IBPS PO Mains Memory Based Paper 2022 Held on 26th November 2022 – Quantitative Aptitude

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IBPS PO Mains Memory Based Paper 2022 Held on 26th November 2022 – Quantitative Aptitude

Directions (1-5): Read the following information carefully and answer the questions.

The given table chart shows the number of poetry books printed by a publisher in three different years namely 2011, 2012 and 2013.

Year	Number of poetry books printed
2011	702
Till 2012	1640
Till 2013	1910

The given table chart shows the percentage of poetry books printed.

Year	% of poetry books printed out of the total number of books printed
2011	M%
2012	N%
2013	K%

Note:-

1) Total number of books printed = Number of poetry books printed + Number of story books printed

2) K = N – M

3) N + K = 95

4) N + M = 115

1) Which of the following represents the difference between the number of story books printed in 2011 and 2013?

I) 2K – 2

II) M + 3

III) N/2 + 8

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a) Only I follows
b) Only II and III follows
c) Only I and II follows
d) Only I and IIIfollows
e) None of these

2) The number of poetry books printed in 2014 is equal to 10M + K + 5 and the number of story books printed in 2014 is 60% of the total number of books printed in 2014. The number of story books printed in 2011 is how much more than the number of story books printed in 2014?
a) N + 68
b) 3M
c) 6K – 18
d) M + K
e) None of these

3) The number of poetry books printed in 2015 is 12 less than the 7 times the difference between the of story books printed in 2011 and 2013. The number of poetry books printed in 2015 is what percentage more than the number of poetry books printed in 2013?
a) 6M – 8K
b) K – 5
c) M – N
d) 1.2M – 10
e) None of these

4) Find the difference between the total number of poetry books printed in all the three years together and the total number of story books printed in all the three years together?
a) 3M + 60
b) N + 3M
c) 8M – 6N
d) K^2 – 6N – 45
e) None of these

5) Out of the total number books printed in 2012, 55% of the books are English language books and the rest of the books are other languages books. The number of English poetry books printed in 2012 is 428. Find the difference between the number of other language poetry and story books printed in 2012?
a) 3M + 4N + 2
b) 6N + 3
c) 17K + 8
d) 9M - 12
e) None of these

6) Sum of two numbers A and B is 61 and when B is divided by A the remainder will be 7 and the quotient will be 2. C^n – 2 is equal to the largest negative integer in the number system and C is a positive integer which is greater than 2. Which of the following value comes between C^n – n + A and B – A?
a) 29
b) 17
c) 27
d) 23

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e) None of these

7) A right angled cylindrical can of radius R cm and height (R + 7) cm is melted to form N number of hemispheres and the volume of each hemisphere can is $11R^3/42$. The contents that can be stored in the cylindrical can will be same as the contents that can be stored in all the hemispheres. Which of the following options can be the values of N? (Both N and R are integers)

1) 16 2) 17 3) 8 4) 13

a) Only (1) follows
b) Both (3) and (4) follows
c) Only (3) follows
d) Both (1) and (4) follows
e) None of these

8) The cost price of an article is Rs.X. If the price of the article is marked by Y% and discount of 25% is offered, then the profit obtained is Rs.(Y + 20). If the article is marked by (y + 5)% and the same discount is offered, then the profit obtained is Rs.(Y + 65). Which of the following option represents the relationship between X and Y?

a) $0.75X = Y/2$
b) $0.25X = 1.2Y - 13^2$
c) $0.5X = 15Y$
d) $X = 20Y$
e) None of these

Directions (9-10): Read the following information carefully and answer the questions.

Three friends Shivam, Tarun and Chetan start their journey from City A to City B at 8 AM, 9 AM and 10 AM respectively and the speed ratioof Shivam, Tarun and Chetan is 1:1.25:0.5 respectively.

9) If Shivam meets Tarun after t hours from the start of the journey and after t hours Tarun starts returning back to City A and meet Chetan, then at what time Tarun and Chetan meet each other?

a) 3.00 PM
b) 3.20 PM
c) 2.30 PM
d) 2.45 PM
e) None of these

10) If the speed of Shivam is 4 km/hr, then find the distance covered by Tarun in 4 hours?

a) 16 km
b) 28 km
c) 24 km
d) 20 km
e) None of these

11) Anmol, Preethi and Sana together started a business with an investment of Rs.(X – 1200), Rs.X and Rs.(X + 1800) respectively and at the end of one year they obtained a total profit of Rs.P. Preethi invested her profit in a scheme which offers an interest rate of 18% per annum

for 5 years and she obtained an interest of Rs.3600. The total profit obtained by all the three is Rs.4800 more than twice the profit obtained by Preeti. Which of the following statements are true?

i) Anmol obtained 18.75% of their total profit.

ii) Sana obtained 50% of their total profit.

iii) Value of X is multiple of 18.

a) Both (i) and (ii) follows

b) Both (ii) and (iii) follows

c) Both (i) and (iii) follows

d) All the three follows

e) None of these

Directions (12-14): Read the following information carefully and answer the questions.

