1 NUMBER SYSTEM

Importance : Being a basic concept of mathematics : 1 and 2 questions on number system are regularly asked in different competitive exams. Its knowledge is also essential to solve other questions.

Scope of questions : Different type of questions like based on fractions, even/odd/whole/divisible/prime/coprime/rational/irrational/numbers and related to divisibility, order, ascending, descending, addition, multiplication, inverse numbers may be asked.

Way to success : These questions are solved by different methods. Maximum practice and rechecking is the way to success for this chapter.

Natural Numbers : Set of counting numbers is callled natural numbers. It is denoted by N. where,

N = {1, 2, 3, ...∞}

Even Numbers : The set of all natural numbers which are divisible by 2 are called even numbers. It is denoted by E.

Where, E = {2, 4, 6, 8, 10, ...∞}

Odd Numbers : The set of all natural numbers which are not divisible by 2 are called odd numbers. In other words, the natural numbers which are not even numbers, are odd numbers. i.e.,

O = {1, 3, 5, 7, ...∞}

Whole Numbers : When zero is included in the set of natural numbers, then it forms set of whole numbers. It is denoted by W. where,

W = {0, 1, 2, 3, ...∞}

Integers : When in the set of whole numbers, natural numbers with negative sign are included, then it becomes set of integers. It is denoted by I or Z.

I : [– ∞, ... –4, –3, –2, –1, 0, 1, 2, 3, 4, ...∞]

Integers can further be classified into negative or positive Integers. Negative Integers are denoted by Z^- and positive Integers are denoted by Z^+.

Z^- = {– ∞, ... –3, – 2, –1} and

Z^+ = {1, 2, 3, ... ∞}

Further 0 is neither negative nor positive integer.

Prime Numbers: The natural numbers which have no factors other than 1 and itself are called prime numbers.

Note that, (i) In other words they can be divided only by themselves or 1 only. As, 2, 3, 5, 7, 11 etc.

(ii) All prime numbers other than 2 are odd numbers but all odd numbers are not prime numbers.

2 is the only one even Prime number.

Co-Prime Numbers : Two numbers which have no common factor except 1, are called Co–Prime numbers. Such as, 9 and 16, 4 and 17, 80 and 81 etc.

It is not necessary that two co–prime numbers are prime always. They may or may not be prime numbers.

Divisible numbers/composite numbers : The whole numbers which are divisible by numbers other than itself and 1 are called divisible numbers or we can say the numbers which are not prime numbers are composite or divisible numbers. As, 4, 6, 9, 15, ...

Note : 1 is neither Prime number nor composite number. Composite numbers may be even or odd.

Rational Numbers : The numbers which can be expressed in the form of $\frac{p}{q}$ where p and q are integers and coprime and $q \neq 0$ are called rational numbers. It is denoted by Q. These may be positive, or negative.

e.g. $\frac{4}{5}, \frac{5}{1}, -\frac{1}{2}$ etc are rational numbers.

Irrational Numbers : The numbers which are not rational numbers, are called irrational numbers. Such as

$\sqrt{2}$ = 1.414213562.....

π = 3.141592653 .....

Real Numbers: Set of all rational numbers as well as irrational numbers is called Real numbers. The square of all of them is positive.

Cyclic Numbers : Cyclic numbers are those numbers of n digits which when multiplied by any other number upto n gives same digits in a different order. They are in the same line. As 142857

2 × 142857 = 285714 : 3 × 142857 = 428571

4 × 142857 = 571428 : 5 × 142857 = 714285

Perfect Numbers : If the sum of all divisors of a number N (except N) is equal to the number N itself then the number is called perfect number. Such as, 6, 28, 496. 8128 etc.

The factor of 6 are 1, 2 and 3

Since, 6 : 1 + 2 + 3 = 6

28 : 1 + 2 + 4 + 7 + 14 = 28

496 : 1 + 2 + 4 + 8 + 16 + 31 + 62 + 124 + 248 = 496

8128 : 1 + 2 + 4 + 8 + 16 + 32 + 64 + 127 + 254 + 508 + 1016 + 2032 + 4064 = 8128. etc.

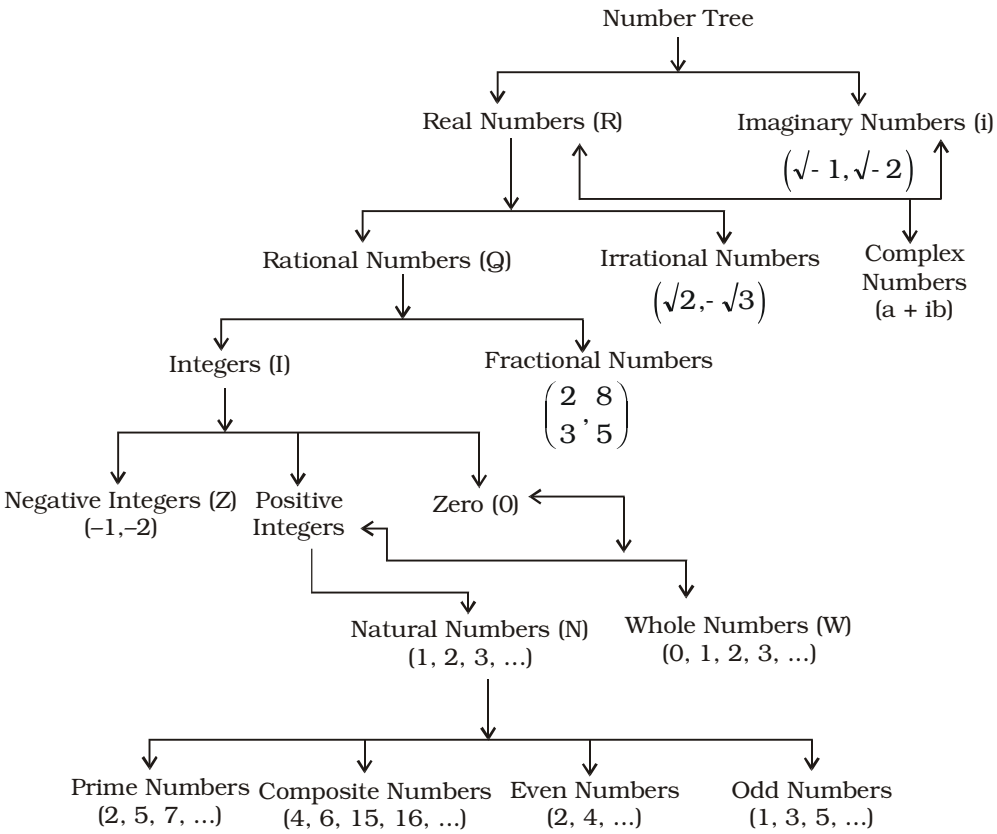
Note : In a perfect number, the sum of inverse of all of its factors including itself is 2 always.

e.g. Factors of 28 are 1,2,4,7,14 are

$$= \frac{1}{1}+\frac{1}{2}+\frac{1}{4}+\frac{1}{7}+\frac{1}{14}+\frac{1}{28}=\frac{56}{28} = 2$$

Complex Numbers : Z = a + ib is called complex number, where a and b are real numbers, $b \neq 0$ and $i = \sqrt{-1}$. Such as, $\sqrt{-2}$, $\sqrt{-3}$ etc.

So, a + ib or 4 + 5i are complex numbers.



Additive Identity : If a + 0 = a, then 0 (zero) is called additive identity.

Additive Inverse : If a + (–a) = 0, so 'a' and '–a' are called additive inverse to each other. As, 2 + (–2) = 0

Additive inverse of 2 is –2.

