

# BOOKS



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## Solutions

### S1. Ans.(c)

**Sol.** Let  $x$  litres of 50% and  $y$  litres of 80% solutions are used.

$$\frac{x}{y} = \frac{80 - 62}{62 - 50} \Rightarrow \frac{x}{y} = \frac{3}{2}$$

Solution get mixed in the ratio 3: 2.

Let the value of newly formed solution =  $Z$  litres

$$\Rightarrow \frac{0.62 Z}{Z + 6} = \frac{1}{2}$$

$$\Rightarrow 1.24 Z = Z + 6$$

$$\Rightarrow Z = \frac{6}{0.24} = 25$$

$\therefore$  Required quantity of mixture having 80% acid =  $\frac{2}{5} \times 25 = 10$  litres

### S2. Ans.(b)

**Sol.** Let his sales be worth Rs.  $x$  then

$$1000 + 2.5\% \text{ of } (x - 4000) = 5\% \text{ of } x + 600$$

$$\Rightarrow x = \text{Rs. } 12,000$$

### S3. Ans (b)

**Sol.** Clearly, the number which have 1 or 9 in the unit's digit, have squares that end in the digit 1.

Such numbers from 1 to 70 are 1,9,11, 19,21, 29,31,39,41,49,51,59,61,69.

$$\text{Required percentage} = \frac{14}{70} \times 100 = 20\%$$

### S4. Ans.(c)

**Sol.** Let time taken by Riya to complete the whole work alone =  $x$  days

time taken by Diya to complete the whole work alone =  $x+2$  days

time taken by Jiya to complete the whole work alone =  $y$  days

$$\frac{1}{x} + \frac{1}{x+2} + \frac{1}{y} = \frac{1}{2} \dots (i)$$

$$\Rightarrow \frac{6}{y} + \frac{3}{x+2} = 1$$

$$\Rightarrow y = \frac{1}{6} \times \left[ 1 - \frac{3}{x+2} \right]$$

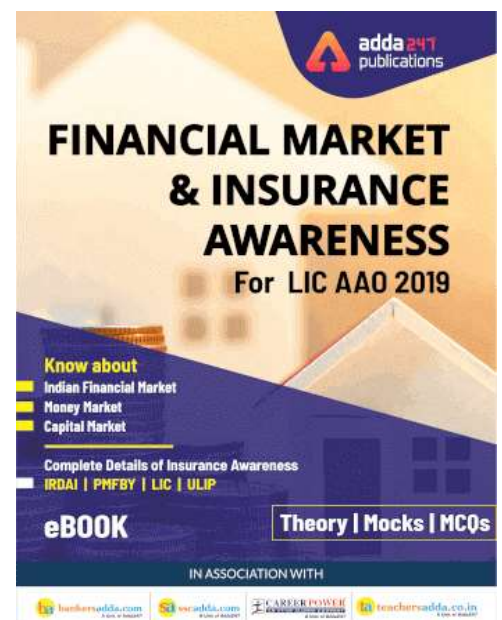
From eqn. (i)

$$\frac{1}{x} + \frac{1}{x+2} + \frac{1}{y} = \frac{1}{2}$$

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

$$\frac{1}{2x+4} + \frac{1}{x} = \frac{1}{3}$$

$$\Rightarrow 3(3x+4) = 2x^2 + 4x$$



$$2x^2 - 5x - 12 = 0$$

$$\Rightarrow x = 4, -1.5$$

Riya = 4 days

∴ Diya = 6 days

Double of original work and also double the efficiency Diya so work can be completed by diya in same time ie. Is 6 days

### S5. Ans. (a)

**Sol.** Aniket profit share in 1<sup>st</sup> year in the form of management =  $12 \times 100 = \text{Rs } 1200$

$$\therefore \text{Interest of Shashank} = \frac{10,000 \times 5 \times 1}{100} = \text{Rs. } 500$$

$$\text{Interest of Aniket} = \frac{4000 \times 5 \times 1}{100} = \text{Rs. } 200$$