The following question consists of three series, each following a different pattern and in each series one of the term is wrong.

Series I : 24, 31.5, 46.5, 69, 98, 136.5, 181.5

Series II : 5926, 886, 166, 46, 22, 18, 14

Series III : 11, 18, 44, 107, 231, 445, 788

12) If the starting term in Series IV is 23 and it follows the same logic as that of Series III and L and M are the 4th and 7th term in Series IV respectively, then find the difference between L and M?

a) 721

b) 674

c) 625

d) 681

e) 700

13) If P, Q and R are the wrong term in Series I, II and III respectively, then which of the following is correct?

a) R > Q > P

b) P > Q < R

c) Q > P < R

d) P > R > Q

e) P > R < Q

14) X and Y are the correct terms to replace the wrong terms in Series I and Series II respectively and Z is equal to the square of the largest root of the equation $a^2 - 15a = -9^2 + 5^2$. Which of the following options are correct?

i) Z = X + Y

ii) 10Y + 3 = X + Z

iii) X = YZ

a) All the three follows

b) Only (ii) follows

c) Both (i) and (iii) follows

d) Only (i) follows

e) None of these

15) The following question contains two equations as I and II. You have to solve both equations and determine the relationship between them and give the answer as follows

I) $\sqrt{(100x^4 + 125x^4)} + 7x + 4^{1/2} = -4x$

II) $\sqrt[3]{(64y^3)} * 2y + 19y + 7^2 = -3y + \sqrt{1600}$

If the smallest root of equation II is multiplied by 2, then which of the following options follows?

i) Resultant > -4

ii) Resultant + 21 (1/2) = Multiple of 5

iii) Resultant is less than the smallest root of equation I

a) Both (i) and (iii) follows

b) Only (iii) follows

c) None of the above

d) Only (ii) follows

e) All the three follows

Direction (16-17): The following question contains four equations as A, B, C and D. You have to solve all equations and determine the relationship between them and give the answer as follows

A) $(a * a) - 3a - \sqrt{(4a^2)} = -6$

B) $b^2 - \sqrt{(81b^2)} = -4 * 5$

C) $c^2 * \sqrt{(625c^6)} \div 5c^3 + 4 * 7 = 39c$

D) $d^2 - 3 * 5d = 7 * -8$

16) Find the LCM of the largest roots of all the four equations.

a) 860

b) 720

c) 760

d) 840

e) None of these

17) For which of the following equations the difference between their roots is 1?

a) All the four equation

b) Both B and C

c) Both A, C and D

d) Only D

e) All except C

18) Following questions contains three statements as i, ii, and iii. You have to determine which statement/s is/are necessary to answer the question and give answer as,

Mixture A and Mixture B contains x% of milk and b% of water respectively and Mixture A and B contains a% of water and y% of milk respectively. Ratio of the quantity of mixture A to B is 3:2. If both the mixtures are mixed together, then the final quantity of milk becomes 23% of the final quantity of mixture. Find the final quantity of milk? (x + y = 45)

i) x – y = 10

ii) Initial quantity of mixture A is 60 liters and the initial quantity of milk in mixture A is 15 liters.

iii) 15 liters of mixture A is mixed with mixture B, then the total quantity of milk in mixture B becomes 40 liters.

a) The data in Both statement (i) and (ii) are necessary to answer the question.

b) The data in all the three statements together are necessary to answer the question.

c) The data statement (ii) alone is sufficient to answer the question.

d) The data in statement (i), (ii) and (iii) are not sufficient to answer the question.

e) The data statement (iii) alone is sufficient to answer the question.

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Directions (19-21): Read the following information carefully and answer the questions.

X men can complete a work in Y days and Y women can complete the same work in X days and 24 men and 12 women together can complete the same work in 53 (1/3) days.

19) If 15 men and 12 women work together, then in how many days the work will be completed?

a) 71 (1/9) days
b) 70 (5/8) days
c) 60 (1/11) days
d) 78 (9/11) days
e) None of these

20) B boys can complete a work in D days. B boys started the work and worked for 0.45D days and after 0.45D days all the boys left the work. 20 men and 24 women together complete the remaining work in 0.6D days. Find the value of D?

a) 40
b) 45
c) 50
d) 54
e) None of these

21) 10 men, 14 women and (G + 24) girls together can complete a work in 16 days and G girls alone can complete the whole work in 26 days. Find the value of G?

a) 88
b) 65
c) 70
d) 80
e) None of these

Directions (22-23): Read the following information carefully and answer the questions.

A hollow cylinder (C1) with a radius of 14 m and is filled with water and a solid cylinder (C2) with a radius of 7 m is put inside C1 and then amount of 9240 m^3 water is spilled from C1.

