A

Hall Id -

Instructions :

1) The Objective of this test is to assess your performance in various areas of competence like Quantitative Ability, Problem Solving Skills and Verbal Ability.

2) The test is of 120 Minutes, contains 60 questions across three sections.

   Section A - 20 Questions
   Section B - 20 Questions
   Section C - 20 Questions

3) Each Question carries equal marks.

4) Negative marking starts after 25% of the attempted questions turn out to be wrong. For e.g. If you have attempted 16 Questions then the total number of wrong answers you are allowed is 4. If you get less than 4 questions wrong, then there will be no negative marking. If you get 10 wrong, then 6 of them will draw negative mark of 50% each. Each section is treated independently for negative marking.

5) Each questions has one and only one correct answer choice.

6) You NEED to submit the question paper along with the answer sheet, at the end of the examination.

IMPORTANT : Question paper type is mentioned in the box above. Do not forget to mark the correct question paper type in your answer sheet. Your answer sheet will not be evaluated if you don't mark correctly or if you leave it blank.

Do Not Ignore any Section.
Good Luck !

Reg Id.

MOCK TEST - 1

SECTION A (Quantitative Aptitude)
(20 Questions)

Commonly used Maths Formula have been provided for quick reference

Series :

a) Sum of first n natural numbers, 1+2+3+4+….n = $\frac{\boldsymbol{n\,(n+1)}}{\boldsymbol{2}}$

b) Sum of Squares of first n natural numbers, $1^2+ 2^2 +\ldots..n^2 = \frac{\boldsymbol{n\,(n+1)(2n+1)}}{\boldsymbol{6}}$

c) Sum of cubes of first n natural numbers, $1^3+ 2^3 +\ldots..n^3 = (\frac{\boldsymbol{n\,(n+1)}}{\boldsymbol{2}})^2$

d) Sum of first n terms of A.P. , $S_n = \frac{n}{2}$ [2a + (n-1)d]

e) Sum of first n terms of G.P. , $S_n = \frac{\boldsymbol{a(1-r^n)}}{\boldsymbol{1-r}}$, when r ≠1

Area/Volume :

a) Surface area of Sphere = 4 π r^2

b) Volume of Sphere = $\frac{4}{3}$ π r^3

c) Curved Surface area of Cone = π r l

d) Slant height of cone, l = $\sqrt{(r^2 + h^2)}$

e) Total Surface area of Cone = π r (r + l)

f) Volume of Cone = $\frac{1}{3}$ π r^2 h

g) Curved Surface area of Cylinder = 2 π r h

h) Volume of Cylinder = π r^2 h

i) Total Surface Area of Cylinder = 2 π r (r + h)

j) Area of Rhombus = $\frac{Product\ of\ its\ diagonals}{2}$

k) Rhombus diagonals are at Right Angles

l) Area of Triangle with sides a, b and c ,
$\sqrt{s(s-a)(s-b)(s-c)}$ where s= $\frac{(a+b+c)}{2}$

Trigonometry/ Geometry :

a) Sin 90 = 1 ; Sin 60 = $\sqrt{3}/2$; Sin 45 = $1/\sqrt{2}$; Sin 30 = $\frac{1}{2}$

b) In a right angle triangle , $(hypotenuse)^2 = (side\ 1)^2 + (side\ 2)^2$

Equations / Polynomials / Maxima / Minima :

a) Roots of a Quadratic Equation ax^2 + bx + c = 0 are $x = \frac{-b\pm\sqrt{b^2-4ac}}{2a}$

b) A function of y = f(x) will have maxima or minima when $\frac{dy}{dx} = 0$

Logarithm :

a) Log b + log c = log(bc)
b) Log b – log c = log (b/c)
c) Log b^a = a log b
d) If $\log_a b$ = c , then b = a^c
e) log is to base 10 unless specified otherwise

Algebra :

a) $a^3 + b^3$ = (a+b)($a^2 - ab + b^2$)
b) $a^3 - b^3$ = (a-b))($a^2 + ab + b^2$)

Permutation & Combination :

a) $n_{c_0} + n_{c_1} + n_{c_2} + \cdots \ldots \ldots + n_{c_n} = 2^n$

Suggestion from Authors :

- These Formulas are already provided in the Original Elitmus pH test before the Quantitative aptitude Questions, you don't have to memorise them.
- We are providing these only once for all the 10 Mock Papers, it would be better if you take a Print out of this Formula list so that you don't have to come to this page again and again.
- For better results, we Suggest you to Try Solving the Questions yourself first, thereafter verify it from the Solutions provided.
- Read the instructions given on the Instructions Page carefully and abide by them.
- Understand, you are competing at the National level and your percentile matters a lot to get an Interview Call , so attempt only those Questions of which you are 100% Sure.
- Practice Each Question from this book at least once before your pH test. All the Best.

Q1. There is an unlimited stock of Blue, Red, White and Grey coloured balls. The balls of each colour are identical. Find the number of ways of selecting 12 balls from the stock?

(a) 35 (b) 495 (c) 465 (d) 455

Solution :

Let the number of Blue, Red, White and Grey coloured balls selected be x_1, x_2, x_3, x_4 respectively .

Then, $x_1 + x_2 + x_3 + x_4 = 12$

We know that the number of non-negative integral solutions of the equation, $x_1 + x_2 + x_3 + x_4 = n$ is $(n + k - 1)_{c_{(k-1)}}$

Here, n = 12 and k = 4.

So, the required answer is $(12 + 4 - 1)_{c_{(4-1)}} = 15_{c_3} = 455$. **Ans. (d)**

Q2. Let A and B be two solid spheres such that the surface area of B is 300% higher than the surface area of A. The volume of A is found to be k% lower than the volume of B. The value of k must be

(a) 85.5 (b) 92.5 (c) 90.5 (d) 87.5

Solution :

The surface area of a sphere is proportional to the square of the radius.

Thus, $\frac{S_B}{S_A} = \frac{4}{1}$ (S. A. of B is 300% higher than A)

Therefore, $\frac{r_B}{r_A} = \frac{2}{1}$

The volume of a sphere is proportional to the cube of the radius.

Thus, $\frac{V_B}{V_A} = \frac{8}{1}$

Or, V_A is $\frac{7}{8}$th less than B i.e. 87.5% **Ans. (d)**

Q3. In a 4000 meter race around a circular stadium having a circumference of 1000 meters, the fastest runner and the slowest runner reach the same point at the end of the 5th minute, for the first time after the start of the race. All the runners have the same staring point and each runner maintains a uniform speed throughout the race. If the fastest runner runs at twice the speed of the slowest runner, what is the time taken by the fastest runner to finish the race?

(a) 20 min (b) 15 min (c) 10 min (d) 5 min

Solution :

The ratio of the speeds of the fastest and the slowest runners is 2 : 1. Hence they should meet at only one point on the circumference i.e. the starting point (As the difference in the ratio in reduced form is 1). For the two of them to meet for the first time, the faster should have completed one complete round over the slower one. Since the two of them meet for the first time after 5 min, the faster one should have completed 2 rounds (i.e. 2000 m) and the slower one should have completed 1 round. (i.e. 1000 m) in this time. Thus, the faster one would complete the race (i.e. 4000 m) in 10 min. **Ans. (c)**

Q4. There are 4 quarts in a gallon. A gallon of petrol sells for Rs.12 and a quart of the same petrol sells for Rs.5. The owner of a rental agency has 6 machines and each machine needs 5 quarts of petrol. What is the minimum amount of money he must spend to purchase enough petrol?

(a) Rs.84 (b) Rs.94 (c) Rs.96 (d) Rs.102

Solution :

Total oil needed = 6 × 5 = 30 quarts = 7 gallons and 2 quarts. [Since, 7 x 4 = 28 + 2]

∴ The cost of oil/quart is cheaper when you purchase by the gallon, he should buy at least 7 gallons of oil. However, in order to get the remaining 2 quarts, it is cheaper to buy 2 quarts individually rather than another gallon. ∴ The minimum amount = 7 × Rs.12 + 2 × Rs.5 = Rs.94. **Ans. (b)**

Q5. If the sum of five consecutive positive integers is A, then the sum of the next five consecutive integers in terms of A is:

(a) A+1 (b) A+5 (c) A+25 (d) 2A

Solution :

If you divide the sum obtained by adding any 5consecutive numbers by '5',

then you will get the Center number of the sequence itself.

i.e. 1 to 5 = 15/5 = 3 . 1, 2, 3, 4, 5

so, sixth consecutive number will be '3' more than the 'Middle term'

i.e. 3+3=6, similarly 3+4=7

Hence going by this. Asked sum would be

[(A/5) + 3]+[(A/5) + 4]+[(A/5) + 5]+[(A/5) + 6]+[(A/5) + 7] = A + 25

Ans. (b)

Q6. A business school club, Friends of Foam, is throwing a party at a local bar. Of the business school students at the bar, 40% are first year students and 60% are second year students. Of the first year students, 40% are drinking beer, 40% are drinking mixed drinks, and 20% are drinking both. Of the second year students, 30% are drinking beer, 30% are drinking mixed drinks, and 20% are drinking both. A business school student is chosen at random. If the student is drinking beer, what is the probability that he or she is also drinking mixed drinks?

(a) 2/5 (b) 4/7 (c) 10/17 (d) 7/24

Solution :

The probability of an event A occurring is the number of outcomes that result in A divided by the total number of possible outcomes.

The total number of possible outcomes is the total percent of students drinking beer.

40% of the students are first year students. 40% of those students are drinking beer.

Thus, the first years drinking beer make up (40% * 40%) or 16% of the total number of students.

60% of the students are second year students. 30% of those students are drinking

beer. Thus, the second years drinking beer make up (60% * 30%) or 18% of the

total number of students.