Total profit of Shashank & Aniket =  $(1200 + 500 + 200) = \text{Rs. } 1900$

Remaining profit =  $4000 - 1900 = 2100$

Ratio of capital for Shashank and Aniket =  $10000 : 4000 = 5 : 2$

$$\therefore \text{Share of Shashank in remaining profit} = \frac{5}{7} \times 2100 = \text{Rs. } 1500$$

$$\text{Share of Aniket in remaining profit} = \frac{2}{7} \times 2100 = \text{Rs. } 600$$

∴ Total profit of Shashank =  $500 + 1500 = \text{Rs. } 2000$

While profit of Aniket =  $1200 + 600 + 200 = \text{Rs. } 2000$

### S6. Ans. (a)

**Sol.** Given 10% → 138

∴ 100% → 1380 = Total runs for MI in five matches

Total runs by Sunrises Hyderabad ⇒

$$25\% = 138 + 90 = 228$$

$$\therefore 100\% = 228 \times 4 = 912$$

Difference =  $1380 - 912 = 468$  runs

### S7. Ans. (b)

**Sol.** Acc. to question

$$(28 + 14 + 25)\% - (18 + 28)\% \rightarrow 168$$

or 21% → 168

$$\therefore 15\% \rightarrow \frac{168}{21} \times 15 = 120 \text{ runs}$$

### S8. Ans. (a)

**Sol.** Total runs scored by RPS =  $\frac{180}{15} \times 100 = 1200$

$$\therefore \text{Total runs scored by MI} = \frac{1200}{1.2} = 1000$$

$$\text{Run scored by RPS in Final} = \frac{180}{80} \times 100 = 225$$

∴ No. of runs scored by MI in final = 245

$$\text{Derived ratio} = 245 : \frac{1000}{5} = 49 : 40$$

**S9. Ans.(d)**

**Sol.** Since exact no. of runs for teams is not given, hence it cannot be determined

**S10. Ans. (e)**

**Sol.** In 4<sup>th</sup> match

MI → 230 runs

$$\therefore \text{Run scored by kkr in its 3<sup>rd</sup> match} = \frac{230}{115} \times 100 = 200$$

$$\therefore \text{Run by RPS in 2<sup>nd</sup> match} = \frac{200 \times 7}{8} = 175$$

Now,

$$20\% \rightarrow 175$$

$$\therefore 10\% \rightarrow \frac{175}{20} \times 10 = 87.5 \approx 88 \text{ Runs}$$

Runs scored in 5<sup>th</sup> match

$$\text{Runs by KKR in its 2<sup>nd</sup> match} \Rightarrow 14\% \rightarrow 200$$

$$\therefore 28\% \rightarrow 400$$

$$\text{Required \%} = \frac{400 - 88}{400} \times 100$$

$$\approx 78\% \text{ (approx.)}$$

**S11. Ans.(b)**

**Sol.**

$$\begin{array}{l|l} \text{I. } y^2 + 3y - y - 3 = 0 & \text{II. } 2x^2 - 4x - 3x + 6 = 0 \\ \Rightarrow y(y + 3) - 1(y + 3) = 0 & \Rightarrow 2x(x - 2) - 3(x - 2) = 0 \\ \Rightarrow (y - 1)(y + 3) = 0 & \Rightarrow x = 2, \frac{3}{2} \\ \Rightarrow y = 1, -3 & \end{array}$$

$$\therefore x > y$$

**S12. Ans.(e)**

**Sol.**

$$\begin{array}{l|l} \text{I. } x^2 + 4x - 2x - 8 = 0 & \text{II. } y^2 = 9 \\ \Rightarrow x(x + 4) - 2(x + 4) = 0 & \Rightarrow y = \pm 3 \\ \Rightarrow x = 2, -4 & \end{array}$$