22) Find the height of the hollow cylinder, if the height of both the cylinders is same?

a) 60 m
b) 48 m
c) 50 m
d) 72 m
e) None of these

23) If the radius of the C2 is increased by 3.5 m and the height of both the cylinders is same, then find the amount of excess water spilled from C1?

a) 11200 m^3
b) 13000 m^3
c) 12400 m^3
d) 11550 m^3
e) None of these

24) Following question contains three statements as i, ii, and iii. You have to determine which statement/s is/are necessary to answer the question and give answer as,

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Find the difference between the marked price of article A and selling price of article B?

i) The cost price of article A is Rs.224 less than the selling price of article B and the discount % offered on article A is 30% and the profit obtained on article B is 40%.

ii) The selling price of article A is Rs.140 less than that of article B and the price of article A is marked by Rs.264.

iii) Discount given in article B is Rs.56 more than the profit obtained on article A.

a) The data in statement (i) alone is sufficient to answer the question.

b) All the three statements are necessary to answer the question.

c) The data in Both statement (ii) and (iii) are necessary to answer the question.

d) The data in statement (ii) alone is sufficient to answer the question.

e) The data in Both statement (i) and (ii) are necessary to answer the question.

25) Following question contains two statements as i, and ii. You have to determine which statement/s is/are necessary to answer the question and give answer as,

Find the ratio of the speed of the boat in still water to the speed of the current?

The upstream speed of the boat is 24 km/hr and the boat can cover P km in upstream in Q hours and it covers 144 km in downstream in the same time. Time taken by the boat to cover 216 km in upstream is R hours more than the time taken by the boat to cover the same distance in downstream.

i) It takes 18 hours for the boat to cover R^2 km in downstream.

ii) $P - Q^3 + R^3 > 102$

a) The data in statement I alone is sufficient to answer the question, while the data in statement II alone is not sufficient to answer the question

b) The data in statement II alone is sufficient to answer the question, while the data in statement I alone is not sufficient to answer the question

c) The data either in statement I alone or in statement II alone is sufficient to answer the question

d) The data given in both statements I and II together are not sufficient to answer the question

e) The data given in both statements I and II together are necessary to answer the question.

Directions (26-30): Read the following information carefully and answer the questions.

The given pie chart shows the percentage distribution of the total runs scored by three batsman namely A, B and C

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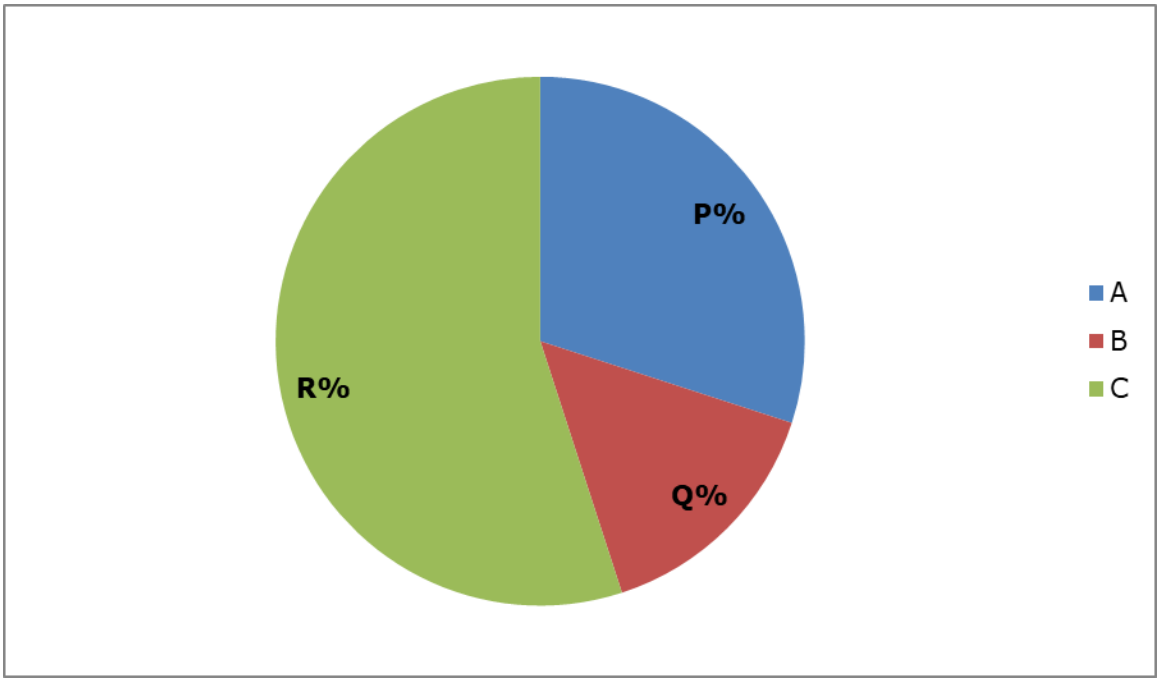
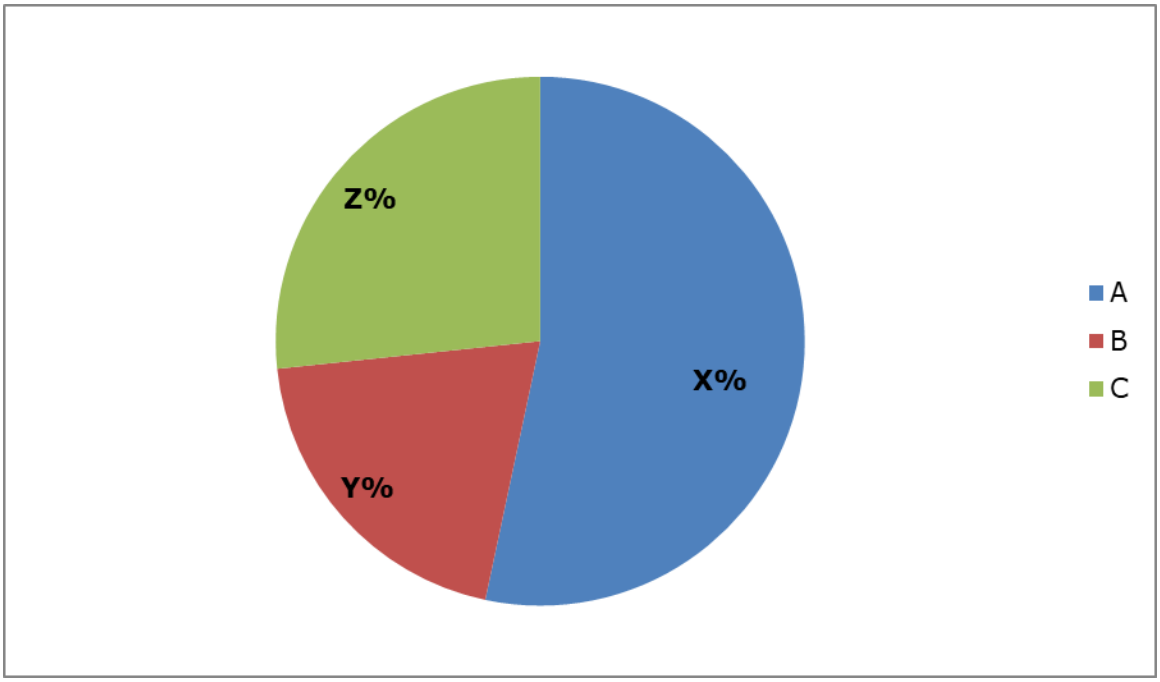