(16% + 18%) or 34% of the group is drinking beer.

The outcomes that result in A is the total percent of students drinking beer and

mixed drinks.

40% of the students are first year students. 20% of those students are drinking both beer and mixed drinks. Thus, the first years drinking both beer and mixed drinks make up (40% * 20%) or 8% of the total number of students.

60% of the students are second year students. 20% of those students are drinking both beer and mixed drinks. Thus, the second years drinking both beer and mixed drinks make up (60% * 20%) or 12% of the total number of students.

(8% + 12%) or 20% of the group is drinking both beer and mixed drinks.

If a student is chosen at random is drinking beer, the probability that they are also drinking mixed drinks is (20/34) or 10/17. **Ans. (c)**

Q7. How many even integers n, where 100 ≤ n ≤ 200, are divisible neither by seven nor by nine?

(a) 39 (b) 37 (c) 40 (d) 38

Solution :

There are 101 integers in all, of which 51 are even. From 100 to 200, there are 14 multiples of 7, of which 7 are even. There are 11 multiples of 9, of which 6 are even. But there is one integer (i.e. 126) that is a multiple of both 7 and 9 and also even. Hence the answer is (51 – 7 – 6 + 1) = 39 **Ans. (a)**

Q8. The diameter of the smaller circle is equal to the side of the square and the diagonal of the square is equal to the diameter of the bigger circle. If the circles are concentric, then their areas are in the ratio

(a) 1 : 2 (b) 2 : 3 (c) 1 : 2 (d) 1 : 4

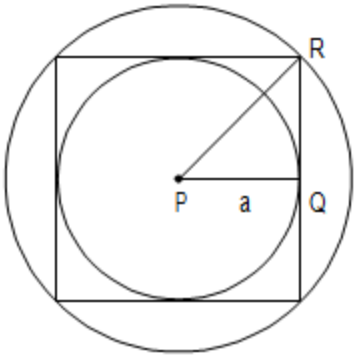
Solution :

The figure can be drawn as such

If radius of smaller circle = PQ = a then QR = a and

PR = $\sqrt{(PQ^2 + QR^2)}$ = $\sqrt{(a^2 + a^2)}$ = a $\sqrt{2}$

Area of smaller Circle = $\pi\ a^2$



Area of bigger circle = π (a $\sqrt{2}$)^2 = 2 π a^2

Ratio of their areas = 1 :2 **Ans. (c)**

Q9. If 10*x/(x+y)+ 20*y/(x+y)=k and if x is less than y, which of the following could be the value of k?

(a)10 (b)12 (c)15 (d)18

Solution :

$$10*\frac{x}{x+y}+20*\frac{y}{x+y}=k$$

$$10*\frac{x+2y}{x+y}=k$$

$$10*(\frac{x+y}{x+y}+\frac{y}{x+y})=k$$

Finally we get: $10*(1+\frac{y}{x+y})=k$

We know that $x<y$

Hence $\frac{y}{x+y}$ is more than 0.5 and less than 1

$0.5<\frac{y}{x+y}<1$

So, $15<10*(1+\frac{y}{x+y})<20$

Only answer between 15 and 20 is 18. **Ans. (d)**

Q 10. A Coach is filling out the starting lineup for his indoor soccer team. There are 10 boys on the team, and he must assign 6 starters to the following positions: 1 goalkeeper, 2 on defence, 2 in midfield, and 1 forward. Only 2 of the boys can play goalkeeper, and they cannot play any other positions. The other boys can each play any of the other positions. How many different groupings are possible?

(a)60 (b) 210 (c) 2580 (d) 3360

Solution :

2C1 select 1 goalkeeper from 2 boys;
8C2 select 2 defence from 8 boys (as 2 boys can only play goalkeeper 10-2=8);
6C2 select 2 midfield from 6 boys (as 2 boys can only play goalkeeper and 2 we've already selected for defence 10-2-2=6);
4C1 select 1 forward from 4 boys (again as 2 boys can play only goalkeeper, 4 we've

already selected for defence and midfield 10-2-4=4)

Total # of selection=2C1*8C2*6C2*4C1=3360 **Ans. (d)**

Q 11. A man cycling along the road noticed that every 12 minutes a bus overtakes him and every 4 minutes he meets an oncoming bus. If all buses and the cyclist move at a constant speed, what is the time interval between consecutive buses

(a)5 minutes (b) 6 minutes (c) 8 minutes (d) 9 minutes

Solution :

Let's say the distance between the buses is d. We want to determine $Interval=\frac{d}{b}$, where b is the speed of bus.

Let the speed of cyclist be c.

Every 12 minutes a bus overtakes cyclist: $\frac{d}{b-c}=12$, $d=12b-12c$;

Every 4 minutes cyclist meets an oncoming bus: $\frac{d}{b+c}=4$, $d=4b+4c$;

$d=12b-12c=4b+4c$, --> $b=2c$, --> $d=12b-6b=6b$.

$Interval=\frac{d}{b}=\frac{6b}{b}=6$ **Ans. (b)**

Q 12. ABCDE is a regular pentagon with F at its center. How many different triangles can be formed by joining 3 of the points A,B,C,D,E and F?

(a) 10 (b) 15 (c) 20 (d) 25

Solution :

Regular pentagon is a pentagon where all sides are equal. In such pentagon center is not collinear to any two vertices, so ANY three points (from 5 vertices and center point) WILL form the triangle.

The question basically asks how many triangles can be formed from the six points on a plane with no three points being collinear.

As any 3 points from 6 will make a triangle (since no 3 points are collinear), then:

6C3=20 **Ans. (c)**

Q 13. If $5^{10x} = 4{,}900$ **and** $2^{\sqrt{y}} = 25$ **. What is the value of** $\frac{(5^{(x-1)})^5}{4^{-\sqrt{y}}}$ **?**

(a) 5 (b) 28/5 (c) 13 (d) 14

Solution :

First thing one should notice here is that x and y must be some irrational numbers (4,900 has other primes then 5 in its prime factorization and 25 doesn't have 2 as prime at all), so we should manipulate with given expression rather than to solve for x and y.

$$5^{10x} = 4{,}900 \rightarrow (5^{5x})^2 = 70^2 \rightarrow 5^{5x} = 70$$

$$\frac{(5^{(x-1)})^5}{4^{-\sqrt{y}}} = 5^{(5x-5)} * 4^{\sqrt{y}} = 5^{5x} * 5^{-5} * (2^{\sqrt{y}})^2 = 70 * 5^{-5} * 25^2 = 70 * 5^{-5} * 5^4 = 70 * 5^{-1} = \frac{70}{5} = 14$$

Ans. (d)

Q 14. How many zeroes are there between the decimal point and the first significant digit in $(1/9)^{200}$ **given** $\log_{10}3 = 0.4771$**?**

(a)84 (b) 85 (c) 191 (d) 190

Solution :

After taking log to the given number if the mantissa of the logarithm is negative, then the characteristic is equal to the number of zeroes immediately following the decimal point.

Therefore, $\log (1/9)^{200} = \log (9^{-200}) = -200 \log (3^2) = -400 \log (3) = -400(0.4771) = -190.84$.

Hence, the number $(1/9)^{200}$ will have 190 zeroes immediately after the decimal point.

Ans. (d)

Q 15. A shepherd has 1 million sheep at the beginning of Year 2000. The numbers grow by x% (x > 0) during the year. A famine hits his village in the next year and many of his sheep die. The sheep population decreases by y% during 2001 and at

the beginning of 2002 the shepherd finds that he is left with 1 million sheep. Which of the following is correct?

(a) x > y (b) y > x (c) x = y (d) Cannot be determined

Solution :

Let us assume the value of x to be 10%.
Therefore, the number of sheep in the herd at the beginning of year 2001 (end of 2000) will be 1 million + 10% of 1 million = 1.1 million

In 2001, the numbers decrease by y% and at the end of the year the number sheep in the herd = 1 million.
i.e., 0.1 million sheep have died in 2001.

In terms of the percentage of the number of sheep alive at the beginning of 2001, it will be (0.1/1.1)×100 % = 9.09%.

From the above illustration it is clear that **x > y.**

Ans. (a)

Q 16. There is a square paper with each of its sides measuring 50 cm. A student has to cut a triangular piece of paper out of this square but can only straight line cut the piece once. The length of a single straight line cut is exactly 30 cm. What is the maximum area of the triangular part obtained (in cm^2)?

(a)450 (b) 150 (c) 225 (d) 400

Solution :

The triangle has to be cut out of the given square with one of its sides as 30 cm. Now, the area would be maximum when the triangle would be a right angled isosceles triangle with the cut of 30 cm being the hypotenuse.

Thus, length of each perpendicular side = $\frac{30}{\sqrt{2}}$ = 15 × $\sqrt{2}$

Thus, area = (0.5) × (15 × $\sqrt{2}$) × (15 × $\sqrt{2}$) = 225 cm^2

Ans. (c)

Q 17. The numbers {1, 3, 6, 7, 7, 7} are used to form three 2-digit numbers. If the sum of these three numbers is a prime number p, what is the largest possible value of p?

(a)211 (b)151 (c) 219 (d) 209

Solution :

What is the largest possible sum of these three numbers that we can form? Maximize the first digit: 76+73+71=220=even, so not a prime. Let's try next largest sum, switch digits in 76 and we'll get: 67+73+71=211=prime.

Ans. (a)

Q 18. The number of possible real solution(s) of y in equation $y^2 - 2y\cos x + 1 = 0$ is

(a) 0 (b) 1 (c) 2 (d) 3

Solution :

We have, $y^2 - 2y\cos x + 1 = 0$

$\Delta = 4\cos^2 x - 4$

For real values of y, we should have Δ greater than or equal to 0.

But here, Δ cannot be greater than 0.

