Quantitative Aptitude - and Problem Solving

eLitmus Previous Year Papers and study materials

Topics	Subtopics	
Aptitude Module (45 min)	• Number Systems (4 Ques) • Probability (2 Ques) • Permutation Combination (2 Ques) • Geometry (3 Questions) • Equations and Inequalities (1-2 Ques) • AP ,GP, HP : (1-2 Ques) • Logarithms (1 Ques) • Speed, Time and Distance (1-3 Ques) • Time and Work (1-2 Ques) • Mixture and alligation (1 Ques), • Percentage (1 Ques)	• 30 m ~ 70 percentile • 40 m ~ 80 percentile • 50 m ~ 90 percentile • 60 m ~ 95 percentile • And if you score more than 60 marks, You will get good percentile 95-100 Percentile.
	• Analytical Reasoning	
	• Numerical Reasoning	

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Computer Fundamentals (15 min)

Topics	Subtopics	
Problem Solving Section	• Data Tabulation based Questions • Crypt arithmetic Problem • Arrangement Based Problems • Bar Graphs/Pie Charts	• 30 marks ~ 70 percentile • 40 marks ~ 80 percentile • 50 marks ~ 90 percentile • 60 marks ~ 95+ percentile

	• Few Miscellaneous Questions	• And if you score more than 60 marks, You will get more percentile 95-100 Percentile.

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English

Topics	Type Questions	
English	1. Questions Related To Grammatical Concepts 2. Paragraph Based Questions 3. Fill In The Blanks 4. Reading Comprehension 5. Questions Related To Grammatical Concepts 6. Paragraph Based Questions 7. Fill In The Blanks 8. Reading Comprehension	• 60 marks ~ 60 percentile • 70 marks ~ 70 percentile • 80 marks ~ 80 percentile • 90 marks ~ 85 percentile • 100 marks ~ 90 percentile • If you score more than 100, be sure to get above 90 percentile.

BUY ENGLISH PAPER HERE - https://www.instamojo.com/wishkaushik/elitmus-previous-years-paper-english-mostly-/

Elitmus Syllabus 2017:

Elitmus Syllabus : Negative Marking Scheme

Elitmus test contains 60 questions and those 60 questions to be solved in 120 minutes (2 Hours), Each question carries 10 marks in all the sections. Every section will have 20 questions and it carries 200 marks in all sections. Negative marking will be calculated through the student wrong attempts. For example, If you did more than 25% Wrongly attempted questions then you will get

negative marking for questions wrongly done. You will lose 5 marks out of 10 marks for question which you wrongly attempted in the outer part of 25% and questions which are Unattempted doesn't follow any penalty.

Example:

Case 1: Student 'A' attempts 12 questions in a section.

Ouput Result: 9 Right, 3 Wrong, 8 Unattempted.

He did exactly 25% wrong in his total no of attempts. Out of 12 questions 9 questions 75% correct 3 questions 25% wrong. So he doest have any negative marking.

Score: 90 (9 Correct questions , 10 marks gets each questions 9*10=90)

Case 2: Student 'B' attempts 12 questions in a section.

Output Result: 8 Right , 4 Wrong, 8 Unattempted.

He did 33% wrong in his total no of attempts which is more than 25% wrong attempts made. Out 12 questions 8 questions correct 66% 4 questions 33% wrong. So he will have negative marking for only wrong attempts over the 25% i.e., only 1 question will have the penalty of 5 marks in the wrongly attempted questions.

Score: 75 (8 Correct questions, 10 marks for each question 8*10=80, Wrong attempts over 25% 1*5=5 , 80-5=75)

Mode of exam will be Pen/Paper OMR mode. Students should mark their answers in the OMR Sheets. E-litmus test will conduct every week or twice in a month. It will conducted in only big cities.

eLitmus Quants Question Paper -1

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.

SECTION A (Quantitative Aptitude)
(20 Questions)

Commonly used Maths Formula have been provided for quick reference

Series :

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

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

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

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. , $S_n = \frac{a(1-r^n)}{1-r}$, when $r \neq 1$

Area/Volume :

a) Surface area of Sphere = $4\pi r^2$

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

c) Curved Surface area of Cone = $\pi r l$

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

e) Total Surface area of Cone = $\pi r (r + l)$

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

g) Curved Surface area of Cylinder = $2\pi r h$

h) Volume of Cylinder = $\pi r^2 h$

i) Total Surface Area of Cylinder = $2\pi r (r + h)$

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 $\frac{dy}{dx} = 0$

QUESTIONS IN THIS PAPER FOR QUANTS -

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 $100 \leq n \leq 200$, 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

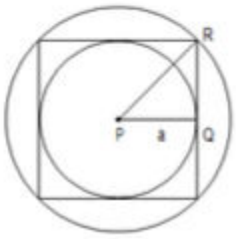
Solution :

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 = πa^2



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

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 = $\frac{30}{\sqrt{2}} = 15 \times \sqrt{2}$

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

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)**

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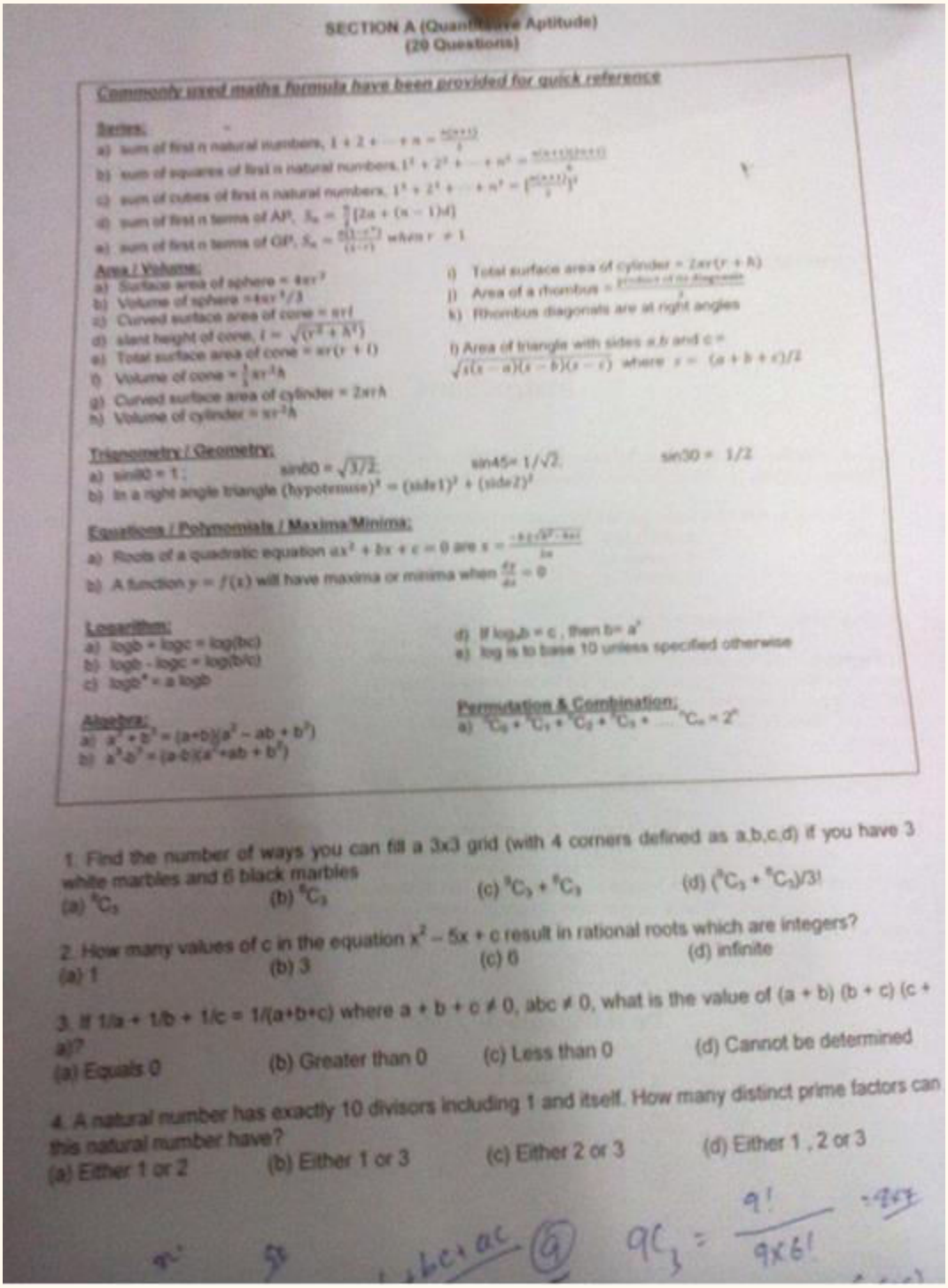


SECTION A (Quantitative Aptitude)
(20 Questions)

Commonly used maths formula have been provided for quick reference

Series:
a) sum of first n natural numbers, $1 + 2 + \cdots + n = \frac{n(n+1)}{2}$
b) sum of squares of first n natural numbers, $1^2 + 2^2 + \cdots + n^2 = \frac{n(n+1)(2n+1)}{6}$
c) sum of cubes of first n natural numbers, $1^3 + 2^3 + \cdots + n^3 = \left[\frac{n(n+1)}{2}\right]^2$
d) sum of first n terms of AP, $S_n = \frac{n}{2}[2a + (n-1)d]$
e) sum of first n terms of GP, $S_n = \frac{a(1-r^n)}{(1-r)}$ where $r \neq 1$

Area / Volume:
a) Surface area of sphere = $4\pi r^2$
b) Volume of sphere = $4\pi r^3/3$
c) Curved surface area of cone = πrl
d) slant height of cone, $l = \sqrt{(r^2 + h^2)}$
e) Total surface area of cone = $\pi r(r + l)$
f) Volume of cone = $\frac{1}{3}\pi r^2 h$
g) Curved surface area of cylinder = $2\pi rh$
h) Volume of cylinder = $\pi r^2 h$
i) Total surface area of cylinder = $2\pi r(r + h)$
j) Area of a rhombus = $\frac{\text{product of its diagonals}}{2}$
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 $s = (a + b + c)/2$

Trigonometry / Geometry:
a) $\sin 0 = 1$; $\sin 60 = \sqrt{3}/2$; $\sin 45 = 1/\sqrt{2}$; $\sin 30 = 1/2$
b) In a right angle triangle (hypotenuse)^2 = (side1)^2 + (side2)^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 $y = f(x)$ 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) ${}^nC_0 + {}^nC_1 + {}^nC_2 + {}^nC_3 + \cdots {}^nC_n = 2^n$

1. Find the number of ways you can fill a 3x3 grid (with 4 corners defined as a,b,c,d) if you have 3 white marbles and 6 black marbles
(a) ${}^9C_3$ (b) ${}^6C_3$ (c) ${}^9C_3 + {}^6C_3$ (d) $({}^9C_3 + {}^6C_3)/3!$

2. How many values of c in the equation $x^2 - 5x + c$ result in rational roots which are integers?
(a) 1 (b) 3 (c) 6 (d) infinite

3. If $1/a + 1/b + 1/c = 1/(a+b+c)$ where $a + b + c \neq 0$, abc $\neq 0$, what is the value of (a + b) (b + c) (c + a)?
(a) Equals 0 (b) Greater than 0 (c) Less than 0 (d) Cannot be determined

4. A natural number has exactly 10 divisors including 1 and itself. How many distinct prime factors can this natural number have?
(a) Either 1 or 2 (b) Either 1 or 3 (c) Either 2 or 3 (d) Either 1 , 2 or 3

5. Eden park is a cricket field while Jubilee park is a football field in Mastnagar. In Mastnagar, all cricket fields are circular and football fields are rectangular or square. Along the boundary of all fields there are advertisement displays. In Mastnagar, the length of advertisement displays has to be the same across all playing fields. Area of Jubilee park is 468 sqm. The farthest distance between any two points in Jubilee park football field is $10\sqrt{10}$ m. Find the approximate area of Eden park?
(a) 1936 m^2 (b) 616 m^2 (c) 281 m^2 (d) Inadequate data

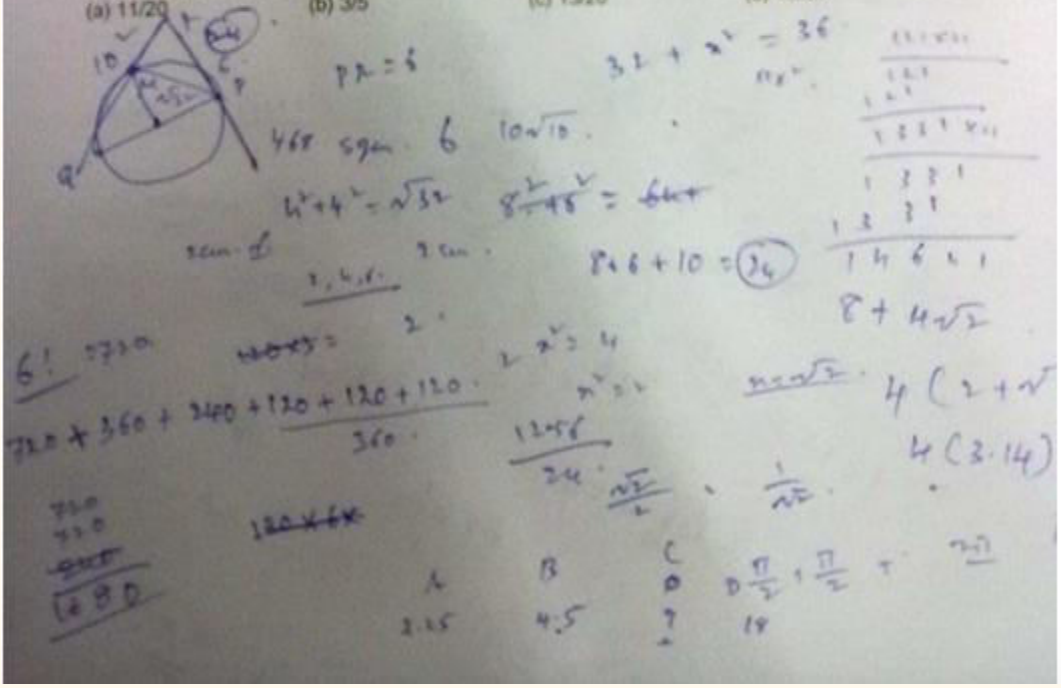
6. If v, w, x, y and z are non-negative integers, each less than 11, then how many distinct combinations of (v,w,x,y,z) satisfy v(11^4) + w(11^3) + x(11^2) + y(11) + z = 151001
(a) 0 (b) 1 (c) 2 (d) 3

7. The circle O having a diameter of 2cm, has a square inscribed in it. Each side of the square is then taken as a diameter to form 4 smaller circles O". Find the total area of all four O" circles which is outside the circle O.
(a) 2 (b) pi - 2 (c) 2 - pi/4 (d) 2 - pi/2

8. How many six digit numbers can be formed using the digits 1 to 6 , without repetition such that the number is divisible by the digit at its units place ?
(a) 402 (b) 528 (c) 648 (d) 720

9. Amit can complete a piece of work in 2.25 days. Badri takes double the time taken by Amit. Chetan takes double that of Badri, and Das takes double that of Chetan to complete the same task. They are split into two groups (of one or more persons) such that the difference between the times taken by the two groups to complete the same work is minimum. What could be the composition of the faster group?
(a) Amit and Das (b) Badri and Chetan
(c) Badri, Chetan and Das (d) Amit alone

10. PR is a tangent to a circle at point P. Q is another point on the circle such that PQ is the diameter and RQ cuts the circle at point M. If the radius of the circle is 4 units and PR = 6 units, then find the ratio of the perimeter of triangle PMR to triangle PQR.
(a) 11/20 (b) 3/5 (c) 13/20 (d) 18/25



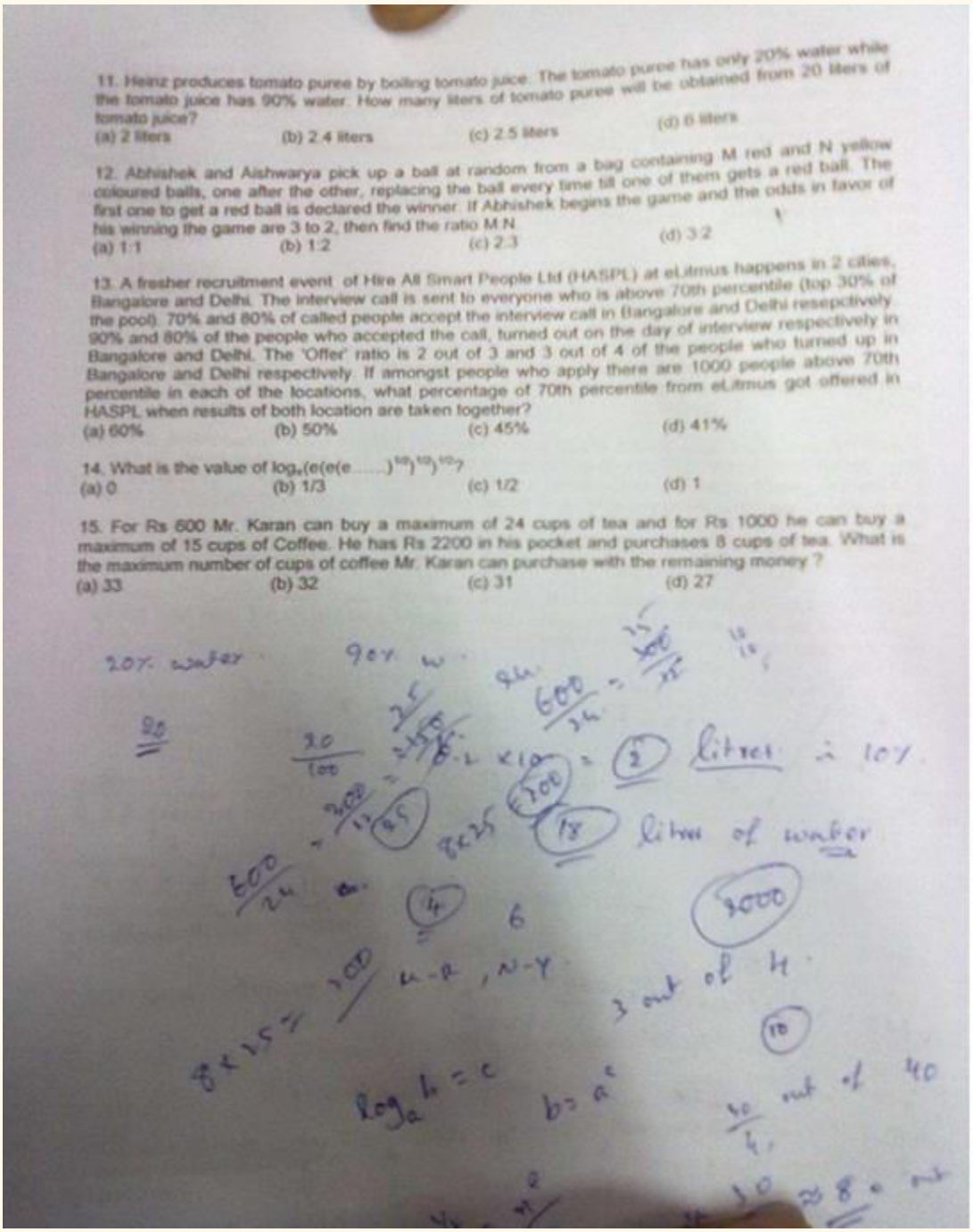
11. Heinz produces tomato puree by boiling tomato juice. The tomato puree has only 20% water while the tomato juice has 90% water. How many liters of tomato puree will be obtained from 20 liters of tomato juice?
(a) 2 liters (b) 2.4 liters (c) 2.5 liters (d) 6 liters

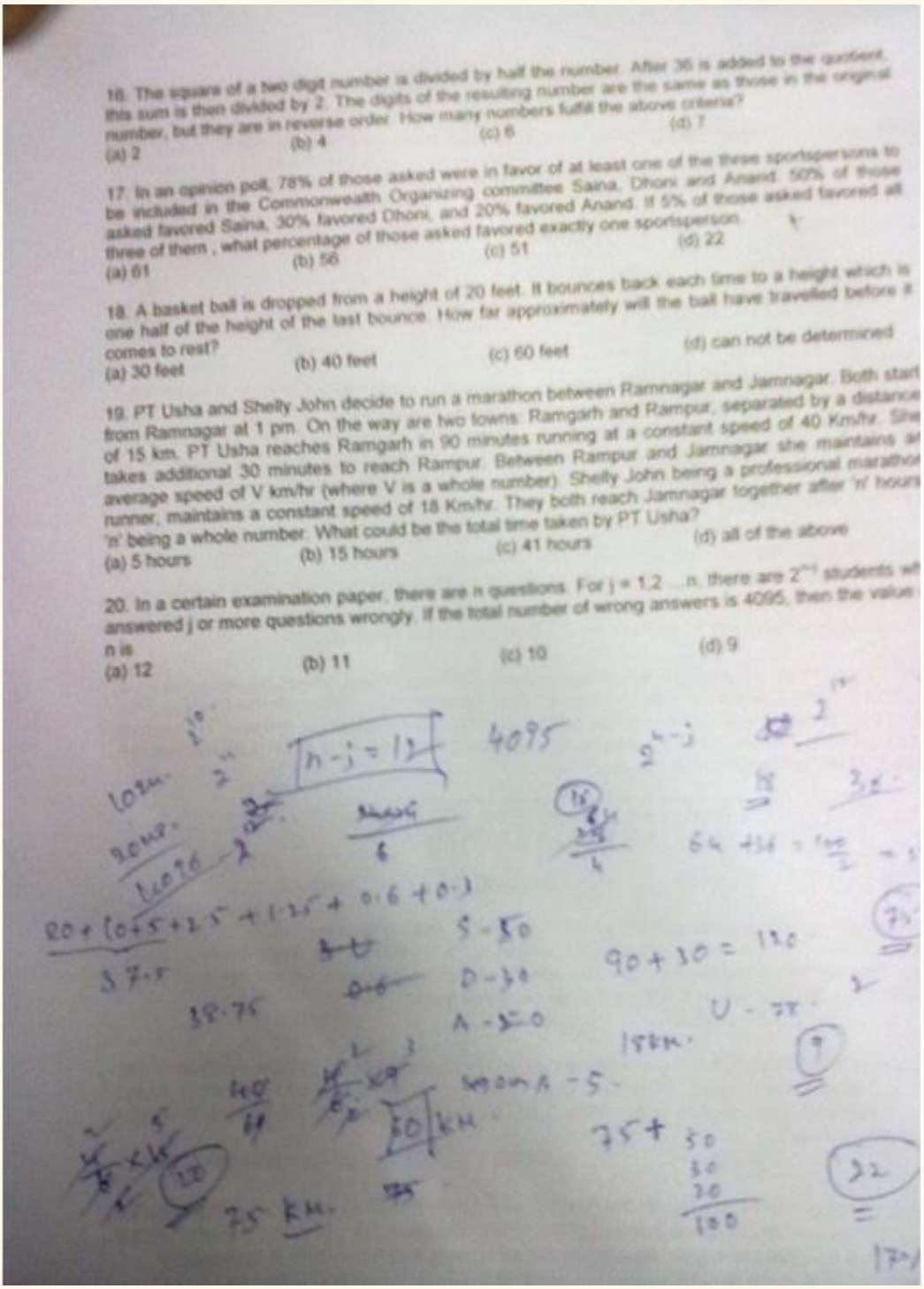
12. Abhishek and Aishwarya pick up a ball at random from a bag containing M red and N yellow coloured balls, one after the other, replacing the ball every time till one of them gets a red ball. The first one to get a red ball is declared the winner. If Abhishek begins the game and the odds in favor of his winning the game are 3 to 2, then find the ratio M:N
(a) 1:1 (b) 1:2 (c) 2:3 (d) 3:2

13. A fresher recruitment event of Hire All Smart People Ltd (HASPL) at eLitmus happens in 2 cities, Bangalore and Delhi. The interview call is sent to everyone who is above 70th percentile (top 30% of the pool). 70% and 80% of called people accept the interview call in Bangalore and Delhi respectively. 90% and 80% of the people who accepted the call, turned out on the day of interview respectively in Bangalore and Delhi. The 'Offer' ratio is 2 out of 3 and 3 out of 4 of the people who turned up in Bangalore and Delhi respectively. If amongst people who apply there are 1000 people above 70th percentile in each of the locations, what percentage of 70th percentile from eLitmus got offered in HASPL when results of both location are taken together?
(a) 60% (b) 50% (c) 45% (d) 41%