The given pie chart shows the percentage distribution of the number of balls faced by three batsman A, B and C.



Note:-

1) The strike rate of A and B is 25% and 33 1/3% respectively.

2) The number of balls faced by B is 180 and C faced half the number of balls faced by A.

3) If A had faced the same number of balls as that of B but scored the same runs as that of his original score, then his strike rate would be 2 times the strike rate of B.

4) Strike rate = (Total number of runs scored)/(Number of balls faced) * 100

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5) The central angle of the runs scored by C is 198°

26) Find the difference between the central angle of the runs scored by A and the central angle of the number of balls faced by B?

a) 20^0

b) 16^0

c) 36^0

d) 24^0

e) None of these

27) If C scored runs by only scoring 4's and 6's and hit 25 4's in the match, then find the number of dot balls faced by C?

a) 195

b) 205

c) 184

d) 200

e) None of these

28) If A had played the same number of balls as B and B had played the same number of balls as C, then which of the following statements is/are correct?

i) Present strike rate of B is the same as the previous strike rate of A.

ii) If B strikes 160 more balls, then B would score a century.

iii) The strike rate of A is more than that of the strike rate of C.

a) All the three follows

b) Only (i) follows

c) Both (ii) and (iii) follows

d) Both (i) and (ii) follows

e) None of these

29) If the strike rate of D is 40% more than the strike rate of A and ratio of the number of balls faced by B to D is 9:10, then find the runs scored by D?

a) 65

b) 70

c) 75

d) 84

e) None of these

30) If the number of 1's played by C is 40 and runs scored by C by hitting 2's is 50, then find the number of runs scored on hitting 4's and 6's by C?

a) 155

b) 145

c) 175

d) 165

e) None of these

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Directions (31-33): Read the following information carefully and answer the questions.

The given table chart shows the cost price and the marked price of two articles A and B.

Articles	Cost price in Rs	Marked price in Rs
A	600X	16Y
B	700X	20Y

The given table charts shows the relationship between X and Y in two different shops P and Q

Shop	Relationship between X and Y
P	Y = 50X
Q	Y = 100X

The given table chart shows the discount offered while selling articles A and B in Shop P and Q at various times

Time	Discount percentage
1.00 Pm	15X
2.00 Pm	10X
3.00 Pm	12X
4.00 Pm	11.5X
5.00 Pm	20X

Note:-

Article A and B is sold in both the shops. X is an integer

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31) Shop P sold article A at 2.00 Pm and obtained a profit of Rs.80. Find the Selling price of article B in Shop Q at 4.00 Pm?

a) Rs.3840
b) Rs.4200
c) Rs.3080
d) Rs.4000
e) None of these

32) If the profit obtained in article A by Shop Q at 3.00 Pm is Rs.616X, then find the difference between the cost price of article B in Shop P and the marked price of article B in Shop P?