Multiplicative Identity : If a × 1 = a. then 1 is called multiplicative identity. e.g. 3 × 1 = 3 etc.

Multiplicative Inverse : If a × b = 1. then we can say that a and b are multiplicative invverse of each other. As

$$2 \times \frac{1}{2} = 1$$

So, multiplicative inverse of 2 is $\frac{1}{2}$

SOME IMPORTANT POINTS ON NUMBERS

(a) 2 is the only even prime number.

(b) Number 1 is neither divisible nor prime.

(c) Two consecutive odd prime numbers are called prime pair.

(d) All natural numbers are whole, rational, integer and real.

(e) All whole numbers are rational Integer and real.

(f) All whole numbers are rational and real.

(g) All whole numbers, rational and irrational numbers are real.

(h) Whole numbers and natural numbers can never be negative.

(i) Natural (including Prime, Composite, even or odd) numbers and whole numbers are never negative.

(j) Fractions are rational.

(k) All prime numbers except 2 are odd.

(l) 0 is neither negative nor positive number.

(m) If a is any number then, if a divides zero, result will be zero. If 0 divides a, then result will be infinite or not defined or undetermined i.e.

$$\frac{0}{a} = 0 \text{ but } \frac{a}{0} = \infty \text{ (infinite)}$$

where a is real number.

(n) Dividing 0 by any number gives zero e.g. $\frac{0}{a} = 0$

(o) The place or position of a digit in a number is called its place value such as
Place value of 2 in 5283 is 200.

(p) The real value of any digit in a certain number is called its face value. As, face value of 2 in 5283 is 2.

(q) The sum and the product of two rational numbers is always a rational number.

(r) The product or the sum of a rational number and irrational number is always an irrational number.

(s) π is an irrational number.

(t) There can be infinite number of rational or irrational numbers between two rational numbers or two irrational numbers.

(u) Decimal indication of an irrational number is infinite coming. as $-\sqrt{3}, \sqrt{2}$

(v) The square of an even number is even and the square of an odd number is odd.

DECIMAL

(w) The decimal representation of a rational number is either finite or infinite recurring e.g. = $\frac{3}{4}$ = 0.75 (finite), $\frac{11}{3}$ = 3.666 ..... (infinite recurring)

(x) If decimal number 0, x and 0. xy are given, then they can be expressed in the form of $\frac{p}{q}$

As, $0.x = \frac{x}{10}$ and $0.xy = \frac{xy}{100}$

(y) If decimal recurring numbers $0.\bar{x}$ and $0.\overline{xy}$ are given, then they can be expressed in the form of $\frac{p}{q}$ As $0.\bar{x} = \frac{x}{9}$ and $0.\overline{xy} = \frac{xy}{99}$

(z) The recurring decimal numbers of type $0.\bar{x}$ or $0.x\overline{yz}$ may be converted to rational form as $\frac{p}{q}$ follows.

$0.x\overline{y} = \frac{xy - x}{90}$ and $0.x\overline{yz} = \frac{xyz - x}{990}$

DIVISIBILITY

Importance : Divisibility questions, if not asked directly, still its knowledge is very essential to solve different questions in simplications.

Scope of questions : The study of this concept is very useful to increase speed in simplication and number system.

Way to success : The knowledge of divisibility rules (of ,2, 3, 4, 5, 6, 8, 9) and of osculaters for 7, 11, 13 etc & mental calculations increase our (speed) time management and accuracy.

Basic Formulae of Divisibility from 2 to 19:

1. Divisibility by 2 : If the last digit of a number is 0 or an even number then that number is diviisible by 2. Such as, 242, 540 etc.

2. Divisibility by 3 : If the sum of all digits of a number is divisible by 3, then that number will be divisible by 3. Such as.

432 : 4 + 3 + 2 = 9 which is divisible by 3.

So, 432 is divisible by 3.

3. Divisibility by 4 : If in any number last two digits are divisible by 4, then whole number will be divisible by 4. Such as,

48424. In this number 24 is divisible by 4. So, 48424 will be divisible by 4.

4. Divisibility by 5 : If last digit of a number is 5 or 0, then that number is divisible by 5. Such as 200, 225 etc.

5. Divisibility by 6 : If a number is divisible by both 2 and 3, then that number is divisible by 6 also, such as 216, 25614 etc.

6. Divisibility by 7 : Here concept of osculator should be applied. The meaning of negative osculator is – there increases or decreases 1 from the factor of 10 of the number. As, 21 : 2 × 10 + 1 = 21

49 : 5 × 10 – 1 = 50 – 1 = 49

To check the divisibility of 7, we use osculator '2', as , 112 : 11 – 2 × 2 = 7 which is divisible by 7

Again,

343 : 34 – 2 × 3 = 28 which is divisible by 7. Then 343 will be divisible by 7.

7. Divisibility by 8 : If in any number last three digits are divisible by 8, then whole number is divisible by 8, such as,

247864 since 864 is divisible by 8.

So, 247864 is divisible by 8.

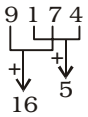
Similarly, 289000 is divisible by 8.

8. Divisibility by 9 : If the sum of all digits of a number is divisible by 9, then that whole number will be divisible by 9. As, 243243 : 2 + 4 + 3 + 2 + 4 + 3 = 18 is divisible by 9.

So, 243243 is divisible by 9.

9. Divisibility by 10 : The number whose last digit is '0', is divisible by 10, such as, 10, 20, 200, 300 etc.

10. Divisibility by 11 : If the difference between "Sum of digits at even place" and "Sum of digits at odd place" is divisible by 11, then the whole number is divisible by 11 such as,



∴ (9 + 7) – (4 + 1) = 16 – 5 = 11 is divisible by 11.

So, 9174 will be divisible by 11.

11. Divisibility by 12 : If a number is divisible by 3 and 4 both. Then the number is divisible by 12. Such as, 19044 etc.

12. Divisibility by 13 : For 13 we use osculator 4, but our osculator is not negative here. It is one-more osculator (4).

143 : 14 + 3 × 4 = 26

and 26 is divisible by 13, So, 143 is divisible by 13.

Similarly for 325 : 32 + 5 × 4 = 52

52 is divisible by 13

Hence, 325 will also be divisible by 13.

13. Divisibility by 14 : If a number is divisible by 2 and 7 both then that number is divisible by 14 i.e. number is even and osculator 2 is applicable.

14. Divisibility by 15 : If a number is divisible by 3 and 5 both, then that number is divisible by 15.

15. Divisibility by 16 : If last 4 digits of a number are divisible by 16, then whole number is divisible by 16. Such as 34**1920**.

16. Divisibility by 17 : For 17, there is a negative 'osculator 5'. This process is same as the process of 7. As.

1904 : 190 – 5 × 4 = 170.

∵ 170 is divisible by 17. So 1904 will be divisible by 17.

17. Divisibility by 18 : If a number is divisible by 2 and 9 both, then that number is divisible by 18.

18. Divisibility by 19 : For 19, there is one–more (positive) osculator 2, which is same processed as 13. As,

361 = 36 + 1 × 2 = 38

∵ 38 is divisible by 19. So 361 is also divisible by 19.

Few more Important Points:

1. Out of a group of n consecutive integers one and only one number is divisible by n.

2. The product of n consecutive numbers is always divisible by n! or = $\lfloor \underline{n}$.

3. For any number n, (n^p–h) is always divisible by P where P is a prime number, for e.g.,

if n = 2 and P = 5 then,

(2^5 – 2) = (32 – 2) = 30 which is divisible by 5.