14. What is the value of $\log_e(e(e(e(e\ldots\ldots)^{1/5})^{1/4})^{1/3})^{1/2}$?
(a) 0 (b) 1/3 (c) 1/2 (d) 1

15. For Rs 600 Mr. Karan can buy a maximum of 24 cups of tea and for Rs 1000 he can buy a maximum of 15 cups of Coffee. He has Rs 2200 in his pocket and purchases 8 cups of tea. What is the maximum number of cups of coffee Mr. Karan can purchase with the remaining money ?
(a) 33 (b) 32 (c) 31 (d) 27





16. The square of a two digit number is divided by half the number. After 36 is added to the quotient, this sum is then divided by 2. The digits of the resulting number are the same as those in the original number, but they are in reverse order. How many numbers fulfil the above criteria?
(a) 2 (b) 4 (c) 6 (d) 7

17. In an opinion poll, 78% of those asked were in favor of at least one of the three sportspersons to be included in the Commonwealth Organizing committee Saina, Dhoni and Anand. 50% of those asked favored Saina, 30% favored Dhoni, and 20% favored Anand. If 5% of those asked favored all three of them , what percentage of those asked favored exactly one sportsperson.
(a) 61 (b) 56 (c) 51 (d) 22

18. A basket ball is dropped from a height of 20 feet. It bounces back each time to a height which is one half of the height of the last bounce. How far approximately will the ball have travelled before it comes to rest?
(a) 30 feet (b) 40 feet (c) 60 feet (d) can not be determined

19. PT Usha and Shelly John decide to run a marathon between Ramnagar and Jamnagar. Both start from Ramnagar at 1 pm. On the way are two towns: Ramgarh and Rampur, separated by a distance of 15 km. PT Usha reaches Ramgarh in 90 minutes running at a constant speed of 40 Km/hr. She takes additional 30 minutes to reach Rampur. Between Rampur and Jamnagar she maintains an average speed of V km/hr (where V is a whole number). Shelly John being a professional marathon runner, maintains a constant speed of 18 Km/hr. They both reach Jamnagar together after 'n' hours 'n' being a whole number. What could be the total time taken by PT Usha?
(a) 5 hours (b) 15 hours (c) 41 hours (d) all of the above

20. 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

QUESTIONS

1. The cost price of 10 articles is equal to the selling price of 9 articles. find the profit percent.

a. 101/9 % b. 100/9 % c. 102/9 % d. 103/9 %

Ans: 100/9 %

Let Cost Price be x and selling price be y
Then given that cost price of 10 articles is equal to the selling price of 9 articles
That means 10x=9y
Y= 10x/9
Profit percent = ((selling price – cost price)/cost price) * 100
= 100/9 %

2. The ratio of radii of two right circular cylinders is 6:7 and their heights are in the ratio 5:9. The ratio of their respective curved surface areas is
a. 14:15 b. 17:19 c. 23:29 d. 10:21

Ans: 10 : 21

Curved surface area of a cylinder = 2 * Pi * r * h
Ratio = (6/7) * (5/9) = 10:21

3. In how many ways can the 7 letters A,B,C,D,E,F and G be arranged so that C and E never together.
a. 5040 b. 6480 c. 3600 d. 1440

Ans: 3600

C and E never together = Total arrangements – C and E together
Total arrangements are 7!
C and E together = pack c and e into one unit + 5 other alphabets = 6! 2! (2! Is two arrange c and e internally)
C and E never together = Total arrangements – C and E together = 7! – 6! 2! = 3600

4. How many numbers are there in all from 4000 to 4999 (both 4000 and 4999 included) having at least one of their digits repeated?
a. 356 b. 216 c. 496 d. 504

Ans: 496

Atleast one of their digits repeated = Total numbers – None of the digits repeated
Total numbers from 4000 to 4999 = 1000
None of the digits repeated = _ _ _ _
There are total 4 places
1st place is filled with 4 only. So only one choice
2nd place is filled with any 9 digits except 4 as we have used 4 in 1st place. So 9 choices

Similarly 3rd place is filled with any 8 digits. So we have 8 choices
4th place is filled with any 7 digits. So we have 7 choices.
So total arrangements = 1 * 9 * 8 * 7 = 504
Ans= 1000 – 504 = 496

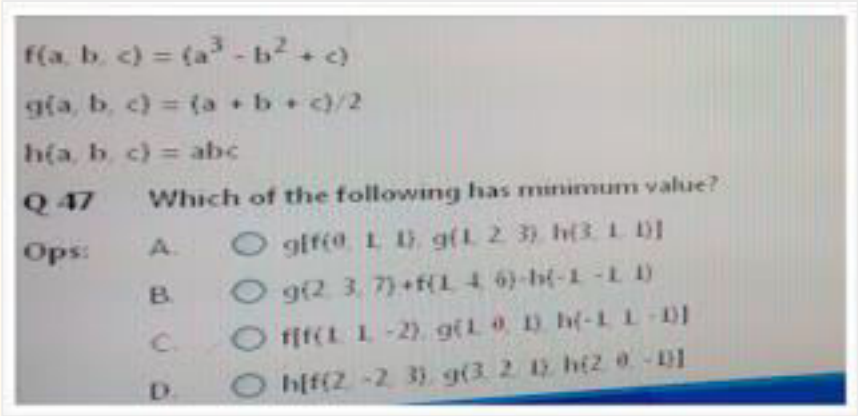
5. if 1/2x +1/4x+1/8x=14 Then the value of x is:
a. 8 b. 12 c. 4 d. 16

Ans: x = 16

6. Which of the following expressions will always be true?

Ans: D

Verify from options



Ans(C)

8. Find the value of h[f(1,2,3), g(2,1,-2), h(1,-1,-1)].
a. 0.5 b. none c. 1 d. 0

Ans(D)

9. A trapezium with an area of 5100 cm2 has the perpendicular distance between the two parallel sides of 60m . if one of the parallel sides be 40m. find the length of the other side.
a. 130 m b. 110 m c. 120 m d. 145 m

Ans: 130 m

Area of a trapezium = (1/2) (a+b) h

10. Find the simple interest on Rs. 306.25 from March 3rd to July 27th(In the same year) at 3.75 percent.
a. Rs. 4.57 b. Rs. 4.59 c. Rs. 4.53 d. Rs 4.58

Ans: 4.59

from March 3rd to July 27th(In the same year) = 146 days
(306.25 * 146 * 3.75)/ (365 * 100) = 4.59

11. Dhruv and Naksh drive at the speeds of 36 Kmph and 54 kmph respectively. If Naksh takes 3 hours lesser than what Dhruv takes for the same distance. Then distance is :
a. 324 km b. 524 km c. 320 km d. 420 km

Ans: 324 km

Let dhruv takes t hours then naksh takes t-3 hours
Because distance is same in both cases
So 36 * t = 54 (t-3)
t=9
ans: 36 * 9 = 324 km

12. The radius of wheel of axis's car is 50 cm. What is the distance that the car would cover in 14 revolutions?
a. 11 m b. 22 m c. 33 m d. 44 m

Ans: 44 m

Distance covered in one revolution is equal to wheel surface area = 2 * Pi * r
Distance covered in 14 revolutions = 14 (2 * (22/7) * 50) = 44000 cm= 44 m

13. P can do a piece of work in 5 days of 8 hours each and Q can do in 4 days of 6 hours each. How long will they take do it working 5 hours a day?
a. 2 days b. 3 days c. 4 days d. 5 days

Ans: 3 days

P can do in 5* 8 hours= 40 hours
Q can do in = 24 hours
Working together in one hour = (1/40) + (1/24) = 1/15
Total work can be finished in 15 hours

They 5 hours a day so total number of days = 15/5 = 3 days

14. Libra had three diamond weighing equal. One of the diamond fell and broke into 4 equal pieces weighing 20gm each. what was the total weight of three diamonds.
a. 200 gm b. 280 gm c. 320 gm d. 240 gm

Ans: 20 * 4 * 3 = 240 gm

16. if the antecedent and consequent of a ratio are increased by 5 and 6 respectively then the ratio is 5:6. find the original ratio. a. 5:6 b. 1:2 c. 2:3 d. 3:4
Ans: let's say original ratio is x:y
(x+5)/(y+6) = 5/6
Then x/y = 5/6

17. Rohit and Rahul start from the same point and move away from each other at right angle. After 4 hours they are 80 km apart. if the speed of Rohit is 4 kmph more than Rahul. what is the speed of Rohit?
a. 16 kmph b. 20 kmph c. 12 kmph d. none

Ans: x is the speed of rahul then (x+4) will be rohit speed

802 = (4x)2 + ((x+4)4)2
X=12
Rohit speed = 12 + 4 = 16kmph

18. Abhimanyu and supreet can together finish a work in 50 days. They worked together for 35 days and then supreet left. After another 21 days, Abhimanyu finished the remaining work. In how many days Abhimanyu alone can finish the work?
a. 70 days b. 75 days c. 80 days d. 60 days

Ans: 35 days worked together + 21 days abhimayu worked = finished the work

35(1/50) + 21(x) = 1
X=70 days
19. if two fair dice are thrown simultaneously. then what is the probability that sum of the numbers appearing on the top faces of the dice is less than 4? a. 6/14 b. none c. 1/12 d. 3/18
Ans: possible cases are (1,1) (1,2) and (2,1) = 3

3/36 = 1/12

20.

21. 3 individuals john wright, greg chappell and gary kristen are in the race for the appointment of new coach of team india. The probabilities of their appointment are 0.5, 0.3 and 0.2 respectively. If john wright is appointed then probability of ganguly appointed as a captain will be 0.7 and corresponding probability if greg chappell or gary kristen is appointed are 0.6 and 0.5 respectively. find the overall probability that ganguly will appointed as a captain.
a. 0.63 b. 0.35 c. 0.18 d. 0.89
Ans: 0.63

22. A man spends Rs 660 on tables and chairs. the price of each table is Rs. 150 and the price of each chair is Rs. 20. If he buys maximum number of tables, what is the ratio of chairs to tables purchased?
a. 2: 5 b. 3:5 c. 2:3 d. 3:4
4 tables + 3 chairs =660
Chairs to tables ratio is 3:4

23. two packets are available for sale.
packet a: peanuts 100 gms for Rs 48 only
packet b: peanuts 150 gms for Rs 72 only
which is a better buy?
a. both have the same value b. packet b c. data insufficient d. packet a
Ans: a. both have the same value

Packet-a : 1 gm cost = 48/100
Packet-b : 1 gm cost = 72/150

24.find the surface area of a piece of metal which is in the form of a parallelogram whose base is 10 cm and height is 6.4 cm
a. 64 cm2 b. 65 cm2 c. 45 cm2 d. 56 cm2
Ans:

25. Sridevi is younger than Rajeev by 4 years. if their ages are in the ratio of 7:9. how old is Sridevi?
Ans: if Sridevi is x then Rajeev will be (x+4)
x/(x+4) = 7/9

x=14

26. A sum of Rs. 900 amounts to Rs. 950 in 3 years at simple interest. If the interest rate is increased by 4%, it would amount to how much?

27. two trains for Palwal leave Kanpur at 10a.m and 10:30 am and travel at the speeds of 60 kmph and 75 kmph respectively. After how many kilometres from Kanpur will the two trains be together?
Ans: 150 km

28. $(x + 1/x) = 6$ the value of $(x5 + 1/x5) = ?$
Ans: 6726

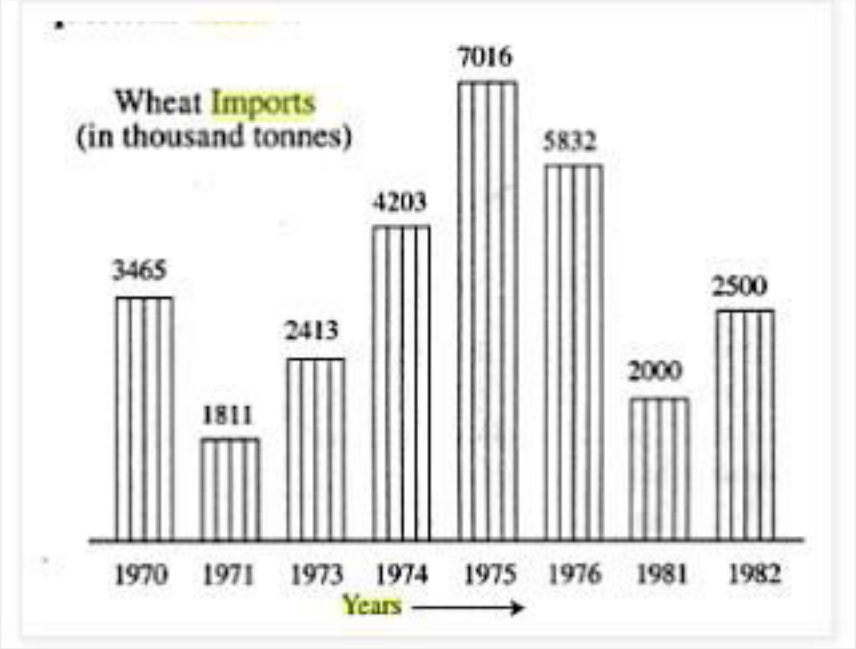
29. In how many ways can 44 people be divided into 22 couples?
Ans: Short cut how many ways n people be divided into n/2 couples
(n!)/{(2!)n/2 (n/2)!} so ans is b. (44!)/{(2!)22 (22!)}

30. Find the remainder when $(x3 + 4 x2 + 6 x - 2)$ is divided $(x+5)$
Ans: -57

31. a solid cylinder has total surface area of 462 cm2 . If total surface area of the cylinder is thrice of its curved surface area. then the volume of the cylinder is:
a. 539 cm3 b. 545 cm3 c. 531 cm3 d. 562 cm3

Ans:539

32.



In which year was there lowest wheat import?
a. 1973 b. 1974 c. 1975 d. 1982
Ans: a

33. What is the ratio of number of years which have imports above the average imports to those which have imports below the average imports?
a. 5:3 b. 2: 6 c. 3: 8 d. none
Ans: d

34. The increase in imports in 1982 was what percent of the imports in 1981?
a. 25% b. 5% c. 125% d. 80%
Ans: a

35. The section of a solid right circular cone by a plane containing vertex and perpendicular to base is an equilateral triangle of side 10 cm. find the volume of the cone?
a. 221.73 cm3 b.223.73 cm3 c.228.73 cm3 d.226.61 cm3

36. A sum of Rs 468.75 was lent out at simple interest and at the end of 1 year and 8 months, the total amount of Rs 500 is recieved. find the rate of interest.
a. 2% b. 4% c. 1% d. 3%
Ans: 4%

37.Consider the following two curves in the X-Y plane
y=(x3+x2+5)

y=(x2+x+5)
Which of the following statements is true for -2<= x <=2?
a. The two curves do not intersect. b. The two curves intersect thrice.
c. The two curves intersect twice. d. The two curves intersect once.
Ans: b

38.Give a model for maximising the profit in a company or minimising the loss in a conflict with optimisation techniques.where quantity f(x) is referred to as the object function while the vector 'x'consists of decision variables.
A. None of the mentioned options. B. x* =arg min f(x) C. x* =arg max f(x) D. x* =an-1+an arg min f(x)n

39. A positive integer is selected at random and is divided by 7,what is the probability that the remainder is 1?
A. 3/7 B. 4/7 C. 1/7 D. 2/7
Ans: 1/7

40. A mixture of 40 litres of salt and water contains 70%of salt.how much water must be added to decrease the salt percentage to 40%?
A. 40 litres B. 30 litres C. 20 litres D.2 litres
Ans: x=30

41. Anirudh,Harish and Sahil invested a total of Rs.1,35,000 in the ratio 5:6:4 Anirudh invested has capital for 8 months. Harish invested for 6 months and Sahil invested for 4 months. If they earn a profit of Rs.75,900,then what is the share of Sahil in the profit?
A. Rs.12,400 B. Rs.14,700 C. Rs.15,800 D. Rs.13,200
Ans: 13,200

42. A man sets out to cycle from Delhi to Rohtak and at the same time another man starts from Rohtak to cycle to cycle to Delhi. After passing each other they completed their journey in (10/3) hours and (16/3) hours respectively.At what rate does the second man cycle if the first cycle at 8 kmph?
A.6.12 kmph B.6.42 kmph C. 6.22 kmph D. 6.32 kmph
Ans: 6.32

43.Two trains are travelling in opposite directions at uniforms speeds of 60 kmph and 50 kmph.They take 5 seconds to cross each other.If the two trains travelled in the same directions.then a passenger sitting in the faster moving train would have overtaken the other than in 18 seconds.what are the lengths of the trains?
A. 87.78 m and 55 m B.112 m and 78 m C.102.78 m and 50 m D.102.78 m and 55 m
Ans: C

44. A cube is given with an edge of 12 units.it is painted on all faces and then cut into smaller cubes of edge of 4 units. How many cubes will have 2 faces painted? A. 2 B. 12 C. 8 D. 0

45.Two numbers are in the ratio xy,when 2 is added to both the numbers.the ratio becomes 1:2.when 3 is subtracted from both the numbers. The ratio becomes 1:3.Find the sum of x and y. A. 27 B. 24 C. 28 D. 26
Ans: 26

46. To earn extra profit,a shopkeeper mixes 30 kg of dal purchased at Rs.36/kg and 26 kg of dal purchased at Rs.20/kg.What will be the profit that he will make if he sells the mixture at Rs.30/kg?
A. Rs.60 B. Rs.80 C. Rs.50 D. Rs.100
Ans: 80

47. There are 4 boys and 3 girls.they sit in arrow randomly.what is the probability that all girls are together?
A. 1/14 B. 2/14 C. 5/14 D. 3/14
Ans: 2/14

48. An oblong piece of ground measures 19m 2.5 dm by 12m5dm.Fom centre of each side of the ground,a path 2 m wide goes across to the center of the opposite side.What is the area of the path?
A. 59.5 m2 B. 54 m2 C. 43 m2 D. 34 m2
Ans: 78.54

49. The circumference of the wheel of a truck is 1 meter.To cover a distance of 1.5 km.the number of revolutions made by the wheel are: A. 3000 B. 37 C. 1500 D. 750
Ans: 1500 revolutions

50. If (x+(1/x))=4,the value of (x5+(1/x5)) is: A. 724 B. 500 C. 752 D. 525
Ans: 724

Read the information given below in the table and answer the question that follow.

Read the information given below in the tabke and answer the question that follow.

Year	Gross turnover in lakh	Profit before int. and depr.	Interest in lakh	Depreciation in lakh	Net profit Lakh
1980-81	1380	380.92	300.25	69.90	10.67
1981-82	1401	404.98	315.40	71.12	18.46
1982-83	1540	520.03	390.85	80.12	49.16
1983-84	2112	599.01	444.44	88.88	65.59
1984-85	2520	811	505.42	91.91	212.78
1985-86	2750.99	920	600.20	99	220.80

Read the information given below in the tabke and answer the question that follow.

Year	Gross turnover in lakh	Profit before int. and depr.	Interest in lakh	Depreciation in lakh	Net profit Lakh
1980-81	1380	380.92	300.25	69.90	10.67
1981-82	1401	404.98	315.40	71.12	18.46
1982-83	1540	520.03	390.85	80.12	49.16
1983-84	2112	599.01	444.44	88.88	65.59
1984-85	2520	811	505.42	91.91	212.78
1985-86	2750.99	920	600.20	99	220.80

51.During which year did the net profit exceed Rs.1 crore for the first time?
A.1985-86 B. 1983-84 C. 1984-85 D. None of the mentioned options
Ans: C

52.During which year was the "gross turnover" closest to thrice the profit before interest and depression?
A. 1985-86 B. 1983-84 C. 1984-85 D. None of the mentioned options.
Ans: A

53. During which of the given years did the net profit from the highest proportion of the profit before interest and depression? A. 1985-86 B. 1983-84 C. 1984-85 D. None of the mentioned options.
Ans: C

54. A sum was put at simple interest at certain rate for 3 years. Had it been put at 1% higher rate it would have fetched Rs. 63 more. The sum is: A. Rs. 2,400 B. Rs. 2,100 C. Rs. 2,200 D.Rs. 2,480
Ans: 2,100

55.For what value of "k" will the equation (2kx2 + 5kx +2)=0 have equal roots?
A. 2/7 B. 9/4 C. 16/25 D. 7/18
Ans: C

56.In triangle PQR, PQ=6 cm,PR=8 cm and QR=12 cm. Calculate the area of the triangle PQR.
A. 23.33 cm2 B. 17.5 cm2 C. 21.33 cm2 D. 28.67 cm2
ANs: 21.33

57. A company named "Dyona Automobiles"has received an order for 5,000 widgets for a total sale price of $5,000 and wants to determine the gross profit that will be generated by completing the order. The other details for producing 100,000 widgets are given as follows:
1.Raw Materials Costs-$10,000
2.Direct Labor Costs-$50,000
A. $5,000 B. $4,000 C. $3,000 D. $2,000

58. If m=(2-√3),then the value of (m6+m4+m2+1) /m3 is:
A. 64 B. 56 C. 69 D. 52

59. 28 children can do a piece of work in 50 days.how many children are needed to complete the work in 30 days?
A. 49 B. 40 C. 35 D. 45
Ans: 49

60. A certain sum of money becomes Rs.750 in 2 years and becomes Rs.873 in 3.5 years.Find the sum and rate of interest. A. Rs.400, 13% p.a B. Rs.500,11%p.a C. Rs.630,12%p.a D. Rs.600,13%p.a

Ans: 586, 14%

61. Henna invested Rs.5000 at 12% simple interest p.a.the interest she will receive after 2 years is:
A. Rs.800 B. Rs.1000 C. Rs.600 D. Rs.1200
Ans: (5000*12*12)/100= 1200

62.A bag contains 3 red,5yellow and 4 green balls.3 balls are drawn randomly,what is the probability that the ball drawn contains no yellow ball? A. 9/44 B. 37/44 C. 43/44 D. 7/44
Ans:
Probability = 35/12C3 =7/44

63. If a2+b2-4(a+b)= -8,then the value of (a-b) is:
A. 4 B. 0 C. 2 D. 8

64. A lent Rs.600 to b for 2 years and Rs.150 to C for 4 years and receive all together Rs.90 as both as interest.Find the rate of interest.
A. 4%p.a B. 2%p.a C. 5%p.a D. 3%p.a
Ans: 5%

65. If the perimeter and the diagonal of a rectangle is 18 cm and √41 cm respectively.Calculate the area of the rectangular field.
A. 25 cm2 B. 29 cm2 C. 18 cm2 D. 20 cm2
Ans:
2(a+b) = 18
(a+b)=9
√ (a2 + b2) = √41
(a+b)2 = a2+b2 + 2ab
ab=20

66. A,B, and C enter into a partnership and their shares are in the ratio 1/2 : 1/3 : 1/4.After 2 months,A withdraws half of his capital and after 10 months,a profit of RS. 378 is divied among them. What is B's share?
A. Rs.144 B. Rs.156 C. Rs.166 D. Rs.129

67. If a:b =4:1,then $\sqrt{(a/b)}+\sqrt{(b/a)}$ is :
A. 1 B. 4/5 C. None of the mentioned options D. 5/4
Ans: 5/2
68. A cube is given with an edge of 12 units.It is painted on all faces and then cut into smaller cubes of edge of 4 units.How many cubes will have 2 faces painted?
A. 8 B. 12 C. 0 D. 2

69.Find the area of Rhombus one of whose diagonals measures 8 cm and the other 10 cm.
A. 47 cm2 B. 34cm2 C. 40 cm2 D. 64cm2

70. Rs 5000 was divided among 5 men, 6 women and 5 boys, such that the ratio of the shares of men, women and boys is 5:3:2 what is the share of the boy?
a. 200 b. 100 c. 250 d. 150
Ans: 200
The ratio of shares of groups of men, women and boys = 5 :3 :2
So share of boys is = (2/10)*5000 = 1000
Share of a boy= 1000/5 = 200

Set 2

01. A milkman mixes 20L of water with 80L of milk. After selling one-fourth of this mixture, he adds a water to replenish the quantity that he has sold. What is the current proportion of water to milk ?
(a) 2 : 3 (b) 1 : 2 (c) 1 : 3 (d) 3 : 4

02. Using only 2, 5, 10, 25 and 50 paise coins, what will be the minimum number of coins required to pay exactly 78 paise, 69 paise and Rs 1.01 to three different persons?
(a) 19 (b) 20 (c) 17 (d) 18

03. Instead of walking along two adjacent sides of a rectangular field, a boy took a short cut along the diagonal and saved a distance equal to half the longer side. Then, the ratio of the shorter side to the longer side is ?
(a) 1:2 (b) 2:3 (c) 1:4 (d) 3:4

04. Mayank, Mirza, Little and Jaspal bought a motorbike for $60,000. Mayank paid one half of the sum of the amounts paid by the other boys, Mirza paid one third of the sum of the amounts paid by the other boys; and Little paid one fourth of the sum of the amounts paid by the other boys. How much did Jaspal has to pay ?
(a) $15,000 (b) $13,000 (c) $17,000 (d) None of these

05. A piece of string is 40 cm long. It is cut into three pieces. The longest piece is 3 times as long as the middle-sized and the shortest piece is 23 cm shorter than the longest piece. Find the length of the shortest piece(in cm) ?
(a) 27 (b) 5 (c) 4 (d) 9

06. Fresh grapes contain 90% water by weight while dried grapes contain 20% water by weight. What is the weight of dry grapes available from 20 kg of fresh grapes ?
(a) 2 Kg (b) 2.4 Kg (c) 2.5 Kg (d) None of these

07. I have one rupees coins, fifty paise coins and twenty five paise coins. The number of coins are in the ratio 2.5 : 3 : 4. If total amount with me is Rs 210, find the number of one rupee coins ?
(a) 90 (b) 85 (c) 100(d) 105

08. After allowing a discount of 11.11% , a trader still makes a gain of 14.28%. At how many percent above the cost price does he mark on his goods ?
(a) 28.56% (b) 35% (c) 22.22% (d) None of these

09. A dealer buys dry fruits at Rs 100, Rs 80 and Rs 60 per kilogram. He mixes them in the ratio 3 : 4 : 5 by weight and sells at a profit of 50%. At what price per kilogram does he sell the dry fruit ?
(a) Rs 80 (b) Rs 100 (c) Rs 95 (d) None of these

10. Two liquids A and B are in the ratio 5 : 1 in container 1 and 1 : 3 in container 2. In what ratio should the contents of the two containers be mixed so as to obtain a mixture of A and B in the ratio of 1 : 1 ?
(a) 2 : 3 (b) 4 : 3 (c) 3 : 2 (d) 3 : 4

Answers : Find Detailed Solutions at the end of the the page.