$\therefore$  No relation


**S13. Ans.(d)**

**Sol.**

$$\begin{array}{l|l} \text{I. } x^2 - 3x - 2x + 6 = 0 & \text{II. } y^2 + 3y - 2y - 6 = 0 \\ \Rightarrow x(x - 3) - 2(x - 3) = 0 & \Rightarrow y(y + 3) - 2(y + 3) = 0 \\ \Rightarrow x = 2, 3 & \Rightarrow y = 2, -3 \end{array}$$

$$\therefore x \geq y$$

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**S14. Ans.(c)****Sol.**

$$\begin{array}{l|l} \text{I. } x^2 + 3x + 2x + 6 = 0 & \text{II. } y^2 + 2y + y + 2 = 0 \\ \Rightarrow x(x+3) + 2(x+3) = 0 & \Rightarrow y(y+2) + 1(y+2) = 0 \\ \Rightarrow x = -3, -2 & \Rightarrow y = -1, -2 \end{array}$$

$$\therefore y \geq x$$

**S15. Ans.(a)****Sol.**

$$\begin{array}{l|l} \text{I. } x^2 + 8x - 7x - 56 = 0 & \text{II. } y^2 - 9y - 8y + 72 = 0 \\ \Rightarrow x(x+8) - 7(x+8) = 0 & \Rightarrow y(y-9) - 8(y-9) = 0 \\ \Rightarrow x = 7, -8 & \Rightarrow y = 8, 9 \end{array}$$

$$\therefore y > x$$

**S16. Ans.(d)****Sol.** -784, -392, -196, -98, -49

$$2401 - 784 = 1617 \text{ not } 1616$$

**S17. Ans.(d)****Sol.**

$$\begin{array}{cccccc} 13 & 20 & 39 & 78 & 145 & 248 \\ \hline & 7 & 19 & 39 & 67 & 103 \\ \hline & 12 & 20 & 28 & 36 & \\ \hline & 8 & 8 & 8 & & \end{array}$$

**S18. Ans.(a)****Sol.**

$$\begin{array}{cccccc} 5679 & 5560 & 5322 & 4965 & 4489 & 3894 \\ \hline & -119 & -238 & -357 & -476 & \\ \hline & =119 \times 2 & =119 \times 3 & =119 \times 4 & & \end{array}$$

$$\begin{aligned} & 4489 - 119 \times 5 \\ & = 4489 - 595 \\ & = 3894 \end{aligned}$$

**S19. Ans.(c)****Sol.**

$$\begin{array}{cccccc} 9050 & 5675 & 3478 & 2147 & 1418 & 1075 \\ \hline & 3375 & 2197 & 1331 & 729 & 343 \\ \hline & =15^3 & =13^3 & =11^3 & =9^3 & =7^3 \end{array}$$

$$= 5675 - 13^3 = 5675 - 2197 = 3478$$



**S20. Ans.(d)****Sol.**  $+(17^2 - 17), +(15^2 - 15), +(13^2 - 13) \dots$ 

$$1588 + (9^2 - 9) = 1588 + 81 - 9 = 1660$$

**S21. Ans.(a)****Sol.** Investment by Abhimanyu =  $\frac{44}{100} \times 70,000 = 30,800$ 

Ratio of interest shared by them

$$30800 : 39200$$

$$= 11 : 14$$

Total interest =  $\frac{1100}{11} \times 25 = 2500$ 

$$2500 = \frac{70000 \times R \times 2}{100} \therefore R = \frac{25}{14} \%$$

**S22. Ans.(c)****Sol.** Total investment in scheme A, B and C together = 195,000Investment of Gaurav in scheme A and E together =  $\frac{56}{100} \times 70000 + \frac{70}{100} \times 40,000$ 

$$= 39200 + 28000$$

$$= 67200$$

$$\text{Required ratio} = \frac{195000}{67200} = \frac{975}{336} = \frac{325}{112}$$

**S23. Ans.(e)****Sol.** Investment made by Abhimanyu in scheme B and C together =  $\frac{35}{100} \times 65,000 + \frac{50}{100} \times 60,000$ 

$$= 22750 + 30000 = 52750$$

Investment by Gaurav in scheme A and F together =  $\frac{56}{100} \times 70000 + \frac{60}{100} \times 55,000$ 

$$= 39200 + 33000 = 72200$$

$$\text{Required } \% = \frac{\left(\frac{72200}{2} - \frac{52750}{2}\right)}{\frac{72200}{2}} \times 100 \approx 27\%$$