a) Rs.800
b) Rs.450
c) Rs.500
d) Rs.600
e) None of these

33) The profit obtained by Shop Q at 4.00Pm by selling article A is what percentage of the profit obtained by Shop Q at 5.00 Pm by Selling article B?

a) (1000 – 184X)/(1300 – 400X)%
b) (1300 – 400X)/(1000 – 184X)%
c) (1200 – 100X)/(1200 – 128X)%
d) (1280X – 3000X)(400X – 800)%
e) None of these

34) Who among the following A or C is elder?

i) Age of A after 6 years is equal to the sum of the 2/3rd of the present age of C and 1/5th of the present age of B.

ii) B's son is 18 years younger than B and A is 12 years elder than B's son.

iii) Double the present age of A is equal to the age of C after 12 years.

a) Both statement (i) and (ii) together are necessary to answer the question.
b) Only statement (i) is necessary to answer the question.
c) Both statement (ii) and (iii) together are necessary to answer the question
d) All the three statements are necessary to answer the question.
e) None of these

35) Total interest obtained by A and B is Rs.(x + 5832). A invested Rs.x in SI at 40% per annum for 3 years and B invested the same amount in CI at the same rate of interest for the same time period. If A invested Rs.2x in SI at 28% rate of interest per annum for 6 years, then find the interest obtained by A?

a) Rs.x^2
b) Rs.(2x + 300)
c) Rs.6x
d) Rs.(1.5x + 220
e) Rs.(3.4x – 120)

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Answer With Explanation

Directions (1-5):

Number of poetry books printed in 2011 = 702

Number of poetry books printed in 2012 = 1640 – 702 = 938

Number of poetry books printed in 2013 = 1910 – 1640 = 270

K = N – M

N + K = 95

N + N – M = 95

2N – M = 95 ---- (1)

N + M = 115 ---- (2)

From (1) and (2),

3N = 210

N = 70%

M = 115 – 70 = 45%

K = 70 – 45 = 25%

Number of story books printed in 2011 = 702 * 55/45 = 858

Number of story books printed in 2012 = 938 * 30/70 = 402

Number of story books printed in 2013 = 270 * 75/25 = 810

Total number of books printed in 2011 = 702 + 858 = 1560

Total number of books printed in 2012 = 938 + 402 = 1340

Total number of books printed in 2013 = 270 + 810 = 1080

Year	Total number of books printed	Number of poetry books printed	Number of story books printed
2011	1560	702	858
2012	1340	938	402
2013	1080	270	810

1. Answer: C

Difference between the number of story books printed in 2011 and 2013 = 858 – 810 = 48

From (I),

2K – 2 = 2 * 25 – 2 = 50 – 2 = 48

From (II),

M + 3 = 45 + 3 = 48

From (III),

N/2 + 8 = 70/2 + 8 = 35 + 8 = 43

2. Answer: A

Number of poetry books printed in 2014 = 10M + K + 5 = 10 * 45 + 25 + 5 = 450 + 30 = 480

Number of story books printed in 2014 = 480 * 60/40 = 720

Required difference = 858 – 720 = 138

N + 68 = 70 + 68 = 138

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3. Answer: B

Number of poetry books printed in 2015 = (858 – 810) * 7 – 12 = 48 * 7 – 12 = 336 – 12 = 324

Required percentage = (324 – 270)/270 * 100 = 54/270 * 100 = 20%

K – 5 = 25 – 5 = 20

4. Answer: D

Required difference = (858 + 402 + 810) – 1910 = 2070 – 1910 = 160

$K^2 – 6N – 45 = 25^2 – 6 * 70 – 45 = 625 – 420 – 45 = 160$

5. Answer: A

Total number of English books printed in 2012 = 1340 * 55/100 = 737

Total number of other language books printed in 2012 = 1340 – 737 = 603

Number of English language poetry books printed in 2012 = 428

Number of English language story books printed in 2012 = 737 – 428 = 309

Number of other language Poetry books printed in 2012 = 938 - 428 = 510

Number of other language Story books printed in 2012 = 603 – 510 = 93

Required difference = 510 – 93 = 417

3M + 4N + 2 = 3 * 45 + 4 * 70 + 2 = 135 + 280 + 2 = 417

6. Answer: D

B = 2A + 7

B – 2A = 7 ---- (1)

A + B = 61 ---- (2)

From (1) and (2),

3A = 54

A = 18

B = 61 – 18 = 43

The largest negative integer is – 1

C is a positive integer which is greater than 2

$C^n – 2 = - 1$

$C^n = 1$

n = 0 (anything power 0 will get 1)

$C^n – n + A = 1 – 0 + 18 = 19$

B – A = 43 – 18 = 25

7. Answer: D

$22/7 * R^2 * (R + 7) = N * 11R^3/42$

$2 * (R + 7) = N * R/6$

12R + 84 = NR

12 + 84/R = N

From (1),

12 + 84/R = 16

84/R = 4

R = 21 cm

Option (1) is possible

From (2),

12 + 84/R = 17

84/R = 5

Option (2) is not possible

From (3),

12 + 84/R = 8

Option (3) is not possible

From (4),

12 + 84/R = 13

84/R = 1

R = 84 cm

Option (4) is possible

8. Answer: C

X * (100 + Y)/100 * 75/100 = X + Y + 20

X * (100 + Y)/100 * 3/4 = X + Y + 20

(300X + 3XY)/400 – 20 = X + Y ---- (1)