4. The square of an odd number when divided by 8 always leaves a remainder 1, as

If we divide $7^2 = 49$ or $5^2 = 25$ by 8 then remainder will be 1.

5. For any natural number n, n^5 or n^{4k+1} is having same unit digit as n has, where k is a whole number, such as,

3^5 = 243 has 3 at its unit place.

6. Square of any natural number can be written in the form of 3n or 3n + 1 or 4n or (4n + 1).

e.g. square of 11 = 121 = 3 × 40 + 1

or 4 × 30 + 1

If $N = a^p b^q c^r$ ..... where a, b and c are prime numbers and p, q and r are natural numbers, then

1. Number of factors of N is given by

F = (p + 1)(q + 1)(r + 1) .....

2. Number of ways to express the number as a product of two factors are $\frac{F}{2}$ F is even or $\frac{F+1}{2}$ if F is odd respectively.

3. Sum of all the factors of the number N.

$$S(F) = \frac{\left(a^{p+1}-1\right)}{(a-1)} \times \frac{\left(b^{q+1}-1\right)}{(b-1)} \times \frac{\left(c^{r+1}-1\right)}{(c-1)}$$

4. The number of ways in which a number N can be resolved into co–prime factors is 2^{k-1}, where k is the number of different Prime factors of the number N.

5. The number of co–primes to number N is given by

$$C(N) = n\left(1-\frac{1}{a}\right)\left(1-\frac{1}{b}\right)\left(1-\frac{1}{c}\right)$$

Special Rules :

Rule 1 : If the sum of digits of two digit number is 'a' and if the digits or the number are reversed, such that number reduces by 'b', then

$$\text{Original Number} = \frac{11a+b}{2}$$

For example : (For number 82) a = 8 + 2 = 10

and b = 82 – 28 = 54 is given then

$$\text{original number} = \frac{11\times10+54}{2} = \frac{164}{2} = 82$$

Rule 2 : If the sum of digits of two digit number is 'a' and if the digits of the number are reveresed, such that number increases by 'b', then,

$$\text{Original Number} = \frac{11a-b}{2}$$

e.g. (For number 47): a = 4 + 7 = 11

& b = 74 – 47 = 27 thus the

$$\text{original number} = \frac{11\times11-27}{2} = 47$$

Rule 3 : If the difference between a number and formed by number reversing digit is *x*, then the difference between both the digits of the number is $\frac{x}{9}$

eg. (for 63) *x* = 63 – 36 = 27

$$\Rightarrow \text{Required difference} = \frac{27}{9} = 3$$

Rule 4 : If the sum of a number and the number formed by reversing the digits is x, then the sum of digits of the number is $\frac{x}{11}$.

e.g. (For number 76) = *x* = 67 + 76 = 143 Required sum of numbers = 67 + 76 = 143

$$\text{Required sum} = \frac{143}{11} = 13$$

Dividend = (Divisor × Quotient) + Remainder

$$\text{Divisor} = \frac{\text{Dividend} - \text{Remainder}}{\text{Quotient}}$$

$$\text{Quotient} = \frac{\text{Dividend} - \text{Remainder}}{\text{Divisor}}$$

Remainder = Dividend – (Divisor × Quotient)

Special Rule for Remainder Calculation:

Rule 5 : If $\frac{a^n}{a-1}$ then remainder will always be 1, whether n is even or odd.

Rule 6 : If $\frac{a^{(\text{even number})}}{(a+1)}$, then remainder will be 1.

Rule 7 : If $\frac{a^{(\text{odd number})}}{(a+1)}$, then remainder will be a.

Rule 8 : If n is a single digit number, then in n^3, n will be at unit place. It is valid for the number 0, 1, 4, 5, 6 or 9 As, digit at unit place in (4^3) is 4.

Rule 9 : If n is a single digit number then in n^p, where p is any number (+ve), n will be at unit place. It is valid for 5 and 6.

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QUESTIONS ASKED IN PREVIOUS SSC EXAMS

TYPE–I

1. Which of the following fraction is the smallest?

$\frac{7}{6}, \frac{7}{9}, \frac{4}{5}, \frac{5}{7}$

(1) $\frac{7}{6}$ (2) $\frac{7}{9}$

(3) $\frac{4}{5}$ (4) $\frac{5}{7}$

(SSC CGL Exam. 04.07.1999 (Ist Sitting)

2. Which of the following fraction is the smallest ?

$\frac{9}{13}, \frac{17}{26}, \frac{28}{29}, \frac{33}{52}$

(1) $\frac{33}{52}$ (2) $\frac{17}{26}$

(3) $\frac{9}{13}$ (4) $\frac{28}{29}$

(SSC CGL Exam. 04.07.1999 (IInd Sitting)

3. The smallest possible three-place decimal number is :

(1) 0.012 (2) 0.123

(3) 0.111

(4) None of the above

(SSC CGL Exam. 27.02.2000 (IInd Sitting)

4. Which of the following fraction is the smallest?

$\frac{8}{15}, \frac{14}{33}, \frac{7}{13}, \frac{11}{13}$

(1) $\frac{8}{15}$ (2) $\frac{7}{13}$

(3) $\frac{11}{13}$ (4) $\frac{14}{33}$

(SSC CGL Exam. 24.02.2002 (Ist Sitting)

5. Which of the following is the smallest fraction ?

$\frac{8}{25}, \frac{7}{23}, \frac{11}{23}, \frac{14}{53}$

(1) $\frac{8}{25}$ (2) $\frac{7}{23}$

(3) $\frac{11}{23}$ (4) $\frac{14}{53}$

(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

6. Which of the following is the largest fraction ? $\frac{6}{7}, \frac{5}{6}, \frac{7}{8}, \frac{4}{5}$

(1) $\frac{6}{7}$ (2) $\frac{4}{5}$

(3) $\frac{5}{6}$ (4) $\frac{7}{8}$

(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

7. The smallest number of five digits exactly divisible by 476 is

(1) 47600 (2) 10000

(3) 10476 (4) 10472

(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

8. The least among the fractions $\frac{15}{16}, \frac{19}{20}, \frac{24}{25}, \frac{34}{35}$ is

(1) $\frac{34}{35}$ (2) $\frac{15}{16}$

(3) $\frac{19}{20}$ (4) $\frac{24}{25}$

(SSC CGL Tier-I Exam. 16.05.2010 (Second Sitting)

9. The greatest fraction among $\frac{2}{3}, \frac{5}{6}, \frac{11}{15}$ and $\frac{7}{8}$ is

(1) $\frac{7}{8}$ (2) $\frac{11}{15}$

(3) $\frac{5}{6}$ (4) $\frac{2}{3}$

(SSC CISF ASI Exam. 29.08.2010 (Paper-1)

10. The least number among

$\frac{4}{9}, \sqrt{\frac{9}{49}}, 0.\dot{4}\dot{5}$ and $(0.8)^2$ is

(1) $\frac{4}{9}$ (2) $\sqrt{\frac{9}{49}}$

(3) $0.\dot{4}\dot{5}$ (4) $(0.8)^2$

(SSC CPO S.I. Exam. 06.09.2009)

11. Which of the following number is the greatest of all ?

$0.9, 0.\overline{9}, 0.0\overline{9}, 0.\overline{09}$

(1) 0.9 (2) $0.\overline{9}$

(3) $0.0\overline{9}$ (4) $0.\overline{09}$

(SSC CHSL DEO & LDC Exam. 28.11.2010 (Ist Sitting)