$\therefore \Delta = 0$ for the real values of y

$\therefore 4\cos^2 x - 4 = 0$ gives $\cos x = \pm 1$

$\therefore \cos x = 0°$ or $180°$

So for these 2 values of x, we get 2 real solutions.

Ans. (c)

Q 19. Ajay purchased four varieties of rice at the rate of 2 kgs/Re., 3 kgs/Re., 4kgs/Re.and 5 kgs/Re. If he mixes all the four varities of rice in the ratio 4 : 3 : 2 : 1 in the given order, then the price at which Ajay should sell the mixture to make a profit of 20% is

(a)2.5 kgs/Re. (b) 3.6 kgs/Re. (c) 3 kgs/Re. (d) $\frac{250}{111}$ kgs / Re.

Solution :

The prices at which Ajay purchased 4 varieties of rice are 50 paise/kg, $\frac{100}{3}$ paise /kg, 25 paise/kg and 20 paise/kg respectively.

They are mixed in the ratio 4:3:2:1. Let, the cost price of the mixture be 'X'.

X = $\frac{1}{10}(4 * 50 + 3 * \frac{100}{3} + 2 * 25 + 1 * 20)$ = 37 paise/Kg.

In order to make a profit of 20%, the selling price of the mixture

will be 1.2 × 37 paise/kg = $\frac{250}{111}$ kgs / Re **Ans. (d)**

Q 20. If the sum of the first thirteen terms of an AP and the sum of the next twelve terms of the progression are in the ratio 26 : 49, then what is the ratio of the thirteenth term to the seventh term of the progression?

(a)3:2 (b) 1:4 (c) 1:5 (d) 4:5

Solution :

Sum of the first thirteen terms = 13 × middle term = 13 × seventh term (say a) = 13a
Sum of the first twenty five terms = 25 × middle term = 25 × thirteenth term(say b) = 25b

Therefore, Sum of the next twelve terms after the first thirteen terms = 25b–13a
Given, 13a/(25b–13a) = 26/49

b/a = 3/2. **Ans. (a)**

Section B (Problem Solving)

20 Questions

<u>Direction For Questions 21 to 24</u> : Answer the questions based on the following information.

ABC is a firm which deals with furniture. Manufacturing of table requires three levels of assembly. The finished table is at first level. The leg assembly and table top are second level. The pieces that go into the leg assembly are at the third level which consist of shortrails, longrails and legs. One unit of table requires one unit of tabletop and one unit of leg assembly. One unit of leg assembly requires 2 units of shortrails, 2 units of longrails and 4 units. Orders are placed just in time to minimize storage.

The lead time for activities are (Lead time is waiting time required to complete one activity)

Parts	Weeks
Assamble table	1
Finished leg assembly	1
Purchase legs	1
Purchase shortrails	1
Purchase longrails	1
Purchase table top	2

The availability of part at present time

Parts	Units
Table	50
Leg assembly	100
Legs	150
Shortrails	50
Longrails	0
Table top	50

Demand of finished Tables

Details	Week 4	Week5	Week6
Demands (units)	200	150	100

21. For meeting the demand of 200 units of finished table of week 4, when would the first order of tabletops be placed?

(a) Week 1 (b) Week 3 (c) Week 4 (d) Week 5

22. When and how many units of shortrail would be placed for meeting the demand of finished table of week 6?

(a) 100 units in week 1 (b) 200 units in week 3 (c) 300 units in week 6 (d) Data insufficient

23. If in-hand units of legs are increased from 150 to 300, then what would be the net requirements of legs for meeting the demand of finished table of week 5?

(a) 1800, 900 (b) 2200, 1100 (c) 1600, 800 (d) 800, 400

24. The supplier of longrails has shiftedhis manufacturing unit to its new location. Because of this the delivery time of long rail has been increased by 1 week. When would the order of longrails be placed to meet the week 5 demand of finished table?

(a) Week 1 (b) Week 4 (c) Week 5 (d) None of above

Solution :

Details of components available on a particular week.
Figure in bracket represent the week to which components belong.

Details	Week1	Week 2	Week 3	Week 4	Week 5	Week 6
Table	50	50+50	100	200	150	
Leg assembly	100	100 – 50 = 50(4)	100(4)	150(6)	100(6)	
Legs	150	150 + 50=200(6)	600(5)	400(6)		
Shortrails	50	50 + 50 = 100(4)	300(5)	200(6)		
Longrails	0	100 (4)	300(5)	200(6)		
Top	50	50 – 50 = 0	100(4)	150(5)	100(6)	

Details of component ordered on a particular week.

Details	Week1	Week 2	Week 3	Week 4	Week 5	Week 6
Table						
Leg assembly						
Legs	50(4)	600(5)	400(6)			
Shortrails	50(4)	300(5)	200(6)			
Longrails	100(4)	300(5)	200(6)			
Top	100(4)	150(5)	100(4)			

21. Answer = (a) Week 1

22. Answer = (b) 200 units' week 3, refer the table above.

The gross requirement of leg is 200 and 600 in week 3 out of 300 in – hand units of legs, 200 units would be used for wek2 requirement and the rest units would be used for meeting the requirements of week 3. Therefore net requirement of week would be 600 – 100 = 500 units of legs for meeting the demand of finished table of week 5.

23. Answer = (b) For meeting the additional demand of 200 tables

Shortrails = 4 ×200 = 800

Legs = 8 × 200 = 1600

Total shortrails = 300 + 800 = 1100

Total legs = 600 + 1600= 2200.

24. Answer = (a) Week 1

As lead – time increased by 1 week so planned order release would be by one week ahead.

Direction For Questions 25 to 26 : Answer the questions based on the following information.

There are five sets of digits - Set A, Set B, Set C, Set D and Set E as shown in given diagram. Set A contains one digit, Set B contains two digits, Set C contains three digits, Set D contains two digits and Set E contains one digit. Rearrange the digits, across the sets such that the number formed out of digits of Set C is multiple of the numbers formed from digits in the sets on either side. For example; in the given diagram, Set C is a

multiple of digits in Set A and Set B but not of Set D and Set E.

SET A	SET B	SET C	SET D	SET E
7	28	196	34	5

25. What is the minimum number of rearrangements required to arrive at the solution? A rearrangement is defined as an exchange of positions between digits across two sets. For example: when 1 from set C is exchanged with 5 of set E, it is counted as one rearrangement.

(a) 2 (b) 5 (c) 8 (d) 3

26. Which of the following pair of digits would occupy set A and E?

(a) 2 and 4 (b) 2 and 6 (c) 3 and 6 (d) 3 and 9

Solution :

We have,

SET A	SET B	SET C	SET D	SET E
7	28	196	34	5

Now in the first rearrangement, 7 from set A is exchanged with 2 of set B to get the following:

SET A	SET B	SET C	SET D	SET E
2	78	196	34	5

Now in the second rearrangement, 4 from set D is exchanged with 5 of set E to get the following:

SET A	SET B	SET C	SET D	SET E
2	78	196	35	4

Now in the third rearrangement, 9 from set C is exchanged with 5 of set D to get the following:

SET A	SET B	SET C	SET D	SET E
2	78	156	39	4

Thus, a minimum of 3 rearrangements are required.

Hence, From above tables.

25. Answer = (d)

26. Answer = (a)

Direction For Questions 27 to 28 : Answer the questions based on the following information.

In order to save the world from the hands of evil forces, eight superheroes are sitting around a circular table to plan their strategy. It was known that Batman and Robin neither sat on adjacent seats nor directly opposite to each other. Superman sits besides Flash Gordon and opposite to Heman while Man-drake sat directly opposite to Phantom who sits adjacent to Superman.

27. The eighth hero, Spiderman, must be sitting next to

(a) Batman (b) Robin (c) Phantom (d) Heman

28. Which of the following statements must be true?

(a) Batman sits to the left of Heman.

(b) Robin sits to the left of Flash Gordon.

(c) Spiderman sits to the right of Phantom.

(d) None of these

Solution :

It is known that:

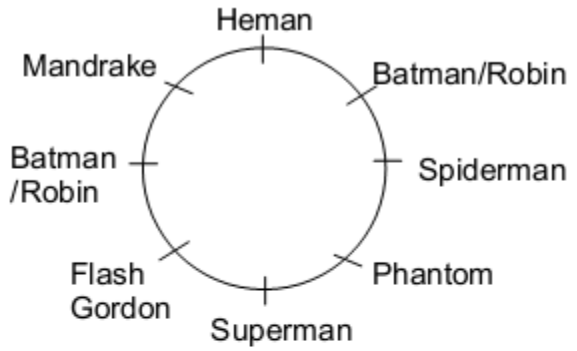
(1) Batman neither sits adjacent nor sits opposite to Robin.

(2) Superman sits between flash Gordon and Phantom (this will give rise to two arrangements)

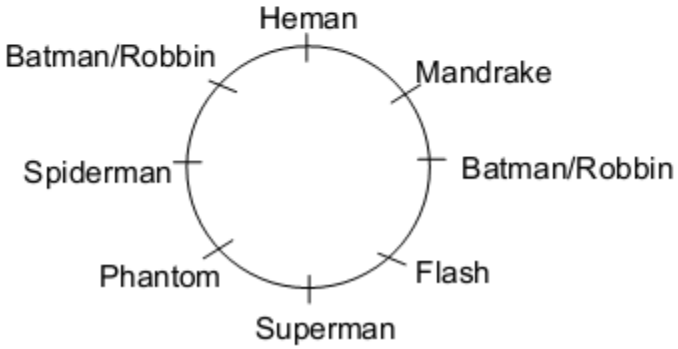
(3) Heman sits opposite Superman and adjacent to Mandrake, who sat directly opposite Phantom.