1. A 2. A
3. D 4. B
5. C 6. C

7. D 8. A
9. D 10. D

Detailed Solution

1.
As one-fourth of the solution (milk + water = 80L + 20L) is sold, solution drawn out of it is 100 x (1/4)= 25 L
Quantity of the milk drawn out = 25 x (4/5)= 20 L
» Quantity of water drawn out= 5L
Now adding 25 L of water, quantity of water = 20 – 5 + 25 = 40L
Also, quantity of milk remaining= 80 – 20 = 60L
Required ratio= 40 : 60= 2 : 3
(a)

2.
78 = 50 + 10 + 10 + 2 + 2 + 2 + 2 = 7
69 = 50 + 10 + 5 + 2 + 2 = 5
1.01 = 50 + 25 + 10 + 10 + 2 + 2 + 2 = 7
Hence, Number of coins 7 + 5 + 7 = 19 Coins
(a)

Profit_Loss_solution_01_P_03

4.
Mayank paid 1/2 of the sum paid by the other three. Let the other three paid $x jointly, then Mayank paid x/2.
So, x + x/2 = 60000 i.e. x = 40000. Hence Mayank paid $20, 000.
Likewise, Mirza and little paid $15000 and $12000 respectively.
Hence, amount paid by Jaspal $(60, 000)-(20,000 + 15,000 + 12,000)=13,000
5.
Let the largest piece be 3x, then middle and shortest piece would be x and (3x – 23) respectively.
or 3x + x + (3x – 23) = 40
i.e. x=9, therefore shortest piece= (3 x 9 – 23) = 4
©

6.
Let y kg of dry grapes is obtained.
Then, solid part in fresh grapes = solid part in the dry grapes

0.10 x 20 = 0.8 x y
y=2.5 Kg.
©

7.
Ratio of number of one rupee, fifty paisa, twenty five paisa coins= 2.5 : 3 : 4
» Ratio of value of coins= 2.5 x 1 : 3/2 : 4/4 » 5 : 3 : 2
Let amount of Rs 1 coins, 50 paisa coins and 25 paisa coins be 5x, 3x and 2x respectively.
So, 5x + 3x + 2x = 210(given)
Hence, x=21
»Value of one rupee coins = number of one rupees coins = 21 x 5=105
(d)

8.
Let the CP be Rs. 100 then SP= Rs. 114.28
(Profit=14.28%)
This SP is arrived after giving a discount of 11.11% on marked price.
Hence if marked price = y
Then, y x 0.8889=114.28 » x=128.56
which is 28.56 % more than the CP.

9.
Cost price of (3 + 4 + 5)= 12Kg of fruits Rs.(300 + 320 + 300)= Rs. 920
SP at a profit of 50% = Rs. 1380
SP of fruits per kg= 1380/12= Rs. 115
Profit_Loss_solution_01_P_10

SET 2

01. Instead of a metre scale, a cloth merchant uses a 120 cm scale while buying, but uses an 80 cm scale while selling the same cloth. If he offers a discount of 20% on cash payment, what is his overall profit percentage?
(a) 20% (b) 25% (c) 40% (d) 15%

02. I sold two watches for Rs 300 each, one at the loss of 10% and the other at the profit of 10%.What is the percentage of loss(-) or profit(+) that resulted from transaction?
(a) (+)10 (b) (-)1(c) (+))1 (d) (-)10

03. The cost of diamond varies directly as the square of its weight. Once, this diamond broke into four pieces with weights in the ration 1 : 2 : 3 : 4. When the pieces were sold, the merchant got Rs 70,000 less. Find the original price of the diamond?
(a) Rs 1.4 lakh(b) Rs. 2 lakh (c) Rs 1 lakh (d) Rs 2.1 lakh

04. A dealer offers a cash discount of 20% and still makes a profit of 20%, when he further allows 16 articles to a dozen to a particular sticky bargainer. How much percent above the cost price were his wares listed?
(a) 100% (b) 80% (c) 75% (d) 66.66%

05. A man buys spirit at Rs 60 per litre, adds water to it and then sells at Rs 75 per litre. What is the ratio of spirit to water if his profit in the deal is 37.5%?
(a) 9 : 1 (b) 10 : 1 (c) 11 : 1 (d) None of these

06. Two oranges, three bananas and four apples cost Rs 15. Three oranges, two bananas and one apple cost Rs 10. I bought 3 oranges, 3 bananas and 3 apples. How much did I pay?
(a) Rs 10 (b) Rs 8 (c) Rs 15 (d) Cannot be det..

07. From each of two given numbers, half the smaller number is subtracted. Of the resulting numbers the larger one is three times as large as the smaller. What is the ratio of the two numbers ?
(a) 2:1 (b) 3:1 (c) 3:2 (d) None of these

08. The marked price of a table is Rs. 1200, which is 20% above the cost price. It is sold at a discount of 10% on the marked price. Find the profit percent.
(a) 10% (b) 8% (c) 7.5% (d) 6%

09. If the work done by (x-1) men in (x+1) days is to the work done by (x+2) men in (x-1)days is in the ratio 9:10, then the value of x is ?
(a) 10 (b) 12 (c) 8 (d) 15

10. A cask contains a mixture of 49 litres of wine and water in the proportion 5:2. How much water must be added to it so that the ratio of wine to water may be 7:4 ?
(a) 3.5 (b) 6 (c) 7 (d) None of these

Answers : Find Detailed Solutions at the end of the the page.

1.	A	2.	B
3.	C	4.	A
5.	B	6.	C
7.	A	8.	B

9. C 10. B

Detailed Solution

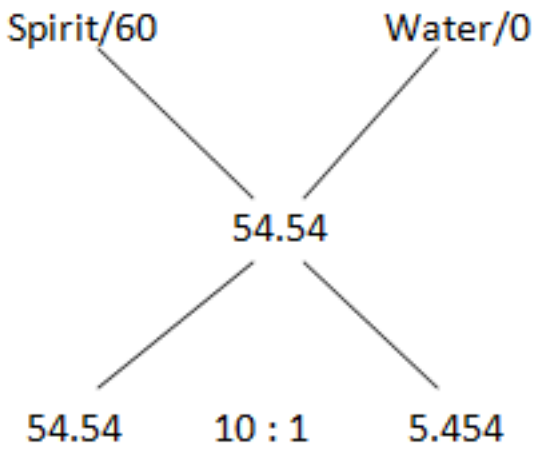
1.
Let the price of 100 cm of cloth be Rs 100, but he gets 120 cm of cloth for Rs 100. Hence, his actual cost for 1 cm = 100/120= Rs. 5/6
Now, instead of selling 100 cm, by cheating he sells 80 cm of cloth for the cost price of 100 cm of cloth.
To calculate his profit, the cost price of 80 cm of cloth = 5/6 X 80= Rs. 66.66
Selling Price of 80 cm of cloth(actually 100 cm for the buyes) at a discount of 20%.
= 100 x 0.8= Rs. 80
Hence Profit Percentage= (80-66.66) x 100/66.66 = 20.02%
or 20 % approx.
(a)

2.
In such case where SP of two items is same and loss % and profit % is also same, there is always a loss on such transaction and it is given by
loss percentage= $(10)^2/100$= 1%

3.
Let the weight of the diamond be 10x, then price the diamond will be $k(10)^2$=$k.100x^2$ where k is a constant.
Weight of each piece= x, 2x, 3x and 4x
Therefore, their price will be kx^2, $k4x^2$, $k9x^2$ and $k16x^2$
Total price of pieces = $kx^2(1 + 4 + 9 + 16) = 30kx^2$
Given,
$k.100.x^2 - k.30.x^2$= 70,000 or kx^2=1,000
» Original price of diamond
=$k.100.x^2$ = 100 x 100=1,00,000

4.
Let the CP of the article be Rs x, since he earns a profit of 20%, Hence SP = 1.2x. It is given that he incurs loss by selling 16 articles at the cost of 12 articles.
loss=(16-12)x100/16=25%
» His selling price = SP x 0.75
Now, SP x 0.75= 1.2x
SP=1.2x/0.75 = 1.6x
This SP is arrived after giving a discount of 20% on MP.
Hence, MP= 1.6x/0.8=2x. It means that article has been marked 100% above the cost price.

5. Selling Price of the mixture at a profit of 37.5% is Rs. 75
Hence, Cost Price= 75/1.375 = Rs. 54.54
Assuming cost of water as 0.
By allegation rule, we get



6.
$2O + 3B + 4A = 15$ —- (1)
$3O + 2B + A = 10$ —- (2)
Adding equation (i) and (ii), we get
$5O + 5B + 5A = 25$ or $O + B + A = 5$
» $3O + 3B + 3A = 3 \times 5 = 15$
(c)

7.

Let the two numbers be x and y and x < y.

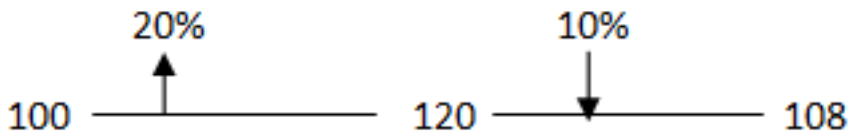
Then, $\left(y-\frac{x}{2}\right)=3\left(x-\frac{x}{2}\right)$

» $\left(y-\frac{x}{2}\right)=\frac{3x}{2}$

Or y= 4x/2 » y= 2x

» y : x = 2 : 1

8.



9. We can solve this problem by taking the different values of x=10, 12, 8, 15
(c)

10.
Initial wine= 35 litres
Initial water = 14 litres
Since, we want to create 7 : 4 mixture of wine and water by adding only water, it mean that the amount of wine is constant at 35 litres.
Thus, 7 : 4 = 35 : 20
Hence, water required is 6 litres.

Elitmus Previous Year Questions on Percentages

Find answers at the end of every set.

SET 1

01. 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 be decreased by ?
(a) 13.64% (b) 15% (c) 18.75% (d) 30%

02. A survey on a sample of 25 new cars being sold at a local auto dealer was conducted to see which of the three popular options-air conditioning, radio and power windows- were already installed. The survey found : 15 had air conditioning, 2 had air conditioning and power windows but no radios, 12 had radio, 6 had air conditioning and radio but no power windows, 11 had power windows, 4 had radio and power windows, 3 had all three options. What is the number of cars that had none of the options?
(a) 4 (b) 3 (c) 1 (d) 2

03. At the end of year 1998, Shepard bought nine dozen goats. Henceforth, every year he added p% of the goats at the beginning of the year and sold q% of the goats at the end of the year where $p>0$ and $q>0$. If Shepard had nine dozen goats at the end of year 2002, after making the sales for that year, which of the following is true?
(a) $p = q$ (b) $p < q$ (c) $p > q$ (d) $p = q/2$

04. The owner of an art shop conducts his business in the following manner. Every once in a while he raises his prices by X%, then a while later he reduces all the new prices by X%. After one such up-down cycle, the price of a painting decreased by Rs 441. After a second up-down cycle, the painting was sold for Rs 1944.81. What was the original prices of the painting (in Rs)?
(a) 2756.25 (b) 2256.25 (c) 2500 (d) 2000

05. A student took five papers in an examination, where the full marks were the same for each paper. His marks in these papers were in the proportion 6 : 7 : 8 : 9 : 10. In all papers together, the candidate obtained 60% of the total marks. Then the number of papers in which he got more than 50% marks is ?
(a) 1 (b) 3 (c) 4 (d) 5

06. A college has raised 75% of the amount it needs for a new building by receiving an average donation of Rs 600 from the people already solicited. The people already represent 60% of people , the college will ask for donations. If the college is to raise exactly the amount needed for the new building, what should be the average donation from the remaining people to be solicited ?

(a) 300(b) 250(c) 400(d) 500

07. Forty percent of the employees of a certain company are men and 75% of the men earn more than Rs 25,000 per year. If 45% of the company's employees earn more than Rs 25,000 per year, what fraction of the women employed by the company earn Rs 25,000 per year ?

(a) 2/11 (b) 1/4 (c) 1/3 (d) ¾

08. In a survey of political preferences, 78% of those asked were in favour of at least one of the proposals : I, II and III, 50% of those asked favoured proposal I, 30% favoured proposal II and 20% favoured proposal III. If 5% of those asked favoured all three of the proposals, what percentage of those asked favoured more than one of the three proposals?

(a) 10 (b) 12 (c) 17 (d) 22

09. One bacteria splits into eight bacteria of the next generation. But due to environment, only 50% of one generation can produce next generation. If the seventh generation number is 4096 million, what is the number in the first generation?

(a) 1 million (b) 2 million (c) 4 million (d) 8 million

10. I bought 5 pens, 7 pencils and 4 erasers. Rahul bought 6 pens, 8 erasers and 14 pencils for an amount which was half more what I had paid. What percent of the total amount paid by me was paid for the pens ?

(a) 37.5% (b) 62.5% (c) 50% (d) None of these

Answers : Find Detailed Solutions at the end of the the page.

1.	D	2.	D
3.	C	4.	A
5.	C	6.	A
7.	D	8.	C
9.	A	10.	B

Detailed Solution

1.

Let the length, breadth and height of the room be 3,2 and 1 unit respectively.

Area of the four walls of the room = 2(l + b) h

=2 (3 + 2) x 1= 10 sq unit

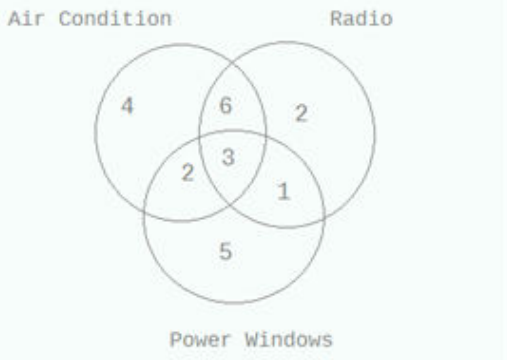
New length, breadth and height of the room will be 6, 1 and 1/2 unit respectively.

Hence, new area of the four walls of the room = 2 (6+1) x 0.5= 7 sq unit.

Percentage decrease (%) = 10-7/10=30

(D)

2. From the given conditions we have,



When we add up all the values we get 23 cars. So, 2 cars don't have any option.

3. If p = q

$$\left(\frac{1+p}{100}\right)\left(\frac{1-q}{100}\right) < 9\ doz$$

Hence, for the final value to be equal to the original value, p should be greater than q. For example, Let p = q = 20 and original number be 100, then

100 x 1.2 x 0.8 = 96.

Hence, it is very clear that for final value to be equal to 100, p should be greater than q.

4. Let the initial price be Rs. X

Then,

$$x - x\left(\frac{100-x}{100}\right)\left(\frac{100+x}{100}\right) = 441$$

$$\Rightarrow \left(\frac{100^2-x^2}{100^2}\right) = \frac{x-441}{x} \qquad \text{--(1)}$$

And

$$x\left(\frac{100^2-x^2}{100^2}\right)^2 = 1944.81 \qquad \text{--(2)}$$

From equation (1) and equation (2) we get

A= Rs. 2756.25

5.

Let the marks scored in five subjects be 6a, 7a, 8a, 9a and 10a.

Total marks in all the five subjects= 40a

Max marks of the five subjects= 40a/0.6

(40a is 60% of total marks)

Hence, Max marks in each subject = 40a/(0.6 x 5)= 13.33a

Hence Percentage in each subject (%)=

*multiply each value by 100.

6a/13.33a= 45.01%

7a/13.33a= 52.51%

8a/13.33a= 60.01%

9a/13.33a=67.51%

10a/13.33a=75.01%

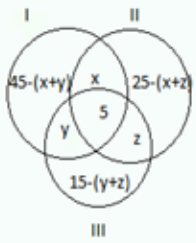
Number of papers in which he got more than 50% marks is 4.

(c)

6.
Let a be the number of people who were asked for donations.
People already solicited= 0.6a
Remaining people= 0.4a
Amount collected from the people solicited= 600 x 0.6a= 360a which is 75% of the amount to be collected. Remaining amount 25%= 120a
Average donation from remaining people = 120a/0.4a=300
(a)

7.
Let number of men and women be 40 and 60 respectively.
» Number of men earning more than Rs 25,000 = 30
»Total number of employees earning more then Rs 25,000 = 45
»Number of women earning more than Rs 25,000= (45 – 30)= Rs 15
»Now, fraction of the women earning Rs 25,000 or less
= (60 – 15)/60 = 45/60 = 3/4
(d)

8. Given ,
$45 - (x + y) + 25 - (x + z) + 15 - (y + z) + (x + y + z + 5) = 78$



Hence, $(x + y + z) = 12$.
Percentage of those asked favoured more than one proposal = 12 + 5 = 17

(c)

9. Let the number of bacteria in the first generation be a
Hence number of bacteria in the second, third, fourth ..... generation would be

$$8\left(\frac{a}{2}\right), 8\left(\frac{4a}{2}\right), 8\left(\frac{16a}{2}\right), \ldots\ldots$$

i.e. a, 4a, 16a, 64a ..... it a Geometric Progression with common difference of 4.
Hence seventh term of the GP
$=a(4)^6=4096$
$=x(2)^{12}=4096$
x=1 or 1 million

(a)

10.

Pens=A

Pencil=B

Eraser=C

Let, 5A + 7B + 4C = 100 —-(1)

then,

6A + 14B + 8C = 150 —-(2)

Mutliplying equation (1) and (2)

10A + 14B + 8C = 200

Now after solving equation (1) and (3) We get,

A=12.5

Hence, total amount paid for 5A=12.5 x 5=62.5

Hence, Percentage of the total amount paid by(%)=62.5

(b)

SET 2

01. Ram sells his goods 25% cheaper than Shyam and 25% dearer than Rahul. How much percentage is Rahul's goods cheaper than Shyam's ?
(a) 33.33% (b) 50% (c) 66.66% (d) 40%

02. In an election between 2 candidates, Bhiku gets 65% of the total valid votes. If the total votes were 6000, what is the number of valid votes that the other candidate Mhatre gets if 25% of the total votes were declared invalid ?
(a) 1625 (b) 1575 (c) 1675 (d) 1525

03. In an examination, Mohit obtained 20% more than Sushil but 10% less than Rajesh. If the marks obtained by Sushil is 1080, find the percentage marks obtained by Rajesh if the full marks is 2000.
(a) 86.66% (b) 72% (c) 78.33% (d) 77.77%

04. The population of the village of Gavas is 10,000 at this moment. It increases by 10% in the first year. However, in the second year, due to migration, the population drops by 5%. Find the population at the end of the third year if in the third year the population increases by 20%.
(a) 12,340 (b) 12,540 (c) 1,27,540 (d) 12,340

05. In a class, 25% of the students were absent for an exam. 30% failed by 20 marks and 10% just passed because of grace marks of 5. Find the average score of the class if the remaining students scored an average of 60 marks and the pass marks are 33 (counting the final score of the students).
(a) 37.26 (b) 37.6 (c) 37.8 (d) 36.93

06. Ram spends 20% of his monthly income on his household expenditure, 15% of the rest on books, 30% of the rest on clothes and saves the rest. On counting, he comes to know that he has finally saved Rs 9520. Find the monthly income ?
(a) 10000 (b) 15000 (c) 20000 (d) 12000

07. Hans and Bhaskar have salaries that jointly amount to Rs 10,000 per month. They spend the same amount monthly and then it is found that the ratio of their savings is 6:1. Which of the following can be Hans's salary ?
(a) Rs 6000 (b) Rs 5000 (c) Rs 4000 (d) Rs 3000

08. 4/5th of the voters in Bellary promised to vote for Sonia and the rest promised to vote for Sushma. Of these voters, 10% of the voters who had promised to vote for Sonia, did not vote on the election day, while 20% of the voters who had promised to vote for Sushma did not vote on the election day. What is the total no. of votes polled if Sonia got 216 votes ?
(a) 200(b) 300(c) 264(d) 100

09. In an examination, 80% students passed in Physics, 70% in Chemistry while 15% failed in both the subjects. If 325 students passed in both the subjects. Find the total number of students who appeared in the examination ?
(a) 500(b) 400(c) 300(d) 600

10. Ravana spends 30% of his salary on house rent, 30% of the rest he spends on his children's education and 24% of the total salary he spends on clothes. After his expenditure, he is left with Rs 2500. What is Ravana's salary ?
(a) Rs 11,494.25 (b) Rs 20,000 (c) Rs 10,000 (d) Rs 15,000
Answers : Find Detailed Solutions at the end of the the page.

1.	D	2.	B
3.	B	4.	B
5.	B	6.	C
7.	A	8.	C
9.	A	10.	C

Detailed Solutions

SET 3

01. A man earns x% on the first Rs 2,000 and y% on the rest of his income. If he earns Rs 700 from Rs 4,000 and Rs 900 from Rs 5,000 of income, find x%.
(a) 20% (b) 15% (c) 25% (d) None of these

02. The price of a Maruti Car rises by 30% while the sales of the car comes down by 20%. What is the percentage change in the total revenue ?