12. The greatest value among the fractions $\frac{2}{7}, \frac{1}{3}, \frac{5}{6}, \frac{3}{4}$ is :

(1) $\frac{3}{4}$ (2) $\frac{5}{6}$

(3) $\frac{1}{3}$ (4) $\frac{2}{7}$

(SSC CHSL DEO & LDC Exam. 21.10.2012 (IInd Sitting)

13. The least number of five digits which has 123 as a factor is

(1) 10037 (2) 10086

(3) 10081 (4) 10063

(SSC Delhi Police SI Exam. 19.08.2012)

14. The largest among the numbers $(0.1)^2$, $\sqrt{0.0121}$, 0.12 and $\sqrt{0.0004}$ is

(1) $(0.1)^2$ (2) $\sqrt{0.0121}$

(3) 0.12 (4) $\sqrt{0.0004}$

(SSC CHSL DEO & LDC Exam. 28.10.2012, Ist Sitting)

15. The greatest among the following numbers $(3)^{\frac{1}{3}}, (2)^{\frac{1}{2}}, 1, (6)^{\frac{1}{6}}$ is :

(1) $(2)^{\frac{1}{2}}$ (2) 1

(3) $(6)^{\frac{1}{6}}$ (4) $(3)^{\frac{1}{3}}$

(SSC CAPFs SI & CISF ASI Exam. 23.06.2013)

16. When 335 is added to 5A7, the result is 8B2. 8B2 is divisible by 3. What is the largest possible value of A ?

(1) 8 (2) 2

(3) 1 (4) 4

(SSC CGL Tier-II Exam. 29.09.2013

17. If a number is as much greater than 31 as it is less than 75, then the number is

(1) 106 (2) 44

(3) 74 (4) 53

(SSC CHSL DEO & LDC Exam. 20.10.2013)

18. The greatest number among 0.7 + $\sqrt{0.16}$, $1.02 - \frac{0.6}{24}$, 1.2×0.83 and $\sqrt{1.44}$ is :

(1) $0.7 + \sqrt{0.16}$ (2) $\sqrt{1.44}$

(3) 1.2×0.83 (4) $1.02 - \frac{0.6}{24}$

(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

19. Which is the largest of the following fractions ?

$\frac{2}{3}, \frac{3}{5}, \frac{8}{11}, \frac{11}{17}$

(1) $\frac{8}{11}$ (2) $\frac{3}{5}$

(3) $\frac{11}{17}$ (4) $\frac{2}{3}$

(SSC CGL Tier-I Re-Exam. (2013) 27.04.2014

20. Sum of three fractions is $2\frac{11}{24}$. On dividing the largest fraction by the smallest fraction, $\frac{7}{6}$ is obtained which is $\frac{1}{3}$ greater than the middle fraction. The smallest fraction is

(1) $\frac{5}{8}$ (2) $\frac{3}{4}$

(3) $\frac{5}{6}$ (4) $\frac{3}{7}$

(SSC CGL Tier-II Exam, 2014 12.04.2015 (Kolkata Region) (TF No. 789 TH 7)

21. Arrangement of the fractions $\frac{4}{3}$, $-\frac{2}{9}$, $-\frac{7}{8}$, $\frac{5}{12}$ into ascending order is

(1) $-\frac{7}{8}, -\frac{2}{9}, \frac{5}{12}, \frac{4}{3}$

(2) $-\frac{7}{8}, -\frac{2}{9}, \frac{4}{3}, \frac{5}{12}$

(3) $-\frac{2}{9}, -\frac{7}{8}, \frac{5}{12}, \frac{4}{3}$

(4) $-\frac{2}{9}, -\frac{7}{8}, \frac{4}{3}, \frac{5}{12}$

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 20.12.2015 (Ist Sitting) TF No. 9692918)

22. Which of the following is correct ?

(1) $\frac{2}{3} < \frac{3}{5} < \frac{11}{15}$

(2) $\frac{3}{5} < \frac{2}{3} < \frac{11}{15}$

(3) $\frac{11}{15} < \frac{3}{5} < \frac{2}{3}$

(4) $\frac{3}{5} < \frac{11}{15} < \frac{2}{3}$

(SSC CGL Tier-II Online Exam.01.12.2016)

TYPE–II

1. A number when divided by 899 gives a remainder 63. If the same number is divided by 29, the remainder will be :

(1) 10 (2) 5

(3) 4 (4) 2

(SSC CGL Exam. 04.07.1999 (IInd Sitting) & SSC CGL Exam. 27.07.2008 (IInd Sitting)

2. $\frac{1}{0.04}$ is equal to :

(1) $\frac{1}{40}$ (2) $\frac{2}{5}$

(3) $\frac{5}{2}$ (4) 25

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

3. A six digit number is formed by repeating a three digit number; for example, 256, 256 or 678, 678 etc. Any number of this form is always exactly divisible by :

(1) 7 only (2) 11 only

(3) 13 only (4) 1001

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

4. The smallest number to be added to 1000, so that 45 divides the sum exactly, is :

(1) 35 (2) 80

(3) 20 (4) 10

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

5. Which of the following numbers will always divide a six-digit number of the form $xyxyxy$ (where $1 \le x \le 9$, $1 \le y \le 9$)?

(1) 1010 (2) 10101

(3) 11011 (4) 11010

(SSC CHSL DEO & LDC Exam. 04.12.2011(IInd Sitting (East Zone)

6. The divisor is 25 times the quotient and 5 times the remainder. If the quotient is 16, the dividend is :

(1) 6400 (2) 6480

(3) 400 (4) 480

(SSC CGL Exam. 24.02.2002 (Ist Sitting) & SSC CGL Prel. Exam. 13.11.2005 (IInd Sitting)

7. The product of two positive numbers is 11520 and their quotient is $\frac{9}{5}$. Find the difference of two numbers.

(1) 60 (2) 64

(3) 74 (4) 70

(SSC CGL Exam. 24.02.2002 (IInd Sitting)

8. When a number is divided by 56, the remainder obtained is 29. What will be the remainder when the number is divided by 8 ?

(1) 4 (2) 5

(3) 3 (4) 7

(SSC CGL Exam. 24.02.2002 (IInd Sitting) & SSC CGL Exam. 04.02.2007 (Ist Sitting)

9. A student was asked to multiply a number by $\frac{3}{2}$ but he divided that number by $\frac{3}{2}$. His result was 10 less than the correct answer. The number was :

(1) 10 (2) 12

(3) 15 (4) 20

(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

10. A number being divided by 52 gives remainder 45. If the number is divided by 13, the remainder will be

(1) 5 (2) 6

(3) 12 (4) 7

(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

11. If $\frac{3}{4}$ of the difference of $2\frac{1}{4}$ and $1\frac{2}{3}$ is subtracted from $\frac{2}{3}$ of $3\frac{1}{4}$ the result is

(1) $\frac{-48}{83}$ (2) $\frac{48}{83}$

(3) $\frac{-83}{48}$ (4) $\frac{83}{48}$

(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

12. A number when divided by 296 gives a remainder 75. When the same number is divided by 37, the remainder will be

(1) 1 (2) 2

(3) 8 (4) 11

(SSC CPO S.I. Exam. 12.01.2003)

13. A number when divided successively by 4 and 5 leaves remainder 1 and 4 respectively. When it is successively divided by 5 and 4 the respective remainders will be

(1) 4, 1 (2) 3, 2

(3) 2, 3 (4) 1, 2

(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

14. In a division problem, the divisor is 4 times the quotient and 3 times the remainder. If remainder is 4, the dividend is

(1) 36 (2) 40

(3) 12 (4) 30

(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

15. Each member of a picnic party contributed twice as many rupees as the total number of members and the total collection was ₹ 3042. The number of members present in the party was

(1) 2 (2) 32

(3) 40 (4) 39

(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

16. How many natural numbers divisible by 7 are there between 3 and 200 ?

(1) 27 (2) 28

(3) 29 (4) 36

(SSC CPO S.I. Exam. 07.09.2003)

17. The sum of first sixty numbers from one to sixty is divisible by

(1) 13 (2) 59

(3) 60 (4) 61

(SSC CPO S.I. Exam. 07.09.2003)

18. A number when divided by 3 leaves a remainder 1. When the quotient is divided by 2, it leaves a remainder 1. What will be the remainder when the number is divided by 6?