Hence, we get the following arrangements:

Case – I Flash sits to the left of Superman



Case – II Phantom sits to the left of Superman



27. Answer = (c) As can be observed in the above possibilities, the Spiderman must be seated adjacent to the Phantom.

28. Answer = (d) The position of Batman and Robin are not fixed, hence choices (a) and (b) cannot be correct. As in case II, Spiderman sits to the left of the Phantom; hence even choice (c) is incorrect.

Direction For Questions 29 to 32 : Each question is followed by two statements. You have to decide whether the information provided in the statements is sufficient for answering the question.

Mark a if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.

Mark b if the question can be answered by using either statement alone.

Mark c if the question can be answered by using both statements together, but cannot be answered by using either statement alone.

Mark d if the question cannot be answered even by using both the statements together.

29. Find the profit percentage earned by the trader.

I. The loss incurred by the trader, when he sells at three-fourth the actual selling price is twice the profit made by the trader when he sells at the actual selling price.

II. Had he sold at 20% less than the actual selling price, the trader would have made a profit of 20%.

Solution :

From statement I, $\left(\mathbf{CP} - \frac{\mathbf{3\ SP}}{\mathbf{4}}\right) = 2(SP - CP)$

As we can find the ratio of SP and CP, profit percentage can be found.

From statement II, 0.8 SP = 1.2 CP

As the ratio of SP and CP is given, profit percentage can be found. **Ans. (b)**

30. There is an amount of Rs.5 in a bag which has only 25 paise coins, 50 paise coins and 1 rupee coins. How many coins are there in the bag? Assume that there is at least one coin of each denomination.

I. The number of one rupee coins is two.

II. The difference between the number of 25 paise coins and 50 paise coins is 6.

Solution :

Using statement I alone, the number of 1 rupee coins, 50 paise coins and 25 paise coins

can be (2, 3, 6), (2, 1, 10), (2, 2, 8) .....

Statement I alone is not sufficient to answer the question.

Using statement II alone, for the difference in the number of 25 paise and 50 paise coins to be 6, consider the cases given below. Note that the number of 25 paise coins can be even only.

Number of 25 paise coins → m

Number of 50 paise coins → n

m	possible n
2	1/3/5/7
4	2/4/6
6	1/3/5
8	2/4
10	1/3
12	2
14	1

Only for m = 8 and n = 2, |m – n| = 6

Statement II alone is sufficient. **Ans. (a)**

31. a and b are two positive numbers. How many of them are odd?

I. Multiplication of b with an odd number gives an even number.

II. a^2– b is even.

Solution :

From statement I,

b is even but nothing can be said about a

From statement II, $a^2 - b$ is even only if both are of the same parity (odd or even)
Combining the two statements, a is also even.

∴ Neither of a and b is odd.

Using both the statements we can answer the question. **Ans. (c)**

32. Is the perimeter of triangle ABC greater than 20?

I. BC-AC=10.

II. The area of the triangle is 20.

Solution :

This problem could be solved knowing the following properties:

For(I):

The length of any side of a triangle must be larger than the positive difference of the other two sides, but smaller than the sum of the other two sides.

Now, as BC-AC=10 then BC>10 and also according to the above property the third side AB is also more than 10, so the perimeter is more than 20. **Sufficient.**

For(II):

A. For a given perimeter equilateral triangle has the largest area.
B. For a given area equilateral triangle has the smallest perimeter.

Let's assume the perimeter is 20. The largest area with given perimeter will have the equilateral triangle, so side=20/3. Let's calculate the area and if the area will be less than 20 it'll mean that perimeter must be more than 20.

$Area = s^2 * \frac{\sqrt{3}}{4} = (\frac{20}{3})^2 * \frac{\sqrt{3}}{4} = \frac{100 * \sqrt{3}}{9} = \frac{173}{9} < 20$, ($\sqrt{3} \approx 1.73$.) → hence area is more than 20. **Sufficient. Ans. (b)**

Direction For Questions 33 to 37 : Answer the questions based on the following information.

12 Hockey teams participated in a tournament. These teams were equally distributed into 2 pools A and B. In the 1st round, each team played a match against all the other teams in the same pool. Top 3 teams with highest average (from both the pools) went to the next round, where all the six teams played against each other once.

Again the top 3 teams with highest average qualified to the finals. In the final round, all the 3 teams played against each other and the team with the highest average was declared the winner.

Scoring: A win earns 4 points, loss earns -2, and a tie will result in 2 each.

Average = Total points/ Number of matches

The following table shows the points tally

Teams	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6
Total	28	0	10	0	16	6	-6	26	6	12	4	14
Average	2.33	0	1	0	1.6	1.2	-1.2	2.16	1.2	1.2	0.8	1.16

Also

-- The winner of the tournament won both its matches in the finals

-- The total points earned by all the teams (Played in the second round) after second round are 100.

33. Which 2 teams do not play against each other in the finals?

(a) A1,B2 (b) A1,B6 (c) A5,B2 (d) B2,B6

34. Find the number of matches won by A2 and A4

(a) 0 (b) 1 (c) 2 (d) 3

35. How many points did the second runner up earn in the finals?

(a) -4 (b) 2 (c) 4 (d) 0

36. After round 2, the highest average of any team can be

(a) 2 (b) 2.4 (c) 2.6 (d) 2.8

37. The first runner up of the tournament was

(a) A1 (b) B1 (c) B6 (d) None of these

Solution :

The teams playing in second round are **A1, A3 A5,B2,B4 and B6**.

Final is played between **B2, B6 and A1**.

Total points earned by the teams which dropped out in second round are 10 + 16 +12 =38. So points earned by B2, B6 and A1 after round 2 is 100-38 = 62.

Total points earned by these teams after final round = 28 +26+14=68, ie. They together earned 6 points in the 3 matches happened in the final round. A1 won both its matches in

final ie. It got 8 points. So the points earned in these 2 matches =4+4-2-2 =4 points. So the match between B2 and B6 resulted in 2 points. Hence it cannot be a draw.

Suppose, B2 had lost that match , then it must've lost 4 points in the final round , while B6 must've gained 2 points which means it's points after second round must've been 12, equal to that of B4, which contradicts the fact that top 3 with highest average made it to the finals. Hence B2 must've won the B2 v/s B6 encounter. That means B2's points after second round must've been 24. while B6's must've been 18.

Hence

33. Answer = (c)

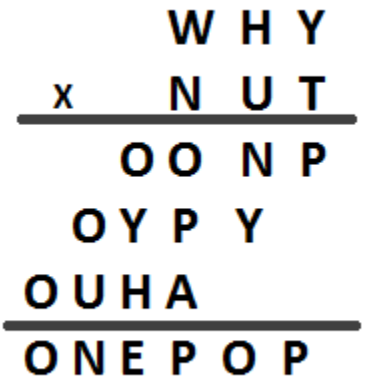
34. Answer = (c)

35. Answer = (a)

36. Answer = (b)

37. Answer = (d)

<u>Direction For Questions 38 to 40</u> : A Multiplication is given below where each letter stands for a single digit number and no two numbers are represented by the same letter.



38. Which of these is not divisible by 2 ?

(a) W (b) Y (c) U (d) N

39. All of these digits appear only once in the multiplication above except :

(a) 2 (b) 5 (c) 6 (d) 8

40. Which of these can be sides of a triangle ?

(a) HYT (b) OWY (c) EUO (d) APW

Solution :

SECTION C (Verbal Ability)
(20 Questions)

Direction For Questions 41 to 44 : Choose the most appropriate choice to fill-in or replace the underlined portion(s) of the sentences below :

41. This _____ a treat

(a) calls at (b) calls against (c) calls (d) calls for

Solution : (d) Calls for

42. The mangoes _____ over time said Ashok.

(a) will ripen (b) was ripe (c) ripes (d) ripe

Solution : (a) will ripen

43. The least considered in the latest Maoist attacks _____the innocent victims.

(a) was (b) were (c) are (d) have been

Solution : (c) are

44. Uprooting plants _____ like uprooting your life

(a) are (b) have been (c) is (d) was

Solution : (c) is

Direction For Questions 45 to 56 : Read each of the following passages carefully and choose the best answer for the questions that follow it.

The single most important and fundamental difference between Chinese and Occidental peoples is undoubtedly the role played by the individual in the society. In the West, we place a strong emphasis on personal achievement, creativity, and initiative. We glory in our individual differences, nurture them, and value them as the essential features that make us unique.

Indeed, uniqueness is a goal unto itself in the West; it's vitally important to us that we not be exactly like other people.

Who in the West hasn't been admonished to be your own person, or to look out for yourself because no one else can be counted on to look out for you ? Who has never been praised for standing up for what you personally believe in, especially when

the tide of opinion is flowing in the opposite direction ? Among Western peoples, the premium is not on conformity; it is on individual expression and rugged independence.

In China, on the other hand—and no matter which side of the Taiwan strait—children are given an entirely different set of messages. Don't question the world around you or try to change it; accept it. Submit willingly and unquestioningly to authority.

Your importance as an individual is not nearly as great as that of the role you play in a larger group.

That "larger group" may have appeared different in ancient China from what it looks like today. In Imperial China, it would have been one's extended family—grandparents, father, mother, siblings, uncles, aunts, and cousins of all descriptions, all of whom might well have lived together in the same compound. In modern day China, the group might be one's nuclear family, one's class at school, one's military unit, fellow members of a delegation. ...The situation varies; the dynamics, however, are much the same no matter what the group is.

Group process in China is not merely based on the authority of the leaders; there is a real premium on consensus. Matters are often debated at great length until agreement is reached on a course of action. And once a decision has been made, individual group members are expected to embrace it and act on it. This is one reason you will seldom hear a Chinese make an irreverent comment, or openly express a view at odds with that of his or her unit. Toeing the mark is important, and it is enforced.