(a) -4% (b) -2% (c) +4% (d) +2%

03. A person who has a certain amount with him goes to market. He can buy 50 oranges or 40 mangoes. He retains 10% of the amount for taxi fares and buys 20 mangoes and of the balance, he purchases oranges. Number of oranges he can purchase?
(a) 36 (b) 40 (c) 15 (d) 20

04. 2/5 of the voters promise to vote for P and rest promised to vote for Q. Of these, on the last day 15% of the voters went back of their promise to vote for P and 25% of voters went back of their promise to vote for Q, and P lost by 2 votes. Then, the total number of voters is ?
(a) 100(b) 110(c) 90 (d) 95

05. The number of votes not cast for the Praja Party increased by 25% in the National General Election over those not cast for it in the previous Assembly Polls and the Praja Party lost by a majority twice as large as that by which it had won the Assembly polls. If a total 2,60,000 people voted each time, how many voted for the Praja Party in the previous Assembly Polls ?
(a) 1,10,000 (b) 1,50,000 (c) 1,40,000 (d) 1,20,000

06. The rate of increase of the price of sugar is observed to be two percent more than the inflation rate expressed in percentage. The price of sugar, on January 1, 1994 is Rs 20 per kg. The inflation rates of the years 1994 and 1995 are expected to be 8% each. the expected price of sugar price on January 1, 1996 would be ?
(a) Rs 23.60 (b) Rs 24.00 (c) Rs 24.20 (d) Rs 24.60

07. A report consists of 20 sheets each of 55 lines and each such line consists of 65 characters. This report is reduced onto sheets each of 65 lines such that each line consists off 70 characters. The percentage reduction in number of sheets is closet to
(a) 20% (b) 5% (c) 30% (d) 35%

08. To pass an examination, 40% marks are essential. A obtains 10% less than the pass marks and B obtains 11.11% marks less than A. What percent less that the sum of A's and B's marks should C obtain to pass the exam ?
(a) 40% (b) 41(3/17)%(c) 28% (d) Any of these

09. The hourly wages of a female labour are increased by 12.5%, whereas the weekly working hours are reduced by 8%. Find the percentage change in the weekly wages if she was getting Rs 1200 per week for 50 hours previously.
(a) +3.5% (b) 4% (c) 4.5% (d) None of these

10. Two numbers X and Y are 20% and 28% less than a third number Z. Find by what percentage is the number Y less than the number X.
(a) 8% (b) 12% (c) 10% (d) 9%
Answers : Find Detailed Solutions at the end of the the page.

1. B 2. C
3. D 4. A
5. C 6. C
7. A 8. D
9. A 10. C

Functions

01. If f(x)=| x – 2 |, then which of the following is always true ?
(a) f(x) = (f(x))2 (b) f(x) = f(-x) (c) f(x) = x – 2 (d) None of these

02. Which of the following functions will have a minimum value at x = -3 ?
(a)f(x) = 2x3 - 4x + 3 (b) f(x)=4x4- 3x+5 (c) f(x) = x6 - 2x – 6 (d) None of these

03. Find the maximum value of the functions 1/(x2 - 3x + 2) ?
(a) 11/4 (b) 1/4 (c) 0 (d) None of these

04. Find the minimum value off function f(x)= log(x2 - 2x + 5) (base 2) ?
(a) -4 (b) 2 (c) 4 (d) -2

05. A function f(x) satisfies f(1)=3600 and f(1) + f(2) +.....f(n) =n2f(n), for all positive integers n>1. What is the value of f(9) ?
(a) 200 (b) 100 (c) 120 (d) 80

06. Let f(x)= max(2x + 1, 3 – 4x), where x is any real number. Then, the minimum possible value of f(x) is
(a) 4/3 (b) 1/2 (c) 2/3 (d) 5/3

07. Let g(x) be a function such that g(x + 1) + g(x – 1) = g(x) for every real x. Then, for what value of p is the relation g(x + p)= g(x) necessarily true for every real x ?
(a) 5 (b) 3 (c) 2 (d) 6

08. If f(x)=x3- 4x + p and f(0) and f(1) are of opposite signs, then which of the following is necessarily true ?

(a) -1 < p < 2 (b) 0 < p < 3 (c) -2 < p < 1 (d) -3 < p < 0

09. Let g(x) = max (5 – x , x + 2). The smallest possible value of g(x) is ?

(a) 4.0 (b) 4.5 (c) 1.5 (d) None of these

10. Let f(x)= |x – 2| + |2.5 – x| + |3.6 – x|, where x is a real number, attains a minimum at ?

(a) x = 2.3 (b) x = 2.5 (c) x = 2.7 (d) None of these

11. Largest value of min (2 + x2 , 6 – 3x), when x > 0 is

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

Answers : Find Detailed Solutions at the end of the the page.

1.	D	2.	D
3.	D	4.	B
5.	D	6.	D
7.	D	8.	B
9.	D	10.	B
11.	C		

Functions Solution

1. Take different values of n to check each option. you can take n=3, 4 etc. option (a), (b), (c) will be rules out.

(d)

2. Differentiate the function with respect to x and equate it to 0 for getting the maximum and minimum value of the functions.
Step 1 : Differentiate with respect to x.
Step 2: Equate to 0
Step 3: Find the value of x
In option (a), (b), (c) none of the three options will get you a value of $x = -3$ as its solution.
(d)

3. The denominator $x^2 - 3x + 2$ has real roots. Hence the maximum value of the function f(x) will be infinity.
(d)

4. The minimum value of the function would occur at the minimum value of $(x^2 - 2x + 5)$ as this quadratic equation function has imaginary roots.
$y = x^2 - 2x + 5$
Step 1 : Differentiate with respect to x
Step 2 : Equate to 0
Step 3 : Find the value of x
$dy/dx = 2x - 2 = 0$ implies $x = 1$
Hence $f(1) = 1^2 - 2 + 5 = 4$
Thus minimum value of the argument of the log is 4.
So minimum value of the function is log 4 (base 2) $= 2$
(b)

5. Given function = $f(1) + f(2) + f(3) + f(4) + \ldots\ldots = n^2 f(n)$
Given $f(1) = 3600$
For $n=2$,
$f(1) + f(2) = 2^2 f(2)$
i.e. $2^2 f(2) - f(2) = f(1)$
$f(2) = f(1)/(2^2-1)$ —(1)
For $n=3$
$f(1)+f(2)+f(3) = 3^2 f(3)$
put the value of f(2) from (1)
» $f(1) + f(1)/(2^2-1) = 3^2 f(3) - f(3)$
» $f(1) + f(1)/(2^2-1) = (3^2-1) f(3)$
now take f(1) in left side
i.e.$f(1) = [1 + 1/(2^2-1)] = f(3)(3^2-1)$
i.e.$f(3) = f(1) \times 2^2/(2^2-1) \times 1/(3^2-1)$
$f(3) = 600$
Similarly
$f(9) = f(1) \times (2^2 \times 3^2 \times 4^2 \ldots\ldots\ldots 8^2)/((2^2-1)(3^2-1)(4^2-1)\ldots\ldots\ldots\ldots\ldots\ldots\ldots (9^2-1))$
$f(9) = 80$
(d)

6. As $f(x) = \max(2x + 1, 3 - 4x)$
A function would b minimum at the point of intersection of these curves.
i.e. $2x + 1 = 3 - 4x$
$x = 1/3$
Hence, minimum value of f(x) is 5/3
(d)

7. $g(x+1) + g(x-1) = g(x)$
$g(x+2) + g(x) = g(x+1)$
Adding these two equation, we get
$g(x+2) + g(x-1) = 0$
» $g(x + 3) + g(x) = 0$ —- (1)
» $g(x + 4) + g(x + 1) = 0$
» $g(x + 5) + g(x + 2) = 0$
» $g(x + 6) + g(x + 3) = 0$
» $g(x+6) - g(x) = 0$ (From (1))
(d)

8. $f(x)=x^3-4x+p$
$f(0)=p$
$f(1)=p-3$
Given f(0) and f(1) are of opposite signs
therefore $p(p-3)<0$
If $p<0$ then $p-3$ is also less than 0.
Hence, $p(p-3)>0$ i.e. p cannot be negative
option (a), (b), (d) are eliminated.
$0<p<3$
(b)

9. $g(x)=\max(5-x, x+2)$
We have to draw graph and the find the point of intersection.
$y=5-x$
$y=x+2$
Hence at the point of intersection of two straight line.
Smallest of $g(x)=3.5$
(d)

10.
$f(x)=|x-2|+|2.5-x|+|3.6-x|$ can attain minimum value when either of the terms $=0$.
Case 1 :
When $|x-2|=0$ i.e. $x=2$
$f(x)=0.5+1.6=2.1$
Case 2 :
When $|2.5-x|=0$ i.e. $x=2.5$
$f(x)=0.5+0+1.1=1.6$
Case 3 :
When $|3.6-x|=0$ i.e. $x=3.6$
$f(x)=1.6+1.1+0=2.7$
Hence, the minimum value of f(x) is 1.6 at $x=2.5$.
(b)

11. Equating $2+x^2=6-3x$
» $x^2+3x-4=0$
» $x^2+4x-x-4=0$
»$(x+4)(x-1)=0$
» $x=-4$ or $x=1$
But $x>0$ so $x=1$ so LHS = RHS i.e. $2+1=3$

Hence, largest value of function min(2 + x^2, 6 – 3x) is 3.
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Alligations Set 01

01. A mixture of 125 gallons of wine and water contains 20% water. How much water must be added to the mixture in order to increase the percentage of water to 25% of the new mixture ?
(a) 10 gals (b) 8.5 gals (c) 8 gals (d) 8.33 gals
02. 4oo students took a mock exam in Delhi, 60% of the boys and 80% of the girls cleared the cut off in the examination. If the total percentage of students qualifying is 65%, how many girls appeared in the examination?
(a) 100(b) 120(c) 150 (d) 300
03. What will be the ratio of petrol and kerosene in the final solution formed by mixing petrol and kerosene that are present in three vessels of equal capacity in ratios 4 : 1, 5 : 2 and 6 : 1 respectively ?
(a) 166 : 22 (b) 83 : 22 (c) 83 : 44 (d) None of these
04. A dishonest grocer professes to sell pure butter at cost price, but he mixes it with adulterated fat and thereby gains 25%. Find the percentage of adulterated fat in the mixture assuming that adulterated fat is freely available ?
(a) 20% (b) 25% (c) 33.33% (d) 40%
05. In a Singapore zoo, there are deers and there are ducks. If the heads are counted, there are 180, while the legs are 448. What will be the number of deers in the zoo
(a) 136(b) 68 (c) 44 (d) 22
06. Two vessels contain a mixture of spirit and water. In the first vessel and ratio of spirit to water is 8 : 3 and in the second vessel the ratio is 5 : 1. A 35 litre cask is filled from these vessels so as to contain a mixture of spirit and water in the ratio of 4 : 1. How many litre are taken from the first vessel ?
(a) 11 litres (b) 22 litres (c) 16.5 litres (d) 17.5 litres
07. In what ratio should water be mixed with soda costing Rs 12 per litre so as to make a profit of 25% by selling the diluted liquid at Rs 13.75 per litre ?
(a) 10:1 (b) 11:1 (c) 1:11 (d) 12:1
08. A 20 percent gain is made by selling the mixture of two types of ghee at Rs 480 per kg. If the type costing 610 per kg was mixed with 126 kg of the other, how many kilograms of the former was mixed ?
(a) 138 kg (b) 34.5 kg (c) 69 kg (d) Cannot be det..
09. A bartender stole champagne from a bottle that contained 50% of spirit and he replaced what he had stolen with champagne having 20% spirit. The bottle then contained only 25% spirit. How much of the bottle did he steal ?

(a) 80% (b) 83.33% (c) 85.71% (d) 88.88%

10. A mixture of 20 litres of brandy and water contains 10% water. How much water should be added to it to increase the percentage of water to 25%?

(a) 2 litres (b) 3 litres (c) 2.5 litres (d) 4 litres

Answers : Find Detailed Solutions at the end of the the page.

1. D 2. A
3. B 4. A
5. C 6. A
7. C 8. D
9. B 10. D

SET 2

Alligations Set 02

01. Two containers of equal capacity are full of a mixture of oil and water. In the first, the ratio of oil to water is 4 : 7 and in the second it is 7 : 11. Now both the mixtures are mixed in a bigger container. What is the resulting ratio of oil to water ?

(a) 149 : 247 (b) 247 : 149 (c) 143 : 241 (d) 241 : 143

02. Two vessels contain spirit and water mixed respectively in the ratio of 1 : 3 and 3 : 5. Find the ratio in which these are to be mixed to get a new mixture in which the ratio of spirit to water is 1 : 2 ?

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

03. The price of a pen and pencil is Rs 35. The pen was sold at a 20% profit and the pencil at a 10% loss. If in the transaction a man gains Rs 4, how much is cost price of the pen ?

(a) Rs 10 (b) Rs 25 (c) Rs 20 (d) None of these

04. A person purchased a cupboard and a cot for Rs 18,000. He sold the cupboard at a profit of 20% and the cot at a profit of 30%. If his total profit was 25.83%, find the cost price of the cupboard ?

(a) Rs 10,500 (b) Rs 12,000 (c) Rs 7500 (d) Rs 10,000

05. A vessel is full of a mixture of kerosene and petrol in which there is 18% kerosene. Eight litre are drawn off and then the vessel is filled with petrol. If the kerosene is now 15%, how much does the vessel hold ?

(a) 40 litres (b) 32 litres (c) 36 litres (d) 48 litres

06. Two solutions of 90% and 97% purity are mixed resulting in 21 litres of mixture of 94% purity. How much is the quantity of the first solution in the resulting mixture ?

(a) 15 litres (b) 12 litres (c) 9 litres (d) 6 litres

07. In what ratio should water be mixed with soda costing Rs 12 per litre so as to make a profit of 25% by selling the diluted liquid at Rs 13.75 per litre ?

(a) 10 : 1 (b) 11 : 1 (c) 1 : 11 (d) 12 : 1

08. A sum of Rs 36.90 is made up of 90 coins that are either 20 paise coins or 50 paise coins. Find out how many 20 paise coins are there in the total amount ?

(a) 47 (b) 43 (c) 27 (d) 63

09. A bonus of Rs 9,85,000 was divided among 300 workers of a factory. Each male workers gets 5000 rupees and each female worker gets 2500 gets. Find the number of male workers in the factory ?

(a) 253 (b) 47 (c) 94 (d) 206

10. In what proportion must water be mixed with milk so as to gain 20% by selling the mixture at the cost price of the milk ? (Assume that water is freely available)

(a) 1 : 4 (b) 1 : 5 (c) 1 : 6 (d) 1 : 12

Answers : Find Detailed Solutions at the end of the the page.

1.	A	2.	C
3.	B	4.	C
5.	D	6.	C
7.	C	8.	C
9.	C	10.	B

Permutations And Combinations 01

01. Five-digit numbers are formed using only 0, 1, 2, 3, 4 exactly once. What is the difference between the greatest and smallest numbers that can be formed ?

(a) 19800 (b) 41976 (c) 32976 (d) None of these

02. In how many ways can Eight Directors, Vice-Chairman and Chairman of a firm be seated at a round table, if the Chairman has to sit between the Vice-Chairman and a Director ?

(a) 9! x 2 (b) 2 x 8! (c) 2 x 7! (d) None of these

03. A man has 9 friends: 4 boys and 5 girls. In how many ways can he invite them, if there have to be 3 exactly girls in the invitees ?

(a) 320(b) 160(c) 80 (d) 200

04. Boxes numbered 1, 2, 3, 4 and 5 are kept in a row and they which are to be filled with either a red or a blue ball, such that no two adjacent boxes can be filled with blue balls. Then, how many different arrangements are possible, given that all balls of a given colour are exactly identical in all respects ?

(a) 8 (b) 10 (c) 15 (d) 22

05. A, B, C, D are four towns, any three of which are non-collinear. Then, the number of ways to construct three roads each joining a pair of towns so that the roads do not form a triangle is ?
(a) 7 (b) 8 (c) 9 (d) 24

06. If a 4-digit number is formed with digits 1, 2, 3 and 5. What is the probability that the number is divisible by 25, if repetition of digits is not allowed ?
(a) 1/12 (b) 1/4 (c) 1/6 (d) None of these

07. A five digit number is formed using digits 1, 3, 5, 7 and 9 without repeating any one of them. What is the sum of all such possible numbers ?
(a) 6666600 (b) 6666660 (c) 6666666 (d) None of these

08. 139 persons have signed for an elimination tournament. All players are to be paired up for the first round, but because 139 is an odd number one player gets a bye, which promotes him to the second round, without actually playing in the first round. The pairing continues on the next round, with a bye to any player left over. If the schedule is planned so that a minimum number of matches is required to determine the champion, the number of matches which must be played is
(a) 136 (b) 137 (c) 138 (d) 139

09. A box contains 6 red balls, 7 green balls and 5 blue balls. Each ball is of different size. The probability that the red ball selected is the smallest red ball ?
(a) 1/18 (b) 1/3 (c) 1/6 (d) ⅔

10. A group of 630 children is arranged in rows for a group photograph session. Each row contains three fewer children than the row in front of it. What number of rows is not possible ?
(a) 3 (b) 4 (c) 5 (d) 6

Answers : Find Detailed Solutions at the end of the the page.

1.	C	2.	B
3.	B	4.	D
5.	D	6.	A
7.	A	8.	C
9.	C	10.	D

Permutation And Combinations Solution 01

1.
Greatest five digit number : 43210
Smallest five digit number : 10234
Difference = 43210-10234= 32976
(c)

2. We consider vice-chairman and the chairman as 1 Unit. Now, 9 persons can be arranged along a circular table in 8! ways. And vice-chairman and chairman can be arranged in 2 different ways. Hence required number of ways=2 x 8!
(b)

3. 3 Girls can be selected out of 5 girls in 5C3 ways.
Since number of boys to be invited is not given, hence out of 4 boys, he can invite them $(2)^4$ ways.
Hence required number of ways is = 5C3 x $(2)^4$ = 160
(b)

4.Total number of ways of filling the 5 boxes numbered as (1, 2, 3, 4 and 5) with either blue or red balls=2^5=32.
Two adjacent boxes with blue can be got in 4 ways.
i.e. (1, 2) (2, 3) (3, 4) (4, 5)
Three adjacent boxes with blue can be got in 3 ways
i.e. (1, 2, 3), (2, 3, 4) and (3, 4, 5)
Four adjacent boxes with blue can be be got in 2 ways.
i.e. (1234) , (2345)
and five boxes with blue can be got in 1 way.
Hence total number of ways of filling the boxes such that adjacent boxes have blue
(4 + 3 + 2 + 1)=10
(d)

5. To construct 2 roads, three towns can be selected out of 4 in 4 x 3 x 2 = 24 ways. Now, if the third road goes from the third town to the first town, a triangle is formed and if it goes to the fourth town, a triangle is not formed. So there are 24 ways to form a triangle and 24 ways of avoiding a triangle.
(d)

6. Total number of 4 digit numbers that can be formed = 4!. If the number is divisible by 25, then the last two digit are 25. So the first two digits can be arranged in 2! ways.
Hence required probability = 2!/4! = 1/12
(a)

7. Keeping one digit in fixed position, other four can be arranged in 4! ways= 24 ways. Thus each of the 5 digits will occur in each of the five place 4! times. Hence the sum of digits in each position is $24(1 + 3 + 5 + 7 + 9) = 600$. So, the sum of all numbers
$=600(1+10+100+1000+10000)=6666600$
(a)

8. Required number of matches played will be $(139 - 1)=138$
(c)

9. Required probability is = 1/6
(c)

10. Let the number of students in the front row be x and the number of rows be n.
Hence, number of students in the next rows would be $(x - 3)$, $(x - 6)$, $(x - 9)$,..... and so on.
Now we have to check for each value of n=3, 4, 5, 6
Firstly take n=3
$x + (x - 3) + (x - 6) =630$
» $3x = 639$ i.e. $x = 213$ (Thus, n=3 is possible)
Likewise if n=4
$x + (x - 3) + (x - 6)+(x - 9) =630$
» $4x - 18 = 630$ i.e. $x = 162$ (Thus, n=4 is possible)
Likewise if n=5
$x + (x - 3) + (x - 6)+(x - 9) +(x -12) =630$
» $5x - 30 = 630$ i.e. $x = 132$ (Thus, n=5 is possible)
Likewise if n=6
$x + (x - 3) + (x - 6)+(x - 9)+(x -12)+(x - 15)=630$
» $6x - 45 = 630$ i.e. $x =112.5$ (NOT AN INTEGER) (Thus, n=6 is not possible)
(d)

Permutation And Combinations 02

01. In a chess competition involving some boys and girls of a school, every student had to play exactly one game with the every other student. It was found that in 45 games both the players were girls and in 190 games both were boys. The number of games in which one player was a boy and the other was a girl is ?
(a) 200(b) 216(c) 235(d) 256
02. A new flag is to be designed with six vertical stripes using some or all of the colours yellow, green, blue and red. Then, the number of ways this can be done such that no two adjacent stripes have the same colour is ?
(a) 12 x 81 (b) 16 x 192 (c) 20 x 125 (d) 24 x 216
03. An intelligence agency forms a code of two distinct digits selected from 0, 1, 2, ... 9 such that the first digit of the code is non-zero. The code, handwritten on a slip, can however potentially create confusion, when read upside down- for example, the code 91 may appear as 16. How many codes are there for which no such confusion can arise ?
(a) 80 (b) 78 (c) 71 (d) 69
04. How many numbers can be made with digits 0, 7, 8 which are greater than 0 and less than a million ?
(a) 496(b) 486(c) 1084 (d) 728
05. In how many ways is it possible to choose a white square and a black square on a chess-board so that the squares must not lie in the same row or column ?
(a) 56 (b) 896(c) 60 (d) 768
06. How many four-letter computer passwords can be formed using only the symmetric letters. (no repetition allowed) (Symmetric letters :- A, H, I, M, O, T, U, V, W, X AND Z)
(a) 7920 (b) 330(c) 14640 (d) 419430
07. How many three-letter computer password can be formed with at least one symmetric letter ? (Symmetric letters: A, H, I, M, O, T, U, V, W, X and Z)
(a) 990(b) 2730 (c) 12870 (d) 1560000
08. For a scholarship, at the most n candidates out of 2n+1 can be selected. If the number of different ways of selection of at least one candidate is 63, the maximum number of candidates that can be selected for the scholarship is ?
(a) 3 (b) 4 (c) 6 (d) 5
09. Ten points are marked on a straight line and 11 points are marked on another straight line. How many triangles can be constructed with vertices from among the above points ?
(a) 495(b) 550(c) 1045 (d) 2475
10. How many numbers can be formed from 1, 2, 3, 4, 5 (without repetition), when the digit at unit's place must be greater than the in the ten's place ?

(a) 54 (b) 60 (c) 17 (d) 2 x 4!