(1) 3 (2) 4

(3) 5 (4) 2

(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

19. The product of two numbers is 9375 and the quotient, when the larger one is divided by the smaller, is 15. The sum of the numbers is :

(1) 395 (2) 380

(3) 400 (4) 425

(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

20. A number, when divided by 119, leaves a remainder of 19. If it is divided by 17, it will leave a remainder of :

(1) 19 (2) 10

(3) 7 (4) 2

(SSC CPO S.I. Exam. 26.05.2005) & SSC CGL Prelim Exam. 27.07.2008)

21. $(7^{19} + 2)$ is divided by 6, the remainder is :

(1) 5 (2) 3

(3) 2 (4) 1

(SSC CPO S.I. Exam. 26.05.2005)

22. When a number is divided by 357 the remainder is 39. If that number is divided by 17, the remainder will be :

(1) 0 (2) 3

(3) 5 (4) 11

(SSC Section Officer (Commercial Audit) Exam. 25.09.2005)

23. A number divided by 68 gives the quotient 269 and remainder zero. If the same number is divided by 67, the remainder is :

(1) 0 (2) 1

(3) 2 (4) 3

(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

24. A number when divided by 6 leaves remainder 3. When the square of the same number is divided by 6, the remainder is :

(1) 0 (2) 1

(3) 2 (4) 3

(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

25. When a number is divided by 893, the remainder is 193. What will be the remainder when it is divided by 47 ?

(1) 3 (2) 5

(3) 25 (4) 33

(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

26. A number divided by 13 leaves a remainder 1 and if the quotient, thus obtained, is divided by 5, we get a remainder of 3. What will be the remainder if the number is divided by 65 ?

(1) 28 (2) 16

(3) 18 (4) 40

(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting)

27. Which of the following number is NOT divisible by 18 ?

(1) 54036 (2) 50436

(3) 34056 (4) 65043

(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting)

28. 64329 is divided by a certain number. While dividing, the numbers, 175, 114 and 213 appear as three successive remainders. The divisor is

(1) 184 (2) 224

(3) 234 (4) 296

(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

29. In a question on division, the divisor is 7 times the quotient and 3 times the remainder. If the remainder is 28, then the dividend is

(1) 588 (2) 784

(3) 823 (4) 1036

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

30. If two numbers are each divided by the same divisor, the remainders are respectively 3 and 4. If the sum of the two numbers be divided by the same divisor, the remainder is 2. The divisor is

(1) 9 (2) 7

(3) 5 (4) 3

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

31. A number consists of two digits. If the number formed by interchanging the digits is added to the original number, the resulting number (i.e. the sum) must be divisible by
(1) 11 (2) 9
(3) 5 (4) 3
(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

32. A number when divided by 5 leaves a remainder 3. What is the remainder when the square of the same number is divided by 5 ?
(1) 1 (2) 2
(3) 3 (4) 4
(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

33. A number when divided by 192 gives a remainder of 54. What remainder would be obtained on dividing the same number by 16 ?
(1) 2 (2) 4
(3) 6 (4) 8
(SSC CPO S.I. Exam. 06.09.2009)

34. A number, when divided by 136, leaves remainder 36. If the same number is divided by 17, the remainder will be
(1) 9 (2) 7
(3) 3 (4) 2
(SSC CGL Tier-I Exam. 16.05.2010 (Second Sitting)

35. Two numbers, when divided by 17, leave remainders 13 and 11 respectively. If the sum of those two numbers is divided by 17, the remainder will be
(1) 13 (2) 11
(3) 7 (4) 4
(SSC CISF ASI Exam 29.08.2010 (Paper-1)

36. A number, when divided by 221, leaves a remainder 64. What is the remainder if the same number is divided by 13 ?
(1) 0 (2) 1
(3) 11 (4) 12
(SSC CPO S.I. Exam 12.12.2010 (Paper-I)

37. When 'n' is divisible by 5 the remainder is 2. What is the remainder when n^2 is divided by 5 ?
(1) 2 (2) 3
(3) 1 (4) 4
(SSC CGL Tier-1 Exam 19.06.2011 (Second Sitting)

38. The remainder when 3^{21} is divided by 5 is
(1) 1 (2) 2
(3) 3 (4) 4
(SSC CGL Tier-1 Exam 26.06.2011 (First Sitting)

39. A number when divided by 49 leaves 32 as remainder. This number when divided by 7 will have the remainder as
(1) 4 (2) 3
(3) 2 (4) 5
(SSC CGL Tier-1 Exam 26.06.2011 (First Sitting)

40. When a number is divided by 36, the remainder is 19. What will be the remainder when the number is divided by 12 ?
(1) 7 (2) 5
(3) 3 (4) 0
(SSC CPO (SI, ASI & Intelligence Officer) Exam 28.08.2011 (Paper-I)

41. $9^6 - 11$ when divided by 8 would leave a remainder of :
(1) 0 (2) 1
(3) 2 (4) 3
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

42. If 17^{200} is divided by 18, the remainder is—
(1) 17 (2) 16
(3) 1 (4) 2
(SSC CGL Prelim Exam. 27.02.2000 (First Sitting)

43. When 2^{31} is divided by 5 the remainder is
(1) 4 (2) 3
(3) 2 (4) 1
(SSC CGL Tier-1 Exam 19.06.2011 (First Sitting)

44. A student was asked to divide a number by 6 and add 12 to the quotient. He, however, first added 12 to the number and then divided it by 6, getting 112 as the answer. The correct answer should have been
(1) 124 (2) 122
(3) 118 (4) 114
(SSC CGL Tier-1 Exam. 19.06.2011 (Second Sitting)

45. When a number is divided by 387, the remainder obtained is 48. If the same number is divided by 43, then the remainder obtained will be–
(1) 0 (2) 3
(3) 5 (4) 35
(SSC CHSL DEO & LDC Exam. 28.11.2010 (Ist Sitting)

46. When two numbers are separately divided by 33, the remainders are 21 and 28 respectively. If the sum of the two numbers is divided by 33, the remainder will be
(1) 10 (2) 12
(3) 14 (4) 16
(SSC CHSL DEO & LDC Exam. 28.11.2010 (IInd Sitting)

47. In a division sum, the divisor is 10 times the quotient and 5 times the remainder. If the remainder is 46, then the dividend is
(1) 4236 (2) 4306
(3) 4336 (4) 5336
(SSC Multi-Tasking (Non-Technical) Staff Exam. 20.02.2011)

48. When a number is divided by 24, the remainder is 16. The remainder when the same number is divided by 12 is
(1) 3 (2) 4
(3) 6 (4) 8
(SSC Multi-Tasking (Non-Technical) Staff Exam. 27.02.2011)

49. The expression $2^{6n} - 4^{2n}$, where n is a natural number is always divisible by
(1) 15 (2) 18
(3) 36 (4) 48
(SSC CHSL DEO & LDC Exam. 04.12.2011 (Ist Sitting (North Zone)