In essence, Chinese enter into a sort of compact with their groups; in exchange for obedience and loyalty, they can expect protection and support and be confident that their well being will be a matter of concern to the group as a whole. Group membership requires that they subordinate their own wills to that of the whole and make decisions based on the best interests of the larger group, not personal selfishness. Chinese people must listen to those in authority and do as they say. And their actions, for good or ill, reflect not only on themselves but also on all of their compatriots. ...

Telephone etiquette provides still another illustration of the pre–eminence of the group in Chinese society. You generally do not identify yourself personally when answering the telephone; what is deemed important is your work unit. The fact that common practice is

to answer "I am the Ministry of Foreign Trade" rather than "I am Mr. Wang" speaks volumes about the relative importance of the individual and the group. So does the fact that it is units, and not individuals, that invite foreign guests, arrange activities for them, and sign contracts with them. ...

Although Chinese people must be ever vigilant in fulfilling obligations to fellow group members, it's important to note that as a rule they feel no comparable responsibility toward outsiders. Courtesy and hospitality are frequently not forthcoming when

Chinese deal with people with whom they have no connections. Indeed, they are capable of treating one another with indifference that can border on cruelty. The "us-them" dichotomy often surfaces in the work of the government in the form of intractable bureaucratic rivalries that impede progress and innovation. It has sometimes been pointed out that one of the Chinese culture's major failings is that its people just don't know how to treat outsiders. Ironically but luckily, foreigners are generally exempt from this kind of treatment, their very foreignness earning them favourable treatment as honoured guests.

45. All of the following are false in relation to the passage, except that :

(a) Chinese society is undemocratic and deprives the individual of freedom.

(b) A member of the group is assured of protection and support by the group, in exchange for obedience and loyalty.

(c) Chinese are not a progressive lot.

(d) China has emerged as a strong nation with the enforcement of this way of life.

46. The Chinese way of living can best be synopsised by which of the following ?

(a)Many hands make light work.

(b)The culture and tradition of a nation is the sum total of the culture and tradition of the individual constituents that go to make it.

(c)One for all and all for one.

(d)Problems are best surmounted collectively.

47. Which of the following, as per the passage, is indicative of the fundamental difference between the culture of the Occident and the Chinese ?

(a) Importance is given to the spiritual way of life rather than the temporal one, in the Chinese tradition, which is absent in the Occident one.

(b) Stress is on the individual rather than on society, in the Occident way of life, which absent in the Chinese pattern of living.

(c) Absence of bureaucracy in both Chinese as well as the Occident setup.

(d) Business ethics more well defined in Chinese society than in the Occident one.

48. From the passage it can be concluded that Chinese believe in:

(a) the united manner of living, each member of a unit working for its well being.

(b) the single pattern of living with individuals going about their own way.

(c) promoting the skills and talents of the individual.

(d) learning from other cultures and traditions.

Solution :

45. Ans. (b) The sixth paragraph states that the obedience and loyalty of a member of the 'group' does not go in vain. Protection and support by the group follow. Hence option (b) best portrays it and is the suitable one. Options (a), (c) and(d) are incorrect.

46. Ans.(c) Though each of the option is a maxim by itself, as far as the passage is concerned, option (c) best relates and is the underlying ideology upon which is founded the Chinese way of living. The concept of living in and working for a 'group' strengthens the idea contained in this option. The remaining options pale out before (c).

47. Ans.(b) The opening paragraph clearly states that the Western society stresses more on the achievements of the individual than those of the society. The Chinese follow the opposite and give importance to the achievements of the group than those of the individual. This is best contained in option (b), making it the correct one.

48. Ans.(a) The passage is about the Chinese belief and emphasis on people living in groups rather than individually. Each member works for and is loyal to the group. Unity and harmony characterize the Chinese way of life. The individual thinking is merged with that of the group. Option (a) correctly portrays this and scores over other options.

Anger has become the national habit. You see it on the sullen faces of fashion models who have obviously been told that anger sells. It pours out of the radio all day. Mumbai journalism hams snarl and shout at each other on television. Generations exchange sneers on TV and printed page. Ordinary people abuse leaders, administrators and the politicians with shockingly personal insults. Rudeness is a justifiable way of showing you can no longer control the fury within. Vile speech, justified on the same ground, is inescapable.

India is angry at New Delhi, angry at the press, angry at immigrants, angry at television, angry at traffic, angry at people who are well off and angry at people who are poor, angry at the conservative and angry at the modern.

The old are angry at the young, young angry at the old. Suburbs are angry at cities, cities are angry at suburbs, and rustic India is angry at both whenever urban and suburban intruders threaten the peaceful rustic sense of having escaped from God's Angry Land.

Enough: A complete catalog of the varieties of bile spoiling the Indian day would fill a library. The question is why. Why has anger become a reflexive response to the inevitable vagaries of national life?

Living perpetually at the boiling point seems to leave the country depressed and pessimistic. Study those scowling models wearing the latest clothes in the Sunday papers and glossy magazines. Those are faces that expect only the IJ-worst. What a pity to waste such lovely new ill clothes on people so incapable of happiness.

The popularity of anger is doubly puzzling, not only because the Indian habit even in the worst of times has traditionally been one of mindless optimism, but also because there is relatively little nowadays for the nation to be angry about.

The country happily elected Prime Minister Nehru in 1947 because it believed his campaign boast about giving it peace and prosperity. The "peace," of course, was life under the endless threat of poverty and inequality, as viewed under Fabian Socialism.

By contrast, the country now, at last, really does enjoy peace, and if the prosperity is not so solid as it was in the 1950s, Indian resources is still the world's vastest. So, with real peace and prosperity, what's to be furious about?

The explanation, I suspect, is that the country got itself addicted to anger and can't shake the habit. It was hooked long ago when there was very good reason for anger.

Massive, irritating and even scary expressions of it were vital in shaking an obdurate government, contemptuous of public opinion, from its determination to pursue policies damaging to the Indian fabric of living.

Massive, irritating and even scary expressions of anger-from Indians of all communities were needed for the triumph of democracy and the people's rights movement.

These were monumental victories. If the nation had been unwilling to get mad to shout, "We're not going to take it anymore!" -they might not have been won.

But what monumental struggle confronts us now ? Giving a young citizen a stake in India is our most pressing problem, but nobody shouts much about that. Most other problems are so un monumental that we might think the time is ripe for greatness: an era of civility conducive to good feeling among neighbors of all races and persuasions, a golden age of progress in learning and the arts and science.

Is this making you angry ? It's easy to imagine the cries of rage from a people habituated to crying rage: Are women not still oppressed by glass ceilings ? Do members of the Backward Class no longer have to suffer the disrespect of the casteist world ? Who dares talk of prosperity when the wealth is distributed so unfairly?

True, all true. There is far too much poverty, casteism remains an affliction, women still don't have economic equality with men. These present economists, philosophers and statesmen with exceedingly complex problems not amenable to solution by red-hot anger.

Politically minded people concerned with these issues have always known that low-grade anger must be maintained, that political feet must be kept to the fire, that the squeaky wheel gets the grease, and so on. The high-intensity fury now seething through the land on these and a hundred other issues, however, doesn't seem focused on any social or economic goal. It's as though the nation got mad as hell a long time ago, got good results, and now can't shake the anger habit.

49. The logic, around which the contents of the passage hover, is best represented by which of the following ?

(a) Anger pushes nations and individuals forward in the path of progress and prosperity.

(b) Anger of the leaders would bring in an element of discipline and restraint in the citizens.

(c) Citizens' anger result in the leaders becoming accountable for the lapses committed in policy framing and their administration.

(d) Complex economic and social problems do not run away, only through of the anger expressed by one and all, a serious application of mind, for arriving at their solutions, is called for.

50. According to the passage, anger is the result of :

(a) mindless optimism of people and things not shaping as per their expectations.

(b) frustration and disillusionment at the state of economic inequality and poverty prevailing in the nation.

(c) it being the national habit, a reflexive response to the inevitable vagaries of national life.

(d) discrimination on grounds of caste, religion and language.

51. The passage comes out with the viewpoint of the politically wise people that :

(a) low-grade anger is to be discarded in preference to high-grade one.

(b) low-grade anger is to preferred to high grade one.

(c) anger is harmful, so there is no question of preferring one to the other.

(d) None of the above.

52. Which of the following, if true, goes against the views endorsed by the author, as brought out in the passage ?

(a) There is no reason for the gush of anger.

(b) Vile speech and rudeness is the justifiable way of showing that the fury within is uncontrollable.

(c) The nation has every reason to be angry for there is a wide gap between promises and fulfillments.

(d) Problems do not get solved through the emotion of anger.

Solution :

49. Ans.(d) Options (a), (b) and (c) are deviant from the contents of the passage, there is thus, no question of they constituting the logic. Option (d) is the plausible one for the last two paragraphs convey this logic.

50. Ans.(c) The passage has mentioned anger sweeping the nation but has not come out with any reason for the citizens feeling angry. The author, on the other hand, has stated anger as a national habit that is unshakeable. Option (c) best signifies this. Option (a) is next best, but does not come strong before (c). The remaining options are inappropriate.

51. Ans.(b) The last paragraph states that the people who are politically wise prefer low-grade anger to the high-grade one. The former enables the squeaky wheel administration and governance to be greased resulting in its movement, whereas, the latter, though seething on a hundred issues is not focussed on any economic or social goal. Option (b) best matches with this. The remaining options are not correct.

52. Ans.(c) Options (a), (b) and (d) are the viewpoints of the author, as made out by the passage. Option (c) differs from what the author feels, as the opposite of it is the viewpoint entertained by the author. Hence option (c) is the sought one.

Is causing harm to the environment a crime ?

Crime can be defined best as a violation of the criminal law. Looking behind most criminal statutes, however, we can generally catch a glimpse of the concept of harm. Criminal activity, such as theft and assault, most of us would agree, is harmful to others.

