

Civils (Prelims)-2013 Paper-II Solutions

Mental Ability

1. Four friends, A, B, C and D distribute some money among themselves in such a manner that A gets one less than B, C gets 5 more than D, D gets 3 more than B. who gets the smallest amount?

- a) A b) B c) C d) D

Ans: Let the amount got by A=x, then the amount of B = x+1,

the amount of D = (x+1)+3 = x+4

the amount of C = (x+4)+5 = x+9.

Therefore, it is clear that "A" get the smallest amount

∴ answer: (a)

2. There are 5 hobby clubs in a collage viz, photography, yachting, chess, electronics and gardening. The gardening group meets every second day, the electronics group meets every third day, the chess group meets every fourth day, the yachting group meets every fifth day and the photography group meets every sixth day. How many times do all the five groups meet on the same day within 180 days?

- a) 3 b) 5 c) 10 d) 18

Ans: The l.c.m or 2,3,4,5,6=60. It means on 60th day all the five groups meet. Therefore, within

180 days, $180/60 = 3$

3 times all the five groups meet on same day

∴ ans: (a)

3. In a class of 45 students, a boy is ranked 20th. when two boys joined, his rank was dropped by one. what is his new rank from the end?

- a) 25th b) 26th c) 27th d) 28th

Ans: After 2 boys joined, total strength = 47.

Rank of the boy from the begining =21

⇒ rank from end=47-21+1=27.

∴ answer: (c)

4. A thief running at 8 kmph is chased by a police man whose speed is 10 kmph. If the thief is 100mt ahead of the policeman, then the time required for the policeman to catch the thief will be?

- a) 2min b) 3min c) 4min d) 6min

Ans: The relative speed between police and thief = $10 - 8 = 2$ kmph. Initial distance between police and thief = 100 mt = 0.1km.

∴ The time taken for the police

$$\text{to catch the thief} = \frac{\text{Dis tan ce}}{\text{relative speed}}$$

$$= 0.1/2 = 0.05 \text{ hrs}$$

$$= 0.05 \times 60\text{min} = 3 \text{ min}$$

∴ answer: (b) (or)

Relative speed = 2 kmph means 2000 mt can be covered by police in 60 min. So time taken to cover

$$100 \text{ mt} = \frac{60}{2000} \times 100 = 3\text{min.}$$

5. A train travels at a certain average speed for a distance of 63 km, and then travels a distance of 72 km. at an average speed of 6 kmph more than its original speed. If it takes 3 hours to complete the total journey, what is the original speed of the train in kmph?

- a) 24 b) 33 c) 42 d) 66

Ans: This problem can be solved by a simple technique rather than by conventional method.

$$\text{Total distance} = 63 + 72 = 135 \text{ km.}$$

$$\text{total time} = 3 \text{ hours.}$$

$$\Rightarrow \text{The overall average speed} = \frac{\text{Total dis tan ce}}{\text{Total time}} = \frac{135}{3} = 45 \text{ kmph.}$$

This overall average speed must be in between the original average speed and the average speed in the second spell. The only possible option among the four given options is 42 kmph. i.e, the original speed = 42 kmph, speed in the second spell = $42 + 6 = 48$ kmph. The overall average speed = 45 kmph. The remaining three options are not viable

∴ ans: (c)

6. A group of 4 persons consists of two men A and B, and two women C and D. The average weight of all 4 is 55 kg. The average weight of two men is over 60 kg. D weights more than 52 kg in this context, which one of the following statements follow logically?

- a) Any man weighs more than any women
- b) C weighs less than 49 kg
- c) C's weight is the lowest
- d) Either of the men weigh more than 60 kg.

Ans: As the average weight of two men is more than 60kg, either or the men weight more than 60kg.

∴ answer: (d)

Let us examine other state-ments: The weight of one man is more than 60kgs. The weight of other man be the lowest among all the four. So statement (a) & (c) do not follow logically. $55 = 60 + 50/2$, therefore the average weight of two women is less than 50 kg. $50 = 52 + 48/2$, therefore, as the weight of D is more than 52 kg, the weight or C is less than 48 kg. Hence statement (b) is also not logically correct.

7. A number when divided by 6 leaves remainder 3. When the cube of the same number is divided by 6, what is the remainder?