50. $(4^{61} + 4^{62} + 4^{63})$ is divisible by
(1) 3 (2) 11
(3) 13 (4) 17
(SSC CHSL DEO & LDC Exam. 04.12.2011 (IInd Sitting (North Zone)

51. 47 is added to the product of 71 and an unknown number. The new number is divisible by 7 giving the quotient 98. The unknown number is a multiple of
(1) 2 (2) 5
(3) 7 (4) 3
(SSC CHSL DEO & LDC Exam. 04.12.2011 (Ist Sitting (East Zone)

52. When an integer K is divided by 3, the remainder is 1, and when K + 1 is divided by 5, the remainder is 0. Of the following, a possible value of K is
(1) 62 (2) 63
(3) 64 (4) 65
(SSC CHSL DEO & LDC Exam. 11.12.2011 (Ist Sitting (Delhi Zone)

53. A number when divided by 91 gives a remainder 17. When the same number is divided by 13, the remainder will be :
(1) 0 (2) 4
(3) 6 (4) 3
(SSC CHSL DEO & LDC Exam. 11.12.2011 (IInd Sitting (Delhi Zone)

54. If the sum of the two numbers is 120 and their quotient is 5, then the difference of the two numbers is–
(1) 115 (2) 100
(3) 80 (4) 72
(SSC CHSL DEO & LDC Exam. 11.12.2011 (IInd Sitting (Delhi Zone)

55. A number when divided by 280 leaves 115 as remainder. When the same number is divided by 35, the remainder is
(1) 15 (2) 10
(3) 20 (4) 17
(SSC CHSL DEO & LDC Exam. 11.12.2011 (Ist Sitting (East Zone)

56. A certain number when divided by 175 leaves a remainder 132. When the same number is divided by 25, the remainder is :
(1) 6 (2) 7
(3) 8 (4) 9
(SSC CHSL DEO & LDC Exam. 11.12.2011 (IInd Sitting (East Zone)

57. The number of integers in between 100 and 600, which are divisible by 4 and 6 both, is
(1) 40 (2) 42
(3) 41 (4) 50
(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (IInd Sitting)

58. The value of λ for which the expression $x^3 + x^2 - 5x + \lambda$ will be divisible by $(x - 2)$ is :
(1) 2 (2) –2
(3) –3 (4) 4
(SSC CHSL DEO & LDC Exam. 21.10.2012, IInd Sitting)

59. If the number formed by the last two digits of a three digit integer is an integral multiple of 6, the original integer itself will always be divisible by
(1) 6 (2) 3
(3) 2 (4) 12
(SSC Multi-Tasking Staff Exam. 17.03.2013, Kolkata Region)

60. Divide 37 into two parts so that 5 times one part and 11 times the other are together 227.
(1) 15, 22 (2) 20, 17
(3) 25, 12 (4) 30, 7
(SSC Multi-Tasking Staff Exam. 24.03.2013, Ist Sitting)

61. The greatest common divisor of $3^{3^{333}} + 1$ and $3^{3^{334}} + 1$ is :
(1) 2 (2) 1
(3) $3^{3^{333}} + 1$ (4) 20
(SSC CGL Tier-I Exam. 21.04.2013)

62. How many numbers between 400 and 800 are divisible by 4, 5 and 6 ?
(1) 7 (2) 8
(3) 9 (4) 10
(SSC Constable (GD) Exam. 12.05.2013 Ist Sitting)

63. A positive integer when divided by 425 gives a remainder 45. When the same number is divided by 17, the remainder will be
(1) 11 (2) 8
(3) 9 (4) 10
(SSC CGL Tier-I Exam. 19.05.2013 Ist Sitting)

64. A number x when divided by 289 leaves 18 as the remainder. The same number when divided by 17 leaves y as a remainder. The value of y is
(1) 5 (2) 2
(3) 3 (4) 1
(SSC CGL Tier-I Exam. 19.05.2013 Ist Sitting)

65. When n is divided by 6, the remainder is 4. When $2n$ is divided by 6, the remainder is
(1) 2 (2) 0
(3) 4 (4) 1
(SSC CHSL DEO & LDC Exam. 10.11.2013, Ist Sitting)

66. Two numbers 11284 and 7655, when divided by a certain number of three digits, leaves the same remainder. The sum of digits of such a three-digit number is
(1) 8 (2) 9
(3) 10 (4) 11
(SSC CHSL DEO & LDC Exam. 10.11.2013, Ist Sitting)

67. In a division sum, the divisor is 3 times the quotient and 6 times the remainder. If the remainder is 2, then the dividend is
(1) 50 (2) 48
(3) 36 (4) 28
(SSC CHSL DEO & LDC Exam. 10.11.2013, IInd Sitting)

68. $2^{16} - 1$ is divisible by
(1) 11 (2) 13
(3) 17 (4) 19
(SSC CGL Tier-1 Exam 26.06.2011 (Second Sitting)

69. The smallest number that must be added to 803642 in order to obtain a multiple of 11 is
(1) 1 (2) 4
(3) 7 (4) 9
(SSC CPO S.I. Exam. 12.01.2003)

70. Which one of the following will completely divide $5^{71} + 5^{72} + 5^{73}$?
(1) 150 (2) 160
(3) 155 (4) 30
(SSC CGL Tier-1 Exam 19.06.2011 (Second Sitting)

71. If $[n]$ denotes the greatest integer $< n$ and (n) denotes the smallest integer $> n$, where n is any real number, then $\left(1\frac{1}{5}\right) \times \left[1\frac{1}{5}\right] - \left(1\frac{1}{5}\right) \div \left[1\frac{1}{5}\right] + (1.5)$ is
(1) 1.5 (2) 2
(3) 2.5 (4) 3.5
(SSC Delhi Police S.I. (SI) Exam. 19.08.2012)

72. The number which is to be added to 0.01 to get 1.1, is
(1) 1.11 (2) 1.09
(3) 1 (4) 0.10
(SSC Data Entry Operator Exam. 31.08.2008)

73. $999\frac{998}{999} \times 999$ is equal to :
(1) 998999 (2) 999899
(3) 989999 (4) 999989
(SSC CHSL DEO & LDC Exam. 27.11.2010)

74. $(2^{71} + 2^{72} + 2^{73} + 2^{74})$ is divisible by
(1) 9 (2) 10
(3) 11 (4) 13
(SSC (South Zone) Investigator Exam 12.09.2010)

75. By which number should 0.022 be multiplied so that product becomes 66 ?
(1) 3000 (2) 3200
(3) 4000 (4) 3600
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

76. $(3^{25} + 3^{26} + 3^{27} + 3^{28})$ is divisible by
(1) 11 (2) 16
(3) 25 (4) 30
(SSC CPO S.I. Exam. 05.09.2004)

77. The value of
$\left(0.3\overline{467} + 0.1\overline{3333}\right)$ is :
(1) 0.48 (2) $0.48\overline{01}$
(3) $0.\overline{48}$ (4) $0.4\overline{8}$
(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

78. The value of
$\frac{3.157 \times 4126 \times 3.198}{63.972 \times 2835.121}$ is closest to
(1) 0.002 (2) 0.02
(3) 0.2 (4) 2
(SSC CPO S.I. Exam. 12.01.2003)

79. $\frac{1}{7} + \left(999\frac{692}{693}\right) \times 99$ is equal to
(1) 1 (2) 99000
(3) 99800 (4) 99900
(SSC CHSL DEO & LDC Exam. 10.11.2013, IInd Sitting)