Some crimes, however, such as drug abuse, prostitution, gambling, and pornography, are sometimes referred to as "victimless crimes" or social order offences because the harm, they cause is not readily identifiable at the individual level. Statutes outlawing social order offenses are rooted in the notion of social harm—that is, although no one who participates in prostitution, say, runs to the police to file a complaint (unless they are robbed, or in some other way directly victimized). Lawmakers recognize that the act somehow lessens the quality of social life. Prostitution, many lawmakers argue, is harmful to the family and (in the case of heterosexual prostitution) demeans the status of women in society.

Today, a whole new class of criminal offences is emerging based upon the notion of environmental damage. In what may be the best known environmental catastrophe to date, the Exxon Valdez , a 1,000-foot supertanker, ran aground in Alaska in 1989 and spilled 11 million gallons of crude oil over 1,700 miles of pristine coastline. Animal life in the area was devastated. The U.S.

Fish and Wildlife Service reported decimation to salmon spawning grounds, the death of 580,000 birds (including 144 bald eagles), and the demise of an unknown, but

presumably vast amount of sea life. The initial cleanup involved over 10,000 people and cost more than $1 billion. Damages were estimated as high as $5 billion.

While the Valdez incident is still near the forefront of national consciousness, environmental crimes of all proportions are a common occurrence. Such crimes range from ecological terrorism, like that waged against Kuwait by Saddam Hussein, to small-scale recycling offences which are frequently committed (sometimes unknowingly) by individual citizens. As ecological awareness continues to expand, new prohibitions are legislated and previously unheard-of offences created. Today, a highly concerned society stands increasingly ready to define abuse of the environment in criminal terms. As a consequence, words like "curbside criminals," "recycling police," and "garbage crime" are becoming commonplace. The state of Pennsylvania, for example, recently enacted a recycling law which mandates stiff sanctions, including fines and jail sentences for violators. Under the law, what had formerly been routine daily activities (throwing out the trash) become criminal offences unless properly conducted (plastics and glass separated from paper products, and lawn clippings and yard trash appropriately bagged).

While human beings have insulted the environment since before the dawn of history, it has only been in this century, as our dependence on the planet has become progressively obvious, that such activities have been ascribed criminal status. Hence, the question: What taken-for-granted aspects of our contemporary everyday lives will become subject to criminal sanctions in the twenty-first century?

53. Endangering the environment, as per the passage, has been accorded the criminal status because :

(a) the harmful effects on the environment have considerably affected life around.

(b) man’s dependence on the earthy resources has become more pronounced.

(c) natures fury and wrath is feared the most.

(d) the gap between the haves and have nots has widened.

54. Abuse of the environment is categorised as a criminal activity because :

(a) there is widespread pressure created by groups committed to preserve environment and ecology.

(b) the climate has undergone a sea change and has become unpredictable.

(c) judicial activism was on the wane and formulation of laws and extending them to human activities had become imperative.

(d) people had to be shaken from their slumber and made to come out of the taken–for–granted mindset.

55. Which of the following, if true, would go against the author's contention as conveyed in the passage ?

(a) Nature has her own ways in decimating and replenishing the resources present in earth.

(b) A sound legislation would be an effective check on man's exploits of environment.

(c) The taken–for–granted mindset of man needs to be changed.

(d) None of the above.

56. All of the following, as per the passage, is false except that :

(a) the Valdez incident did not arouse the required awareness in people.

(b) social order offences are harmful to its victims.

(c) a strict and an effective law followed by an exemplary punishment will serve as a deterrent.

(d) Nature will cause havoc if man does not care for the environment.

Solution :

53. Ans.(b) The concluding lines of the passage give the answer. While the assault on the environment has been since times immemorial, the awareness and the awakening to this fact is on account of man's dependence on the resources available in the planet earth. Option (b) best aligns with this line of thinking and is correct. Option (a) is the next best though it fades out before (b). The remaining options are incorrect.

54. Ans.(d). The last paragraph comes out with the reason for classifying abuse of environment as criminal activity. Since times immemorial, man has exploited nature and caused danger to the environment. Since man's dependence on the limitedly available resources has become acute, unless stringent and tight laws are not imposed and if environmental abuse be not classified as criminal activity, man's attack on the ecology

and environment would go unchecked. Option (d) best represents this. The remaining options are not proper.

55. Ans.(a). Option (a) dilutes the strength of the author's contention. The passage makes a case for man to go all out for ecological and environmental preservations and has stated legislation to serve as an effective deterrent in the event of violation. The remaining options are concordant with the contents of the passage.

56. Ans.(c). The passage in the third paragraph has suggested the imposition of punishment in violation of the law on environment. It is true that the fear of law and punishment has an effect on people. The example of the steps taken by the state of Pennsylvania is a fitting example supporting this viewpoint. Option (c) best states this and is selected as the correct one. The remaining options are not true as the passage does not state them.

Direction For Questions 57 – 58 : There are two gaps in each of the following sentences. From the pairs of words given, choose the one that fills the gap most appropriately. The First word in the pair should fill the first gap.

57. Human history is largely a record of faltering _____, of complacent surrender to _____

(a) effort, circumstance (b) ego, enemies (c) steps, self (d) attempt, Lord

58. His irresponsible and _____ behaviour invited _____ observations on his mental ability

(a) puerile, positive (b) favourable,childish (c) careful, glowing (d) adult, adulatory

Solution :

57. Answer = (a)

58. Answer = (a)

Direction For Questions 59 – 60 :Sentence A, B, C and so on given in each question, when properly sequenced, form a coherent paragraph. Choose the most logical order of sentences from among the four given choices

59.

1. Buddhism is a way to salvation.

A. But Buddhism is more severely analytical.

B. In the Christian tradition there is also a concern for the fate of human society conceived as a whole, rather than merely as a sum or network of individuals.

C. Salvation is a property, or achievement of individuals.

D. Not only does it dissolve society into individuals, the individual in turn is dissolved into component parts and instants, a steam of events.

6. In modern terminology, Buddhist doctrine is reductionist.

[a] ABCD [b] CBAD [c] BDAC [d] ABCD

60.

1. The problem of improving Indian agriculture is both a sociological and an administrative one.

A. It also appears that there is a direct relationship between the size of a state and development.

B. The issues of Indian development, and the problems of India's agricultural sector, will remain with us long into the next century.

C. Without improving Indian agriculture, no liberalisation and de-licensing will be able to help India.

D. At the end of the day, there has to be a ferment and movement of life and action in the vast segment of rural India.

6. When it starts marching, India will fly.

[a] DABC [b] CDBA [c] ACDB [d] ABCD

Solution :

59. Ans = (b) 1C is a logical pair. Salvation is a point which is explained in C.

60. Ans = (d) AB is a logical pair. So is CD which follows AB.

MOCK TEST - 2

SECTION A (Quantitative Aptitude)
(20 Questions)

Q 1. Two different numbers when divided by the same divisor left remainders of 11 and 21 respectively. When the numbers' sum was divided by the same divisor, the remainder was 4. What was the divisor?
(a)36 (b) 28 (c) 12 (d) 9

Solution :

Let the divisor be a.

x = a*n + 11 ---- (1)

y = a*m + 21 ----- (2)

also given, (x+y) = a*p + 4 ------ (3)

adding the first 2 equations. (x+y) = a*(n+m) + 32 ----- (4)

equate 3 and 4.

a*p + 4 = a*(n+m) + 32

or

a*p + 4 = [a*(n+m) + 28] + 4

cancel 4 on both sides.

u will end up with.

a*p = a*(n+m) + 28.

which implies that 28 should be divisible by a. or in short a = 28 works. **Ans. (b)**

Q 2. The length, breadth and height of a room are in the ratio 3:2:1. If the breadth and height are halved while the length is doubled, then the total area of the four walls of the room will

(a) remain the same. (b) decrease by 13.64%. (c) decrease by 15% (d) decrease by 30%.

Solution :

Let the original length, breadth and height of the room be 3x, 2x and x respectively.

∴ The new length, breadth and height are 6x, x and x/2 respectively.

Area of four walls = (2 × length × height) + (2 × breadth × height)

Original area of four walls = 6x2 + 4x2 = 10x2

New area of four walls = 6x2 + x2 = 7x2

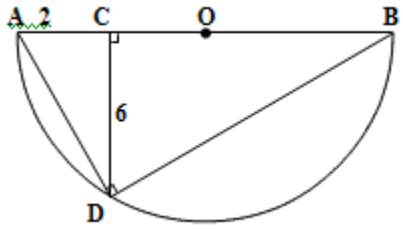
∴ Area of wall decreases by [(10x2 − 7x2)/10x2] × 100 = 30%

Hence, **Ans. (d)**

Q 3. A semicircle is drawn with AB as its diameter. From C, a point on AB, a line perpendicular to AB is drawn meeting the circumference of the semicircle at D. Given that AC = 2 cm and CD = 6 cm, the area of the semicircle (in sq. cm.) will be:

(a) 32 (b) 50 (c) 40.5 (d) 81

Solution :



Let CB = x cm ΔACD and ΔADB are similar triangles.

∴ AD/AB = AC/AD ∴ AD2 = AC × AB = 2 × (2 + x) In ΔACD,

∴ (AC2 + CD2) = AD2 = 2 × (2 + x) ∴ 40 = 2 × (2 + x) ∴ x = 18

∴ Diameter AB = 20 cm ∴ Radius = 10 cm

∴ Area of semicircle = 50π sq. cm. Hence, **Ans. (b)**

Q 4. Suppose you have a currency, named Miso, in three denominations: 1 Miso, 10 Misos and 50 Misos. In how many ways can you pay a bill of 107 Misos?

