Find the number of Managers in a factory?

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MODEL QUESTIONS

Direction (Q. No. 1-5) : In the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer.

a) a < b b) a > b
c) a ≤ b d) a ≥ b
e) a = b or the relationship cannot be determined

1. I. $9a^2 - 4 = 0$
II. $25b^2 - 30b + 9 = 0$

2. I. $a^2 - 30a + 221 = 0$
II. $b^2 - 24b + 143 = 0$

3. I. $a^2 + 20a + 51 = 0$
II. $b^2 + 40b + 391 = 0$

4. I. $a^2 = 841$
II. $b^2 + 56b + 783 = 0$

5. I. $3a^2 - a - 2 = 0$
II. $9b^2 - 6b - 3 = 0$

Direction (Q. No. 6-10) : Find out the wrong number in the series

6. –64, –28, –2, 6.25, 7.359375
a) –64 b) 7.359
c) 6.25 d) –28 e) –2

7. 12, 68, 158, 288, 472, 712
a) 288 b) 158 c) 12
d) 472 e) 712

8. 55, 61.2, 67.6, 75.2, 81
a) 55 b) 61.2 c) 75.2
d) 67.6 e) 81

9. 28, 44, 64, 90, 116
a) 64 b) 44 c) 90
d) 116 e) 28

10. 948, 945, 979, 924, 1060, 858
a) 858 b) 1060 c) 924
d) 979 e) 945

11. In a factory, the average salary of 25 workers is Rs. 9500 while the average salary of 9 Assistant managers is Rs. 30000 and the average salary of Managers is Rs. 45000. If average salary of entire staff is Rs. 19437.5, then find the number of Managers in a factory?
a) 12 b) 9 c) 7
d) 6 e) 5

12. A travels a distance of 300 km with a speed of 72 kmph in time t. To travel a distance of 560 km taking double amount of time, what should be the speed?
a) 67.2 kmph b) 116.6 kmph
c) 120 kmph d) 56 kmph
e) None of the above

13. In a journey of 480 km, a bus covered 90 km at a speed of 60 km/hr, 240 at a speed of 80 km/hr and the remaining distance at a speed of 75 km/hr. If the bus started at 10 : 15 AM and took a total halt of 40 minutes, at what time will it reach its destination?
a) 5 :05 PM b) 5 : 15 PM
c) 5 : 25 PM d) 5 : 35 PM
e) 5 : 45 PM

14. Raj invests Rs. 25000, Rahim invests Rs. 30000 in a business for a year. After 5 months, Ram join the business and invests Rs. 10000. After 3 months and after 6 months, Raj add Rs. 15000 more to his investment and Rahim withdraws Rs. 5000 from his investment. Find the profit share of Raj if profit share of Ram is Rs. 22400.
a) Rs. 156000 b) Rs. 195600
c) Rs. 189600 d) Rs. 139200
e) Rs. 125000

15. A trader mixes 26 kg of rice at Rs. 20 per kg with 30 kg rice of another variety costing Rs. 36 per kg. If he sells the mixture at Rs. 30 per kg his profit will be-
a) –7% b) 5% c) 8%
d) 10% e) None of these

Directions (Q. No. 16-20) : What should come in place of question mark (?) in the following questions? (You do not have to calculate the exact value)

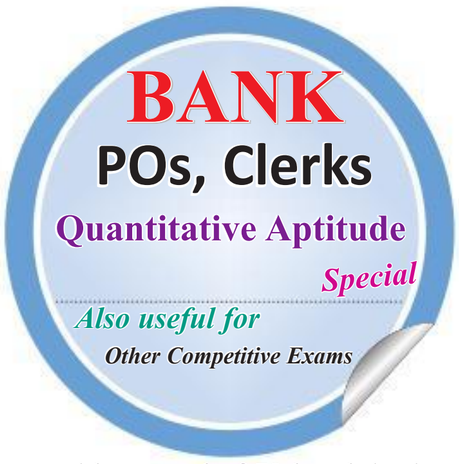
16. (?)% of 599.69 + $(9.987)^2$
$= \sqrt{123904.08}$
a) 294 b) 42 c) 412
d) 1024 e) None of these

17. $4895 + 364 \times 0.75 - \sqrt{2399.89}$
= (?) – 4912.91 ÷ 7^3
a) 8130 b) 5133
c) 4210 d) 2700
e) None of these