80. $(49)^{15} - 1$ is exactly divisible by :
(1) 50 (2) 51
(3) 29 (4) 8
(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

81. If a and b are two odd positive integers, by which of the following integers is $(a^4 - b^4)$ always divisible ?
(1) 3 (2) 6
(3) 8 (4) 12
(SSC CGL Tier-I Exam. 16.05.2010 (First Sitting)

82. If m and n are positive integers and $(m - n)$ is an even number, then $(m^2 - n^2)$ will be always divisible by
(1) 4 (2) 6
(3) 8 (4) 12
(SSC CGL Tier-II Exam.16.09.2012)

83. If 5432*7 is divisible by 9, then the digit in place of * is :
(1) 0 (2) 1
(3) 6 (4) 9
(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

84. The least number, which must be added to 6709 to make it exactly divisible by 9, is
(1) 5 (4) 4
(3) 7 (4) 2
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

85. The total number of integers between 100 and 200, which are divisible by both 9 and 6, is :
(1) 5 (2) 6
(3) 7 (4) 8
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

86. How many 3-digit numbers, in all, are divisible by 6 ?
(1) 140 (2) 150
(3) 160 (4) 170
(SSC CPO S.I. Exam.26.05.2005 & SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

87. If 'n' be any natural number, then by which largest number $(n^3 - n)$ is always divisible ?
(1) 3 (2) 6
(3) 12 (4) 18
(SSC CGL Tier-I Exam. 16.05.2010 (Second Sitting)

88. If n is an integer, then $(n^3 - n)$ is always divisible by :
(1) 4 (2) 5
(3) 6 (4) 7
(SSC CGL Exam.13.11.2005 (Ist Sitting) & SSC CHSL DEO & LDC Exam. 27.11.2010)

89. If the sum of the digits of any integer lying between 100 and 1000 is subtracted from the number, the result always is
(1) divisible by 6
(2) divisible by 2
(3) divisible by 9
(4) divisible by 5
(SSC CHSL DEO & LDC Exam. 20.10.2013)

90. If a number is divisible by both 11 and 13, then it must be necessarily :
(1) divisible by (11 + 13)
(2) divisible by (13 – 11)
(3) divisible by (11 × 13)
(4) 429
(SSC CGL Prelim Exam. 27.02.2000 (Second Sitting)

91. If * is a digit such that 5824* is divisible by 11, then * equals :
(1) 2 (2) 3
(3) 5 (4) 6
(SSC CGL Prelim Exam. 27.02.2000 (Second Sitting)

92. If 78*3945 is divisible by 11, where * is a digit, then * is equal to
(1) 1 (2) 0
(3) 3 (4) 5
(SSC CPO S.I. Exam. 05.09.2004)

93. If the number 4 8 3 2 7 * 8 is divisible by 11, then the missing digit (*) is
(1) 5 (2) 3
(3) 2 (4) 1
(SSC CPO S.I. Exam. 09.11.2008)

94. Both the end digits of a 99 digit number N are 2. N is divisible by 11, then all the middle digits are :
(1) 1 (2) 2
(3) 3 (4) 4
FCI Assistant Grade-III Exam. 05.02.2012 (Paper-I) East Zone (IInd Sitting)

95. If n is a whole number greater than 1, then $n^2(n^2 - 1)$ is always divisible by :
(1) 16 (2) 12
(3) 10 (4) 8
(SSC CPO S.I. Exam. 26.05.2005)

96. A 4-digit number is formed by repeating a 2-digit number such as 2525, 3232, etc. Any number of this form is always exactly divisible by :
(1) 7 (2) 11
(3) 13
(4) Smallest 3-digit prime number
(SSC CGL Prelim Exam. 13.11.2005 (First Sitting) & SSC CGL Tier-I Exam.16.05.2010 (IInd Sitting)

97. What least number, of 5 digits is divisible by 41?
(1) 10045 (2) 10004
(3) 10041 (4) 41000
(SSC CPO S.I. Exam. 03.09.2006)

98. It is given that $(2^{32} + 1)$ is exactly divisible by a certain number. which one of the following is also definitely divisible by the same number ?
(1) $2^{96} + 1$ (2) 7×2^{33}
(3) $2^{16} - 1$ (4) $2^{16} + 1$
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

99. The greatest whole number, by which the expression $n^4 + 6n^3 + 11n^2 + 6n + 24$ is divisible for every natural number n, is

(1) 6 (2) 24

(3) 12 (4) 48

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

100. How many numbers between 1000 and 5000 are exactly divisible by 225 ?

(1) 16 (2) 18

(3) 19 (4) 12

(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

101. Find the largest number, which exactly divides every number of the form $(n^3 - n)(n-2)$ where n is a natural number greater than 2.

(1) 6 (2) 12

(3) 24 (4) 48

(SSC CPO S.I. Exam. 09.11.2008)

102. The greatest number less than 1500, which is divisible by both 16 and 18, is

(1) 1440 (2) 1404

(3) 1386 (4) 1368

(SSC (South Zone) Investigator Exam 12.09.2010)

103. The least number, which is to be added to the greatest number of 4 digits so that the sum may be divisible by 345, is

(1) 50 (2) 6

(3) 60 (4) 5

(SSC CGL Tier-1 Exam 19.06.2011 (Second Sitting)

104. $4^{61} + 4^{62} + 4^{63} + 4^{64}$ is divisible by

(1) 3 (2) 10

(3) 11 (4) 13

(SSC CPO S.I. Exam. 12.01.2003)

105. The difference of a number consisting of two digits from the number formed by interchanging the digits is always divisible by

(1) 10 (2) 9

(3) 11 (4) 6

(SSC CGL Tier-I Exam. 21.04.2013 IInd Sitting)

106. Which one of the numbers is divisible by 25 ?

(1) 303310 (2) 373355

(3) 303375 (4) 22040

(SSC CGL Tier-II Exam. 29.09.2013)

107. The least number which must be added to the greatest number of 4 digits in order that the sum may be exactly divisible by 307 is

(1) 132 (2) 32

(3) 43 (4) 75

(SSC CGL Tier-I Re-Exam. (2013) 20.07.2014 (IInd Sitting)

108. If $a = 4011$ and $b = 3989$ then value of ab = ?

(1) 15999879 (2) 15899879

(3) 15989979 (4) 15998879

(SSC CGL Tier-I Re-Exam. (2013) 27.04.2014

109. For any integral value of n, $3^{2n} + 9n + 5$ when divided by 3 will leave the remainder

(1) 1 (2) 2

(3) 0 (4) 5

(SSC CGL Tier-I Exam. 19.10.2014

110. The solution to the inequality $12x - 61 \leq 6$ is

(1) $x \leq 6$ (2) $0 \leq x \leq 6$

(3) $-6 \leq x \leq 6$ (4) $-6 \leq x \leq 0$

(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014

111. 5349 is added to 3957. Then 7062 is subtracted from the sum. The result is not divisible by

(1) 4 (2) 3

(3) 7 (4) 11

(SSC CHSL DEO Exam. 02.11.2014 (Ist Sitting)

112. The product of all the prime numbers between 80 and 90 is

(1) 83 (2) 89

(3) 7387 (4) 598347

(SSC CHSL DEO Exam. 02.11.2014 (Ist Sitting)

113. If n is even, $(6^n - 1)$ is divisible by

(1) 37 (2) 35

(3) 30 (4) 6

(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014, IInd Sitting (TF No. 545 QP 6)

114. I have x marbles. My elder brother has 3 more than mine, while my younger brother has 3 less than mine. If the total number of marbles is 15, the number of marbles that I have is

(1) 3 (2) 5

(3) 8 (4) 7

(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014, IInd Sitting (TF No. 545 QP 6)

115. Weight of a bucket when filled fully with water is 17 kg. If the weight of the bucket when half filled with water is 13.5 kg, what is the weight of empty bucket ?