(a) 17 (b) 16 (c) 18 (d) 19

Solution :

Let the number of currency 1 Miso, 10 Misos and 50 Misos be x, y and z respectively.
x+10y+50z=107

Now the possible values of z could be 0, 1 and 2.

For z=0: x+10y=107

Number of integral pairs of values of x and y that satisfy the equation:
x+10y=107 will be 11.

These values of x and y in that order are:
(7,10);(17,9);(27,8)…(107,0)

For z=1: x+10y=57

Number of integral pairs of values of x and y that satisfy the equation:
x+10y=57 will be 6.

These values of x and y in that order are:
(7,5);(17,4);(27,3);(37,2);(47,1) and (57,0)

For z=2: x+10y=7

There is only one integer value of x and y that satisfies the equation:
x+10y=7 in that order is (7,0)

Therefore total number of ways in which you can pay a bill of 107 Misos:
=11+6+1= **18**

Ans. (c)

Q 5. McDonald's ran a campaign in which it gave game cards to its customers. These game cards made it possible for customers to win hamburgers, French fries, soft drinks, and other fast-food items, as well as cash prizes. Each card had 10 covered spots that could be uncovered by rubbing them with a coin. Beneath three of these spots were "No Prize" signs. Beneath the other seven spots were names of prizes, two of which were identical.

For example, one card might have two pictures of a hamburger, one picture of a Coke, one of French fires, one of a milk shake, one of 5 Dollar, one of 1000 Dollar and three "No Prize" signs. For this card the customer could win a hamburger.

To win on any card, the customers had to uncover the two matching spots (which showed the potential prize for that card) before uncovering a "No Prize"; any card with a "No Prize" uncovered was automatically void. Assuming that the two matches and the three "No Prize" signs were arranged

randomly on the cards, what is the probability of a customer winning?

(a) 0.10
(b) 0.15
(c) 0.12
(d) 0.18

Solution :

As per the question there are 10 cover spots out of which

(i). Three spots are there with no prize (identical)
(ii). Two spots of the same sign (Prize)
(iii). Five other spots which are distinct

Let three spots of no prize are (x, x, x), two spots of same sign are b (P, P) and five other spots are (A, B,C, D, E).

Total number of cases without restriction:
$= \frac{\mathbf{10}!}{\mathbf{3}!\times\mathbf{2}!}$
⇒ Total number of favourable cases happen in the following ways which shows sequence of can covering

CASE I: Second uncovering is P
P P _ _ _ _ _ _ _ _ =8C3×5!×1

CASE II:
_ _ P _ _ _ _ _ _ =7C3×5!×2

CASE III:
=6C3×5!×3

CASE IV:
=5C3×5!×4

CASE V:
=4C3×5!×5

CASE VI:
=3C3×5!×6

Total number of favourable cases:
$= \frac{\textbf{case (I+II+III+IV+V+VI)}}{\frac{\mathbf{10}!}{\mathbf{3}!\times\mathbf{2}!}} = \mathbf{0.10}$

Ans. (a)

Q 6.

A pool has two water pumps A and B and one drain C. Pump A alone can fill the whole pool in x hours, and pump B alone can fill the whole pool in y hours. The drain can empty the whole pool in z hours, where z>x. With pumps A and B both running and the drain C unstopped till the pool is filled, which of the following represents the amount of water in terms of the fraction of the pool which pump A pumped into the pool?

(a) $\frac{yz}{x+y+z}$ **(b)** $\frac{yz}{yz+xz-xy}$ **(c)** $\frac{yz}{yz+xz+xy}$ **(d)** $\frac{xyz}{yz+xz-xy}$

Solution :

With pumps A and B both running and the drain unstopped the pool will be filled in a rate $\frac{1}{x}+\frac{1}{y}-\frac{1}{z}=\frac{yz+xz-zy}{xyz}$ pool/hour. So, the pool will be filled in $\frac{xyz}{yz+xz-xy}$ hours (time is reciprocal of rate).

In $\frac{xyz}{yz+xz-xy}$ hours A will pump $\frac{1}{x}*\frac{xyz}{yz+xz-xy}=\frac{yz}{yz+xz-xy}$ amount of the water into the pool.

Ans. (b)

Q7. The sum of four consecutive two-digit odd numbers, when divided by 10, becomes a perfect square. Which of the following can possibly be one of these four numbers?

(a) 21 **(b) 25** **(c) 41** **(d) 67**

Solution :

The four consecutive two-digit odd numbers will have

(1, 3, 5, 7) or (3, 5, 7, 9) or (5, 7, 9, 1) or (7, 9, 1, 3) or (9, 1, 3, 5) as units digits.

As the sum divided by 10 yields a perfect square, the sum is a multiple of 10.

∴ The units digits have to be (7, 9, 1, 3).

Thus the four numbers will be (10x + 7), (10x + 9), (10x + 11) and (10x + 13),

where 0 < x < 9 (as each of these numbers is a two digit number)

Sum of these numbers = 40x + 40 = 40(x + 1)

Now, 40(x + 1)/10 = 4(x + 1) is a perfect square

As 4 is a perfect square, (x + 1) is some perfect square < 10

If x + 1 = 4, x = 3, and the four numbers are 37, 39, 41 and 43

If x + 1 = 9, x = 8, and the four numbers are 87, 89, 91 and 93

Hence, **Ans. (b).**

Q 8. If $\log_y x = a.\log_z y = b.\log_x z = ab$, then which of the following pairs of values for (a,b) is not possible ?

(a)2, ½ (b) 1,1 (c) $\pi, 1/\pi$ (d) 2,2

Solution :

$\log_y x = a \cdot \log_z y = b \cdot \log_x z = ab$

Since, $a \cdot \log_z y = ab$ → $b = \log_z y$

And $b \cdot \log_x z = ab$ → $a = \log_x z$

$\therefore \log_y x = ab = \log_z y \times \log_x z$

$\therefore \frac{\log x}{\log y} = \frac{\log y}{\log z} \times \frac{\log z}{\log x}$

$\therefore \frac{\log x}{\log y} = \frac{\log y}{\log x}$

$\therefore (log\ x)^2 = (log\ y)^2$

$\therefore \log x = \pm \log y$

$\therefore \log x = \log y$ or $\log x = -\log y$

$\therefore x = y$ or $x = \frac{1}{y}$

$\therefore ab = \log_y x = 1$ or -1

Only option (d) does not satisfy this. So, **Ans. (d)**

Q 9. The number of employees in Obelix Menhir Co. is a prime number and is less than 300. The ratio of the number of employees who are graduates and above, to that of employees who are not, can possibly be:

(a) 101 : 88 (b) 87 : 100 (c) 110 : 111 (d) 97 : 84

Solution :

Consider options. As the number of employees is prime we can add the numerator and denominator of ratios directly to find the number of employees.

1. Number of employees = 101 + 88 = 189

Number of employees = 189, which is not a prime number.

∴ Option a is eliminated.

2. Number of employees = 87 + 100 = 187

Number of employees = 187, which is not a prime number.

∴ Option b is eliminated.

3. Number of employees = 110 + 111 = 221

Number of employees = 221, which is not a prime number.

∴ Option c is eliminated.

4. Number of employees = 97 + 84 = 181

Number of employees = 181, which is a prime number.

∴ The ratio of employees = 97 : 84 Hence, **Ans. (d)**

Q 10. There are 6 tasks and 6 persons. Task 1 cannot be assigned either to person 1 or to person 2; task 2 must be assigned to either person 3 or person 4. Every person is to be assigned one task. In how many ways can the assignment be done?

(a) 144 (b) 180 (c) 192 (d) 360

Solution :

Task 2 can be assigned in 2 ways (either to person 3 or person 4).

Task 1 can then be assigned in 3 ways (persons 3 or 4, 5 and 6)

The remaining 4 tasks can be assigned to the remaining 4 persons in 4! = 24 ways

∴ The assignment can be done in 24 × 2 × 3 = 144 ways Hence, **Ans. (a)**

Q 11. Abhinandan starts in a car from Amritsar towards Bangalore. After some time he realises that he will cover only 80% of the distance in the scheduled time and he therefore hastened at thrice his speed and thus managed to reach Bangalore exactly on time. Find the time after which Abhinandan changed his speed, given that he could have been late by 4 hours if he had not made the changes.

(a)13 hours (b) 9 hours (c) 12 hours (d) 14 hours

Solution :

Let the original speed be s km/h and scheduled time = t hours and total distance = D km. then s x t=4/5D ...(i)

and s × (t + 4) = D ...(ii)

From Eq. (i) and (ii), we get t = 16hours

Assume s = 1kmph, then D = 20 km Again, since he increased his speed after k hours, then $s_1t_1 + s_2t_2$ = D

1 × k + 3 × (16 – k) = 20

k = 14. **Ans. (d)**

Q 12. Let a, b, c, d be four integers such that a+b+c+d = 4m+1 where m is a positive integer. Given m, which one of the following is necessarily true?

(a) The minimum possible value of $a^2 + b^2 + c^2 + d^2$ is $4m^2$–2m+1

(b) The minimum possible value of $a^2 + b^2 + c^2 + d^2$ is $4m^2$+2m+1

(c) The maximum possible value of $a^2 + b^2 + c^2 + d^2$is $4m^2$–2m+1

(d) The maximum possible value of $a^2 + b^2 + c^2 + d^2$is $4m^2$+2m+1

Solution :

$(a + b + c + d)^2 = (4m + 1)^2$

Thus, $a^2 + b^2 + c^2 + d^2$ + 2(ab + ac + ad + bc + bd + cd) = $16m^2$ + 8m + 1

$a^2 + b^2 + c^2 + d^2$ will have the minimum value if (ab + ac + ad + bc + bd + cd) is the maximum.

