Aptitude Test : --80 Minutes -35 Questions

1. Given a collection of points P in the plane, a 1-set is a point in P that can be separated from the rest by a line; i.e. the point lies on one side of the line while the others lie on the other side. The number of 1-sets of P is denoted by n1(P). The maximum value of n1(P) over all configurations P of 10 points in the plane is

   a.10 b. 3 c.5 d.9

   Answer: a.10

   Solution: The minimum/maximum value of n1(P) over all configurations P of "X" points in the plane in general position:

   Answer will be "X". Just take the value "X"

   Here, X=10.So, answer is 10.

2. The teacher is testing a student's proficiency in arithmetic and poses the following question.1/3 of a number is 3 more than 1/6 of the same number. What is the number?

   a.18 b.12 c. 21 d.6

   Answer: a.18

   Solution: Let number be x

   (1/3)*x=3+(1/6)*x

   Or, x/3 = (18+x)/6

   Or, 2x = 18 + x

   Or, x = 18

3. Planet fourfi resides in 4-dimensional space and thus the currency used by its residents are 3-dimensional objects. The rupee notes are cubical in shape while their coins are spherical. However the coin minting machinery lays out some stipulations on the size of the coins.
   The diameter of the coins should be at least 64mm and not exceed 512mm.
   Given a coin, the diameter of the next larger coin is at least 50% greater.
   The diameter of the coin must always be an integer.
   You are asked to design a set of coins of different diameters with these requirements and your goal is to design as many coins as possible. How many coins can you design?

   a.9 b.8 c.5 d. 6

Answer: D. 6

Solution: First coin will be of diameter 64mm.

Next Coin's diameter = 3x/2 = 3 * 64/2 = 96

Next coin's diameter = 3 * 96/2 = 144 and so on

So diameter of coin will be $(3/2)^n \times 64$

$(3/2)^n \times 64 < 512$

$(3/2)^n < 8$

So n will be 5

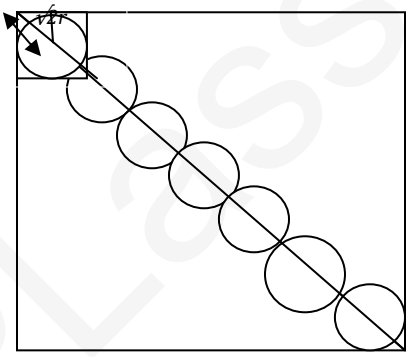
Hence 6 such coins can be made of diameter from 64mm to 486 mm.

4. Anoop managed to draw 7 circles of equal radii with their centres on the diagonal of a square such that the two extreme circles touch two sides of the square and each middle circle touches two circles on either side. Find the ratio of the radius of the circles to the side of the square.

a.1:(4+ 7√3) b.1:(2+ 7√2) c.1:(2+ 6√2) d.(2+ 7√2):1

Answer: C 1:(2+ 6√2)

Solution:



$2\sqrt{2}r + 12r = \sqrt{2}a$

$r / a = \sqrt{2}/(2\sqrt{2}r + 12)$

$= 1: (2+6\sqrt{2})$

5. Ferrari S.p.A. is an Italian sports car manufacturer based in Maranello, Italy. Founded by Enzo Ferrari in 1928 as Scuderia Ferrari, the company sponsored drivers and manufactured race cars before moving into production of street-legal vehicles in 1947 as Ferrari S.p.A.. Throughout its history, the company has been noted for its continued participation in racing, especially in Formula One, where it has enjoyed great success. Rohit once bought a Ferrari. It could go 2 times as fast as Mohit's old Mercedes. If the speed of Mohit's Mercedes is 32 km/hr and the

distance travelled by the Ferrari is 952 km, find the total time taken in hours for Rohit to drive that distance.

a.476 b.15.88 c.14.88 d.29.75

Answer: C

Solution: Mohit's Seed = 32 km/hr
So, Rohit's speed = 64 km/hr
Time taken = 952/64 = 14.875

6. A sheet of paper has statements numbered from 1 to 30. For all values of n from 1 to 30, statement n says "At most n of the statements on this sheet are false" Which statements are true and which are false?

   a.The odd numbered statements are true and the even numbered are false.

   b.All statements are true.

   c.The even numbered statements are true and the odd numbered are false.

   d.All statements are false.