- a) 1
- b) 2
- c) 3
- d) 4

Ans: The remainder when the cube of the same number is divided by 6 = $3^3 \text{ mod } 6 = 27 \text{ mod } 6 = 3$ (When 27 is divided by 6, the remainder is 3)

∴ answer: (c)

8. 14 Pumps of equal capacity can fill a tank in 6 days. If the tank has to be filled in 4 days, what is the number of extra pumps required?

- a) 6
- b) 7
- c) 9
- d) 11

ans: $N_1 D_1 = N_2 D_2$

N- number of pumps,

D- number of days

$$14 \times 6 = N_2 \times 4$$

$$\Rightarrow N_2 = \frac{14 \times 6}{4} = 21$$

It means 21 pumps can fill the tank in 4 days.

∴ Extra pumps required

$$= 21 - 14 = 7.$$

∴ answer: (b)

9. A candidate attempted 12 questions and secured full marks in all or them. If he obtained 60% in the test and all questions carried equal marks, then what is the number of questions in the test?

- a) 36 b) 30 c) 25 d) 20

Ans: 60% marks \rightarrow 12 questions

$$\Rightarrow 100\% \text{ marks} \rightarrow \frac{12}{60} \times 100 = 20 \text{ questions}$$

\therefore answer: (d)

10. In a restaurant, a cup of coffee costs twice that of a cup of tea. If the cost of 5 cups of coffee and 10 cups of tea is Rs.20, how much would 10 cups of coffee and 5 cups of tea cost?

- a) Rs.30 b) Rs.27 c) Rs.25 d) Rs.32

Ans: 5 cups of coffee +10 cups of tea

$$= 10 \text{ cups of tea} + 10 \text{ cups of tea}$$

$$= 20 \text{ cups of tea} = \text{Rs.}20$$

$$\text{One cup of tea} = \text{Rs.}1, \text{ and}$$

$$\text{one cup of coffee} = \text{Rs.}2$$

$$\text{The cost of 10 cups of coffee and 5 cups of tea} = 10 \times 2 + 5 \times 1 = \text{Rs.} 25$$

\therefore answer: (c)

11. How many two-digit whole numbers yield a remainder of 3 when divided by 10 and also yield a remainder of 3 when divided by 4?

- a) one c) two d) three d) four

Ans: The following are the two-digit whole numbers which yield a remainder of 3 when divided by 10

13,23,33,43,53,63,73,83,93, among the above, the following four whole numbers yield a remainder of 3 when divided by 4.

$$23,43,63,83$$

\therefore answer: (d)

12. The mother's age is six times her son's age. Four years hence, the age of the mother will be four times her son's age. What is the present age of the son?(in Years)

- a) 6 b) 5 c) 4 d) 3

Ans: Let the present age of son = x years

$$\Rightarrow \text{mother's present age}$$

$$= 6x \text{ years}$$

after 4 years, age of son

$$= x+4 \text{ years}$$

$$\text{age of mother} = 6x+4 \text{ years}$$

$$\text{from the given data, } 6x+4=4 \times (x+4) \Rightarrow 6x+4=4x+16$$

$$\Rightarrow 2x=12 \Rightarrow x=6 \text{ years}$$

\therefore answer: (a)

13. If the price of a book is reduced by Rs.5, a person can buy 5 more books for Rs.300. What is the original list price of the book?

- a) Rs.15 b) Rs. 20 c) Rs.25 d) Rs.30

Ans: From the given data, it is understood that we need to identify two factors of 300 such that the difference between them is 5. $300=15 \times 20$

It means, the original price is Rs.20, then we can buy 15 books. If the book price is Rs.15, then we can buy 20 books

\therefore answer: (b)

14. Ram on selling 33 chairs of wood obtains a profit equal to the selling price of 11 chairs of wood. What is his profit percentage?

- a) 48% b) 49% c) 50% d) 60%

Ans: selling price of 33 chairs - cost price of 33 chairs = selling price of 11 chairs (profit)

$$\Rightarrow \text{selling price of 22 chairs}$$

$$= \text{cost price of 33 chairs.}$$

$$\Rightarrow \frac{\text{selling price}}{\text{cost price}} = \frac{33}{22} = \frac{3}{2}$$

profit percentage

$$= \left(\frac{\text{selling price}}{\text{cost price}} - 1 \right) \times 100 = \left(\frac{3}{2} - 1 \right) \times 100 = 50\%$$

\therefore answer: (c)

15. It can take 12 hours to fill a swimming pool using two pipes. If the pipe of larger diameter is used for 4 hours and the pipe of smaller diameter is used for 9 hours, then pipe of larger diameter alone can fill the swimming pool in?