18. 639.929 + 31.972 × 20.891–
$45.951 = \sqrt[4]{?} + 6^4$
a) 810000 b) –810000
c) 27000 d) 18
e) None of these

19. $\sqrt{9024.89} \times \sqrt{80.59} \div 14.978 + (?)$
= 19867.789
a) 98101 b) 36001
c) 20811 d) 19811
e) None of these

20. 99.67 +202.15 ÷ 1.97 –32.20
= ? % of 1300.03
a) 2 b) 18 c) 11
d) 13 e) 20



Solutions

1. e; I. $9a^2 - 4 = 0$
⇒ (3a + 2) (3a –2) = 0
Then, a = –0.66 or a = +0.66
II. $25b^2 - 30b + 9 = 0$
⇒ (5b–3) (5b–3) = 0
Then, b = 0.6
So, when a = 0.66, a < b for b = 0.6
And when a = +0.66, a > b for b = 0.6
∴ So, we can observe that there is no particular relation between a and b.

2. d; I. $a^2 - 30a + 221 = 0$
⇒ (a–13) (a–17) = 0
Then, a = 13 or a = 17
II. $b^2 - 24b + 143 = 0$
⇒ (b –11) (b –13) =0
Then, b = 11 or b = 13
So, when a = 13, a > b for b = 11 and a = b for b = 13
And when a = 17, a > b for both b = 11 and 13
∴ So, we can observe that a ≥ b

3. d; I. $a^2 + 20a + 51 = 0$
⇒ (a +3) (a +17) = 0
Then, a = –3 or a = –17
II. $b^2 + 40b + 391 = 0$
⇒ (b+17) (b+23) =0
Then, b = –17 or b = –23
So, when a = –3, a > b for b =–17 and a > b for b = –23
And when a = –17, a = b for b = –17 and a > b for b = –23
∴ So, we can observe that a ≥ b

4. e; I. $a^2 = 841$
⇒ (a + 29) (a –29)=0
Then, a = –29 or a = +29
II. $b^2 + 56b + 783 = 0$
⇒ (b + 27) (b +29) = 0
Then, b = –27 or b = –29
So, when a= –29, a < b for b = –27 and a = b for b = –29
And when a = +29, a > b= –27 and a > b for b = –29
∴ So, we can observe that there is no relation between a and b.

5. e; I. $3a^2 - a - 2 = 0$
⇒ (3a +2) (a –1) =0
Then, a = (–2/3) or a = 1
II. $9b^2 - 6b - 3 = 0$
⇒ (9b+3) (b–1) =0
Then, b = (–1/3) or b =1
So, when a = (–2/3), a < b for b = (–1/3) and a < b for b =1
And when a =1, a > b for b = (1/3) and a = b for b = 1
∴ So, the relationship cannot be determined

6. c;
⇒ –64 ÷ 2 + 4 = –28
⇒ –28 ÷ 4 + 5 = –2
⇒ –2 ÷ 8 + 6 = 5.75
⇒ 5.75 ÷ 16 + 7 = 7.359375
⇒ Wrong number in series = 6.25

7. a;
⇒ $12 + 7^2 + 7 = 68$
⇒ $68 + 9^2 + 9 = 158$
⇒ $158 + 11^2 + 11 = 290$
⇒ $290 + 13^2 + 13 = 472$
⇒ $472 + 15^2 + 15 = 712$
⇒ Wrong number in series = 288

8. c;
⇒ 50 × 1.1 = 55
⇒ 51 × 1.2 = 61.2
⇒ 52 × 1.3 = 67.6
⇒ 53 × 1.4 = 74.2
⇒ 54 × 1.5 = 81
⇒ Wrong number in series = 75.2

9. c;
⇒ $4 \times 6 + 2^2 = 28$
⇒ $5 \times 7 + 3^2 = 44$
⇒ $6 \times 8 + 4^2 = 64$
⇒ $7 \times 9 + 5^2 = 88$
⇒ $8 \times 10 + 6^2 = 116$
⇒ Wrong number in series = 90

10. a;
⇒ $948 - 2^3 + 5 = 945$
⇒ $945 + 3^3 + 7 = 979$
⇒ $979 - 4^3 + 9 = 924$
⇒ $924 + 5^3 + 11 = 1060$
⇒ $1060 - 6^3 + 13 = 857$
⇒ Wrong number in series = 858

11. d;
Let number of Managers in a factory be M.
Given,
Total salary of entire staff in a factory = 19437.5 × (25 + 9 +M)
Total salary of 25 workers
= 25 × 9500 = 237500
Total salary of 9 Assistant Managers = 9 × 30000 = 270000
Given,
⇒ 19437.5(34 + M)
= 237500 + 270000 + 45000 × M
⇒ 660875 + 19437.5M
= 507500 +45000M
⇒ 153375 = 25562.5M
⇒ M = 6
∴ Required number of Managers is 6.