   Answer: B

7. There are two boxes, one containing 10 red balls and the other containing 10 green balls. You are allowed to move the balls between the boxes so that when you choose a box at random and a ball at random from the chosen box, the probability of getting a red ball is maximized. This maximum probability is

   a.14/19 b.3/4 c.1/2 d.37/38

   Answer: A

   Solution: The probability will be maximum when all green ball will be in one box along with 9 red balls and a single red ball is in other box
   Probability = ½ + ½ ×9/19 = 14/19

8. There are two water tanks A and B, A is much smaller than B. While water fills at the rate of one litre every hour in A, it gets filled up like 10, 20, 40, 80, 160 .. in tank B. (At the end of first hour, B has 10 litres, second hour it has 20, and so on). If 1/32 of B's volume is filled after 3 hours, what is the total duration required to fill it completely?

   a.10 hours b.7 hours c.9 hours d. 8 hours

Answer: D

Solution: After 3 hours volume filled = 40 litres.

Total capacity if B = 40 ×32 = 1280

Duration required to fill it completely = 8hrs

9. Alok and Bhanu play the following min-max game. Given the expression

   N = 12 + X*(Y - Z)

   where X, Y and Z are variables representing single digits (0 to 9), Alok would like to maximize N while Bhanu would like to minimize it. Towards this end, Alok chooses a single digit number and Bhanu substitutes this for a variable of her choice (X, Y or Z). Alok then chooses the next value and Bhanu, the variable to substitute the value. Finally Alok proposes the value for the remaining variable. Assuming both play to their optimal strategies, the value of N at the end of the game would be

   a.-69 b.30 c.12 d.93
   Answer: C
   Solution: Alok 's 1st choice 9, Bhanu substitutes it to z, 2nd choice 9, she chooses y, 3rd, 9.. she chooses x, then equation wud be 12+9*(9-9)= 12

10. The IT giant Tirnop has recently crossed a head count of 150000 and earnings of $7 billion. As one of the forerunners in the technology front, Tirnop continues to lead the way in products and services in India. At Tirnop, all programmers are equal in every respect. They receive identical salaries ans also write code at the same rate.Suppose 12 such programmers take 12 minutes to write 12 lines of code in total. How many lines of code can be written by 72 programmers in 72 minutes?

    a.432 b.12 c.72 d. 6

    Answer: A

    Solution: 12 programmers take 12 minutes to write 12 lines of code
    So 72 programmers take 12 minutes to write 72 lines of code
    So 72 programmers take 72 minutes to write 432 lines of code

11. A hollow cube of size 5 cm is taken, with a thickness of 1 cm. It is made of smaller cubes of size 1 cm. If 4 faces of the outer surface of the cube are painted, totally how many faces of the smaller cubes remain unpainted?

a. 500 b.900 c. 488 d.800

Answer: C

Solution: Size of big cube = 5cm
Total volume of the big cube = 5*5*5 = 125cm^3
Size of the hollow cube inside the big cube = 3cm
Volume of the hollow space inside the big cube = 3*3*3 = 27cm^3
Therefore, volume occupied by small cubes (or volume of thickness) = 125 - 27 = 98cm^3
Total number of face = 98 * 6 =588
No of painted faces = 25*4 = 100
so answer here would be :-
588-100 = 488

12. On the planet Oz, there are 8 days in a week- Sunday to Saturday and another day called Oz day. There are 36 hours in a day and each hour has 90 min while each minute has 60 sec. As on earth, the hour hand covers the dial twice every day.Find the approximate angle between the hands of a clock on Oz when the time is 12:40 am.

    a.251 b.89 c.111 d.71

    Answer : B

    Solution: Angle covered by hour hand in 1 hour = 360/18 = 20
    Degree in one min 20/90 = 2/9
    Degree angle covered by minute hand in one min = 360/90 = 4 degree
    Relative degree difference = 4 - 2/9 = 34/9
    Now -240 + 34/9 * 40 = 88.88
    So, 89°

