c)****Sol.****For Rakesh**

Let SP = Rs x

$$C = x \left( \frac{100}{125} \right) = \frac{4}{5}x$$

$$\text{Profit} = x - \frac{4}{5}x = \frac{x}{5}$$

**For Deepak**

$$C = x \left( \frac{75}{100} \right) = \frac{3}{4}x$$

$$\therefore \text{for deepak, Profit} = \frac{x}{4}$$

Acc. to question

$$\frac{x}{4} - \frac{x}{5} = \text{Rs } 100$$

$$x = \text{Rs } 2000$$

**S9. Ans.(b)****Sol.**

$$r = \frac{35}{2} \text{ dm} = \left( \frac{35}{2} \times 10 \right) = 175 \text{ cm,}$$

$$h = 24 \text{ dm} = 240 \text{ cm}$$

$$\text{Volume of drum} = \left( \frac{22}{7} \times 175 \times 175 \times 240 \right) = (22 \times 25 \times 175 \times 240) \text{ cm}^3$$

$$\text{Volume of a tin} = (25 \times 22 \times 35) \text{ cm}^3$$

$$\text{Number of tins} = \left( \frac{22 \times 25 \times 175 \times 240}{25 \times 22 \times 35} \right) = 1200$$

**S10. Ans.(d)****Sol.** Let, radius = 5x and height = 12x cm.

$$= \frac{1}{3} \times \frac{22}{7} \times 12x \times 5x \times 5x = \frac{2200}{7} \Rightarrow x = 1$$

$$\therefore r = 5 \text{ and } h = 12$$

$$\therefore \ell = \sqrt{r^2 + h^2} = \sqrt{25 + 144} = \sqrt{169} = 13 \text{ cm}$$

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### S11. Ans.(c)

**Sol.** Let tank will be filled "x hours after 10 am

$$\therefore \frac{x}{2} + \frac{x-1}{6} = 1$$

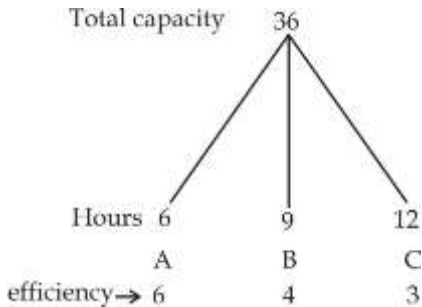
$$\frac{3x + x - 1}{6} = 1$$

$$\Rightarrow x = \frac{7}{4} = 1\frac{3}{4} = 1 \text{ hr. } 45 \text{ minute}$$

So, tank will be filled at 10 + 1 : 45 = 11 : 45 am

### S12. Ans.(c)

**Sol**



$$\Rightarrow (B + C) \text{ in half an hours } \frac{7}{2} \text{ units}$$

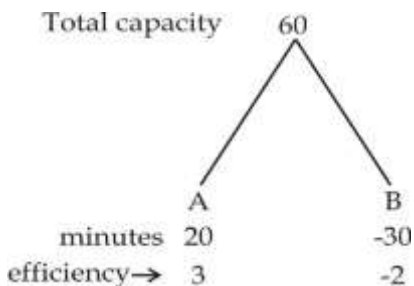
$$\text{Remaining} = 36 - \frac{7}{2} = \frac{65}{2}$$

⇒ Time taken by all three pipes to fill remaining part

$$= \frac{65}{2(6 + 4 + 3)} = 2\frac{1}{2} \text{ hrs.}$$

### S13. Ans.(c)

**Sol.**



Total efficiency in 2 minutes = (3 - 2) = 1 unit/2 minutes

In 1<sup>st</sup> minutes A fill 3 units & in 2nd, B empty 2 units

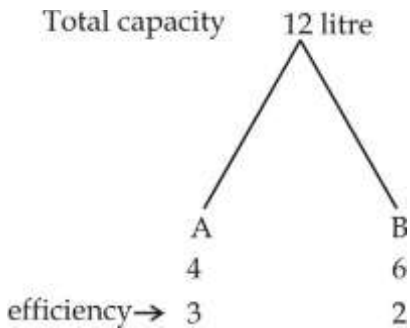
|                  |                             |                              |
|------------------|-----------------------------|------------------------------|
| ∴                | <b>Efficiency</b>           | <b>Time</b>                  |
|                  | $\frac{1 \times 57}{57}$    | $\frac{2 \times 57}{114}$    |
| (A+B) together → | 57                          | 114                          |
| A work →         | $\frac{3 \text{ unit}}{60}$ | $\frac{1 \text{ mint}}{115}$ |

So, required answer = 115 minutes



**S14. Ans.(b)**

**Sol.**



A/q, for 1st hour, A is opened & for 2<sup>nd</sup> hours 'B' is opened. So, work done in 4 hours =  $2(3 + 2) = 10$

Remaining =  $12 - 10 = 2$  ltr.