X * (100 + Y + 5)/100 * 75/100 = X + Y + 65

X * (105 + Y)/100 * 3/4 = X + Y + 65

(315X + 3XY)/400 – 65 = X + Y ---- (2)

From (1) and (2),

(315X + 3XY)/400 – 65 = (300X + 3XY)/400 – 20

15X/400 = 45

X = 1200

From (1),

(300 * 1200 + 3 * 1200 * Y)/400 – 20 = 1200 + Y

(360000 + 3600Y)/400 = 1220 + Y

360000 + 3600Y = 488000 + 400Y

3200Y = 128000

Y = 40

0.5X = 15Y => 0.5 * 1200 = 15 * 40 => 600 = 600

Option (C) follows

Directions (9-10):

Ratio of the speed of Shivam, Tarun and Chetan = 1:1.25:0.5 = 4:5:2

Let the speed of Shivam be 40 km/hr and the speed of Tarun be 50 km/hr and the speed of Chetan be 20 km/hr.

9. Answer: A

Shivam and Tarun meet each other after 9 AM.

In one hour Shivam covers 40 km.

Time taken by Shivam and Tarun to meet each other = 40/(50 – 40) = 40/10 = 4 hours

Chetan starts at 10 AM and he covers 60 km in 3 hours (10 AM to 1 AM) and the distance covered by Tarun till 1 PM is (50 * 4) = 200 km

Chetan and Tarun meet at a distance of 140 km (200 – 60)

Time taken by Chetan and Tarun to meet each other = 140/(50 + 20) = 140/70 = 2 hours

They meet at 3.00 PM

10. Answer: D

Speed of Tarun = 4 * 5/4 = 5 km/hr

Distance covered by Tarun = 5 * 4 = 20 km

11. Answer: A

Profit obtained by Preethi = 3600 * 100/18 * 1/5 = Rs.4000

Total profit = 4800 + 2 * 4000 = 4800 + 8000 = Rs.12800

P = Rs.12800

X/(X – 1200 + X + X + 1800) = 4000/12800

X/(3X + 600) = 5/16

16X = 15X + 3000

X = 3000

Investment ratio of Anmol, Preethi and Sana = (3000 – 1200) : 3000 : (3000 + 1800) = 1800:3000:4800 = 3:5:8

Profit % of Anmol = 3/16 * 100 = 18.75%

So Statement (i) follows

Profit % of Sana = 8/16 * 100 = 50%

So Statement (ii) follows

X is not a multiple of 18

So Statement (iii) does not follow

Directions (12-14):

Series I:

24 + 7.5 = 31.5

31.5 + 15 = 46.5

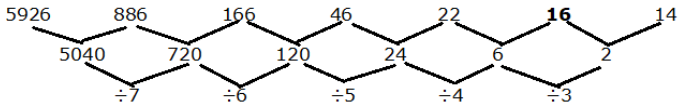
46.5 + 22.5 = 69

69 + 30 = **99**

99 + 37.5 = 136.5

136.5 + 45 = 181.5

Series II:



Series III:

11 + (2^3 – 1) = 18

18 + (3^3 – 1) = 44

44 + (4^3 – 1) = 107

107 + (5^3 – 1) = 231

231 + (6^3 – 1) = **446**

446 + (7^3 – 1) = 788

12. Answer: D

23 + (2^3 – 1) = 30

30 + (3^3 – 1) = 56

56 + (4^3 – 1) = 119

119 + (5^3 – 1) = 243

243 + (6^3 – 1) = 458

458 + (7^3 – 1) = 800

Required difference = 800 – 119 = 681

13. Answer: B

P = 98, Q = 18andR = 445

P > Q < R

14. Answer: B

X = 99 , Y = 16

a^2 – 15a = -81 + 25

a^2 – 15a + 56 = 0

a^2 – 8a – 7a + 56 = 0

a(a – 8) – 7(a – 8) = 0

a = 8, 7

$Z = 8^2 = 64$

From (i),

Z = X + Y

64 = 99 + 16

Option (i) does not follow.

From (ii),

10Y + 3 = X + Z

10 * 16 + 3 = 99 + 64

163 = 163

Option (ii) follows.

From (iii),

X = YZ

99 = 16 * 64

99 = 1024

Option (iii) does not follow.