13. The pacelength P is the distance between the rear of two consecutive footprints. For men, the formula, n/P = 144 gives an approximate relationship between n and P where, n = number of steps per minute and P = pacelength in meters. Bernard knows his pacelength is 164cm. The formula applies to Bernard's walking. Calculate Bernard's walking speed in kmph.

    a.236.16 b.8.78 c.23.62 d.11.39

    Answer: C
    pacelength = 1.64 m
    number of steps per min (n) = P × 144 = 144× 1.64
    Walking speed in meter per minute = 144 × 1.64 × 1.64
    Speed in kmph $= 144 \times 1.64 \times 1.64 \times 10^{-3} \times 60 = 23.62$

14. A hare and a tortoise have a race along a circle of 100 yards diameter. The tortoise goes in one direction and the hare in the other. The hare starts after the tortoise has covered 1/5 of its distance and that too leisurely. The hare and tortoise meet when the hare has covered only 1/8 of the distance. By what factor should the hare increase its speed so as to tie the race?

    a.40 b.5 c.8 d. 37.8

    Answer: D

    Solution: Hare starts when tortoise has covered 1/5th of the distance. And both meet when hare is at 1/8th of the distance. So hare traveled 1/8 of the distance and tortoise traveled (4/5-1/8=) 27/40 of the distance.

    Since the time taken is same so d/v should be same, consider t as speed of tortoise and h as speed of hare. So.

    27/40t=1/8h

    h=(5/27)t

    Now, to complete the race with a tie, both have to travel the remaining distance in same time. So, hare has to travel 7/8 of the distance and tortoise has to travel the 1/8 of the distance in same time. Speed of tortoise is t and new speed of hare is H. So

    1/8t=7/8H

    H=7t

    Now the factor by which hare's speed is increase can be calculated by the division of H and h.

    7t/(5/27)t

    (7x27)/5

    ~37.80

15. Alok and Bhanu play the following min-max game. Given the expression N=40+X+Y-Z, where X, Y and Z are variables representing single digits (0 to 9), Alok would like to maximize N while Bhanu would like to minimize it. Towards this end, Alok chooses a single digit number and Bhanu substitutes this for a variable of her choice (X, Y or Z). Alok then chooses the next value and Bhanu, the variable to substitute the value. Finally Alok proposes the value for the remaining variable. Assuming both play to their optimal strategies, the value of N at the end of the game would be

    A 49

B 51

C 31

D 58

Answer: A

Solution: Alok 1st choice 9, bhanu substitutes it to z, 2nd choice 9, she chooses y, 3rd, 9.. she chooses x, then equation wud be 40+9+9-9= 49

16. The IT giant Tirnop has recently crossed a head count of 150000 and earnings of $7 billion. As one of the forerunners in the technology front, Tirnop continues to lead the way in products and services in India. At Tirnop, all programmers are equal in every respect. They receive identical salaries and also write code at the same rate. Suppose 14 such programmers take 14 minutes to write 14 lines of code in total. How long will in take 5 programmers to write 5 lines of code in total ?

A 19
B 5
C 14
D 70

Answer: B

17. 14 people meet and shake hands. The maximum number of handshakes possible if there is to be no "cycle" of handshakes is (A cycle of handshakes is a sequence of people a1, a2, ..ak, k>2 such that the pairs {a1,a2}, {a2,a3},…, {a(k-1), ak}, {ak, a1} shake hands).

A 11

B 12

C 10

D 13

Answer: D

Solution: The cycle of handshake nos = 14
i.e.,(a1,a2),(a2,a3).....(a13,a14),(a14,a1).
so, to make it no cycle (or) non-continuous the handshake is
b/w only (a1,a2),(a2,a3).....(a13,a14).

So (a14,a1) will not come.
So no of handshake = 14-1

= 13.

