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S26. Ans.(c)

Sol. C.P. of 10 note books $\Rightarrow 140 \times 10 = 1400$ Rs.

Profit on selling one pen $\Rightarrow \frac{50 \times 200}{100} =$ Rs 100

Number of pen required $\Rightarrow \frac{1400}{100} = 14$

S27. Ans.(d)

Sol. Let speed of slower train = 2x

$\Rightarrow$ speed of faster train = 5x

ATQ,

$$\frac{150 + 200}{2x + 5x} = 15$$

$$x = \frac{10}{3}$$

Time required

$$= \frac{350}{\frac{50}{3} - \frac{20}{3}} = 35 \text{ second}$$

S28. Ans.(b)

Sol. Ratio of profit share of B and E is

$35\% \times 80,000 \times 9 : 15\%$ of $80,000 \times 12 = 7 : 4$

Required difference $= \frac{(7-4)}{11} \times 15400$

$$= \frac{3}{11} \times 15400 = Rs\ 4200$$

S29. Ans.(d)

Sol. Ratio of profit share of A, C and D is

A	:	C	:	D
$25\% \times 80,000 \times 6$	:	$15\% \times 80,000 \times x$	:	$10\% \times 80,000 \times 8$
150	:	15x	:	80
30	:	3x	:	16

ATQ,

$$\frac{30}{30 + 16 + 3x} = \frac{6750}{13050}$$

$$\Rightarrow \frac{30}{46 + 3x} = \frac{15}{29}$$

$\Rightarrow 46 + 3x = 58$

x = 4 months

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S30. Ans.(a)

Sol. Amount invested by F = $\frac{15}{100} \times 80,000 + 4000$

= 12000 + 4000 = Rs 16,000

Amount invested by A = $\frac{25}{100} \times 80,000$ = Rs 20,000

Ratio of profit share of F, C and A

F	:	C	:	A
16000×6	:	12000×8	:	20,000×12
2	:	2	:	5

ATQ,

5 + 2 → 8750

Then total annual profit = 9 → $\frac{8750}{7} \times 9$ = Rs 11,250

S31. Ans.(c)

Sol. I. $(x - 2)^2 = 9$

$\Rightarrow (x - 2) = \pm 3$

$\Rightarrow x = 5, -1$

II. $(2y + 8)^2 = 16$

$(2y + 8) = \pm 4$

$\Rightarrow y = -2, -6$

$x > y$

S32. Ans.(e)

Sol. I. $x^2 - 16x + 64 = 0$

$x^2 - 8x - 8x + 64 = 0$

$x(x - 8) - 8(x - 8) = 0$

$(x - 8)(x - 8) = 0$

$x = 8, 8$

II. $y^2 - 16y + 63 = 0$

$y^2 - 7y - 9y + 63 = 0$

$y(y - 7) - 9(y - 7) = 0$

$(y - 9)(y - 7) = 0$

$y = 9, 7$

No relation can be established between x & y

S33. Ans.(d)

Sol. I. $\frac{25}{x^2} - \frac{15}{x} + 2 = 0$

$\Rightarrow 2x^2 - 15x + 25 = 0$

$\Rightarrow 2x^2 - 10x - 5x + 25 = 0$

$2x(x - 5) - 5(x - 5) = 0$

$(2x - 5)(x - 5) = 0$

$x = \frac{5}{2}, 5$

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II. $\dfrac{40}{y^2} + 1 = \dfrac{13}{y}$

$\Rightarrow y^2 - 13y + 40 = 0$

$\Rightarrow y^2 - 8y - 5y + 40 = 0$

$\Rightarrow y(y - 8) - 5(y - 8) = 0$

$(y - 5)(y - 8) = 0$

$y = 5, 8$

$y \geq x$

S34. Ans.(d)

Sol. I. $\dfrac{48}{x^2} - \dfrac{14}{x} + 1 = 0$

$\Rightarrow x^2 - 14x + 48 = 0$

$\Rightarrow x^2 - 8x - 6x + 48 = 0$

$\Rightarrow x(x - 8) - 6(x - 8) = 0$

$\Rightarrow (x - 8)(x - 6) = 0$

$x = 8, 6$

II. $\dfrac{45}{y^2} + \dfrac{1}{y} = 2$

$\Rightarrow 2y^2 - y - 45 = 0$

$\Rightarrow 2y^2 - 10y + 9y - 45 = 0$

$\Rightarrow 2y(y - 5) + 9(y - 5) = 0$

$\Rightarrow (2y + 9)(y - 5) = 0$

$y = 5, -\dfrac{9}{2}$

$x > y$

S35. Ans.(e)

Sol. I. $x^2 + 3x - 4 = 0$

$x^2 + 4x - x - 4 = 0$

$x(x + 4) - 1(x + 4) = 0$

$(x - 1)(x + 4) = 0$

$x = 1, -4$

II. $y^2 + 10y + 24 = 0$

$y^2 + 4y + 6y + 24 = 0$

$y(y + 4) + 6(y + 4) = 0$

$(y + 6)(y + 4) = 0$

$y = -4, -6$

$x \geq y$

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S36. Ans.(c)
Sol. From I, II & III
Let speed of Amit and Abhi be 4x and 5x km/hr respectively.
5x – 4x = 20
∴ x = 20 km/hr
Let distance be d km
$$\frac{d}{80} - \frac{d}{100} = 1$$
$$\therefore d = \frac{80 \times 100}{20} = 400 \text{ km}$$

S37. Ans.(b)
Sol. From I and II
Let length and breadth be 3x m and 2x m respectively
2πr = 440   [r → radius of circle]
r = 70 m
∴ breadth = 10 m
& length = 15 m
∴ Area = 10 × 15 = 150 m²
Statement I and III are same.