**S24. Ans.(a)****Sol.** Investment of Abhimanyu in scheme B =  $\frac{35}{100} \times 65000 = 22750$ Investment of Gaurav in scheme B =  $65000 - 22750 = 42250$ 

Investment of Abhimanyu in scheme C = 30000

Investment of Gaurav in scheme C = 30000

Total interest for scheme B =  $65000 \times \frac{2 \times 10}{100} + 22750 \times \frac{10}{100}$ 

$$= 13000 + 2275 = 15275$$

Total interest in scheme C =  $60000 \times \frac{2 \times 1}{3} + 30000 \times \frac{1}{3}$ 

$$= 40,000 + 10,000 = 50,000$$

$$\text{Total Interest} = 50,000 + 15,275 = 65,275$$

**S25. Ans.(b)****Sol.** Amount invested by Gaurav in scheme D, E and F

$$= \frac{60}{100} \times 80,000 + \frac{70}{100} \times 40,000 + \frac{60}{100} \times 55,000$$

$$= 48000 + 28000 + 33000 = 109000$$

Amount invested by Abhimanyu in B, C and D

$$= \frac{35}{100} \times 65000 + \frac{50}{100} \times 60000 + \frac{40}{100} \times 80000$$

$$= 22750 + 30000 + 32000 = 84750$$

$$\text{Required \%} = \frac{109000}{84750} \times 100 \approx 128\%$$

**S26. Ans.(d)****Sol.** IN ASSISTANT A → 2, S → 3, T → 2, I → 1

IN STATISTICS A → 1, S → 3, T → 3, I → 2

∴ P [same letter] = P(A) + P(S) + P(S) + P(T) + P(I)

$$= \frac{2}{9} \times \frac{1}{10} + \frac{3}{9} \times \frac{3}{10} + \frac{2}{9} \times \frac{3}{10} + \frac{1}{9} \times \frac{2}{10}$$

$$= \frac{19}{90}$$

**S27. Ans.(c)****Sol.** Total number of ways by which 4-digit number can be formed =  ${}^5P_4 = 120$ Numbers which are divisible by 5 =  ${}^4P_3 = 24$ Required Probability =  $24/120 = 1/5$ **S28. Ans.(d)****Sol.** Let the number of minutes taken to empty the cistern be x minutes.

According to the question,

$$\frac{x}{6} - \frac{x+5}{12} - \frac{x+5}{15} = 0$$

$$\Rightarrow \frac{x}{6} - \frac{x}{12} - \frac{x}{12} - \frac{5}{12} - \frac{x}{15} - \frac{5}{15} = 0$$

$$\Rightarrow \frac{x}{6} - \frac{x}{12} - \frac{x}{15} = \frac{5}{12} + \frac{5}{15}$$

$$\Rightarrow \frac{10x - 5x - 4x}{60} = \frac{25 + 20}{60}$$

$$\Rightarrow \frac{x}{60} = \frac{45}{60} \Rightarrow x = 45 \text{ minute}$$

**S29. Ans.(b)****Sol.** A can fill the tank = 30 minutes

B can fill the tank = 20 minutes

C can fill the tank = 10 minutes

LCM of (30, 20, 10) = 60

A B C

$$\text{Efficiency} = \frac{60}{30} \frac{60}{20} \frac{60}{10}$$

2 3 6

Given, A, B and C are discharging chemical's P, Q and R respectively.

In 3 minutes, A discharge P =  $3 \times 2 = 6$

3 minutes B discharge Q =  $3 \times 3 = 9$

3 minutes C discharge R =  $6 \times 3 = 18$

Total Quantity of chemical in 3 minutes =  $18 + 9 + 6 = 33$

Ratio of R after 3 minutes =  $\frac{18}{33} = \frac{6}{11}$

**S30. Ans.(b)**

**Sol.** Let C alone can complete work in C days

$$\frac{20}{80} + \frac{60}{120} + \frac{28}{C} = 1$$

$$\text{or, } \frac{28}{C} = \frac{1}{4}$$

or, C = 112 days