18. 45 suspects are rounded by the police and questioned about a bank robbery. Only one of them is guilty. The suspects are made to stand in a line and each person declares that the person next to him on his right is guilty. The rightmost person is not questioned. Which of the following possibilities are true?
A. All the suspects are lying.
B. The leftmost suspect is guilty.
C. The rightmost suspect is guilty.

A A only

B A and C

C B only

D A and B

Answer: D
Solution: If A is true that means all are lying. i.e leftmost is guilty. So whenever A is true B is also true and whenever B is true A is also true. Hence D

19. The dynamics of crowd behaviour are hard to study because usually people are not reliable witnesses of their own behaviour. Now consider 4 people standing in the queue of a supermarket. You want to predict their behaviour based on their age group. You get to know from the supermarket records that their average age 4 years ago was 43 years. After a while, another person joins the queue and the present average of all the 5 is 40 years. The present age of the last person in the queue is :

A 28 years

B 12 years

C 32 years

D 24 years

Answer: B

Solution: Sum of ages of 4 people 4 years ago = $43 \times 4 = 172$

Sum of the ages of 4 people now = 172 + 16 = 188

Sum of ages of 5 peoples after 5^{th} person join $= 40 \times 5 = 200$

Present age of 5^{th} person $= 200 - 188 = 12$

20. One day Snow-white meets Pal and Unicorn in the Fairyland. She knows the Pal lies on Mondays, Tuesdays and Wednesdays, and tells the truth on the other days of the week. Unicorn, on the other hand, lies on Thursdays, Fridays and Saturdays, but tells the truth on the other days of the week. Now they make the following statements to Snow-white Pal: Yesterday was one of those days when I lie. Unicorn: Yesterday was one of those days when I lie too. What day is it?

A Tuesday

B Monday

C Thursday

D Sunday

Answer: C

Solution: *Case I:* Suppose A is lying today. Today can be Monday, Tuesday or Wednesday. And yesterday he told the truth. So today is Monday. So Unicorn should tell the truth. According to him he was lying yesterday i.e. Sunday. But on Sunday he tells the truth. Hence invalid case
Case II: Suppose A is telling the truth. Today can be Thursday, Friday, Saturday or Sunday. Yesterday he was lying according to him. So Today is Thursday. On Thursday Unicorn lies. So yesterday he was telling truth. Yesterday was Wednesday. It supports our case.

Hence today is **Thursday**.

21. The Barnes Foundation in Philadelphia has one of the most extra-ordinary and idiosyncratic collections in French impressionist art. Dr. Barnes who put together this collection has insisted that the paintings be hung in a particular manner specified by him at a museum designed by the French architect Paul Philippe Cret who also designed the Rodin Museum. The museum has, say, seven galleries â€“ Eugene Boudin, Cassatt, Boudin, Forain, Gonzales, Manet and Monet. Visitors reach the main Eugene Boudin by an elevator, and they can enter and leave the exhibition only through Eugene Boudin gallery. Once inside, visitors are free to move as they

choose. The following list includes all of the doorways that connect the seven galleries: There is a doorway between Eugene Boudin and Cassatt, a doorway between Eugene Boudinand Boudin, and a doorway between Eugene Boudin and Gonzales galleries. There is a doorway between Cassatt and Boudin galleries. There is a doorway between Gonzales and Forain and a doorway between Gonzales and Manet galleries. There is a doorway between Manet and Monet galleries. Which of the following rooms CANNOT be the third gallery that any visitor enters ?

A Monet

B Boudin

C Forain

D Cassatt

Answer: A

Solution: Monet cannot be third gallery that any visitor enters.
according to the conditions there can be four ring connections.
1stly between Eugene Boudin, Cassatt and Boudin.
2ndly between Eugene Boudin,Gonzales and Forain.
3rdly between Eugene Boudin,Gonzales,Manet and Monet .
So,Monet cannot be third gallery that any visitor enters

22. Mr. Beans visited a magic shop and bought some magical marbles of different colours along with other magical items. While returning home whenever he saw a coloured light, he took out marbles of similar colours and counted them. So he counted the pink coloured marbles and found that he has bought 25 of them. Then he counted 14 green marbles and then 21 yellow marbles. He later counted 30 purple coloured marbles with him. But when he reached a crossing, he looked at a red light and started counting red marbles and found that he had bought 23 Red marbles. As soon as he finished counting, it started raining heavily and by the time he reached home he was drenched. After reaching home he found that the red, green and yellow marbles had magically changed colours and became white, while other marbles were unchanged. It will take 1 day to regain its colours, but he needs to give atleast one pair of marbles to his wife now. So how many white marbles must be choose and give to his wife so as to ensure that there is atleast one pair of red, yellow and green marbles ?