⇒ 2 lt. will be filled by

A in  $\frac{2}{3}$  hrs.

So, total time =  $4 + \frac{2}{3}$  hrs =  $4\frac{2}{3}$  hrs

**S15. Ans.(a)**

**Sol.** He can select a girl in 6 ways and a boy in 8 ways. Therefore, by fundamental principle of multiplication, he can select a girl and a boy in  $6 \times 8 = 48$  ways. i.e.,

Place: G B

Selection: 6 8

Total ways =  $6 \times 8 = 48$

**S16. Ans.(b)**

**Sol.**  $441 - 233 + 1650 \approx ? + 1226$

⇒  $1858 \approx ? + 1226$

⇒  $? \approx 1858 - 1226 \approx 632 \approx 630$

**S17. Ans.(c)**

**Sol.**  $? \approx 23 \times 19 \times 8 \approx 3496 \approx 3500$

**S18. Ans.(c)**

**Sol.**

$$? \approx \frac{1300 \times 74}{100} + \frac{1900 \times 10}{100}$$

$$\approx 962 + 190 \approx 1152 \approx 1150$$

**S19. Ans.(a)**

**Sol.**

$$? \approx \left(\frac{8}{3}\right)^2 \times \frac{400}{40} \times \frac{900}{40} \approx 1600$$

**S20. Ans.(d)****Sol.**

$$? \approx \frac{700 \times 90}{100} + \frac{1000 \times 50}{100} - 170$$

$$\approx 630 + 500 - 170 \approx 960$$

**S21. Ans.(c)****Sol.** Let side of square is a cm.

$$\therefore a^2 = 196$$

$$\Rightarrow a = 14 \text{ cm}$$

$$\therefore \text{radius of larger circle} = 28 \text{ cm}$$

$$\therefore \text{radius of smaller circle} = 28 \times \frac{3}{7} = 12 \text{ cm}$$

$$\therefore \text{Circumference of smaller circle} = 2 \times \pi \times 12 = 24 \pi \text{ cm}$$

**S22. Ans.(b)****Sol.** Sum of all angles of quadrilateral = 360

$$\Rightarrow 3x + 4x + 6x + 7x = 360$$

$$\Rightarrow x = 18$$

$$\therefore \text{Second largest angle} = 6 \times 18$$

$$= 108$$

$$\therefore \text{adjacent angle of parallelogram}$$

$$= 180 - \frac{108}{2} = 126^\circ$$

**S23. Ans.(b)****Sol.** Radius of sheet = slant height of cone = 14 cm

And circumference of sheet = circumference of base of cone

$$\text{or, } \pi \times 14 = 2 \times \pi \times r$$

$$\text{or, } r = 7 \text{ cm}$$

$$\therefore \text{height of cone} = \sqrt{14^2 - 7^2} = 7\sqrt{3} \text{ cm} \approx 12 \text{ cm}$$

**S24. Ans.(c)****Sol.** RUMMY

There are 5 letters.

$$\text{And number of words formed} = \frac{5!}{2!}$$

$$= \frac{5 \times 4 \times 3 \times 2 \times 1}{2 \times 1} = \frac{120}{2} = 60$$

**S25. Ans.(d)****Sol.** Let sides of rectangle = a, 2a, side of a square = b

$$2(a+2a) = 4b, a = \frac{2}{3}b$$

$$\text{Area of rectangle} = a \times 2a = 2a^2 \text{ or } \left[\frac{8}{9}\right]b^2$$

$$\text{Area of square} = b^2$$

$$\text{Ratio} = 8:9$$

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**S26. Ans.(b)****Sol.** Good cars of companies Alto, Swift, and Sedan together

$$= \left( \frac{7}{9} \times \frac{24}{100} \times 6,00,000 + \frac{11}{15} \times \frac{15}{100} \times 6,00,000 + \frac{12}{17} \times \frac{17}{100} \times 6,00,000 \right) = 2,50,000$$