15. Answer: B

$\sqrt{(100x^4 + 125x^4)} + 7x + 4^{1/2} = -4x$

$\sqrt{225x^4} + 7x + 2 = -4x$

$15x^2 + 11x + 2 = 0$

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$15x^2 + 6x + 5x + 2 = 0$

$15x(x + 2/5) + 5(x + 2/5) = 0$

$x = -1/3, -2/5$

$\sqrt[3]{(64y^3)} * 2y + 19y + 7^2 = -3y + \sqrt{1600}$

$4y * 2y + 19y + 49 = -3y + 40$

$8y^2 + 22y + 9 = 0$

$8y^2 + 18y + 4y + 9 = 0$

$8y(y + 9/4) + 4(y + 9/4) = 0$

$y = -1/2, -9/4$

Resultant = $-9/4 * 2 = -4.5$

i) $-4.5 < -4$ So i) does not follow

ii) $-4.5 + 21\ (1/2) = (-9 + 43)/2 = 34/2$ = not a multiple of 5

iii) Resultant is less than the smallest root of equation I (iii) follows

Direction (16-17):

A) $(a * a) – 3a - \sqrt{(4a^2)} = -6$

$a^2 – 3a – 2a = -6$

$a^2 – 5a + 6 = 0$

$a^2 – 3a – 2a + 6 = 0$

$a(a – 3) – 2(a – 3) = 0$

$a = 2, 3$

B) $b^2 - \sqrt{(81b^2)} = -4 * 5$

$b^2 – 9b + 20 = 0$

$b^2 – 5b – 4b + 20 = 0$

$b(b – 5) – 4(b – 5) = 0$

$b = 4, 5$

C) $c^2 * \sqrt{(625c^6)} \div 5c^3 + 4 * 7 = 39c$

$c^2 * 25c^3 \div 5c^3 + 28 = 39C$

$5c^2 – 39C + 28 = 0$

$5c^2 – 35c – 4c + 28 = 0$

$5c(c – 7) – 4(c – 7) = 0$

$c = 4/5, 7$

D) $d^2 – 3 * 5d = 7 * -8$

$d^2 – 15d + 56 = 0$

$d^2 – 8d – 7d + 56 = 0$

$d(d – 8) – 7(d – 8) = 0$

$d = 7, 8$

16. Answer: D

Required LCM = (3, 5, 7, 8) = 840

17. Answer: E

Difference between the roots of equation A = 3 – 2 = 1

Difference between the roots of equation B = 5 – 4 = 1

Difference between the roots of equation C = 7 – 4/5 not equal to 1

Difference between the roots of equation D = 8 – 7 = 1

18. Answer: C

From statement (i),

$2x = 55$

$x = 55/2$

$y = 45 – 55/2 = 35/2$

So statement (i) alone is not sufficient to answer the question

From statement (ii),

% of milk in mixture A = $15/60 * 100 = 25\%$

$x = 25$

$y = 45 – 25 = 20$

Initial quantity of mixture B = $60 * 2/3 = 40$ liters

Quantity of milk in mixture B = 40 * 20/100 = 8 liters

Total quantity of milk in the final mixture = 15 + 8 = 23 liters

So statement (ii) alone is sufficient to answer the question

From statement (iii),

Quantity of mixture A = 3a

Quantity of mixture B = 2a

Quantity of milk in mixture B = 2a * y/100

Quantity of water in mixture B = 2a * b/100

2a * y/100 + 15 * x/100 = 40

So statement (iii) alone is not sufficient to answer the question

Directions (19-21):

Efficiency of men and women are equal (XY = YX)

Time taken by one man to complete the work = Time taken by one woman to complete the work = a days

24/a + 12/a = 3/160

36/a = 3/160

a = 1920 days

19. Answer: A

Time taken by 15 men and 12 women together to complete the work = 15/1920 + 12/1920 = 27/1920 = 9/640 = 71 (1/9) days

20. Answer: A

(20m + 24w) * 0.6D + B * 0.45D = 1920

44 * 0.6D + B * D * 0.45 = 1920

BD = 1920

26.4D + 1920 * 0.45 = 1920

26.4D + 864 = 1920

26.4D = 1056

D = 40

21. Answer: D

(G + 24)/(G * 26) + 10/1920 + 14/1920 = 1/16

(G + 24)/(G * 26) + 24/1920 = 1/16

(G + 24)/(G * 26) + 1/80 = 1/16

(G + 24)/(G * 26) = 1/16 – 1/80

(G + 24)/(G * 26) = (5 – 1)/80

(G + 24)/(G * 26) = 4/80

(G + 24)/(G * 26) = 1/20

10G + 240 = 13G

3G = 240

G = 80

22. Answer: A

If a certain quantity of water spilled out means the volume of the water spilled will be equal to the volume of the cylinder that is immersed in another cylinder.

Let the height of the cylinder be h m.

22/7 * 7 * 7 * h = 9240

h = 60 m

23. Answer: D

Volume of C2 = 22/7 * 10.5 * 10.5 * 60 = 20790 m^3

Excessive amount of water spilled from C1 = 20790 – 9240 = 11550 m^3

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24. Answer: E

From statement (i),

Cost price of article A = Rs.224 + selling price of article B

The discount % offered on article A is 30% and the profit obtained on article B is 40%.

So statement (i) alone is not sufficient to answer the question

From statement (ii),

Selling price of article A + 140 = Selling price of article B

The price of article A is marked by Rs.264.

So statement (ii) alone is not sufficient to answer the question

From statement (iii),

Discount given in article B is Rs.56 more than the profit obtained on article A.