A 46

B 35

C 29

D 48

Answer: A

Solution: There are 23, 21, 14 marbles in red yellow and green which turns out to be white.

In worst case scenario select all 23 red and 21 yellow and 2 more green balls. So, a total of 46. Now atleast one pair among them will be of same color

23. A greengrocer was selling watermelon at a penny each, chickoos at 2 for a penny and peanuts at 3 for a penny. A father spent 7p and got the same amount of each type of fruit for each of his three children, Jane, Joe and Jill. Jane is three years older than Jill and Joe is exactly half the age of Jane and Jill together. What did each child get ?

A 1 watermelon, 3 chickoos, 2 peanuts

B 1 watermelon, 1 chickoo, 1 peanus

C 1 watermelon, 2 chickoos, 2 peanuts

D 1 watermelon, 2 chickoos, 1 peanut

Answer: D

Solution: Since he got same amount of each fruit for 3 of his children. So The amount of each fruit is multiple of. The only possible case is for 3 watermelon, 6 chikoos and 1 peanut. So the total amount spent will be 7p.

Hence each child get 1 watermelon, 2 chikoos and 1 peanut.

24. Given 3 lines in the plane such that the points of intersection form a triangle with sides of length 20, 20 and 20, the number of points equidistant from all the 3 lines is

A 4

B 3

C 0

D 1

Answer: D

Solution: It will be the incenter.

25. 33 people {a1, a2,…,a33} meet and shake hands in a circular fashion. In other words, there are totally 33 handshakes involving the pairs, {a1,a2}, {a2,a3},…,{a32, a33}, {a33, a1}. Then the size of the smallest set of people such that the rest have shaken hands with at least one person in the set is

A 10

B 11

C 16

D 12

Answer: C

Solution: The smallest set will be 16.

Choosing one of the people in 32 pairs , {a1,a2}, {a2,a3},…,{a32, a33}

26. Consider two vessels, the first containing one litre of water and the second containing one litre of pepsi. Suppose you take one glass of water out of the first vessel and pour it into the second vessel. After mixing you take one glass of the mixture from the second vessel and pour it back into the first vessel. Which one of the following statements holds now?

A There is less Pepsi in the first vessel than water in the second vessel.

B There is more Pepsi in the first vessel than water in the second vessel.

C There is as much Pepsi in the first vessel as there is water in the second vessel.

D None of the statements holds true.

Answer: D
Solution: Suppose 1 glass of water = 100 ml

Stage 0: Vessel 1 = 1000ml water and Vessel 2 = 1000 ml pepsi

Now,

Stage 1: Take 100 ml (1 glass) water from Vessel 1 and put it in Vessel 2

Vessel 1 = 900 ml water

Vessel 2 = 1000ml pespi + 100 ml water(Water and Pepsi in the ratio 1:10)

Stage 2: Mix contents of Vessel 2 and take 100 ml from Vessel 2 and put it into Vessel 1

Contents taken from Vessel 2 = (1/11 * water + 10/11 * pepsi)*100 = 100/11 water + 1000/11 pepsi

Vessel 1 = 900 water + 100/11 water + 1000/11 pepsi = 10000/11 water + 1000/11 pepsi.....(A)

Vessel 2 = 1000ml pespi + 100 ml water - (100/11 water + 1000/11 pepsi) = 10000/11 pepsi + 1000/11 water....(B)
From (A) and (B), we find that option D is the correct answer!