Answers :Find Detailed Solutions at the end of the page

1.	A	2.	A
3.	D	4.	D
5.	D	6.	A
7.	C	8.	A
9.	C	10.	B

Detailed Solutions SET

Permutation and Combination Solution 02

1. Let there be m boys and n girls.
Then nC2 = 45 » n(n – 1)=90» n =10
mC2 = 190 » m(m – 1) = 380 » m=20
Number of games played between one boy and one girl
= 10C1 x 20C1= 10 x 20=200
(a)

2. Any of the 4 colours can be chosen for the first stripe. Any of the remaining 3 colours can be used for the second stripe. The stripe can again be colored in 3 ways. (We can repeat the colour of the first stripe, but not use the colour of the second stripe).
Similarly, there are 3 ways to colour each of the remaining stripes.
» The number of ways the flag can be coloured is
$4 \times (3)^5 = (12)(3)^4$
(a)

3. The available digits are 0, 1, 2 ..... 9. The first digit can be chosen in 9 ways (0 not acceptable), the second digit can be accepted in 9 ways (digits repetition not allowed). Thus the code can be made in 9 x 9=81 ways.
Now, there are only 4 digits which can create confusion 1, 6, 8, 9. The same can be given in the following ways.
Total number of ways confusion can arise = 4 x 3=12
Thus, required answer= 81-12=69
(d)

4.
Number of ways for selecting single digit=2
Number of ways for selecting two digit= 2 x 3=6
Number of ways for selecting three digit= 2 x 3 x 3=18
Number of ways for selecting four digit= 2 x 3 x 3 x 3=54
Number of ways for selecting five digit=2 x 3 x 3 x 3 x 3=162
Number of ways for selecting six digit= 2 x 3 x 3 x 3 x 3 x 3=486
Hence, total number of ways = (2 + 6 + 18 + 54 + 162 + 486)=728
(d)

5. There are 32 black and 32 white square on a chess-board then number of ways in choosing one white and one black square on the chess.
32C1 x 32C1= 32 x 32=1024
Number of ways in which square lies in the same row
White square=4
Black square=4
Number of rows=8
4C1 x 4C1 x 8 = 128
»Number of ways in which square lies in the same column= 128
Total number in which square lie on the same row or same column= 128 + 128=256.
(d)

6. Ist place of the four letter password can be filled in 11 ways.
IInd place of four letter password can be filled in 10 ways.
IIIrd place of four letter password can be filled in 9 ways.
IVth place of four letter password can be filled in 8 ways.
Hence, required number of ways= 11 x 10 x 9 x 8=7920 ways
(a)

7. Three letter password from 26 letters can be selected in 26 x 25 x 24 ways. Three letter password from 15 asymmetric letters can be selected in 15 x 14 x 13 ways.
Hence, three letter password with at least one symmetric letter can be made in (26 x 25 x 24)-(15 x 14 x 13)=12870 ways.
(c)

8. At lease one candidate out of (2n + 1) candidates can be selected in $(2^{n+1} - 1)$ ways.
» $2^{2n+1} - 1 = 63$ » $2^{2n+1} = 64 = (2)^6$» n=2.5
Since n cannot be a fraction. Hence n=3.
(a)

9. Required number of triangles formed
10C2 x 11 + 11C2 x 10= 45 x 11 + 55 x 10 = 1045
(c)

10. The digit in the unit's place should be greater than that in the ten's place. Hence, if digit 5 occupies the unit place then remaining four digits need not to follow any order.
Hence required number of ways = 4!
However, if digit 4 occupies the unit place then 5 cannot occupies the ten's positions. Hence, digits at the ten's place will be one among 1, 2 or 3. This can happen in 3 ways. The remaining 3 digits can be filled in the remaining three places in 3! ways. Hence in all we have (3 x 3!) numbers ending in 4.
Similarly, if we have 3 in the unit's place, the ten's place can be either 1 or 2. This can happen in 2 ways. The remaining 3 digits can be arranged in the remaining 3 places in 3! ways. Hence we will have (2 x 3!) numbers ending in 3. Similarly, we can find that there will be 3! numbers ending in 2 and no number ending with 1. Hence total number of numbers
= 4! + (3) x 3! + (2)3! + 3!
= 4! + 6 x 3! = 24 + (6 x 6) = 60
(b)

Elitmus Previous Years Questions On Number System

SET 1

Number System 02

01. If n is any odd number greater than 1, then n(n2 - 1) is always divisible by ?
(a) 96 (b) 48 (c) 24 (d) None of these
02. If a number 774958A96B is to be divisible by 8 and 9, the respective values of A and B will be
(a) 7 and 8 (b) 8 and 0 (c) 5 and 8 (d) None of these
03. Three consecutive positive even numbers are such that thrice the first number exceeds double the third by 2, the third number is ?
(a) 10 (b) 14 (c) 16 (d) 12
04. Three bells chime at intervals of 18 min, 24 min and 32 min respectively. At a certain time, they begin to together, What length of time will elapse before they chime together again ?
(a) 2 h and 24 min (b) 4h and 48 min (c) 1 h and 36 min (d) 5h
05. Two positive integers differ by 4 and sum of their reciprocals is 10/21. Then, one of the numbers is ?
(a) 3 (b) 1 (c) 5 (d) 21
06. (56-1) is divisible by ?
(a) 13 (b) 31 (c) 5 (d) None of these
07. The remainder obtained when a prime number greater that 6 is divided by 6 is
(a) 1 or 3 (b) 1 or 5 (c) 3 or 5 (d) 4 or 5
08. For the product n(n+1)(2n+1) , which one of the following is not necessarily true ?
(a) It is even (b) Divisible by 3 (c) divisible by (n(n+1)(2n+1))/2 (d) Never divisible by 237
09. 72 Hens Rs ...96.7.. Then what does each hen cost, where two digits in place of ".... , ..."are not visible written in illegible hand-writing ?
(a) Rs 3.23 (b) Rs 5.11 (c) Rs 5.51 (d) Rs 7.22
10. Which is the least number that must be subtracted from 1856 so that the remainder when divided by 7, 12, 16, is 4?
(a) 137(b) 1361 (c) 140(d) 172
Answers : Find Detailed Solutions at the end of the the page.

1.	C	2.	B
3.	B	4.	B
5.	A	6.	B
7.	B	8.	D
9.	C	10.	D

Number System Solution 02

1.
We have use put different values of n (odd numbers) greater than 1.
i.e. n=3, 5, 7, 9
When n=3 $n(n^2 - 1) = 24$
When n=5 $n(n^2 - 1) = 120$
When n=7 $n(n^2 - 1) = 336$
using options we find that all the numbers are divisible by 24
(c)

2.
Numbers are **divisible by 8** if the number formed by the last three digits is evenly divisible by 8.
Numbers are **divisible by 9** if the sum of all the individual digit is divisible by 9.
The number 774958A96B is divisible by 8 if 96B is divisible by 8. And 96B is divisible by 8 if B is either 0 and 8. Now to make the same number divisible by 9 sum of all the digits should be divisible by 9. Hence, $(55 + A + B)$ is divisible by 9 if $(A + B)$ is either 0 or 8
i.e. either $A = 0$ or $B = 8$ or $A = 8$ or $B = 0$
Since, the number is divisible by both A and B. Hence, A and B may take either values i.e. 8 and 0
(b)

3.
Let the three even number are $(x - 2)$, x, $(x + 2)$
Then, $3(x - 2) - 2(x + 2) = 2$
$3x - 6 - 2x - 4 = 2$ i.e. x=12
Hence, the third number is $(12 + 2) = 14$
(b)

4.
We have to take the L.C.M of 18, 24 and 32 i.e. 288 min.
Hence, bells will chime together again after 4 Hours and 48 Minutes.
(b)

5. Let one number be a, then second number will be (a + 4)

As per question,

$$\frac{1}{a}+\frac{1}{(a+4)}=\frac{10}{21}$$

$$\frac{a+a+4}{a(a+4)}=\frac{10}{21}$$

$$\frac{2a+4}{a(a+4)}=\frac{10}{21}$$

a = 3

6.

$(5^6 - 1) = (5^3)^2 - (1)^2 = (125)^2 - (1)^2$

$=(125 + 1)(125 - 1) = 126 \times 124 = 31 \times 2 \times 2 \times 126$

Here we can easily conclude. (5^6-1) is divisible by 31

(b)

7.

We have take some prime number greater than 6 i.e. 7, 11, 13, 17, 19, 23, 29,31, 37, 41

Now we have divide the numbers by 6. The remainder is always either 1 or 5.

(b)

8.

We have to check for each option separately by taking the different values of n.

Option (a) : Check for n= 3, 4, 5, 6...

Option (b) : Check for n= 3, 4, 5, 7...

Option (c) : Divisible

Option (d) : For n= 237 : n(n + 1)(2n + 1) is divisible.

(d)

9.
We have to check for each option.
(a) 3.23 x 72 = 232.56
(b) 5.11 x 72 = 367.92
(c) 5.51 x 72 = 396.72
(d) 7.22 x 72 =519.84
Option (c) is nearest to Rs. .....96.7...
(c)

10.
Firstly, we have to take LCM of 7, 12, 16 = 336
If we divide 1856 by 336, then remainder is 176. Since it is given that remainder in this condition is 4. Hence, the lease number to be subtracted = (176 – 4)172.
(d)

SET 2

Number System 01

01. The number of common terms in the two sequences 17, 21, 25, ... , 417 and 16, 21, 26, ...,466 is ?
(a) 19 (b) 20 (c) 77 (d) 22
02. How many integers, greater than 999 but not greater than 4000, can be formed with the digits 0, 1, 2, 3 and 4, if repetition of digits is allowed ??
(a) 374(b) 500(c) 375(d) 376
03. What is the number of distinct terms in the expansion of (a + b + c)20 ?
(a) 231(b) 253(c) 242(d) 210
04. What are the last two digits of 72008 ?
(a) 21 (b) 61 (c) 01 (d) 41
05. The integers 1, 2, 3, ... 40 are written on blackboard. The following operation is then repeated 39 times. In each repetition, any two numbers, say a and b, currently on the blackboard are erased and a new number a + b – 1 is written. What will be the number left on the board at the end ?
(a) 820(b) 821(c) 781(d) 819
06. An intelligence agency decides on a code of 2 digits selected from 0, 1, 2, ..., 9. But on the slip on which the code is hand written allows confusion between top and bottom, because there are indistinguishable. Thus, for example, the code 91 could be confused with 16. How many codes are there such that there is no possibility of any confusion?

(a) 25 (b) 75 (c) 80 (d) None of these

07. A young girl counted in the following way on the fingers of her left hand. She started calling the thumb 1, the index finger 2, middle finger 3, ring finger 4, little finger 5, then reversed direction, calling the ring finger 6, middle finger 7, index finger 8 and thumb 9 and then back to the index finger for 10, middle finder for 11 and so on. She counted up to 1994. She ended on her ?

(a) thumb (b) index finger (c) middle finger (d) ring finger

08. Let U(n+1)= 2Un + 1, (n=0, 1, 2, ...) U0=0 then U(10) would be nearest to ?

(a) 1023 (b) 2047 (c) 4095 (d) 8195

09. The product of all integers from 1 to 100 will have the following numbers of zeros at the end ?

(a) 20 (b) 24 (c) 19 (d) 22

10. The number of positive integers not greater than 100, which are not divisible by 2, 3 or 5 is ?

(a) 26 (b) 18 (c) 31 (d) None of these

Answers : Find Detailed Solutions at the end of the the page.

1.	B	2.	D
3.	A	4.	C
5.	C	6.	C
7.	B	8.	A
9.	B	10.	A

1.

Both the sequences (17, 21, 25 ..... and (16, 21, 26..... are arithmetic progression with a common difference of 4 and 5 respectively.

In both the sequence first common term is 21.

Hence a new arithmetic sequence containing the common terms of both the series can be formed with a common difference of LCM of (4, 5) is 20

New sequence will be 21, 41, 61, ...401

n^{th} term = a + (n-1)d

401= 21 + (n-1)20

n-1=19

Hence, n=20

(b)

2.
The number required is greater than 999 and less than and equal to 4000.
Now out off our digits, 0, 1, 2, 3, 4.
To form a number greater than 999 and less than 4000.
The digit at thousands place can be selected in 3 ways(0 and 4 cannot be taken)
The digit at hundreds place can be selected in 5 ways.
The digit at tens place can be selected in 5 ways.
Total required number of ways= 3 x 5 x 5 x 5 = 375 ways
Since, 4000 is also one of the required number.
Therefore, total number of ways=375 + 1
(d)

3. Number of terms in $(a_1 + a_2 + a_3 + \cdots \ldots a_n)^{m}$ is $m + n - 1\, C_{n-1}$

Here m=20 and n=3
(a)

4. We have to find the cycle for the last two digits of 7^n where n=1, 2, 3, ...

$7^1 = 07(07)$
$7^2 = 49(49)$
$7^3 = 343(43)$
$7^4 = 01(2401)$
$7^5 = 07(16807)$

Here we have a cycle of 4. Now we have to use 4n rule.

$7^1 = 07(07)$ $4n + 1$
$7^2 = 49(49)$ $4n + 2$
$7^3 = 343(43)$ $4n + 3$
$7^4 = 01(2401)$ 4n

Now we have to find the remainder for 2008/4.
As the remainder is 0.
Hence, last two digit of $(7)^{2008}$= 01

5.
According to question, if two numbers say a and b are erased and replaced by a new number a + b − 1, then in every repetition, the number of integers gets reduced by 1 and consequently at the last repetition there will be only one number left.
Whatever may be our selection of two numbers a and b. In any and every repetition, the final number so arrived will not changes.
Now, the sum of integers from 1 to 40= n(n + 1)/2 = 820
As, discussed above the sum of integers of the first, second, third ..... repetitions will be 819, 818, 817, ... so on respectively. Therefore, after 39 operations there will be only 1 number left and that will be 820 − 39=781

6.
(c)

7.
Thumb Finger :1, 9, 17, ...
Index Finger: 2, 8, 10, 16, 18, ...
Middle Finger: 3, 7, 11, 16, 19, ...
Ring Finger : 4, 6, 12, 14, 20, ...
Little Finger : 5, 13, 21, ...
Numbers on thumb forms a AP with common difference=8
Numbers on middle forms a AP with common difference=4
1993 will be on thumb.
Hence, 1994 will be on index finger.

8.
$U_{(n+1)} = 2U_n + 1$, (n=0, 1, 2, ...) $U_0 = 0$
Put
n=0, U1=1
n=1, U2=3
n=2, U3=7
n=4, U5=31
Seeing this pattern we can conclude i.e. $U_{(n)} = 2^n - 1$
Hence $U(10) = (2)^{10} - 1 = 1023$

9.
Every combination of 5 and 2 will give one zero, and number of zero in the product of any number is decided by the number of 2 and 5, whichever is less.
Hence, this problem can be solved by determining the number of 2 and 5 between 1 to 100.
Clearly there are 20 numbers which are divisible by 5. Besides, there are four numbers 25, 50, 75, and 100 which will have one addition 5. Hence, number of zeroes in the product of all the numbers from 1 to 100 is 21.
(b)

10.
There are 50 odd numbers less than 100 which are not divisible by 2. Out of these 50 there are 17 number which are divisible by 3.
Out of remaining there are 7 numbers which are divisible by 5.
Hence, numbers which are not divisible by 2, 3, 5 = 50 – 17 – 7 = 26

MEDIUM IMPORTANCE:

Cost price of 4 calculators and 2 pencil is 6200. What is the cost of ten calculators and five pencils.
Sol: C+2P=6200-->2C+P=3100
SO 10C+5P=5(2C+P)=5(3100)=15,500 RS

12 men can complete work in 6 days whereas 10 men and 21 women take 3 days to finish the same work .in how many days can 12 women alone complete.
Sol: 10 men's, 1 day work=10/(12*6)=5/36
If 21 women's, 1 day work= 21/W ,then
3[(5/36)+(21/W)]= 1 ,On solving, W=108
So, 12 women can complete the work in 108/12=9 days

$27^{18}/14$ find the remainder value?
Sol: Any number of the form (a*x-1)^n /a the remainder will be +1 if the power n is even.
and the remainder will be -1 or (a-1) if the power is odd. According to this the remainder will be 1

What is the probability of getting a odd sum when two dice are thrown.
Sol: odd numbers 3,5,7,9,11(between 2(min sum)-12(max sum))
cases:- 3-(1,2),(2,1) 5-(3,2),(2,3),(4,1),(1,4) 7-(1,6),(6,1),(2,5),(5,2),(3,4),(4,3)
9-(3,6),(4,5),(5,4),(6,3) 11-(5,6),(6,5)
total cases=18 therefore probability=18/36=>1/2

If log(p+q)(p-q)= -1; then find the value of: log(p+q)(P^2-q^2)
Sol: log(p+q)(p^2-q^2)=log(p+q)^2(p-q)=log(p+q)^2 + log(p-q) = 2 log(p+q) + log(p-q) = log(p+q)+log(p+q)+log(p-q)
log(p+q)-1= log(p+q)-log 10= log (p+q)/10;

Find the number of consecutive zeros at the end of 72!
Sol: By using formula round(n/5)+round(n/25)+.....round(n/5^n)
round(72/5)+round(72/25)=14+2=16

Find the maximum value of n such that 77! is perfectly divisible by 720^n
Sol: 720 = (2^4) x (3^2) x (5)
Number of twos in 77! is: 38 + 19 + 9 + 4 + 2 + 1 = 73
So number of 2^4 will be: = 18
Similarly, Number of threes in 77! is:
25 + 8 + 2 = 35
So number of 3^2 will be: = 17
and number of fives will be:
= 15 + 3 = 18
Hence the number of 720s that we can obtain is 17.

Some persons can do a piece of work in 12 days. Two times the number of such persons will do half of that work in:
Sol: 3 days

If $\log_{10}2 = 0.3010$, what is the number of digits in 2^{64}
Sol: $2^{64}= 64 \log2=64*0.3010=19.264$
Characteristic(integral part of log) is one less than no. of digits. here characteristic=19; So no of digits=19+1.

$\log_y 1369y=3$ then what is the value of y?
Sol: $y^3=1369y$ $y^2=1369$ $y=37$

4.28 and -3.28 are two numbers on a real number line. If 1 is added to both the numbers ,then which of the following is true?
a.Distance between the two numbers is 2 units more than the distance between 4.28 and -3.28
b.Distance between the two numbers is 2 units less than the distance between 4.28 and -3.28
c.Distance between the two numbers is equal to than the distance between 4.28 and -3.28
d.None
Ans:c
distance b/w 4.28 and -3.28 = 7.56
distance b/w 5.28 and -2.28 = 7.56

What is the greatest 4-digit perfect square, which is exactly divisible by 3, 5, 7 and 9?
a. 9999 b. 9684 c. 9801 d. Cannot be determined
e. 11025

What is the remainder when 17^{23} is divided by 16?
a. 1 b.0 c.2 d.3
Sol: Apply bionomial theorem. 17 can be written as (16+1)
similarly $17^{23}= (16+1)^{23}$
expand above equation using bionomial theorem then we get 24 terms, in that 23 terms contain 16^x as one term for $x>0$; 24th term will be $24c_{24}\ 1^{24} =1$ when you divide 1 with 16 you get 1 as remainder.

Antilog10^{100}
Sol: All you need to know is that AntiLog(X) = 10^x.
so ans is $10^{(10^{100})}$

Four bells begin to toll together and then each one at intervals of 6 s, 7 s, 8 s and 9 s respectively. The number of times they will toll together in the next 2 hr is:
Sol: lcm of 6,7,8,9=504 sec; in 2 hrs =3600*2 sec
so no times they will ring =3600*2/504==14 times
21. The students are in the ratio 2:3:5.if 20 students are increased in each batch the ratio changes to 4:5:7 The total number of students in the three batches before the increase was
Sol: Let number of students be x

2x+20 : 3x+20 : 5x+20 = 4:5:7 --> x = 10
Initially the number of the students would be 20,30 and 50 --> 100 ans

Sum of money doubles itself in 9 years, in how many years it will become 8 times itself?
Sol: 27 years; 9yrs = 2(sum); 18yrs = 4(sum);
27yrs = 8(sum)

What is the smallest four-digit number which when divided by 6, leaves a remainder of 5 and when divided by 5 leaves a remainder of 3?
1. 1043 2. 1073 3. 1103 4.None of these
Sol: ans is none of these because :
let us assume the smallest 4 digit number be 1000 if we divide it with 6 we get remainder 4 so to get a rem of 5 add 1 to it => 1001.
Then the general form of a number is 1001+6k for every positive integer value of k it always yields rem 5 when divided by 6
then by trail and error if we take k=2 then number is 1013
which when divided by 5 gives a rem of 3
so the right ans is 1013 which is none of these from options

A, B, C started a business with their investments in the ratio 1:3:5. After 4 months, A invested the double amount as before and B as well as C withdrew half of their investments. The ratio of their profits at the end of the year is:
Sol: Let their initial investments be x, 3x and 5x respectively. Then,
A : B : C = (x * 4 + 2x * 8) : (3x * 4 + 3x/2 * 8) : (5x * 4 + 5x/2 * 8)
= 20x : 24x : 40x = 5 : 6 : 10.

There are 10 yes or no questions. How many ways can these be answered?
Sol: for 1 question 2 possibilities
for 2nd question 2 possibilities
for 3rd question 2 possibilities
.
.
..
.
2^{10}=1024

In an examination, 70% of students passed in physics, 65% in chemistry, 27% failed in both subjects. The percentage of students who passed is:
1. 66% 2. 62% 3. 69% 4. None of these
Sol: let's total student be 100
Passed in atleast one subject= 100-27=73.
73= 70+65-x(passed both subjects)
x=62.

If the simple interest on a sum at 4% per annum for 2 years is Rs. 80, then the compound interest on the same sum for the same period is:
1. Rs. 86.80 2. Rs. 86.10 3. Rs. 88.65 4. Rs. 81.60
Sol: S.I for 2 years is 80;
Then S.I for one year is 40. C.I for 2 years = S.I for 2 years + S.I for 40
=80+(40*4*1)/100=80+1.60=81.6
28. Prabodh bought 30 kg of rice at the rate of Rs. 8.50 per kg and 20 kg of rice at the rate of Rs. 9.00 per kg. He mixed the two. At what price (App.) per kg should he sell the mixture in order to get 20% profit?
1. Rs. 9.50 2. Rs. 8.50 3. Rs. 10.50 4. Rs. 12.00
Sol: 30*8.5+20*9=435
20% of 435 is 87
total= 435+87=522
522=50*x; x=10.44= 10.5(approx)

Mohan walks a certain distance and rides back in 6 hours and 15 minutes. If he walks both ways he takes 7 hours and 45 minutes. If Mohan rides both ways the time which he will take will be:
1. 4 hours 2. 19/4 hours 3. 9/2 hours 4. 17/4 hours 5. None of these
Sol: W+R=375 minutes(6 hours 15 minutes)
2W=465 minutes(& hours 45 minutes)
2R=?
2(W+R)=375*2=750
2R=750-465=285=19/4

In an examination 10 questions are to be answered choosing at least 4 from each of part A and part B. If there are 6 questions in part A and 7 in part B, in how many ways can 10 questions be answered ?
1. 212 2. 266 3. 272 4. 312 5. Correct Op
Sol: 266 = 6c4*7c6+6c5*7c5+6c6*7c4

A boy move 6 m in west then he turn towards south and move 20 m then turn towards east and move 12 m again move toward north and move 12 m . How much dist he is away from his starting point.
Sol: sqrt(8^2+6^2)=10

$3*(4^4+4^3+4^2+4+1) = ?$
Sol: $3*(4^5-1)/4-1$ (applying sum of n terms in G.P)
$=4^5-1= 1023$

$\log_{10} 2=.6096$ $\log_{10} 3=.4709$ then $\log_{10} 12 = ?$
Sol: $\log_{10} 12= \log_{10} (2^2*3)= \log_{10} 2^2+ \log_{10} 3= 2 \log_{10} 2+ \log_{10} 3=2*0.6096+0.4709= 1.6901$

log xy - log |x| = ?
Sol: log xy - log |x| = log x + log y - log |x| = log y
since $x > 0$ for log to be defined.
hence |x| = x

$\log_{25}625 - \log_{31}961 + \log_{29}841 = ?$
Sol: 2-2+2=2

How many 5 digit nos are possible from 2,7,0,8,4 if the first digit is not zero
Sol: if there is no repetition then its equal to=4*4*3*2*1=96
if repetitions are allowed = 4*5*5*5*5=2500

400 have how many factors?
Sol: 15 factors....
$400=2^4*5^2$
no of factor=5*3=1

A box contain 6 yellow,3 red and 2 green ball 5 ball is randomly selected what is the probability that at least one ball is yellow.
Sol: probability=at least 1 ball yellow
=1-no ball yellow
=1-{(6C0*3C3*2C2)/11C5}
=1-(1/462)
=0.997

How many two digit numbers have exactly 5 factors?
Sol: for a two digit number to have 5 factors it must be a squared number and it must not be a square of prime number. the two numbers are,
4^2 = 16 = 1,2,4,8,16
9^2 = 81 = 1,3,9,27,81

How many four digit numbers have exactly 5 factors?
Sol: for any no. greater than 100 to have 5 factors it must be the 4th power of the prime number.
e.g, 5^4 = 625 = 1,5,25,125,625
7^4 = 2401 = 1,7,49,343,2401
11^4 = 14641 = 1,11,121,1331,14641
so the only 4 digit number having 5 factors is 2401
and two digit number having 5 factors are 16 and 81

15?1792 is divisible by 9 only when ?=
1.1 2.4. 3.3. 4.2.
Sol: 1+5+1+7+9+2=25=2+5=7+?=9 so ?=2

$2^{x+y}=2/2^{3/2}$; $2^{x-y}=2$; Find the values of x and y?
Sol: $2^{x+y}=2^{1-3/2}$; x+y=-1/2;
and $2^{x-y}=2^1$; x-y=1;
and x=1/4 y=-3/4

6 years back, Rom and Dom had their ages in the ratio 1:2. 6 years from now the ratio of their ages would be 3:4. What is the ratio of their ages today?
Sol: (x-6)/(y-6)=1/2 ....(1)
(x+6)/(y+6)=3/4 ..(2)
by solving these eqn, we get x=12 and y=18 i.e. 2/3

A locomotive engine, without any wagons attached to it, can go at a speed of 40 km/hr. Its speed is diminished by a quantity that varies proportionally as the square root of the number of wagons attached. With 16 wagons, its speed is 28 km/hr. The Op 1: 99 Op 2: 100 Op 3: 101 Op 4: 120 Op 5:

If 33 untrained labourers can do a work in 15 days of 12 hr. each, how many trained labourers can do 50% more work in 11 days of 9 hr each ? (It may be assumed that it takes 2 trained labourers to do the work of 5 untrained labourers) Op 1: 42 Op 2: 36 Op 3: 90 Op 4: 100 Op 5:
Sol: 5u=2t u=2/5t
(33*2t*15*12)/(5*xt*11*9)=2/3
x=36 op 2:36

|X - 5| + 4 > 0 and |X2| < 4. Then x can be: Op 1: 4 Op 2: 2 Op 3: 0.5 Op 4: All of these Op 5:
Sol: Op 3: 0.5; 4.5+4>0; &(0.5)^2

If r = at^2 and s = 2at, the relation among s, r and a is: 1. s^2=4ar 2. s=ar 3. s=2ar 4. s^2=ar 5. None of these
Sol: s=2at; squaring on both sides; $s^2=4a^2t^2=4a*\ at^2=4ar$; so option 1 is correct

If |x| + |y| = 7, then what is the sum of minimum and maximum values of x + y? 1. 3/2 2. -7 3. 7 4. 0 5.none
Sol: 0; as mod has property; |x|=x;x>0; =-x;x

If $x^4 + 1/x^4 = 47$, then find the value of $x^3 + 1/x^3$ 1. 18 2. 27 3. 9 4. 12
Sol: $(x^2+1/x^2)^2=x^4+1/x^4+2$
so $x^2+1/x^2=7$

$(x+1/x)^2=x^2+1/x^2+2=7+2=9$
so x+1/x=3;

now $(x+1/x)^3=x^3+3*x+3*1/x + 1/x^3$
$3^3=x^3+3*3+1/x^3$
so $x^3+1/x^3=18$

If a, b, c are roots of the equation $x^3-4x^2+6.5x + 3.5 = 0$, then what is the value of $a^2 + b^2 + c^2$? a. 1 b. 64 c. 169 d.3 Sol: let l,m,n be roots of $ax^3+bx^2+cx+d=0$; then l+m+n=-b/a, lmn=-d/a,
lm+mn+ln=c/a,
here a=1, b=-4, c=6.5

$a^2+b^2+c^2= (a+b+c)^2-2(ab+bc+ca)=3.$

If $1^3 + 2^3+ 3^3+ .....+ 9^3 = 2025$,then the value of $(0.11)^3 + (0.22)^3 + ...+ (0.99)^3$ is ?
Sol: $(11/100)^3 +(22/100)^3 + ...(99/100)^3$
take $(11/100)^3$ as common then
$(11/100)^3[1^3+2^3+3^3+ .....+9^3]$
$=(11/100)^3*2025= 2.695275$

In a purse there are 30 coins, twenty one-rupee and remaining 50-paise coins. Eleven coins are picked simultaneously at random and are placed in a box. If a coin is now picked from the box, find the probability of it being a rupee coin? Op 1: 4/7 Op 2: 1/2 Op 3: 2/3 Op 4: 5/6 Op 5:
Sol: 2/3

A ,B, C are three students who attend the same tutorial classes. If the Probability that on a particular day exactly one out of A and B attend the class is 7/10,Exactly one out of B and C attends is 4/10 exactly one out of A and C attends is 7/10.if the probability that all the three attend the class is 9/100 then find the probability that all at least one attends the class.
Sol: Probability(at least one attending) = 1- Probability(none attending)
Let the Probability of A,B,C attending the class be a,b,c
So not attending will be 1-a,1-b,1-c
Exactly one of A,B
$a(1-b) + b(1-a) = 7/10$
$a+b -2ab =7/10$

B,C
$b(1-c)+c(1-b) = 4/10$
$b+c -2bc =4/10$

C,A
$a(1-c) + c(1-a) =7/10$
$c+a -2ac=7/10$

Add all 3 u get
$2(a+b+c) - 2(ab+bc+ca) = 18/10$
$a+b+c -ab -bc-ca =9/10$

P(atleast one) = 1 - P(none)
$1 - [(1-a)(1-b)(1-c)]$
$1- [1 -a -b-c+ab+bc+ca -abc]$
$1-[1 - (9/10 + 9/100)]$
$= 99/100$

A box contains 10 balls numbered 1 through 10. Anuj, Anisha and Amit pick a ball each, one after the other, each time replacing the ball. What is the probability that Anuj picks a ball numbered less than that picked by Anisha, who in turn picks a lesser number than amit.
Sol:
67. A, B, C, D and E play the following game. Each person picks one card from the cards numbered 1 through 10. The person who picks the greatest numbered card loses and is out of the game. Now the remaining four return their cards to the pack and draw again, and again the person with the greatest numbered card loses. This process is repeated till only one person is left in the game that is declared the winner. What is the probability that A is the
winner?
Sol: Ans:1/5
Total five persons so anybody can be the winner.
68. a buy clips at 12 for R.s. 60 .How many clips should he sellfor Rs. 60 to earn a profit of 20% ?
Sol: x+0.2x=60;
x=50;
12 clips for 60
so 10 clips for 50.
ans:10

An article was sold for Rs. 2770. Had it been sold for Rs. 3000 there would have been an additional gain of 10%. Cost Price of the article is:
Sol: given selling price is = 2770
he said if we sell it for 3000 there would be a 10% more gain
3000-2770=230
because of this Rs.230 he can gain 10% more
from profit percentage formula
230*100/ cost price =10
from the above equation cost price is 2300

The probability that a man can hit a target is 3/4. He tries 5 times. The probability that he will hit the target at least three times is:
Sol: Hitting the target at least 3 times means it can be greater than 3 also i.e.3,4,5
in 5 chances hitting target by 3 times is
5c3*(3/4)^3*(1/4)^2 = 10*27/1024= 270/1024
probability of hitting by 4 times is
5c4*(3/4)^4(1/4)^1=5*81/1024= 405/1024
probability of hitting 5 times is
5c5*(3/4)^5 = 243/1024
total is (270+405+243)/1024= 918/1024
=459/512

A 5-digit number is formed by the digits 1,2,3,4 and 5 without repetition. What is the probability that the number formed is a multiple of 4?
Sol: any number is divisible with 4 iff last two digits should be divisible with 4.

so if last digit is 2 then 12, 32 and 52 can be last two digits. so 3* 3!
if last digit is 4 then only possibility is 24 so 3!
total= 3* 3! + 3!= 4!
so 4!/5!=1/5

In how many ways can a number 6084 be written as a product of two different factors ?
Sol: $6084 = 6 * 1014 = 6*6*169 = 2^2 * 3^2 * 13^2$
So the pairs will have either 0,1, or 2 powers of each of three prime numbers. But one of these has two identical numbers, and the rest come in pairs of duplicates.
The answer is ((3*3*3)-1)/2 + 1= 13.

A lady gives dinner party to five guests to be selected from 9 friends .The number of ways of forming the party of 5,given that two of the friends will not attend the party together is
Sol: No of guests to be invited=5
Therefore,
No of ways forming the party= (9-2)c5*2c0+(9-2)c4*2c1 =7c5*1+7c4*2 =91

There are 5 letters and five addressed envelops. the number of ways in which all the letters can be put in wrong envelops is:
Sol: We have N letters and N envelopes. The Letters can be put in the N envelopes in N! ways . We want to count the Number of "Derangements" (The no. of ways that no letter goes into right envelope).

N!(1- 1/1! + 1/2! - 1/3! +.....+(-1)n 1/n!) (this the the formula).
Here N = 5.
So When We put N = 5 in Formula we get 44 ans.

A five -digit number divisible by 3 is to be formed using numerals 0,1,2,3,4 and 5 without repetition. The total number of ways this can be done is:
Sol: we have 5 place to arrange this no. and the total should be divisible by 3
no. are :- 0,1,2,3,4,5
take five no.
0+1+2+3+4=10(not divisible by 3)
1+2+3+4+5=15(divisible by 3) possible combination 5!=120
2+3+4+5+0=14(not divisible by 3)
3+4+5+0+1=13(not divisible by 3)
4+5+0+1+2=12(divisible by3)
so these no. we can take, but remember that we can not take 0 at 1st place so
possible combination is 4*4*3*2*1=96
5+0+1+2+3=11(not divisible by 3)
total no.is=120+96=216

Mark price of a good is 45 Rs. If seller sells it at 42 Rs as discount price and also want 5 % profit then what will be cost price?
Sol: x+0.05x=42; then x=40

In a bag there are 5 white, 8 red, 2 black and 3 blue balls. what is probability that ball picked is red or black?
Sol: Total balls=18; Probability=red/tot + black/tot ; 10/18 =5/9

How many 4 digit even no. is possible by 1,2,3,4 if no one is repeated?
Sol= 3! + 3! =12

$\log_3 9-\log_4 256+\log_5 125=?$
Sol: 2-4+3=1;

If a=2 & b=1 then $\log_{(a+b)}(a^2-b^2)=?$
Sol: substitute a= and b=1 in $\log_{(a+b)}(a^2-b^2)= \log_3 3=1$

A coin is tossed 3 times by raju. what is probability that raju win all three time?
Sol: 1/2 * 1/2 * 1/2 = 1/8

If there are 5 different roads to go into a city then no. of ways to go and back to home?
Sol: 25,if one goes using 1st road,there are 5 roads to come back.....so 5*5, 25 is the ans

Probability of finding 9 of hearts from deck of 52 cards ?
Sol: there is only 1,9 of heart is present in a deck of 52 cards. so probability of finding 9 of heart=1/52

$\log_{\sqrt{6}} 1296=$?
Sol: $\log_{\sqrt{6}} 6^4= 8$;

Hemant and Ajay start a two-length swimming race at the same moment but from opposite ends of the pool. They swim in lane and at uniform speed, but Hemant is faster than Ajay.They first pass at a point 18.5 m from the deep end and having completed one length, each one is allowed to rest on the edge for exactly 45 seconds.After setting off on the return length, the swimmers pass for the second time just 10.5 m from the shallow end.How long is the pool?
Sol:

A and B start together from the same point on a circular track and walk in the same direction till they both again arrive together at the starting point. A completes one circle in 224 s and B in 364 s. How many times will A have passed B?
Sol: 13 times; LCM of 224,364=2912;so, A does 13 circles while B does 8 in 2912s.
Thus A crosses B 13 times.
Which is more-successive discount of 40% of 30 % OR flat 70% ?
Sol: flat 70%;
because on Rs. 100 ,
successive discount of 40% of 30 %=100*0.6*0.7=42;
flat 100*0.3=30,
so discount of 70% is more

If log(base p)25p=2.Find the value of P?
Sol: p^2=25*p so p=25;

49 pumps can empty a reservor 6 1/2 days, working 8 hours a day. if 196 pumps are used for 5 hours a day , then the same work will completed in. 1. 2.6 days 2. 3 days 3. 2.5 days 4. 2 day
Sol: 49*13/2*8=196*x*5
x=2.6 days

If 7 spider make 7 webs in 7 days then 1 spider will make 1 web in how many days? 1.1 2.7 3. 7/2 4.49
Sol: 7 Days

Ravi brought 300 liter of milk at Rs 19 per liter. he added 200 liter ofd water to it and sold 400 of milk at rs 20 per liter.to the rest, he added 10 liter more water to it and then sold it for rs. 15 per liter.if he used miniral water that cast iRs 10 per liter.then the money earned by ravi is: 1. 4000 2.4500 3.1800 4.1850
Sol: total cost price will be.. (300*19 + 210 *10)as 300 lt of was purachsed @ rs 19 and 210 lts of water is added @ rs 10. sp will be , (400*20 + 110 *15)
so CP = 7800 & SP = 9650
profit = 9650 -7800 = 1850

$2^{x+y}=2*(2)^{1/2}$ and $2^{x-y}= 2^{1/2}$, the value of x is. 1.1 2.2 3.3 4.4 5.none of these
Sol: as compare the powers of both eq's
such that x+y= 3/2; x-y=1/2; on solving x=1

Whats the value 1%(modulus) 160/130; 1.160/130 2.1/130 3.1/160 4. 130/160
Sol: 1 %160/130
ie % having higher priority compare to /
so it is calculated as (1%160)/130
so 1/130

Revati brought a machine of 4,50,000 and sold it to raghu at profit . Raghu sold the machine to danush at loss of 10% for 4 95 000 . wt profit got revati ?
Sol: raghu's cp is revati's sp.
raghu's cp= (100/90)*4,95,000= 550000.
profit %= (100000/450000)*100= 22.22.
answer is 4. 22.22%

What is prabablity to getting at least one of tail . when two coins are tossed simultaineouly?
Sol:3/4

in out of 52 cards, 4 cards to be are selected and one card of it should be spade and one card card should be heart. in How many ways can these card selected
Sol: There are 13 spades and 13 heart cards in pack of 52
we need to select 4 cards and one is from spades and one is from hearts and remaining 2 are form remaining cards
ie 13c1 * 13c1 * 50c2
13^2*50c2

In the election, the wining candidate won by 15% of votes. if a total 5000 votes were cast of which is 86% where eligible. then how many votes the wining candidate get?
Sol: 86% votes are eligible in 5000
so the number of votes are 5000*86/100=4300
now if loss candidate get x votes then winning one gets 15%more than that of x
ie the total votes is equal to the winning and loss candidate votes
x + (x*115/100)= 4300
from it x = 2000
now we need to calculate for winning candidate
ie x*115/100 = 2000*115/100 = 2300
114. 47,322 bulb are to be packed in several boxes. Each box should contains equal Numbers of bulbs and no bulb should be unpacked number of boxed used can be:
1. 12 2. 11 3. 8 4. 14
Sol: Only 11 can divide the given number.

How many 4 digit number can we made from 1 2 3 4 5 6 and 7 with none of digits being repeated?
Sol: 7*6*5*4=840

What is the value of $(10101)_2$ in decimal form
Sol: 21
Wts is price of a pair of sandles is decreased by 10% the number of pair sold incresed by 20%. wt is nxt effect on sells?
1.8% decreases 2.10% decreases 3.10% increases 4. 8% increases
Sol: let price of sandles is x= 100rs.
price is decreased by 10%; x=90rs;
now it is increased by 20%; x=x + 20%(90)
x=90+18; x=108; means increases 8%;

What is the value of $\log_7(1/49)$
Sol: -2
119. 18.3454545nis equalent to;
1 1009/55 2.1009/99 3.342/990 4. 345/99
Sol: option 1.

Price of salt is increased by 25% in order not to increase the expenditure a lady must reduce her consumption by:
Sol: let's say lady need 1 salt packet per month and cost is 100 rupees
now salt packet rate is increased by 25% so new price will be 125.
but lady should not increase the expenditure, then how much she can buy with 100 rupees= 100/125
rate of decrease is given by ((1- (100/125))1)*100 = 20

How money factors does 400 have?
Sol: 15

What is square root of 54 05 625?
Sol: use square root division method.... taking groups of 5 40 56 25
ans is :2325

$\log_4 2 + \log_4 32$ is equals to
Sol: 4

Product of any two odd numbers is:
a.always odd b.always even c.sometimes odd and same times even d.divisible by 6
Sol: (a)

Suparna needs to browse through 75pages of a novel before she gives her review to the class. She has 2.5 hrs before the lecture. What should be her reading speed in pages/hour?

1. 16
2. 30
3. 20
4. 22

The value of log100.1 is :

1. 0
2. -1
3. -10
4. -100

A written exam consists of 6 questions with the answer options as yes/no/none. In how many ways can the examinees select the answers

1. 6 ways
2. 6 ways
3. 3.3.3.3.3
4. $(3^6$

What is the sum of the two consecutive numbers, the difference of whose squares is 19?

1. 9

2. 10

3. 18

4. 19

P is an integer. P>883. If (p-7) is a multiple of 11, then the largest number that will divide (p+4) (p+15) is :

1. 11
2. 121
3. 242
4. None of the above

Find the least number which when divided by 5, 7 and 13 leaves the same remainder 3 in each case

1. 398
2. 453
3. 458
4. 463

Which number should be subtracted from 321 so that it becomes prime?

1. 2
2. 4
3. 6
4. 9

$2^8 X 2^2 =$

1. 4^{10}
2. 2^{10}
3. 2^{16}
4. 4^{16}

What will be the value of the expression $a^{8/3} * a^{-6/9}$?

1. a^{-2}
2. a^{-1}
3. a^0
4. a^1
5. a^2

What is the square root of 576/9?

1. 4
2. 8
3. 12
4. 16

Which number is the fourth power of 7?

1. 2401

2. 2421
3. 2601
4. 2621

HCF of two numbers is 11 and their LCM is 693. If one number is 77, find the other number?

1. 7
2. 9
3. 63
4. 99

Recycling 900 kg of paper saves 17 trees . How many trees are saved when 1200 kg of paper are recycled?

1. 19
2. 25
3. 20
4. 22

How many different four letter words can be formed (the words need not to be meaningful) using the letters of the word PACIFIC such that the first letter is p and the last letter is F?

1. 8
2. 3
3. 6
4. 7!/5!

Mauli purchased a designer saree from Mumbai at $8/9^{th}$ of its MRP. When she came back to Delhi, her neighbour coaxed mauli to sell the saree to her. She was even ready to pay 9% more than its MRP. What would Mauli's gain percentage be, if she decides to sell the saree to her neighbour?

1. 15.59%
2. 16.61%
3. 20.36%
4. 22.65%

A goods carriage of length 2km, headed to Srinagar from Punjab was running at a speed of 30 km/hr. It crosses a tunnel which is 58 km long with that speed. Find the time taken by the goods carriage to cross the tunnel?

1. 4 hours
2. 3 hours
3. 2 hours
4. 1 hour

A lucky draw is organized as part of the first anniversary celebration of new Age Company. There are 25 chits in a bowl one for each employee and the chits are marked from 1-25. Sarika and Rajesh have chits marked with numbers that are multiples of 3 or 7. They want to know if there are chances of them being

awarded the trip to Goa which is the first prize of the lucky draw. When one chit is drawn at random, what is the probability that the chit has a number which is a multiple of 3 or 7?

1. 3/25
2. 2/11
3. 11/25
4. 10/25

What is the loss percentage incurred by a company when it buys an asset for Rs. 1,50,000 and sells it for Rs. 75,500?

1. 49.67%
2. 49.34%
3. 98.68%
4. 98.34%

If Ruparno is expected to spend Rs. 2,300 on electricity bill in the first 3 months of the year, what amount can he be expected to spend on electricity bill for the rest of the year?

1. Rs. 5,400
2. Rs. 5,700
3. Rs. 6,200
4. Rs. 6,900

Out of every 100 people in police department, 10 are women. Out of every 100 people in military forces, 3 are women. In a batch of 180 police personnel and 200 army personnel, how many of them would be women?

1. 24
2. 30
3. 18
4. 6

Probability of one of the power plants over heating is 0.15 per day and the probability of failure of the backup cooling system is 0.11. if these events are independent, what is the probability of 'big trouble' (i.e., both evnets taking place)?

1. 0.35
2. 0.0185
3. 0.0165
4. 0.26

There are 5 clients and 5 consultants in a round table meeting. In how many ways can the clients be seated such that no consultant is next to the other consultant?

1. 5!6!
2. 4! 4!
3. 4! 5!

4. 9!

5. 10 5! 4!

The question consists of two statements- A and B. find out if the information given in the statement(s) is sufficient to find the solution to the problem.

Given:

A: Probability of finding a Red marble is the same as that of a Green marble but is double that of finding a Yellow marble.

B: There are 6 Green marbles in the jar.

1. if the question can be answered by using statement A alone but not by using B alone

2. if the question can be answered by using statement B alone but not by using A alone

3. if the question can be answered by using either statements alone

4. if the question can be answered by using both the statements together but not by either statement alone

Evaluate : $\log_5{}^3 17^6$

1. 2 $\log_5 17$

2. $\log_5 17$

3. $\log_5 17^{18}$

4. 0.5 $\log_{17} 5$

5. 2 $\log_{125} 17$

If a=5 and b=4 then, what is the value of lof(a-b)(a^2-b^2-2b)?

1. -1

2. 0

3. 1

4. undefined

Pick the odd man out.

1. ACFJ

2. CEHL

3. PRUY

4. SUXZ

3, 15, 35, 63....

1. 101

2. 121

3. 99

4. 98

Based on the given passage find out which of the following statements can be inferred from the passage.

According to a recent study, in the local municipal elections, the candidate who interacts more with the Resident's Welfare Associations and wins their trust will get the maximum name recognition name in the elections.

1. local resident's welfare associations are the most important factor in elections in the city
2. Maximum name recognition will help a candidate will help a candidate win a higher percentage of votes cast during the election
3. Resident's welfare associations exert a a lot of influence over the voting population residing in the city.
4. For maximum name recognition a candidate need not spend a lot of money on posters, banners and advertising campaigns.

Decode the word(s) / pattern given in the question

If TENNIS is coded as UDOMJR, then CRICKET is coded as:

1. DPJBMDV
2. DQJBMEU
3. DQJBLDU
4. BSHDJFS

Choose the right answer

Pick the odd man out

1. STV
2. XYA
3. KKT
4. BDE

Find the next number in the series.

18, 19, 21, 24, ...

1. 26
2. 25
3. 27
4. 28

Set 2

Ques 1 : Choose the correct answer.

If the sum of two numbers is 55 and the H.C.F. and L.C.M of these numbers are 5 and 120 respectively, then the sum of the reciprocals of the numbers is equal to:

Option 1 : 55/601
Option 2 : 601/55
Option 3 : 11/120
Option 4 : 120/11

Correct Answer :11/120

Ques 2 : Choose the correct answer.

Three different containers contain 496 litres, 403 litres and 713 litres of mixtures of milk and water respectively. What biggest measure can measure all the different quantities exactly ?

Option 1 : 1 litre
Option 2 : 7 litre
Option 3 : 31 litre
Option 4 : 41 litre

Correct Answer :31 Liters

Ques 3 : Choose the correct answer.
Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together ?

Option 1 : 4
Option 2 : 10
Option 3 : 15
Option 4 : 16

Correct Answer : 16

Ques 4 : Choose the correct answer.
Four different electronic devices make a beep after every 30 minutes, 1 hour, 3/2 hour and 1 hour 45 minutes respectively. All the devices beeped together at 12 noon. They will again beep together at:

Option 1 : 12 midnight
Option 2 : 3 a.m.
Option 3 : 6 a.m.
Option 4 : 9 a.m.

Correct Answer : 9am

Ques 5 : Choose the correct answer.
The number of prime factors of (3 x 5)12 (2 x 7)10 (10)25 is:

Option 1 : 47
Option 2 : 60
Option 3 : 72

Option 4 : None of these

Correct Answer : None Of These

Ques 6 : Choose the correct answer.
What least value must be assigned to * so that the number 63576*2 is divisible by 8?

Option 1 : 1
Option 2 : 2
Option 3 : 3
Option 4 : 4

Correct Answer :3

Ques 7 : Choose the correct answer.
Which of the following numbers is exactly divisible by 24 ?

Option 1 : 35718
Option 2 : 63810
Option 3 : 537804
Option 4 : 3125736

Correct Answer :3125736

Ques 8 : Choose the correct answer.
The number nearest to 15207, which is divisible by 467, is:

Option 1 : 14342
Option 2 : 15211
Option 3 : 14944
Option 4 : 15411
Option 5 : None of these

Correct Answer :15411

Ques 9 : Choose the correct answer.
The smallest number, which is a perfect square and contains 7936 as a factor is:

Option 1 : 251664
Option 2 : 231564
Option 3 : 246016
Option 4 : 346016
Option 5 : None of these

Correct Answer :246016

Ques 10 : Choose the correct answer.
In a division problem, the divisor is twenty times the quotient and five times the remainder. If remainder is 16, the number will be:

Option 1 : 3360
Option 2 : 336
Option 3 : 1616
Option 4 : 20516
Option 5 : None of these

Correct Answer :336

Ques 11 : Choose the correct answer.
The L.C.M. of two numbers is 4800 and their G.C.M. is 160. If one of the numbers is 480, then the other number is:
Option 1 : 1600
Option 2 : 1800
Option 3 : 2200
Option 4 : 2600
Option 5 : None of these

Ques 12 : Choose the correct answer.
The L.C.M. of two numbers is 140. If their ratio is 2:5, then the numbers are:

Option 1 : 28,70
Option 2 : 28,7
Option 3 : 8,70
Option 4 : 8,40
Option 5 : None of these

Ques 13 : Choose the correct answer.
If a number is exactly divisible by 85, then what will be the remainder when the same number is divided by 17?