So statement (iii) alone is not sufficient to answer the question

From (i) and (ii),

Let the selling price of article be Rs.x

Cost price of article A = x – 224

Marked price of article A = x – 224 + 264 = x + 40

Selling price of article A = (x + 40) * 70/100

Difference between the marked price of article A and selling price of article B = x + 40 – x = Rs.40

So both (i) and (ii) are necessary to answer the question.

25. Answer: D

Let the speed of the boat in still water be B km/hr and the speed of the current be C km/hr.

B – C = 24 km/hr

P/24 = Q ---- (1)

144/(B + C) = Q ---- (2)

216/24 – 216/(B + C) = R

216/(B + C) = 9 – R ---- (3)

From statement (i),

$R^2/(B + C) = 18$

So, Statement I alone is not sufficient to answer the question.

From statement (ii),

$P – Q^3 + R^3 > 102$

So, Statement II alone is not sufficient to answer the question.

Directions (26-30):

Let the number of runs scored by B be m.

33 1/3 = m/180 * 100

100/3 = m/180 * 100

m = 60

Let runs scored by A be n.

33 (1/3) * 2 = n/180 * 100

200/3 = n/180 * 100

n = 120

Number of balls faced by A = 120 * 100/25 = 480

Number of balls faced by C = 480/2 = 240

Runs scored by C = (120 + 60) * 198/(360 – 198) = 180 * 198/162 = 220

Batsman	Total runs	Number of balls

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	scored	faced
A	120	480
B	60	180
C	220	240

26. Answer: C

Required difference = 120/(120 + 60 + 220) * 360 – 180/(480 + 180 + 240) * 360 = 120/400 * 360 – 180/900 * 360 = 108 – 72 = 36^0

27. Answer: A

Number of 6's hit by C = (220 – 25 * 4)/6 = (220 – 100)/6 = 120/6 = 20

Number of dot balls faced by C = 240 – 25 – 20 = 195

28. Answer: D

Number of balls played by A = 180

Present strike rate of A = 120/180 * 100 = 33 (1/3) %

Number of balls played by B = 240

Present strike rate of B = 60/240 * 100 = 25%

Present strike rate of B is the same as the previous strike rate of A.

Statement (i) follows.

Runs to be scored by B if he plays 160 more balls = 60/240 * 400 = 100

Statement (ii) follows.

Strike rate of C = 220/240 * 100 = 91.67%

Statement (iii) does not follow.

29. Answer: B

Strike rate of D = 25 * 140/100 = 35%

Number of balls faced by D = 180 * 10/9 = 200

Runs scored by D = 35 * 200/100 = 70

30. Answer: C

Number of 2's hit by C = 50/2 = 25

The number of runs scored on hitting 4's and 6's by C = 240 – 40 – 25 = 175

Directions (31-33):

Shop	Article A		Article B	
	Cost price	Marked price	Cost price	Marked price
P	600X	800X	700X	1000X
Q	600X	1600X	700X	2000X

31. Answer: C

800X * (100 – 10X)/100 = 600X + 80

8X * (100 – 10X) = 600X + 80

$800X – 80X^2 = 600X + 80$

$2X^2 – 5X + 2 = 0$

$2X^2 – X – 4X + 2 = 0$

X(2X – 1) – 2(2X – 1) = 0

X = 2, 1/2

X = 2

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Selling price of article B in Shop Q at 4.00 Pm = 2000 * 2 * (100 – 11.5 * 2)/100 = 4000 * 77/100 = Rs.3080

32. Answer: D

1600X * (100 – 12X)/100 = 600X + 616X

16X * (100 – 12X) = 1216X

100 – 12X = 76

12X = 24

X = 2

Required difference = 1000 * 2 – 700 * 2 = 2000 – 1400 = Rs.600

33. Answer: A

Required percentage = [(1600X * (100 – 11.5X)/100 – 600X)]/[(2000X * (100 – 20X)/100 – 700X) = (1000 – 184X)/(1300 – 400X)%

34. Answer: A

From statement (i),

A + 6 = 2C/3 + B/5

So, Statement I alone is not sufficient to answer the question.

From statement (ii),

B's son + 18 = B

B's son + 12 = A

So, Statement II alone is not sufficient to answer the question.

From (i) and (ii),

B – 18 = A – 12

B = A + 6

A + 6 = 2C/3 + (A + 6)/5

A + 6 = (10C + (3A + 18))/15

15A+ 90 = 10C + 3A + 18

10C – 12A = 72

C is elder than A

So both statements (i) and (ii) are required to answer the question.

From statement (iii),

Double the present age of A is equal to the age of C after 12 years

So, Statement III alone is not sufficient to answer the question.

35. Answer: E

$(3 * x * 40)/100 + x * (1+40/100)^3 – x = x + 5832$

6x/5 + 218x/125 = x + 5832

(150x + 218x)/125 = x + 5832

368x = 125x + 729000

243x =729000

x = Rs.3000

Interest obtained by A = 2 * 3000 * 28 * 6/100 = Rs.10080 = Rs.(3.4x – 120)

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