Total number of bad cars of companies Ferrari Mercedes and Sujuki together

$$= \left( \frac{3}{10} \times \frac{22}{100} \times 6,00,000 + \frac{1}{6} \times \frac{10}{100} \times 6,00,000 + \frac{7}{24} \times \frac{12}{100} \times 6,00,000 \right) = 70,600$$

$$\therefore \text{Required ratio} = \frac{250,000}{70,600} = \frac{1250}{353}$$

**S27. Ans.(d)****Sol.** Total number of bad cars of companies Sujuki, Swift and sedan

$$= \left( \frac{7}{24} \times \frac{12}{100} + \frac{4}{15} \times \frac{15}{100} + \frac{5}{17} \times \frac{17}{100} \right) \times 6,00,000$$

$$= \left( \frac{7}{2} + 4 + 5 \right) \times 6000$$

$$= 75,000$$

**S28. Ans.(c)****Sol.** Average number of good cars

$$= \frac{1}{6} \times \left( \frac{7}{10} \times \frac{22}{100} + \frac{7}{9} \times \frac{24}{100} + \frac{5}{6} \times \frac{10}{100} + \frac{11}{15} \times \frac{15}{100} + \frac{12}{17} \times \frac{17}{100} + \frac{17}{24} \times \frac{12}{100} \right) \times 6,00,000$$

$$= \frac{1}{6} \times (92,400 + 1,12,000 + 50,000 + 66,000 + 72,000 + 51,000)$$

$$= 73,900$$

**S29. Ans.(a)****Sol.** Good cars of companies Mercedes Swift and Alto

$$= \left( \frac{5}{6} \times \frac{10}{100} \times 6,00,000 + \frac{11}{15} \times \frac{15}{100} \times 6,00,000 + \frac{7}{9} \times \frac{24}{100} \times 6,00,000 \right)$$

$$= 2,28,000$$

Bad cars of companies Mercedes swift and Alto

$$= \left( \frac{1}{6} \times \frac{10}{100} + \frac{4}{15} \times \frac{15}{100} + \frac{2}{9} \times \frac{24}{100} \right) \times 6,00,000$$

$$= 66,000$$

$$\therefore \text{Required percentage} = \frac{2,28,000}{66,000} \times 100$$

$$= 345.45\%$$

**S30. Ans.(c)****Sol.** Required difference

$$= \left[ \left( \frac{17}{24} \times \frac{12}{100} + \frac{7}{10} \times \frac{22}{100} + \frac{7}{9} \times \frac{24}{100} \right) - \left( \frac{1}{6} \times \frac{10}{100} + \frac{4}{15} \times \frac{15}{100} + \frac{5}{17} \times \frac{17}{100} \right) \right] \times 6,00,000$$