Option 1 : 3
Option 2 : 1
Option 3 : 4
Option 4 : 0

Ques 14 : Choose the correct answer.
The least perfect square number which is exactly divisible by 3, 4, 7, 10 and 12 is:

Option 1 : 8100
Option 2 : 17600
Option 3 : 44100
Option 4 : None of these

Ques 15 : Choose the correct answer.
(xn+yn) is divisible by (x-y):

Option 1 : for all values of n
Option 2 : only for even values of n
Option 3 : only for odd values of n
Option 4 : for no values of n

Ques 16 : Choose the correct answer.
The greatest number that will divide 63, 138 and 228 so as to leave the same remainder in each case:
Option 1 : 15
Option 2 : 20
Option 3 : 35
Option 4 : 40

Ques 17 : Choose the correct answer.
Find the largest number, smaller than the smallest four-digit number, which when divided by 4,5,6 and 7 leaves a remainder 2 in each case.
Option 1 : 422
Option 2 : 842
Option 3 : 12723
Option 4 : None of these

Ques 18 : Choose the correct answer.
What is the highest power of 5 that divides 90 x 80 x 70 x 60 x 50 x 40 x 30 x 20 x 10?
Option 1 : 10
Option 2 : 12
Option 3 : 14
Option 4 : None of these

Ques 19 : Choose the correct answer.
If a and b are natural numbers and a-b is divisible by 3, then a3-b3 is divisible by:
Option 1 : 3 but not by 9
Option 2 : 9
Option 3 : 6
Option 4 : 27

Ques 20 : Choose the correct answer.

What is the greatest positive power of 5 that divides 30! exactly?
Option 1 : 5
Option 2 : 6
Option 3 : 7
Option 4 : 8

Ques 21 : Choose the correct answer.
In how many ways can a number 6084 be written as a product of two different factors ?
Option 1 : 27
Option 2 : 26
Option 3 : 13
Option 4 : 14

Ques 22 : Choose the correct answer.
What is the smallest four-digit number which when divided by 6, leaves a remainder of 5 and when divided by 5 leaves a remainder of 3?
Option 1 : 1043
Option 2 : 1073
Option 3 : 1103
Option 4 : None of these

Ques 23 : Choose the correct answer.
P is an integer. P>883. If P-7 is a multiple of 11, then the largest number that will always divide (P+4) (P+15) is:
Option 1 : 11
Option 2 : 121
Option 3 : 242
Option 4 : None of these

Ques 24 : Choose the correct answer.
Let C be a positive integer such that C + 7 is divisible by 5. The smallest positive integer n (>2) such that C + n2 is divisible by 5 is:
Option 1 : 4
Option 2 : 5
Option 3 : 3
Option 4 : Does not exist

Ques 25 : Choose the correct answer.
Four bells begin to toll together and then each one at intervals of 6 s, 7 s, 8 s and 9 s respectively. The number of times they will toll together in the next 2 hr is:
Option 1 : 14 times
Option 2 : 15 times
Option 3 : 13 times
Option 4 : 11 times

Ques 26 : Choose the correct answer.
The product of two numbers is 16200. If their LCM is 216, find their HCF.
Option 1 : 75
Option 2 : 70
Option 3 : 80
Option 4 : Data inconsistent

Ques 27 : Choose the correct answer.
There are four prime numbers written in ascending order of magnitude. The product of first three is 385 and that of last three is 1001. Find the first number.
Option 1 : 5
Option 2 : 7
Option 3 : 11
Option 4 : 17

Ques 28 : Choose the correct answer.
M and N are two distinct natural numbers. HCF and LCM of M and N are K and L respectively. A is also a natural number, which of the following relations is not possible?
Option 1 : K*L=A
Option 2 : K*A=L
Option 3 : L*A=K
Option 4 : None of these

Ques 29 : Choose the correct answer.
On dividing a number by 999,the quotient is 366 and the remainder is 103.The number is:
Option 1 : 364724
Option 2 : 365387
Option 3 : 365737
Option 4 : 366757

Ques 30 : Choose the correct answer.
The difference between two numbers is 1365.When the larger number is divided by the smaller one ,the quotient is 6 and the remainder is 15.The smaller number is:
Option 1 : 240
Option 2 : 270
Option 3 : 295
Option 4 : 360

Ques 31 : Choose the correct answer.
The ratio of two numbers is 3:4 and their HCF is 4.Their LCM is:
Option 1 : 12 Option 2 : 16 Option 3 : 24 **Option 4 : 48**

Ques 32 : Choose the correct answer.

A rectangular courtyard 3.78 meters long and 5.25 meters wide is to be paved exactly with square tiles ,all of the same size. What is the largest size of the tile which could be used for the purpose?
Option 1 : 14 cm **Option 2 : 21 cm** Option 3 : 42 cm Option 4 : None of these

Ques 33 : Choose the correct answer.
The least perfect square which is divisible by 3, 4, 5, 6, 8 is:
Option 1 : 900 Option 2 : 1200 Option 3 : 2500 **Option 4 : 3600**

Ques 34 : Choose the correct answer.
What will be obtained if 8 is subtracted from the HCF of 168, 189, and 231?
Option 1 : 15 Option 2 : 10 Option 3 : 21 **Option 4 : None of these**

Ques 35 : Choose the correct answer.
The largest four digit number which is a multiple of 8, 10,12 and 15 is:
Option 1 : 120 Option 2 : 9600 Option 3 : 9840 **Option 4 : 9960**

Ques 36 : Choose the correct answer.
If logx (0.1) = -1/3, then the value of x is:
Option 1 : 10 Option 2 : 100 **Option 3 : 1000** Option 4 : 1/1000

Ques 37 : Choose the correct answer.
If ax = by, then:
Option 1 : log(a/b) = x/y Option 2 : log(a) / log(b) = x/y **Option 3 : log(a) / log(b) = y/x** Option 4 : None of these

Ques 38 : Choose the correct answer.
If log8 x + log8 (1/6) = 1/3 then the value of x is:
Option 1 : 12 Option 2 : 16 Option 3 : 18 Option 4 : 24

Ques 39 : Choose the correct answer.
If log x + log y = log (x + y), then:
Option 1 : x = y Option 2 : xy=1 Option 3 : y = (x-1)/x **Option 4 : y = x/(x-1)**

Ques 40 : Choose the correct answer.
If log10 7 = a, then log10(1/70) is equal to:
Option 1 : -(1 + a) Option 2 : (1 + a)-1 Option 3 : a/10 Option 4 : 1/10a

Ques 41 : Choose the correct answer.
If log{(a+b)/3} = 0.5(log a + log b), then the correct relation between a and b is:
Option 1 : a2+b2 = 7ab Option 2 : a2-b2 = 7ab Option 3 : (a+b)2 = 2 Option 4 : (a+b)/3 = (1/2)(a+b)
Option 5 : None of these

Ques 42 : Choose the correct answer.
If log x = log 3 + 2 log 2- (3/4) log 16. The value of x is:

Option 1 : 1/2 Option 2 : 1 **Option 3 : 3/2** Option 4 : 2 Option 5 : None of these

Ques 43 : Choose the correct answer.
If log x =(1/2) log y = (1/5) log z, the value of x4y3z-2 is:
Option 1 : 0 **Option 2 : 1** Option 3 : 2 Option 4 : 3 Option 5 : None of these

Ques 44 : Choose the correct answer.
If log10000 x = -1/4, then x is given by:
Option 1 : 1/100 **Option 2 : 1/10** Option 3 : 1/20 Option 4 : none of these

Ques 45 : Choose the correct answer.
The value of 3-1/2 log3(9) is:
Option 1 : 3 **Option 2 : 1/3** Option 3 : 2/3 Option 4 : none of these

Ques 46 : Choose the correct answer.
loge xy - loge |x| equals to:
Option 1 : loge x Option 2 : loge |x| Option 3 : - loge x **Option 4 : none of these**

Ques 47 : Choose the correct answer.
The value of (loga n) / (logab n) is given by:
Option 1 : 1 + loga b Option 2 : 1 + logb a Option 3 : loga b Option 4 : logb a

Ques 48 : Choose the correct answer.
If (a4 - 2a2b2 + b4)x-1 = (a-b)2x (a+b)-2, then x equals to:
Option 1 : (a - b) / (a + b) Option 2 : log (a2 - b2) Option 3 : log (a + b) / log (a - b) **Option 4 : log (a - b) / log (a + b)**

Ques 49 : Choose the correct answer.
If a, b, and c are in geometric progression then loga n, logb n and logc n are in:
Option 1 : AP Option 2 : GP **Option 3 : HP** Option 4 : None of these

Ques 50 : Choose the correct answer.
What is the value of antilog10100?
Option 1 : 2 **Option 2 : 10100** Option 3 : 100 Option 4 : 10

Ques 51 : Choose the correct answer.
If antilog x 5 = 30, what can you infer about x?
Option 1 : x is a number between 1 and 2 Option 2 : x is 305 Option 3 : x is a number between 2 and 3
Option 4 : None of these

Ques 52 : Choose the correct answer.

Every time x is increased by a given constant number, y doubles and z becomes three times. How will log(y) and log(z) behave as x is increased by the same constant number?
Option 1 : Both will grow linearly with different slopes Option 2 : Both will grow linearly with same slopes
Option 3 : y will grow linearly, while z will not Option 4 : z will grow linearly, while y will not

Ques 53 : Choose the correct answer.
x triples every second. How will log2x change every second?
Option 1 : It will double every second Option 2 : It will triple every second **Option 3 : It increases by a constant amount every second.** Option 4 : None of these

Ques 54 : Choose the correct answer.
f(x) grows exponentially with x, how will f(log(x)) grow?
Option 1 : Exponentially **Option 2 : Linearly** Option 3 : Quadratically Option 4 : None of these

Ques 55 : Choose the correct answer.
What is the value of log512 8?
Option 1 : 3 **Option 2 : 1/3** Option 3 : -3 Option 4 : -1/3

Ques 56 : Choose the correct answer.
What is the value of log7 (1/49)?
Option 1 : 2 Option 2 : 1/2 Option 3 : -1/2 **Option 4 : -2**

Ques 57 : Choose the correct answer.
Given that log64 x = 2/6, what is the value of x?
Option 1 : 2 **Option 2 : 4** Option 3 : 6 Option 4 : 8

Ques 58 : Choose the correct answer.
If 7x = 85, what is the value of x?
Option 1 : log785 Option 2 : log857 Option 3 : log107 Option 4 : log1085

Ques 59 : Choose the correct answer.
If log102 = 0.3010, what is the number of digits in 264
Option 1 : 19 **Option 2 : 20** Option 3 : 18 Option 4 : None of these

Ques 60 : Choose the correct answer.
What is log110?
Option 1 : 1 Option 2 : 10 Option 3 : 0 **Option 4 : Tends to infinity**

LOW IMPORTANCE:

Ques 61 : Choose the correct answer.
What is log100 ?
Option 1 : 0 Option 2 : 10 Option 3 : 1 **Option 4 : Not defined**

Ques 62 : Choose the correct answer.
What is the value of log3 (-9)?
Option 1 : 3 Option 2 : 1/3 Option 3 : -3 **Option 4 : Not defined**

Ques 63 : Choose the correct answer.
Rajeev multiplies a number by 10, the log (to base 10) of this number will change in what way?
Option 1 : Increase by 10 **Option 2 : Increase by 1** Option 3 : Multiplied by 10 Option 4 : None of these

Ques 64 : Choose the correct answer.
The logarithm of a very small positive number will tend to which of the following?
Option 1 : 0 **Option 2 : negative infinity** Option 3 : positive infinity Option 4 : 1

Ques 65 : Choose the correct answer.
If n numbers are in geometric progression, the logarithm of the number will be in which of the following?
Option 1 : Geometric Progression **Option 2 : Arithmetic Progression** Option 3 : Harmonic Progression
Option 4 : None of these

Ques 66 : Choose the correct answer.
Which of the following is equivalent to log(a + b) ?
Option 1 : log a + log b Option 2 : log a * log b Option 3 : log a - log b **Option 4 : None of these**

Ques 67 : Choose the correct answer.
What is the value of log3 (1/9) + log 9 81 ?
Option 1 : 2 Option 2 : -2 **Option 3 : 0** Option 4 : 4

Ques 68 : Choose the correct answer.
What is the value of log3 1.5 + log3 6 ?
Option 1 : 2 Option 2 : 2.7 Option 3 : 1.8 Option 4 : None of these

Ques 69 : Choose the correct answer.
Which of the following is log8 x equivalent to?
Option 1 : log2 (x/3) Option 2 : log2 (3x) **Option 3 : (log2x)/ 3** Option 4 : None of these

Ques 70 : Choose the correct answer.
If n numbers are in arithmetic progression, the logarithm of the number will be in which of the following?
Option 1 : Exponentially Option 2 : Linearly Option 3 : Quadratically **Option 4 : None of these**

Ques 71 : Choose the correct answer.
What is the value of log20 1 ?
Option 1 : 0 Option 2 : 1 Option 3 : 20 Option 4 : None of these

Ques 72 : Choose the correct answer.
The unit's digit in the product (771 x 659 x 365) is
Option 1 : 1 Option 2 : 2 **Option 3 : 4** Option 4 : 6

Ques 73 : Choose the correct answer.
1.52 * 0.02251/2 = ?
Option 1 : 0.0375 **Option 2 : 0.3375** Option 3 : 3.275 Option 4 : 32.75

Ques 74 : Choose the correct answer.
If x1/2 / 4411/2 = 0.02, the value of x is:
Option 1 : 0.1764 Option 2 : 1.764 Option 3 : 1.64 Option 4 : 2.64

Ques 75 : Choose the correct answer.
The value of 21/2 upto three places of decimal is
Option 1 : 1.41 Option 2 : 1.412 Option 3 : 1.413 **Option 4 : 1.414**

Ques 76 : Choose the correct answer.
The value of (8-25- 8-26) is:
Option 1 : 7 x 8-25 **Option 2 : 7 x 8-26** Option 3 : 8 x 8-26 Option 4 : None of these

Ques 77 : Choose the correct answer.
If 22n-1 = (1 / 8n-3) then the value of n is:
Option 1 : 3 **Option 2 : 2** Option 3 : 0 Option 4 : -2

Ques 78 : Choose the correct answer.
If 2x = 3y = 6-z, then (1/x + 1/y + 1/z)
is equal to:
Option 1 : 0 Option 2 : 1 Option 3 : 3/2 Option 4 : -0.5

Ques 79 : Choose the correct answer.
What is the remainder when 1723 is divided by 16?
Option 1 : 0 **Option 2 : 1** Option 3 : 2 Option 4 : 3

Ques 80 : Choose the correct answer.
What will be the remainder when 1336 is divided by 2196?
Option 1 : 0 **Option 2 : 1** Option 3 : 12 Option 4 : 2195

Ques 81 : Choose the correct answer.
The roots of the equation 4x-3*2x+2+32=0 would include-
Option 1 : 2, 3 Option 2 : 1, 2, 3 Option 3 : 1, 2 Option 4 : 4, 8

Ques 82 : Choose the correct answer.
If ax =b, by=c and cz =a, then the value of xyz is:
Option 1 : 0 **Option 2 : 1** Option 3 : 2 Option 4 : 3

Ques 83 : Choose the correct answer.
If x = 1+21/2 and y=1-21/2, then x2+y2 is -
Option 1 : 2 Option 2 : 3 **Option 3 : 6** Option 4 : 0

Ques 84 : Choose the correct answer.
If 4x+3 = 2x+7, then the value of x is:
Option 1 : 3 Option 2 : 2 **Option 3 : 1** Option 4 : None of these

Ques 85 : Choose the correct answer.
2x+y = 2*(2)1/2 and 2x-y = 21/2,the value of x is:
Option 1 : 1 Option 2 : 2 Option 3 : 3 Option 4 : 4 Option 5 : None of these

Ques 86 : Choose the correct answer.
If x = 8, y = 27, the value of (x4/3+y2/3)1/2 is:
Option 1 : 5 Option 2 : 6 Option 3 : 7 Option 4 : 8 Option 5 : None of these

Ques 87 : Choose the correct answer.
If xy = yx and x = 2y, the value of y is:
Option 1 : 1 **Option 2 : 2** Option 3 : 3 Option 4 : 4 Option 5 : None of these

Ques 88 : Choose the correct answer.
If 2x * 3y = 18 and 22x * 3y= 36, the value of x is:
Option 1 : 0 **Option 2 : 1** Option 3 : 2 Option 4 : 3 Option 5 : None of these

Ques 89 : Choose the correct answer.
What is the value of 500 ?
Option 1 : 0 **Option 2 : 1** Option 3 : 50 Option 4 : None of these

Ques 90 : Choose the correct answer.
What is the value of 6-2 ?
Option 1 : 1/36 Option 2 : 36 Option 3 : -36 Option 4 : None of these

Ques 91 : Choose the correct answer.
What is the value of 0-10 ?
Option 1 : 0 Option 2 : 1 Option 3 : -10 **Option 4 : None of these**

Ques 92 : Choose the correct answer.
What is the value of 251.5 ?
Option 1 : 325 Option 2 : 32.5 **Option 3 : 125** Option 4 : None of these

Ques 93 : Choose the correct answer.
What is the value of (0.027)1/3?
Option 1 : 0.3 Option 2 : 0.03 Option 3 : 0.003 Option 4 : None of these

Ques 94 : Choose the correct answer.
What is the value of (0.016)1/4?
Option 1 : 0.2 Option 2 : 0.02 Option 3 : 0.002 **Option 4 : None of these**

Ques 95 : Choose the correct answer.
Walking 6/7th of his usual speed, a man is 12 minutes too late. The usual time taken by him to cover that distance is:
Option 1 : 1 hour **Option 2 : 1 hr 12min** Option 3 : 1 hr 15 min Option 4 : 1 hr 20 min

Ques 96 : Choose the correct answer.
A boat running upstream takes 8 hours 48 minutes to cover a certain distance, while it takes 4 hours to cover the same distance running downstream. What is the ratio between the speed of the boat and speed of the water current respectively ?
Option 1 : 2 : 1 Option 2 : 3 : 2 **Option 3 : 8 : 3** Option 4 : Cannot be determined Option 5 : None of these

Ques 97 : Choose the correct answer.
In a 100 m race, A can beat B by 25 m and B can beat C by 4 m. In the same race, A can beat C by:
Option 1 : 21 m Option 2 : 26 m **Option 3 : 28 m** Option 4 : 29 m

Ques 98 : Choose the correct answer.
In a family, the father took 1/5 of the cake and he had 4 times as much as others had, then the family members are:
Option 1 : 16 **Option 2 : 17** Option 3 : 18 Option 4 : None of these

Ques 99 : Choose the correct answer.
The price of sugar is increased by 25%. In order not to increase the expenditure a lady must reduce her consumption by:
Option 1 : 25% **Option 2 : 20%** Option 3 : 30% Option 4 : None of these

Ques 100 : Choose the correct answer.
I read 3/8 of a book on one day, and 4/5 of the remainder on another day. If now there were 30 pages unread, the book contains:
Option 1 : 240 pages Option 2 : 230 pages Option 3 : 340 pages Option 4 : 140 pages Option 5 : None of these

Ques 101 : Choose the correct answer.
In an examination, 70% of students passed in physics, 65% in chemistry, 27% failed in both subjects. The percentage of students who passed is:
Option 1 : 66% **Option 2 : 62%** Option 3 : 69% Option 4 : None of these

Ques 102 : Choose the correct answer.
An article was sold for Rs. 2770. Had it been sold for Rs. 3000 there would have been an additional gain of 10%. Cost Price of the article is:
Option 1 : Rs. 2100 Option 2 : Rs. 2200 **Option 3 : Rs. 2300** Option 4 : Rs. 2400 Option 5 : None of these

Ques 103 : Choose the correct answer.
Rakesh buys a scooter worth Rs. 10,000. He sells it to Mohan at a profit of 10%. If after sometime Mohan sells it back to Rakesh at a loss of 10%, then totally:
Option 1 : Rakesh loses Rs. 100 Option 2 : Rakesh loses Rs. 1100 Option 3 : Rakesh gains Rs. 100 **Option 4 : Rakesh gains Rs. 1100** Option 5 : None of these

Ques 104 : Choose the correct answer.
The list price of an electric iron is Rs. 300. If two successive discounts of 15% and 10% are allowed, its selling price will be:
Option 1 : Rs. 229.50 Option 2 : Rs.231.50 Option 3 : Rs.232.50 Option 4 : Rs. 234.50 Option 5 : None of these

Ques 105 : Choose the correct answer.
The rate of compound interest at which a sum of Rs. 8000 amounts to Rs. 8820 in 2 years, is:
Option 1 : 5% Option 2 : 4% Option 3 : 6% Option 4 : 7% Option 5 : None of these

Ques 106 : Choose the correct answer.

A car is 250 metres behind the bus. The car and bus are moving with speed 60 km/hr and 35 km/hr respectively. The car will be ahead of bus by 250 metres in:
Option 1 : 37 seconds Option 2 : 48 seconds **Option 3 : 72 seconds** Option 4 : 68 seconds Option 5 : None of these

Ques 107 : Choose the correct answer.
Mohan walks a certain distance and rides back in 6 hours and 15 minutes. If he walks both ways he takes 7 hours and 45 minutes. If Mohan rides both ways the time which he will take will be:
Option 1 : 4 hours **Option 2 : 19/4** hours Option 3 : 9/2 hours Option 4 : 17/4 hours Option 5 : None of these

Ques 108 : Choose the correct answer.
Population of a village is eight thousand. If 6% men and 10% women are added, population becomes 8,600, then the number of men in the village was:
Option 1 : 4800 **Option 2 : 5000** Option 3 : 5060 Option 4 : 6000

Ques 109 : Choose the correct answer.
If 15 oxen or 20 cows can eat the grass of a field in 80 days, then in how many days will 6 oxen and 2 cows eat the same grass?
Option 1 : 40 Option 2 : 60 Option 3 : 100 **Option 4 : 160**

Ques 110 : Choose the correct answer.
At a certain party the ratio of gents and ladies was 1 : 2. But when 2 gents and 2 ladies left the party, the ratio became 1 : 3. How many people were initially present in the party?
Option 1 : 12 Option 2 : 15 Option 3 : 18 Option 4 : 24

Ques 111 : Choose the correct answer.
Prabodh bought 30 kg of rice at the rate of Rs. 8.50 per kg and 20 kg of rice at the rate of Rs. 9.00 per kg. He mixed the two. At what price (App.) per kg should he sell the mixture in order to get 20% profit?
Option 1 : Rs. 9.50 Option 2 : Rs. 8.50 **Option 3 : Rs. 10.50** Option 4 : Rs. 12.00

Ques 112 : Choose the correct answer.
The cash price of a television is Rs. 4022. A customer paid Rs. 1500 in cash and promised to pay the remaining money in 3 monthly equal instalments at the rate of 5% per annum compound interest. What is the value of each instalment?
Option 1 : Rs. 926.10 Option 2 : Rs. 903.33 Option 3 : Rs. 928.30 Option 4 : Rs. 940.50

Ques 113 : Choose the correct answer.
The population of a village decreases at the rate of 20% per annum. If its population 2 years ago was 10000, what is its present population?
Option 1 : 6000 Option 2 : 10000/144 **Option 3 : 6400** Option 4 : 7600

Ques 114 : Choose the correct answer.
A certain sum of money at simple interest becomes Rs. 1062 in 2 years and Rs. 1183.50 in 3½ years. What is rate of interest per annum?

Option 1 : 7% Option 2 : 6% **Option 3 : 9%** Option 4 : 5%

Ques 115 : Choose the correct answer.
If the simple interest on a sum at 4% per annum for 2 years is Rs. 80, then the compound interest on the same sum for the same period is:
Option 1 : Rs. 86.80 Option 2 : Rs. 86.10 Option 3 : Rs. 88.65 **Option 4 : Rs. 81.60**

Ques 116 : Choose the correct answer.
A man covers a distance of 1200 km in 70 days resting 9 hours a day, if he rests 10 hours a day and walks with speed 1½ times of the previous in how many days will he cover 750 km?
Option 1 : 30 **Option 2 : 31.25** Option 3 : 31 Option 4 : 33

Ques 117 : Choose the correct answer.
A train leaves Delhi at 6.00 a.m. and reaches Agra at 10.00 a.m. Another train leaves Agra at 8.00 a.m. and reaches Delhi at 11.30 a.m. At what time do the two trains cross each other if the distance between Delhi and Agra is 200 km?
Option 1 : 8.45 a.m. **Option 2 : 8.56 a.m.** Option 3 : 9.20 a.m. Option 4 : 9.56 a.m.