- a) 20 hours b) 18 hours c) 16 hours d) 8 hours

Ans: Let us assume both the pipes are

$$\text{used for 9 hours, then } \frac{9}{12} = \frac{3}{4} \text{ th}$$

of the tank is filled.

⇒ in $9-4=5$ hours, the larger pipe

can fill $\frac{3}{4} - \frac{1}{2} = \frac{1}{4}$ th of the tank.

⇒ Larger pipe can fill the tank in $5 \times 4 = 20$ hours.

∴ answer: (a)

16. Five bells begin to toll together and toll respectively at intervals of 6, 7, 8, 9 and 12 seconds. What is the number of times they will toll together in an hour, excluding the one at the start?

- a) 6 b) 7 c) 8 d) 9

Ans: The L.c.m. of 6,7,8,9,12=504 i.e for every 504 seconds, all the five bells toll together.

one hour=3600 seconds

$$\frac{3600}{504} = 7.14,$$

therefore excluding at the start, all the five bells toll together 7 times in one hour.

∴ answer: (b)

17. A person allows a 10% discount for cash payment from the marked price of a toy and still he makes a 10% gain. What is the cost price of the toy which is marked Rs.770?

- a) Rs.600 b) Rs. 610 c) Rs. 620 d) Rs. 630

Ans: The person has given 10% discount on the marked price of Rs. 770.

⇒ Selling price

$$= 770 - 10\% \text{ of } 770$$

$$= \text{Rs.}693.$$

$$\text{cost price} = \frac{\text{selling price} \times 100}{(100 + \text{gain}\%)} = \frac{693 \times 100}{(100 + 10)} = \text{Rs.}630$$

∴ **Answer: (d)**

18. In a rare coin collection, there is one gold coin for every three non-gold coins. 10 more gold coins are added to the collection and the ratio of gold coins to non-gold coins would be 1: 2. Based on the information, the total number of coins in the collection now becomes?

- a) 90 b) 80 c) 60 d) 50

Ans: Conventional Method

Originally, Let the no. of gold coins = k, then the no. of non-gold coins = 3k

After adding 10 gold coins, no. of gold coins = $k+10$

\Rightarrow no. of non-gold coins

$$= 2 \times (k+10) = 2k + 20$$

$$\Rightarrow 3k = 2k + 20$$

$$\Rightarrow k = 20, \text{ i.e., originally the no. of gold coins} = 20, \text{ non-gold coins} = 3 \times 20 = 60$$

$$\therefore \text{No. of coins in the collection now becomes } (20+10) + 60 = 90$$

\therefore **Answer : (a)**

Simple Technique :

Initially, for one gold coin, there are 3 non-gold coins. After adding 10 more gold coins, now for one gold coin, there are 2 non-gold coins. It means for this newly added 10 gold coins, there are 20 non-gold coins each taken from the set of 3 non-gold coins. i.e. originally, there are 20 gold coins

$$\therefore \text{Total no. of coins} = 20 + 60 + 10 = 90$$

19. A gardener has 1000 plants, he wants to plant them in such a manner that the number of rows and columns remains the same. What is the minimum number of plants that he needs more for this purpose?

- a) 14 b) 24 c) 32 d) 34

Ans : Let the number of rows and columns = x

then the total number of plants

$$= X \times X = X^2$$

$$\text{Now by observation, } 31^2 = 961, 32^2 = 1024$$

$$\therefore \text{minimum no. of plants required} = 1024 - 1000 = 24$$

Answer: (b)

20. A sum of Rs.700 has to be used to give seven cash prizes to the students of a school for their overall academic performance. If each prize is Rs.20. less than its preceding prize, what is the least value of the prize?