27. Amok is attending a workshop "How to do more with less" and today's theme is Working with fever digits. The speakers discuss how a lot of miraculous mathematics can be achieved if mankind (as well as womankind) had only worked with fever digits. The problem posed at the end of the workshop is "How many 10 digit numbers can be formed using the digits 1, 2, 3, 4, 5 (but with repetition) that are divisible by 4?" Can you help Amok find the answer?

A 1953125

B 781250

C 2441407

D 2441406

Answer : A

Solution: For a number to be divisible by 4 last two digit of the number should be divisible by 4.
Possible combination of last two digits here are: 12, 24, 32, 44, 52
First eight places in each cases can be filled by 5^8 ways.
Hence Total number of ways = $5 \times 5^8 = 1953125$

28. For the FIFA world cup, Paul the octopus has been predicting the winner of each match with amazing success. It is rumored that in a match between 2 teams A and B, Paul picks A with the same probability as A's chances of winning. Let's assume such rumors to be true and that in a match between Ghana and Bolivia, Ghana the stronger team has a probability of 11/12 of winning the game. What is the probability that Paul with correctly pick the winner of the Ghana-Bolivia game?

A .92

B .01

C .85

D .15

Answer: C

Solution: Probability that Ghana wins = 11/12

So, Probability that Bolivia wins = 1 - 11/12 = 1/12

Now, for Paul to predict the correct result, there are two cases (mutually exclusive)

Case 1: Bolivia wins

So, required probability as per the question = 1/12 * 1/12

Case 2: Ghana wins

So, required probability as per the question = 11/12 * 11/12

So, Desired answer = 1/12 * 1/12 + 11/12 * 11/12 = 122/144 =8.5

Hence, option C

29. There are two boxes, one containing 39 red balls and the other containing 26 green balls. You are allowed to move the balls between the boxes so that when you choose a box at random and a ball at random from the chosen box, the probability of getting a red ball is maximized. This maximum probability is

A .60

B .50

C .80

D .30

Answer: C

Solution: The probability will be maximum if box 1 contain only 1 red ball and box 2 contain 38 red balls and 26 green balls

Required probability = ½ + ½ × 38/64 = 0.80

30. After the typist writes 40 letters and addresses 40 envelopes, she inserts the letters randomly into the envelopes (1 letter per envelope). What is the probability that exactly 1 letter is inserted in an improver envelope?

A $1\frac{1}{40}$

B 1/40

C 1/401

D 0

Answer: D

Solution: It is impossible that exactly 1 letter is inserted in improper envelope. At least 2 letter can be place improperly. Hence probability is 0.

31. A hare and a tortoise have a race along a circle of 100 yards diameter. The tortoise goes in one direction and the hare in the other. The hare starts after the tortoise has covered 1/3 of its distance and that too leisurely. The hare and tortoise meet when the hare has covered only 1/4 of the distance. By what factor should be hare increase its speed so as the win the race?

A 4

B 3

C 12

D 5.00

Answer: D

Solution: Hare starts when tortoise has covered 1/3rd of the distance. And both meet when hare is at 1/4th of the distance. So hare traveled 1/4 of the distance and tortoise traveled (2/3-1/4=) 5/12 of the distance.

Since the time taken is same so d/v should be same, consider t as speed of tortoise and h as speed of hare. So.

5/12t=1/4h

h=(3/5)t

Now, to complete the race with a tie, both have to travel the remaining distance in same time. So, hare has to travel 3/4 of the distance and tortoise has to travel the 1/4 of the distance in same time. Speed of tortoise is t and new speed of hare is H. So

1/4t=3/4H

H=3t

Now the factor by which hare's speed is increase can be calculated by the division of H and h.

3t/(3/5)t

=5

32. A sheet of paper has statements numbered from 1 to 20. For each value of n from 1 to 20, statements n says “At least n of the statements on this sheet are true.” Which statements are true and which are false?

A The odd numbered statements are true and the even numbered are false.

B The first 13 statements are false and the rest are true.

C The first 6 statements are true and the rest are false.

D The even numbered statements are true and the odd numbered are false.

Answer: C

Solution: when atleast one of the statement is true, first one will be true.

first n no. of statements must be true.

when any one statement becomes false,

All the follwing statements also becomes false.