S38. Ans.(a)
Sol. From I
Passed = 400
From III
Let number of appeared & Failed students be 5x and 3x respectively
2x = 400 ⇒ x = 200
∴ failed = appeared – passed
= 1000 – 400 = 600

S39. Ans.(a)
Sol. <u>From I</u>
$$\frac{PR \times 2}{100} = 44000$$
PR = 2200000
<u>From II</u>
$$P + \frac{PRT}{100} = 154000$$
<u>From III</u>
$$\text{Difference} = \frac{PR^2}{100^2}$$
$$\frac{PR^2}{100^2} = 120$$
From I and III R can be found.

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S40. Ans.(e)

Sol. Let the smaller no. is x & bigger no. is y.

From I

Y = x + 6

From II,

$$\frac{40}{100} \times x = \frac{30}{100} \times y$$

From III,

$$\frac{\frac{y}{2}}{\frac{x}{3}} = \frac{2}{1}$$

⇒ 3y = 4x

∴ from I and II or I and III

S41. Ans.(b)

Sol. Let amount of milk removed = 2x lit

So, amount of water added = x lit

Now

$$\rightarrow \frac{165 - 2x}{x} = \frac{5}{3}$$

x = 45 lit

S42. Ans.(c)

Sol. At least one black can be chosen in three ways:

1. first one is black, second is non-black

2. first one is non-black, second is black

3. both are black.

Probability of selecting a box is $\frac{1}{2}$

Now, probability of choosing at least one black ball from first box

$$= \frac{1}{2} \times \left(\frac{2}{4} \times \frac{2}{3} + \frac{2}{4} \times \frac{2}{3} + \frac{2}{4} \times \frac{1}{3} \right) = \frac{5}{12}$$

Probability of choosing at least one black ball from 2ⁿᵈ box

$$= \frac{1}{2} \times \left(\frac{4}{16} \times \frac{12}{15} + \frac{12}{16} \times \frac{4}{15} + \frac{4}{16} \times \frac{3}{15} \right) = \frac{27}{120}$$

Final probability

$$= \frac{5}{12} + \frac{27}{120} = \frac{50 + 27}{120} = \frac{77}{120}$$

S43. Ans.(a)

Sol. Let speed of train B be x m/s

And length of train B be y m

Then length of train A is $2y$ m

Speed of train A = $84 \times \frac{5}{18} = \frac{210}{9}$ m/s = $\frac{70}{3}$ m/s

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A.T.Q,

$\frac{2y+y}{10} = \frac{70}{3} - x$ …………(i)

and $\frac{2y+y}{22.5} = \frac{70}{3} - 2x$

solving (i) and (ii), $y = 50$ m

S44. Ans.(c)

Sol. Let, inner radius of cylinder be 'x' cm.

$\frac{4}{3}\pi(6)^3 = \pi \times 32 \,(5^2 - x^2)$

or, $\frac{4 \times 6 \times 6 \times 6}{3 \times 32} = 25 - x^2$

or, $x^2 = 25 - 9$

or, $x = 4$ cm

Hence, thickness = 5 – 4 = 1 cm.

S45. Ans.(b)

Sol. X's investment

$= (700 \times 3) + \left(700 \times \frac{5}{7} \times 3\right) + \left(500 + 200 \times \frac{3}{5}\right) \times 6$

= Rs. 7320

Y's investment = 600 × 12 = Rs. 7200.

∴ X's share from profit

$= \frac{7320}{(7320+7200)} \times 726 = Rs.\,366.$

S46. Ans.(a)

Sol. Total man working on odd days in March $= \frac{1000 \times 30}{100} = 300$

Total odd days in March = 16

Total man hour = 300×16×8

Similarly,

Total man hour of April on even days = 15 × 8 × 1200

Required % $= \frac{300 \times 16 \times 8}{15 \times 8 \times 1200} \times 100 = 26\frac{2}{3}\%$

S47. Ans.(d)

Sol. Total man hour of April

$= \frac{1500}{100} \times [20 \times 15 + 80 \times 15] \times 8 = 1,80,000$

Total man hour of August

$= 750 \times \frac{40}{100} \times 15 \times 8 + 16 \times 750 \times \frac{60}{100} \times 8$

= 36000 + 57600 = 93,600

Required difference = 1,80,000 – 93,600 = 86,400

S48. Ans.(b)

Sol. Required ratio

$$= \frac{10 \times 15 \times 70 \times 8}{15 \times 75 \times 4 \times 8}$$

$= 7 : 3$

S49. Ans.(c)

Sol. Man-hour on odd days on April $= 15 \times 300 \times 8 = 36000$

Man-hour on odd days on August $= 16 \times 75 \times 6 \times 8 = 57600$

Required % $= \dfrac{57600 - 36000}{57600} \times 100 = 37.5\%$

S50. Ans.(a)

Sol. Man-hour on even days →

March $= 15 \times 8 \times 700 = 84{,}000$

April $= 15 \times 8 \times 1200 = 1{,}44{,}000$

August $= 15 \times 8 \times 300 = 36{,}000$

Required Average $= 88{,}000$