Ques 118 : Choose the correct answer.
How many litres of a 90% solution of concentrated acid needs to be mixed with a 75% solution of concentrated acid to get a 30 L solution of 78% concentrated acid?
Option 1 : 24 L Option 2 : 22.5 L **Option 3 : 6 L** Option 4 : 17.5 L

Ques 119 : Choose the correct answer.
If x is a positive number and y = x2, then which of the following is true?
Option 1 : y is always more than x Option 2 : x is always more than y Option 3 : x is always equal to y
Option 4 : None of these

Ques 120 : Choose the correct answer.
Rajiv has a number x in his mind. He finds out that the square of x is less than x. What is the range of x?
Option 1 : x is more than 0 Option 2 : x is less than 1 **Option 3 : x is more than 0, but less than 1** Option 4 : This is not possible

Ques 121 : Choose the correct answer.
What is the value of: x1.5 * x2 ?
Option 1 : x3 **Option 2 : x3.5** Option 3 : x0.75 Option 4 : None of these

Ques 122 : Choose the correct answer.
What is the value of: (33*812*20)/95 ?
Option 1 : 0 **Option 2 : 3** Option 3 : 1/3 Option 4 : None of these

Ques 123 : Choose the correct answer.
What number should be divided by (0.81)1/2 to give the result as 81?
Option 1 : 9 Option 2 : 81 **Option 3 : 72.9** Option 4 : 0.9

Ques 124 : Choose the correct answer.
If 6(x-3) = 36(x-5), then what is the value of x?
Option 1 : 2 Option 2 : No value will agree Option 3 : -1 **Option 4 : 7**

Ques 125 : Choose the correct answer.
Which is the largest among 21/2, 51/3 and 41/4 ?
Option 1 : (2)1/2 **Option 2 : 51/3** Option 3 : 41/4 Option 4 : None of these

Ques 126 : Choose the correct answer.
What is the value of 10009/1004?
Option 1 : 1005 Option 2 : 105 **Option 3 : 1019** Option 4 : None of these

Ques 127 : Choose the correct answer.
In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together ?
Option 1 : 120 **Option 2 : 720** Option 3 : 4320 Option 4 : 2160 Option 5 : None of these

Ques 128 : Choose the correct answer.
In how many different ways can the letters of the word 'CORPORATION' be arranged so that the vowels always come together ?
Option 1 : 810 Option 2 : 1440 Option 3 : 2880 **Option 4 : 50400** Option 5 : 5760

Ques 129 : Choose the correct answer.
How many 3 digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated ?
Option 1 : 5 Option 2 : 10 Option 3 : 15 **Option 4 : 20**

Ques 130 : Choose the correct answer.
A committee is to be formed comprising 7 members such that there is a simple majority of men and at least 1 women. The shortlist consists of 9 men and 6 women. In how many ways can this be done?
Option 1 : 3,724 Option 2 : 3,630 **Option 3 : 4,914** Option 4 : 5,670

Ques 131 : Choose the correct answer.
From a pack of 52 playing cards, 4 cards are removed at random. In how many ways can the 1st place and 3rd place cards be drawn out such that both are black ?
Option 1 : 64,974 Option 2 : 62,252 Option 3 : 69,447 **Option 4 : 1,592,500**

Ques 132 : Choose the correct answer.
In how many ways can the digits 2,3,5,7 and 9 be placed to form a three-digit number so that the higher order digit is always greater than the lower order digits? (Assume digits are all different).
Option 1 : 8 Option 2 : 9 **Option 3 : 10** Option 4 : 15

Ques 133 : Choose the correct answer.

In how many ways can 4 ladies and 4 men form two mixed doubles teams for a tennis match?
Option 1 : 72 Option 2 : 108 Option 3 : 36 Option 4 : 84

Ques 134 : Choose the correct answer.
In CAT entrance examination paper there are 3 sections, each containing 5 questions. A candidate has to solve 5, choosing at least one from each section. The number of ways he can choose is
Option 1 : 2,500 **Option 2 : 2,250** Option 3 : 2,750 Option 4 : 3,250

Ques 135 : Choose the correct answer.
A boy has 4 different boxes and 5 different marbles. In how many ways can he place the marbles in the boxes such that each box has at least one marble ?
Option 1 : 560 **Option 2 : 240** Option 3 : 420 Option 4 : 36

Ques 136 : Choose the correct answer.
A teacher was trying to form the groups of students in such a way that every group has equal number of students and that number should be a prime number. She tried for first 5 prime numbers, but on each occasion exactly one student was left behind. If t
Option 1 : 0 Option 2 : 2 Option 3 : 3 **Option 4 : 4**

Ques 137 : Choose the correct answer.
Ram buys 7 novels from a book fair. Shyam buys 8 novels from the fair, none of which is common with those bought by Ram. They decide to exchange their books one for one. In how many ways can they exchange their books for the first time ?
Option 1 : 7!x8! Option 2 : 7x8! Option 3 : 7!x8 **Option 4 : 56**

Ques 138 : Choose the correct answer.
In an examination 10 questions are to be answered choosing at least 4 from each of part A and part B. If there are 6 questions in part A and 7 in part B, in how many ways can 10 questions be answered ?
Option 1 : 212 **Option 2 : 266** Option 3 : 272 Option 4 : 312

Ques 139 : Choose the correct answer.
A box contains 20 tickets of identical appearance, the tickets being numbered 1, 2, 3, ..., 20. In how many ways can 3 tickets be chosen such that the numbers on the drawn tickets are in arithmetic progression ?
Option 1 : 18 Option 2 : 33 Option 3 : 56 **Option 4 : 90**

Ques 140 : Choose the correct answer.
A company could advertise about its new product in 4 magazines, 3 newspapers and 2 television channels. But in a later move it decided to give advertisements in only 2 of the magazines, one of the newspapers and one the TV channels. In how many ways can
Option 1 : 30 **Option 2 : 36** Option 3 : 44 Option 4 : None of these

Ques 141 : Choose the correct answer.

In how many ways can the letters of the word 'ERGONOMICS' be rearranged such that the vowels always appear together?
Option 1 : 6! /2! Option 2 : 6!*4! Option 3 : 7! /2! **Option 4 : (7! * 4!)/2!**

Ques 142 : Choose the correct answer.
How many different four letter words can be formed (the words need not be meaningful) using the letters of the word PACIFIC such that the first letter is P and the last letter is F?
Option 1 : 8 Option 2 : 3 Option 3 : 6 Option 4 : 7!/5!

Ques 143 : Choose the correct answer.
The value of 74P2 is
Option 1 : 2775 Option 2 : 150 **Option 3 : 5402** Option 4 : none of these

Ques 144 : Choose the correct answer.
In how many different ways can the letters of the word ' HARDWARE' be arranged in such a way that the vowels always come together.
Option 1 : 120 **Option 2 : 1080** Option 3 : 1440 Option 4 : 4320 Option 5 : 720

Ques 145 : Choose the correct answer.
In how many ways a committee, consisting of 4 men and 10 women can be formed from 6 men and 10 women?
Option 1 : 266 Option 2 : 50 **Option 3 : 15** Option 4 : 8640 Option 5 : none of these

Ques 146 : Choose the correct answer.
Out of 7 consonants and four vowels ,how many words of three consonants and 2 vowels can be formed?
Option 1 : 210 Option 2 : 1050 **Option 3 : 25200** Option 4 : 21400 Option 5 : none of these

Ques 147 : Choose the correct answer.
3 books of mathematics and 5 books of physics are placed on a shelf so that the books on the same subject always remain together .The possible arrangements are .
Option 1 : 1440 Option 2 : 1956 Option 3 : 720 Option 4 : none of these

Ques 148 : Choose the correct answer.
The number of possible selections of one or more questions from 8 given questions, each question having an alternative, is
Option 1 : 28-1 **Option 2 : 38-1** Option 3 : 48-1 Option 4 : none of these

Ques 149 : Choose the correct answer.

A five -digit number divisible by 3 is to be formed using numerals 0,1,2,3,4 and 5 without repetition. The total number of ways this can be done is

Option 1 : 216 Option 2 : 240 Option 3 : 600 Option 4 : 3125

Ques 150 : Choose the correct answer.

Let A be containing 10 distinct elements ,then the total number of distinct functions from A to A IS

Option 1 : 10! **Option 2 : 1010** Option 3 : 210 Option 4 : 210-1

Ques 151 : Choose the correct answer.

A polygon has 44 diagonals, the number of its sides is

Option 1 : 10

Option 2 : 11

Option 3 : 12

Option 4 : 22

Ques 152 : Choose the correct answer.

The number of triangles that can be formed by choosing the vertices from a set of 12 points, seven of which lie on the same straight line is

Option 1 : 105

Option 2 : 115

Option 3 : 175

Option 4 : 185

Ques 153 : Choose the correct answer.

There are 5 letters and five addressed envelopes. the number of ways in which all the letters can be put in wrong envelopes is

Option 1 : 119

Option 2 : 44

Option 3 : 59

Option 4 : 40

Ques 154 : Choose the correct answer.

The number of ways in which 8 different flowers can be strung to form a garland so that 4 particular flowers are never separated is

Option 1 : 960

Option 2 : 2880

Option 3 : 288

Option 4 : 576

Ques 155 : Choose the correct answer.

At an election there are five candidates and three members to be elected , and a voter may vote for any number of candidates not greater than the number to be elected. Then the number of ways in which a voter may vote is
Option 1 : 25
Option 2 : 30
Option 3 : 32
Option 4 : none of these

Ques 156 : Choose the correct answer.
There are n different books and p copies of each. the number of ways in which a selection can be made from them is
Option 1 : np
Option 2 : pn
Option 3 : (p+1)n -1
Option 4 : (n+1)p-1

Ques 157 : Choose the correct answer.
The sides AB, BC, CA of a triangle ABC have 3,4 and 5 interior points respectively on them. The total number of triangles that can be constructed by using these points as vertices is
Option 1 : 220
Option 2 : 204
Option 3 : 205
Option 4 : 195

Ques 158 : Choose the correct answer.
A lady gives dinner party to five guests to be selected from 9 friends .The number of ways of forming the party of 5,given that two of the friends will not attend the party together is
Option 1 : 56
Option 2 : 126
Option 3 : 91
Option 4 : none of these

Ques 159 : Choose the correct answer.
Each question has four choices out of which only one is correct. A candidate has to answer four questions. The number of ways he fails to give all answers correctly, is
Option 1 : 15
Option 2 : 81
Option 3 : 255
Option 4 : 256

Ques 160 : Choose the correct answer.
A college has 10 basketball players. A 5-member team and a captain will be selected out of these 10 players. How many different selections can be made?
Option 1 : 1260

Option 2 : 210
Option 3 : 10C6 * 6!
Option 4 : 10C5 * 6

Ques 161 : Choose the correct answer.
There are 10 yes or no questions. How many ways can these be answered?
Option 1 : 1084
Option 2 : 2048
Option 3 : 1024
Option 4 : 100

Ques 162 : Choose the correct answer.
If the letters of the word CHASM are rearranged to form 5 letter words such that none of the word repeat and the results arranged in ascending order as in a dictionary what is the rank of the word CHASM?
Option 1 : 24
Option 2 : 31
Option 3 : 32
Option 4 : 30

Ques 163 : Choose the correct answer.
A bag contains 4 white, 5 red and 6 blue balls. Three balls are drawn at random from the bag. The probability that all of them are red, is:
Option 1 : 1/22
Option 2 : 3/22
Option 3 : 2/91
Option 4 : 2/77

Ques 164 : Choose the correct answer.
A box contains 20 electric bulbs, out of which 4 are defective. Two bulbs are chosen at random from this box. The probability that at least one of these is defective, is:
Option 1 : 4/19
Option 2 : 7/19
Option 3 : 12/19
Option 4 : 21/95

Ques 165 : Choose the correct answer.
In a class, 30% of the students offered English, 20% offered Hindi and 10% offered both. If a student is selected at random, what is the probability that he has offered English or Hindi ?
Option 1 : 2/5
Option 2 : 3/4
Option 3 : 3/5
Option 4 : 3/10

Ques 166 : Choose the correct answer.

A box contains 6 red balls, 7 green balls and 5 blue balls. Each ball is of a different size. The probability that the red ball being selected is the smallest red ball, is
Option 1 : 1/18
Option 2 : 1/3
Option 3 : 1/6
Option 4 : 2/3

Ques 167 : Choose the correct answer.
If A and B are 2 independent events and P(A)=0.5 and P(B) = 0.4, find P(A/B):
Option 1 : 0.5
Option 2 : 0.4
Option 3 : 0.88
Option 4 : None of these

Ques 168 : Choose the correct answer.
A 5-digit number is formed by the digits 1,2,3,4 and 5 without repetition. What is the probability that the number formed is a multiple of 4?
Option 1 : 1/4
Option 2 : 1/5
Option 3 : 2/5
Option 4 : 1/120
Option 5 : 4

Ques 169 : Choose the correct answer.
In a single throw of dice, what is the probability to get a number greater or equal to 4?
Option 1 : 1/3
Option 2 : 2/3
Option 3 : 1/2
Option 4 : None of these

Ques 170 : Choose the correct answer.
A bag contains 5 oranges, 4 bananas and 3 apples. Rohit wants to eat a banana or an apple. He draws a fruit from the bag randomly. What is the probability that he will get a fruit of his choice?
Option 1 : 3.5/12
Option 2 : 7/12
Option 3 : 5/12
Option 4 : None of these

Ques 171 : Choose the correct answer.
There are two boxes A and B. Box A has three red and four blue balls. Box B has five red and two blue balls. Anya draws a ball from each bag randomly. What is the probability that both balls are red?
Option 1 : 4/7
Option 2 : 8/49
Option 3 : 7/8

Option 4 : 15/49

Ques 172 : Choose the correct answer.
Ravi has a bag full of 10 Nestle and 5 Cadbury chocolates. He draws two chocolates. What is the probability that he got at least one Nestle chocolate?
Option 1 : 2/3
Option 2 : 3/7
Option 3 : 2/21
Option 4 : None of these

Ques 173 : Choose the correct answer.
The probability of having at least one tail in 5 throws of a coin is
Option 1 : 1/32
Option 2 : 31/32
Option 3 : 1/5
Option 4 : None of these

Ques 174 : Choose the correct answer.
A bag contains 5 yellow and 4 brown pencils. If two pencils are drawn, what is the probability that the pencils are of the same colour?
Option 1 : 5/108
Option 2 : 1/6
Option 3 : 5/18
Option 4 : 4/9

Ques 175 : Choose the correct answer.
A single letter is drawn at random from the word, “ASPIRATION”, the probability that it is a vowel is?
Option 1 : 1/2
Option 2 : 1/3
Option 3 : 3/5
Option 4 : 2/5

Ques 176 : Choose the correct answer.
The probability that a man can hit a target is 3/4. He tries 5 times. The probability that he will hit the target at least three times is:
Option 1 : 291/364
Option 2 : 371/464
Option 3 : 471/502
Option 4 : 459/512

Ques 177 : Choose the correct answer.
An unbiased dice is rolled 3 times. The probability that the value on the dice is not more than 4 in any of the 3 rolls is:
Option 1 : 8/27

Option 2 : 1/27
Option 3 : 26/27
Option 4 : 2/3

Ques 178 : Choose the correct answer.
Probability of occurrence of event A is 0.5 and that of event B is 0.2. The probability of occurrence of both A and B is 0.1. What is the probability that none of A and B occur?
Option 1 : 0.3
Option 2 : 0.4
Option 3 : 0.7
Option 4 : None of these

Ques 179 : Choose the correct answer.
An unbiased coin is tossed 5 times. If tail appears on first four tosses, then probability of tail appearing on the fifth toss is:
Option 1 : 1/2
Option 2 : 1
Option 3 : 0
Option 4 : 4/5

Ques 180 : Choose the correct answer.
X and Y are two independent events. The probability that X and Y occur is 1/12, and the probability that neither occur is 1/2, the probability of occurrence of X can be:
Option 1 : 1/3
Option 2 : 1/5
Option 3 : 1/2
Option 4 : 1/10

Ques 181 : Choose the correct answer.
An unbiased coin is tossed n times. If the probability of getting 4 tails equals the probability of getting 7 tails, then the probability of getting two tails is:
Option 1 : 55/2048
Option 2 : 3/4096
Option 3 : 1/1024
Option 4 : None of these

Ques 182 : Choose the correct answer.
Sudhanshu and Pankaj stand in a circle with 10 other persons. If the arrangement of the person is at random, then the probability that there are exactly 3 persons between Sudhanshu and Pankaj is?
Option 1 : 9/11
Option 2 : 2/11
Option 3 : 1/11
Option 4 : None of these

Ques 183 : Choose the correct answer.
Three numbers are chosen from 1 to 30 randomly. The probability that they are not consecutive is:
Option 1 : 1/145
Option 2 : 144/145
Option 3 : 139/140
Option 4 : 1/140

Ques 184 : Choose the correct answer.
A bag is full of 20 bananas and no other fruit. Rajeev draws a fruit from the bag. What is the probability that he will draw a banana?
Option 1 : 1
Option 2 : 0
Option 3 : 1/2
Option 4 : None of these

Ques 185 : Choose the correct answer.
An unbiased dice is rolled 5 times and the outcomes are 1, 2, 3, 4 and 5 respectively. If it is rolled again, what is the probability that the outcome is 6?
Option 1 : 1
Option 2 : 5/6
Option 3 : 1/6
Option 4 : None of these

Ques 186 : Choose the correct answer.
The probability of drawing an apple from a bag of fruits is 6/25. How many apples should Ravi draw, so that there is a chance he will draw 12 apples on average?
Option 1 : 25
Option 2 : 50
Option 3 : 12
Option 4 : None of these

Ques 187 : Choose the correct answer.
What is the probability for a day to be Sunday?
Option 1 : 1/7
Option 2 : 1/5
Option 3 : 52/365
Option 4 : None of these

Ques 188 : Choose the correct answer.
Rani has a bag with three blue and three yellow coins. She takes out a coin, sees its colour and puts it back in the bag. She does this thrice. What is the probability that she saw all blue coins.
Option 1 : 1/8
Option 2 : 1/2
Option 3 : 1/3

Option 4 : None of these

Ques 189 : Choose the correct answer.
Shikhar has a bag with 2 balls, each of which can be black or white with equal probability. Now, he draws out a ball and it turns out to be black. After this event, what is the probability that both balls are black?
Option 1 : 1/2
Option 2 : 1/4
Option 3 : 1
Option 4 : None of these

Ques 190 : Choose the correct answer.
A coin is tossed thrice. What is the probability that the first toss of coin lands head, second tail and third lands tail as well?
Option 1 : 1/16
Option 2 : 3/8
Option 3 : 1/8
Option 4 : None of these

Ques 191 : Choose the correct answer.
The probability of occurrence of event A is 0.3 and that of event B is 0.4. The events are independent. What is the probability of occurrence of both A and B?
Option 1 : 0.7
Option 2 : 0.1
Option 3 : 0.12
Option 4 : Cannot be determined

Ques 192 : Choose the correct answer.
The probability of occurrence of event A is 0.1 and that of event B is 0.2. The events are mutually exclusive. What is the probability of occurrence of both A and B?
Option 1 : 0.1
Option 2 : 0
Option 3 : 1
Option 4 : Cannot be determined

Ques 193 : Choose the correct answer.
The probability of occurrence of event X is 0.8 and that of event Y is 0.05. The events are mutually exclusive. What is the probability of occurrence of either X or Y?
Option 1 : 0.85
Option 2 : 0.75
Option 3 : 0
Option 4 : Cannot be determined

Ques 194 : Choose the correct answer.

10% of the voters did not cast their vote in an election between two candidates. 10% of the votes polled were found invalid. The successful candidate got 54% of the valid votes and won by a majority of 1620 votes. The number of voters enrolled on the vo

Option 1 : 25000

Option 2 : 33000

Option 3 : 35000

Option 4 : 40000

Ques 195 : Choose the correct answer.

A, B, C started a business with their investments in the ratio 1:3:5. After 4 months, A invested the same amount as before and B as well as C withdrew half of their investments. The ratio of their profits at the end of the year is:

Option 1 : 4:3:5

Option 2 : 5:6:10

Option 3 : 6:5:10

Option 4 : 10:5:6

Ques 196 : Choose the correct answer.

Tea worth Rs. 126 per kg and Rs. 135 per kg are mixed with a third variety in the ratio 1:1:2. If the mixture is worth Rs. 153 per kg, the price of the third variety per kg will be:

Option 1 : Rs. 169.50

Option 2 : Rs. 170

Option 3 : Rs. 175.50

Option 4 : Rs. 180

Ques 197 : Choose the correct answer.

A can contains a mixture of two liquids A and B in the ratio 7:5. When 9 litres of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7:9. How many litres of liquid A was contained by the can initially ?

Option 1 : 10

Option 2 : 20

Option 3 : 21

Option 4 : 25

Ques 198 : Choose the correct answer.

A man bought a number of clips at 3 for a rupee and an equal number at 2 for a rupee. At what price per dozen should he sell them to make a profit of 20% ?

Option 1 : Rs 4

Option 2 : Rs 5

Option 3 : Rs 6

Option 4 : Rs 7

Ques 199 : Choose the correct answer.

Padam purchased 30 kg of rice at the rate of 17.50 per kg and another 30 kg rice at a certain rate. He mixed the two and sold the entire quantity at the rate of Rs. 18.60 per kg and made 20% overall profit. At what price per kg did he purchase the lot
Option 1 : Rs.12.50
Option 2 : Rs. 13.50
Option 3 : Rs. 14.50
Option 4 : Rs. 15.50
Option 5 : None of these

Ques 200 : Choose the correct answer.
The manufacturer of a certain item can sell all he can produce at the selling price of Rs. 60 each. It costs him Rs. 40 in materials and labour to produce each item and he has overhead expenses of Rs. 3000 per week in order to operate the plant. The numb
Option 1 : 200
Option 2 : 250
Option 3 : 300
Option 4 : 400

Ques 201 : Choose the correct answer.
A sells a bicycle to B at a profit of 20%. B sells it to C at a profit of 25%. If C pays Rs. 225 for it, the cost price of the bicycle for A is:
Option 1 : Rs. 110
Option 2 : Rs.120
Option 3 : Rs. 125
Option 4 : Rs. 150

Ques 202 : Choose the correct answer.
If 5% more is gained by selling an article for Rs. 350 than by selling it for Rs. 340, the cost of the article is:
Option 1 : Rs. 50
Option 2 : Rs. 160
Option 3 : Rs. 200
Option 4 : Rs. 225

Ques 203 : Choose the correct answer.
Consider the following statements : If a sum of money is lent at simple interest, then the
1. Money gets doubled in 5 years if the rate of interest is 50/3 %.
2. Money gets doubled in 5 years if the rate of interest is 20%.
3. Money becomes
Option 1 : 1 and 3 are correct
Option 2 : 2 alone is correct
Option 3 : 3 alone is correct
Option 4 : 2 and 3 are correct

Ques 204 : Choose the correct answer.

The difference between simple interest and compound interest on Rs.1200 for one year at 10% per annum reckoned half-yearly is:
Option 1 : Rs. 2.50
Option 2 : Rs. 3
Option 3 : Rs. 3.75
Option 4 : Rs. 4
Option 5 : None of these

Ques 205 : Choose the correct answer.
A sum of money lent at compound interest for 2 years at 20% per annum would fetch Rs. 482 more, if the interest was payable half-yearly than if it was payable annually. The sum is:
Option 1 : Rs. 10,000
Option 2 : Rs. 20,000
Option 3 : Rs. 40,000
Option 4 : Rs. 50,000

Ques 206 : Choose the correct answer.
The simple interest on Rs. 10 for 4 months at the rate of 3 paise per rupee per month is:
Option 1 : Rs. 1.20
Option 2 : Rs. 1.60
Option 3 : Rs. 2.40
Option 4 : Rs. 3.60

Ques 207 : Choose the correct answer.
If the compound interest on a sum for 2 years at 25/2 % per annum is Rs. 510, the simple interest on the same sum at the same rate for the same period of time is:
Option 1 : Rs. 400
Option 2 : Rs. 450
Option 3 : Rs. 460
Option 4 : Rs. 480