- a) Rs. 30 b) Rs. 40 c) Rs. 60 d) Rs. 80

Ans : Let the least value of the prize

$$= \text{Rs.}k$$

then the total of all seven prizes

$$= 7k + 20 \times (1+2+3+4+5+6)$$

$$= 7k + 420$$

$$\therefore 7k+420 = 700$$

$$\Rightarrow k = \frac{700-420}{7} = 40$$

\therefore **Answer: (b)**

21. Out of 120 applications for a post, 70 are male and 80 have a driver's license. What is the ratio between the minimum to maximum number of males having driver's license?

- a) 1 to 2 b) 2 to 3 c) 3 to 7 d) 5 to 7

Ans : Maximum number of males with license.

All 70 males may have the driver's license, the remaining to with license may be females.

\therefore maximum number = 70

minimum number : out of 120 applicants, number of females $120 - 70 = 50$

All these 50 females may have the license.

Then the minimum number of males with the driver's license.

$$= 80 - 50 = 30$$

\therefore The required ratio = 30 to 70 = 3 to 7

\therefore **Answer : (c)**

22. In a garrison, there was food for 1000 soldiers for one month. After 10 days, 1000 more soldiers joined the garrison. How long would the soldiers be able to carry on with the remaining food?

- a) 25 days b) 20 days c) 15 days d) 10 days

Ans: The available food is sufficient for 1000 soldiers for 30 days. After 10 days, the remaining food is sufficient for 1000 soldiers for 20 days. but for 2000 soldiers. It is sufficient for 10 days (No. of soldiers gets doubled. so the no. of days gets halved)

\therefore **Answer : (d)**

23. The tank-full petrol in Arun's motor cycle lasts for 10 days. If he starts using 25% more every day how many days will the tank full petrol last?

- a) 5 b) 6 c) 7 d) 8

Ans: Let Arun's daily consumption of petrol initially = 100 units

\Rightarrow total capacity of tank

$$= 10 \times 100 = 1000 \text{ units}$$

Later Arun's daily consumption

$$= 100 + 25 = 125$$

No. of days the tank full petrol

$$= \frac{1000}{125} = 8 \text{ days.}$$

∴ **Answer: (d)**

24. A person can walk a certain distance and drive back in 6 hours. He can also walk both ways in 10 hours. How much time will he take to drive both ways?

- a) 2 hours b) 2.5 hours c) 5.5 hours d) 4 hours

Ans: Time for

i) walk one way + drive one way = 6 hours

ii) walk both the ways = 10hrs

$$\Rightarrow \text{iii) walk one way} = \frac{10}{2} = 5 \text{ hours}$$

$$\Rightarrow \text{iv) drive one way} = 6 - 5 = 1 \text{ hour}$$

$$\Rightarrow \text{v) drive both the ways}$$

$$= 1 + 1 = 2 \text{ hrs}$$

∴ **Answer : (a)**

25. Five people A, B, C, D, and E are seated about a round table. Every chair is spaced equidistant from adjacent chairs.

i) 'C' is seated next to A

ii) A is seated two seats from D

iii) B is not seated next to A which of the following must be true?

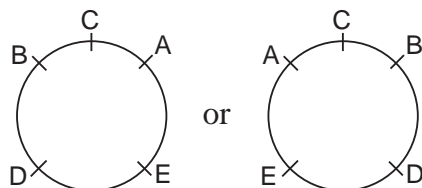
I. D is seated next to B

II. E is seated next to A

select the correct answer from the following codes.

- a) I only b) II only c) Both I and II d) Neither I nor II

Ans: From the given data, the five people can be seated in the following two ways.



From the above arrangements, it is that both I and II are true.

Answer : (c)

26. The music director of a film wants to select four persons to work on different aspects of composition of a piece of music. Seven persons are available for this work. They are Rohit, Tanya, Shobha, Kaushal, Kunal, Mukesh, and Jaswant. Rohit and Tanya will not work together. Kunal and Shobha will not work together. Mukesh and Kunal want to work together. Which of the following is the most acceptable group of people that can be selected by the music director?

- a) Rohit, Shobha, Kunal and Kaushal, b) Tanya, Kaushal, Shobha and Rohit
c) Tanya, Mukesh, Kunal, and Jaswant d) Shobha, Tanya, Rohit and Mukesh

Ans: Let us follow the process of elimination

- (a) is not correct as Kunal and Shobha will not work together
(b) is not correct as Rohit and Tanya will not work together similarly (d) is also not correct
∴ **Answer : (c)**