$$= 2,55,400 - 64,000 = 1,91,400$$

**S31. Ans.(c)**

$$\text{Sol. } \frac{250 \times 14}{100} \times \frac{150 \times ?}{100} = 840$$

$$\Rightarrow 35 \times \frac{3}{2} \times ? = 840$$

$$\Rightarrow ? = \frac{840 \times 2}{105} = 16$$

**S32. Ans.(e)**

$$\text{Sol. } 25 \times 14 - 42 + 4^? = 18^2$$

$$\Rightarrow 350 - 42 + 4^? = 324$$

$$\Rightarrow 4^? = 324 - 308 = 16$$

$$? = 2$$

**S33. Ans.(a)****Sol.**

$$(17 - 9 + 3) + \left(\frac{1}{2} - \frac{5}{6} + \frac{7}{12}\right) = ?$$

$$\Rightarrow 11 + \frac{1}{4} = ?$$

$$\Rightarrow ? = 11\frac{1}{4}$$

**S34. Ans.(e)**

$$\text{Sol. } 28.314 - 31.4272 + 113.92 = ? + 29.113$$

$$\Rightarrow ? = 142.234 - 60.5402$$

$$= 81.6938$$

**S35. Ans.(c)****Sol.**

$$\frac{1}{6} \times \frac{92}{100} \times \frac{24}{23} \times 650 = 85 + ?$$

$$\Rightarrow \frac{4}{25} \times 650 = 85 + ?$$

$$? = 104 - 85 = 19$$

**S36. Ans.(b)**

$$\text{Sol. I. } x^2 - 1 = 0$$

$$\text{or, } x^2 = 1$$

$$\text{or, } x = \pm\sqrt{1} = \pm 1$$

$$\text{II. } y^2 + 4y + 3 = 0$$

$$\text{or, } y^2 + y + 3y + 3 = 0$$

$$\text{or, } y(y + 1) + 3(y + 1) = 0$$

$$\text{or, } (y + 3)(y + 1) = 0$$

$$\text{or, } y = -3 \text{ or, } -1$$

$$\therefore x \geq y$$

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**S37. Ans.(d)**

**Sol. I.**  $x^2 - 7x + 12 = 0$

or,  $x^2 - 4x - 3x + 12 = 0$

or,  $x(x - 4) - 3(x - 4) = 0$

or,  $(x - 3)(x - 4) = 0$

or,  $x = 3$  or,  $4$

**II.**  $y^2 - 12y + 32 = 0$

or,  $y^2 - 8y - 4y + 32 = 0$

or,  $y(y - 8) - 4(y - 8) = 0$

or,  $(y - 4)(y - 8) = 0$

or,  $y = 4$  or,  $8$

$\therefore x \leq y$

**S38. Ans.(c)**

**Sol.**  $x = \sqrt{1000} = 10, y = \sqrt{1331} = 11$

$\therefore x < y$

**S39. Ans.(a)****Sol.** Solving these two linear equations, we get  $x = 5, y = 3$ .

$\therefore x > y$

**S40. Ans.(e)**

**Sol. I.**  $2x^2 + 11x + 12 = 0$

or,  $2x^2 + 8x + 3x + 12 = 0$

or,  $2x(x + 4) + 3(x + 4) = 0$

or,  $(2x + 3)(x + 4) = 0$

$\therefore x = -\frac{3}{2}$  or,  $-4$

**II.**  $5y^2 + 27y + 10 = 0$

or,  $5y^2 + 27y + 2y + 10 = 0$

or,  $5(y + 5) + 2(y + 5) = 0$

or,  $(5 + 2)(y + 5) = 0$

$\therefore y = -\frac{2}{5}$  or,  $-5$

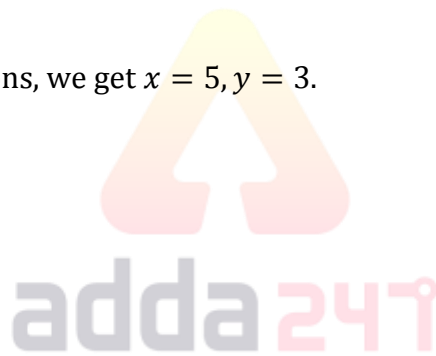
The relationship cannot be established.

**S41. Ans.(b)**

**Sol.** Difference =  $\frac{(230+370)}{2} - \frac{(200+380)}{2} = 300 - 290 = 10$

**S42. Ans.(a)**

**Sol.** Required average =  $\frac{150+240+360}{3} = \frac{750}{3} = 250$



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**S43. Ans.(d)**

**Sol.** Production of S in 2012 =  $360 \times \frac{120}{100} = 432$

Production of T in 2012 =  $240 \times \frac{125}{100} = 300$

∴ Total production of S and in 2012 =  $432 + 300 = 732$

**S44. Ans.(e)**

**Sol.** Required ratio =  $\frac{150 + 200}{240 + 360} = \frac{350}{600} = 7 : 12$

**S45. Ans.(e)**

**Sol.** Production of firm Q in both years = 600

Production of firm R in 2011 and firm T in 2010 = 620

∴ Required percentage =  $\frac{620 - 600}{620} \times 100 = 3.22\%$

**S46. Ans.(a)**

**Sol.**  $\approx \frac{1}{4} \times 2800 + 15 \times 2400$

=  $700 + 36000 = 36700$

**S47. Ans.(b)**

**Sol.**  $\approx \frac{1080}{36} + 187 \times 20 = 30 + 3740 = 3770$

**S48. Ans.(e)**

**Sol.**  $\approx \frac{5}{4} \times 4876 + 88 \times 15 = 5 \times 1219 + 1320$

=  $6095 + 1320 = 7415$

**S49. Ans.(a)**

**Sol.**  $\approx \frac{39 \times 15 - 28 \times 10}{5} = 36 + ?$

⇒  $61 = 36 + ? \Rightarrow ? = 25$

**S50. Ans.(e)**

**Sol.**  $\approx 158 \times 4 + \frac{1}{5} \times 850 + ? = 952$

⇒  $632 + 170 + ? = 952$

∴  $? \approx 150$