12. a;
Now, distance and speed are directly proportional
∴ d1 = s1(t1)
And d2 = s2(t2)
Also, t2 = 2(t1)
$\frac{d1}{d2} = \frac{(t1)(a1)}{(2t1)(a2)}$ ∴ $\frac{300}{560} = \frac{72}{2(a2)}$
$\therefore S2 = \frac{(72)(560)}{2(300)} = 67.2$ kmph

13. c;
Remaining distance covered at speed of 75 km/hr
= 480 – 90 – 240 = 150 km
∵ Time = Distance/speed
Total travel time
$= \frac{90}{60} + \frac{240}{80} + \frac{150}{75}$
= 1.5 + 3 + 2 = 6.5 hrs
Now, Halt time = 40 min.
$= \frac{40}{60} = 0.667$hrs
⇒ Total time of journey
= 6.5 + 0.667 = 7.167 hrs
= 7 hrs 10 min
∵ The bus started at 10 : 15 AM
∴ Bus reached its destination at 5: 25 PM

14. d;
Raj's investment
= 25000 × 3 + 40000 × 9 = 435000
Rahim's investment
= 30000 × 6 + 25000 × 6 =330000
Ram's investment
= 10000 × 7 = 70000
Ratio of profit share
= 435000 : 330000 : 70000
⇒ 87 : 66 : 14
Tota profit $= 22400 \times \frac{167}{14} = 267200$
∴ Profit share of Raj
= 267200 × 87/167 = Rs. 139200

15. b;
C. P. of 56 kg rice
= (26 × 20 + 30 × 36)
= Rs. (520 + 1080) = Rs. 1600
S. P. of 56 kg rice
= 56 × 30 = Rs. 1680
Profit = SP– CP = 80
Profit % $= \frac{80}{1600} \times 100 = 5\%$

16. b;
(?)% of 599.69 + $(9.987)^2$
$= \sqrt{123904.08}$
Approximating the value to the nearest integer
⇒ (?)% of 600 + $(10)^2 = \sqrt{123904}$
⇒ [6× (?)] + 100 = 352
⇒ [6 × (?)] = 252
⇒ (?) = 252/6]
= 42

17. b; 4895 + 364 × 0.75 – 49
= (?) –4912.91 ÷ 7^3
Approximating the value to the nearest integer
⇒ 4895 + 364 × 3/4 – 49 = (?) – 4913 ÷ 7^3
⇒ 4895 + 91 × 3 – 49 = (?) – 4913 ÷ 343
⇒ 4895 + 273 – 49 = (?) –14
⇒ (?) = 4895 + 224 +14
⇒ (?) = 5133

18. a;
639.929 + 31.972 × 20.891–45.951
$= \sqrt[4]{?} + 6^4$
Approximating the value to the nearest integer
$\Rightarrow 640 + 32 \times 21 - 46 = \sqrt[4]{?} + 6^4$
$\Rightarrow \sqrt[4]{?} = 640 + 672 - 46 - 1296$
⇒ (?) = $(-30)^4$ = 810000

19. d;
$\sqrt{9024.89} \times \sqrt{80.59} \div 14.978 + (?)$
= 19867.789
Approximating the value to the nearest integer
$\sqrt{9025} \times \sqrt{81} \div 15 + (?) = 19868$
⇒ 95 × 9 ÷ 15 + (?) = 19868
⇒ (?) = 19868 – 57
⇒ (?) = 19811

20. d; Given Expression,
99.67 + 202.15 – 1.97 –32.20
= 7% of 1300.03
Given expression becomes,
= 100 + 202 ÷ 2-32 = ?% of 1300
= 100 + 101 – 32 = ?% of 1300
201 – 32 = ?% of 1300
169 = x% of 1300
$x = \frac{169}{13}$ ⇒ x = 13

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