This is possible if a = b = c = d = (m + 0.25) …….since a + b + c + d = 4m + 1

In that case 2((ab + ac + ad + bc + bd + cd) = $12(m + 0.25)^2 = 12m^2 + 6m + 0.75$

Thus, the minimum value of $a^2 + b^2 + c^2 + d^2$ = $(16m^2 + 8m + 1)$ – 2(ab + ac + ad + bc + bd + cd)

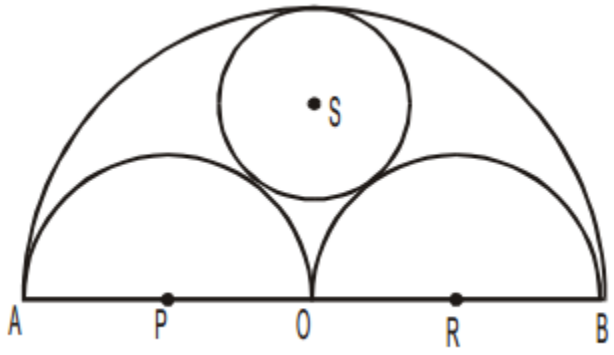
= $(16m^2 + 8m + 1) – (12m^2 + 6m + 0.75)$

= $4m^2 + 2m + 0.25$

Since it is an integer, the actual minimum value = $4m^2 + 2m + 1$

Ans. (b)

Q 13. Three horses are grazing within a semi-circular field. In the diagram given below, AB is the diameter of the semi-circular field with center at O. Horses are tied up at P, R and S such that PO and RO are the radii of semi-circles with centers at P and R respectively, and S is the center of the circle touching the two semi-circles with diameters AO and OB. The horses tied at P and R can graze within the respective semi-circles and the horse tied at S can graze within the circle centered at S. The percentage of the area of the semi-circle with diameter AB that cannot be grazed by the horses is nearest to



(a)20 (b) 28 (c) 36 (d) 40

Solution :

If the radius of the field is r, then the total area of the field = $\pi r^2/2$.

The radius of the semi-circles with centre's P and R = r/2.

Hence, their total area = $\pi r^2/4$

Let the radius if the circle with centre S be x. Thus, OS = (r – x), OR = r/2 and RS = (r/2 + x). Applying Pythagoras theorem, we get $(r-x)^2 + (r/2)^2 = (r/2 + x)^2$

Solving this, we get x = r/3.

Thus the area of the circle with centre S = $\pi r^2/9$.

The total area that can be grazed = πr^2 (1/4 + 1/9) = 13 $\pi r^2/36$

Thus the fraction of the field that can be grazed = 26/36 (area that can be grazed /

area of the field)

The fraction that cannot be grazed = 10/36 = 28% (approx.)

Ans. (b)

Q 14. In a certain examination paper, there are n questions. For j = 1,2 …n, there are 2^{n-j} students who answered j or more questions wrongly. If the total number of wrong answers is 4095, then the value of n is

(a)12 (b) 11 (c) 10 (d) 9

Solution :

Let us say there are only 3 questions. Thus there are 2^{3-1}= 4 students who have done 1 or more questions wrongly, 2^{3-2} = 2 students who have done 2 or more questions wrongly and 2^{3-3}= 1 student who must have done all 3 wrongly. Thus total number of wrong answers = 4 + 2 + 1 = 7 = $2^3 - 1 = 2^n - 1$.

In our question, the total number of wrong answers = 4095 = 2^{12} – 1. Thus n = 12.

Ans. (a)

Q 15. The rate of a certain chemical reaction is directly proportional to the square of the concentration of chemical A present and inversely proportional to the concentration of chemical B present. If the concentration of chemical B is increased by 100%, which of the following is closest to the percent change in the concentration of chemical A required to keep the reaction rate unchanged?

(a) 100% decrease (b) 50% decrease (c) 40% decrease (d) 40% increase

Solution :

NOTE: Put directly proportional in nominator and inversely proportional in denominator. $RATE = \frac{A^2}{B}$, (well as it's not the exact fraction it should be multiplied by some constant but we can ignore this in our case).

We are told that B increased by 100%, hence in denominator we have 2B. We want the rate to be the same. As rate is directly proportional to the SQUARE of A, A should also increase (nominator) by x percent and increase of A in square should be 2. Which means x^2=2, x=~1.41, which is approximately 40% increase. $R = \frac{A^2}{B} = \frac{(1.4A)^2}{2B}$

Ans. (d)

Q 16. A man cycling along the road noticed that every 12 minutes a bus overtakes him and every 4 minutes he meets an oncoming bus. If all buses and the cyclist move at a constant speed, what is the time interval between consecutive buses?

(a)5 minutes (b) 6 minutes (c) 8 minutes (d) 9 minutes

Solution :

Let's say the distance between the buses is d. We want to determine $Interval = \frac{d}{b}$, where b is the speed of bus.

Let the speed of cyclist be c.

Every 12 minutes a bus overtakes cyclist: $\frac{d}{b-c} = 12$, $d = 12b - 12c$;

Every 4 minutes cyclist meets an oncoming bus: $\frac{d}{b+c} = 4$, $d = 4b + 4c$;

$d = 12b - 12c = 4b + 4c$, --> $b = 2c$, --> $d = 12b - 6b = 6b$.

$Interval = \frac{d}{b} = \frac{6b}{b} = 6$ **Ans. (d)**

Q 17. What is the sixtieth term in the following sequence? 1, 2, 4, 7, 11, 16, 22...

(a) 1,671 (b) 1,760 (c) 1,761 (d) 1,771

Solution :

The difference between consecutive terms of the sequence are in AP

2-1 = 1; 4-2 = 2; 7-4 = 3;

$T_n = S_n - S_{n-1}$

$S_n = 1+2+4+7.....$ n terms $= 1+(1+1)+(2+2)+(3+4).....$

$S_n = 1+(1+2+3+4....$ n-1 terms $) +1+2+4+7+11.....$ n-1 terms

=> $S_n = 1+\frac{n*(n-1)}{2}+S_{n-1}$

=> $S_n - S_{n-1} = T_n = 1+\frac{n*(n-1)}{2}$

$T_{60} = 1+\frac{60*(60-1)}{2} = 1+30*59 = 1771$ **Ans. (d)**

Q 18. One morning, Govind Lal the owner of the local petrol bunk, was adulterating the petrol with kerosene. He had two identical tanks – the first was full of pure petrol while the second was empty. First he transferred an arbitrary amount of petrol from the first tank into the second and then replaced the petrol removed from the first tank with kerosene. He then repeated this process one more time but this time he ensured that by the end of the process the second tank was exactly full. If the concentration of petrol in the second tank is 75% and the cost price of kerosene is half that of petrol, then what is Govind Lal's net profit percentage on selling the contents of the second tank given that he claims to sell the petrol at a profit of 25%?

(a)$42\frac{6}{7}\%$ (b) $66\frac{2}{3}\%$ (c) $83\frac{1}{3}\%$ (d) 100%

Solution :

The data is tabulated below :

I Tank		II Tank		
Petrol	Kerosene	Petrol	Kerosene	Total
100				
$100 - x$	x	x $\frac{(100-x)^2}{100}$	$\frac{(100-x)\,x}{100}$	100

If the concentration in tank II is 75%, x = 50

The quantity of petrol in tank II is $x + \frac{(100-x)^2}{100} = 50 + 25 = 75$ and that of Kerosene is 25.

If the cost of Kerosene is k, the cost of petrol in 2k and the cost price for the contents of tank II is 25k + 75(2k) = 175k

The nominal rate of profit is 25%, i.e., the selling price is 200k + 50k = 250k

∴ Actual profit percentage = $\frac{250-175}{175} = \frac{75}{125} = \frac{3}{7} = \frac{300}{7}\ \% = 42\frac{6}{7}\ \%$ **Ans. (a)**

Q 19. A tennis ball is initially dropped from a height of 180 m. After striking the ground, it rebounds (3/5)th of the height from which it has fallen. The total distance that the ball travels before it comes to rest is

(a) 540 m (b) 600 m (c) 720 m (d) 900 m

Solution :

Initial distance travelled = 180 m

Distance travelled after 1st rebound

Upward = $\frac{3}{5} \times 180$ = 108 m

Downward = 108 m

Total = 108 + 108 = 216 m

Distance travelled after 2nd rebound (upward and downward)

$= \frac{3}{5} \times 108 \times 2 = \frac{3}{5} \times 216$ m

This gives an infinite G.P. with a = 216 and r = $\frac{3}{5}$

For an infinite G.P. with r < 1

S = $\frac{a}{1-r}$ = $\frac{216}{1-\frac{3}{5}}$ = 540 m

Since initial distance was 180 m,

Total distance = (180 + 540) m = 720 m

Hence, **Ans. (c)**

Q 20. There is a triangular building (ABC) located in the heart of Jaipur, the Pink City. The length of the one wall in east (BC) direction is 397 feet. If the length of south wall (AB) is perfect cube, the length of southwest wall (AC) is a power of three, and the length of wall in southwest (AC) is thrice the length of side AB, determine the perimeter of this triangular building.

(a) 3209 feet (b) 3213 feet (c) 3773 feet (d) 3313 feet

Solution :

BC = 397

Let AB = a^3 and AC = 3^n

Also

AC = 3 × AB

∴ 3^n = 3 × a^3

∴ $3^{(n-1)}$ = a^3

Now, let the perimeter be equal to p

p = BC + AC + AB

= 397 + 3^n + $3^{(n-1)}$

(p - 397) = $3^{(n-1)}$ × (3 + 1) = $3^{(n-1)}$× 4

Thus the LHS of the above equation should be a multiple of 3 and 4. Substitute the value of perimeter given in the options and verify this. Among the options, only (3313 - 397) is divisible by 3 and 4. Hence, **Ans. (d)**