(1) 12 kg (2) 8 kg

(3) 10 kg (4) 7 kg

(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014, IInd Sitting (TF No. 545 QP 6)

116. In a farm there are cows and hens. If heads are counted they are 180, if legs are counted they are 420. The number of cows in the farm is

(1) 130 (2) 150

(3) 50 (4) 30

(SSC CGL Tier-II Exam. 12.04.2015 (TF No. 567 TL 9)

117. The number which can be written in the form of n (n + 1) (n + 2), where n is a natural number, is

(1) 7 (2) 3

(3) 5 (4) 6

(SSC CGL Tier-II Exam. 12.04.2015 (TF No. 567 TL 9)

118. A number when divided by 2736 leaves the remainder 75. If the same number is divided by 24, then the remainder is

(1) 12 (2) 3

(3) 0 (4) 23

(SSC CGL Tier-II Exam, 2014 12.04.2015 (Kolkata Region) (TF No. 789 TH 7)

119. The maximum value of F in the following equation

5E9 + 2F8 + 3G7 = 1114 is

where E, F, G each stands for any digit.

(1) 8 (2) 9

(3) 7 (4) 5

(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam, 21.06.2015 IInd Sitting)

120. The sum of four numbers is 48. When 5 and 1 are added to the first two; and 3 and 7 are subtracted from the 3rd and 4th, the numbers will be equal. The numbers are

(1) 9, 7, 15, 17 (2) 4, 12, 12, 20

(3) 5, 11, 13, 19 (4) 6, 10, 14, 18

(SSC CGL Tier-I Exam, 09.08.2015 (Ist Sitting) TF No. 1443088)

121. The least number that should be added to 2055, so that the sum is exactly divisible by 27 is

(1) 28 (2) 24

(3) 27 (4) 31

(SSC CGL Tier-I Exam, 09.08.2015 (Ist Sitting) TF No. 1443088)

122. What is the Arithmetic mean of the first 'n' natural numbers ?

(1) $\frac{n(n+1)}{2}$ (2) $\frac{n+1}{2}$

(3) $\frac{n^2(n+1)}{2}$ (4) $2(n+1)$

(SSC CGL Tier-I Exam, 09.08.2015 (Ist Sitting) TF No. 1443088)

123. A number when divided by 361 gives a remainder 47. If the same number is divided by 19, the remainder obtained is

(1) 3 (2) 8

(3) 9 (4) 1

(SSC CGL Tier-II Exam, 25.10.2015, TF No. 1099685)

124. The difference between the greatest and the least four digit numbers that begin with 3 and ends with 5 is

(1) 999 (2) 900

(3) 990 (4) 909

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 01.11.2015, IInd Sitting)

125. The sum of two numbers is 75 and their difference is 25. The product of the two numbers is :

(1) 1350 (2) 1250

(3) 125 (4) 1000

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (Ist Sitting) TF No. 6636838)

126. The difference between the greatest and least prime numbers which are less than 100 is

(1) 96 (2) 97

(3) 94 (4) 95

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 20.12.2015 (Ist Sitting) TF No. 9692918)

127. Which one of the following is the minimum value of the sum of two integers whose product is 24?

(1) 25 (2) 11

(3) 8 (4) 10

(SSC CGL Tier-I (CBE) Exam.10.09.2016)

128. If the sum of the digits of a three digit number is subtracted from that number, then it will always be divisible by

(1) 3 only

(2) 9 only

(3) Both 3 and 9

(4) All of 3, 6 and 9

(SSC CGL Tier-II Online Exam.01.12.2016)

129. The greater of the two numbers whose product is 900 and sum exceeds their difference by 30 is

(1) 60 (2) 75

(3) 90 (4) 100

(SSC CGL Tier-II Online Exam.01.12.2016)

130. In a division sum, the divisor 'd' is 10 times the quotient 'q' and 5 times the remainder 'r'. If $r = 46$, the dividend will be

(1) 5042 (2) 5328

(3) 5336 (4) 4276

(SSC CGL Tier-II Online Exam.01.12.2016)

131. A number when divided by 44, gives 432 as quotient and 0 as remainder. What will be the remainder when dividing the same number by 31?

(1) 3 (2) 4

(3) 5 (4) 6

(SSC CPO SI, ASI Online Exam.05.06.2016) (IInd Sitting)

132. A number when divided by 729 gives a remainder of 56. What will we get as remainder if the same number is divided by 27?

(1) 4 (2) 2

(3) 0 (4) 1

(SSC CPO SI, ASI Online Exam.05.06.2016) (IInd Sitting)

133. What is the smallest 6-digit number that is completely divisible by 108 ?

(1) 100003 (2) 100004

(3) 100006 (4) 100008

(SSC CPO Exam. 06.06.2016) (Ist Sitting)

134. If 25 is added to a number it becomes 3 less than thrice of the number. Then number is :

(1) 15 (2) 14

(3) 19 (4) 20

(SSC CPO SI & ASI, Online Exam. 06.06.2016) (IInd Sitting)

145. The number $334 \times 545 \times 7p$ is dividible by 3340 if p is at least.

(1) 2 (2) 4

(3) 3 (4) 1

(SSC CPO SI & ASI, Online Exam. 06.06.2016) (IInd Sitting)

136. If the sum of a number and its reciprocal be 2, then the number is

(1) 0 (2) 1

(3) –1 (4) 2

(SSC CGL Tier-I (CBE) Exam. 29.08.2016) (IInd Sitting)

137. When a number is divided by 56, the remainder will be 29. If the same number is divided by 8, then the remainder will be

(1) 6 (2) 7

(3) 5 (4) 3

(SSC CGL Tier-I (CBE) Exam. 31.08.2016) (Ist Sitting)

138. A positive number when decreased by 4, is equal to 21 times the reciprocal of this number. The number is :

(1) 3 (2) 7

(3) 5 (4) 9

(SSC CGL Tier-I (CBE) Exam. 03.09.2016) (IInd Sitting)

139. When n is divided by 4, the remainder is 3. The remainder when $2n$ is divided by 4 is :

(1) 1 (2) 2

(3) 3 (4) 6

(SSC CGL Tier-I (CBE) Exam. 02.09.2016) (IInd Sitting)

140. A number when divided by the sum of 555 and 445 gives two times their difference as quotient and 30 as the remainder. The number is

(1) 220030 (2) 22030

(3) 1220 (4) 1250

(SSC CGL Tier-II (CBE) Exam. 30.11.2016)

141. When a number x is divided by a divisor it is seen that the divisor = 4 times the quotient = double the remainder. If the remainder is 80 then the value of x is

(1) 6480 (2) 9680

(3) 8460 (4) 4680

(SSC CGL Tier-II (CBE) Exam. 30.11.2016)

142. On dividing a certain number by 342 we get 47 as remainder. If the same number is divided by 18, what will be the remainder ?

(1) 15 (2) 11

(3) 17 (4) 13

(SSC CGL Tier-II (CBE) Exam. 30.11.2016)

143. The sum of three numbers is 252. If the first number is thrice the second and third number is two–third of the first, then the second number is

(1) 41 (2) 21

(3) 42 (4) 84

(SSC CGL Tier-II (CBE) Exam. 30.11.2016)

144. The difference between the greatest and the least five-digit numbers formed by the digits 2, 5, 0, 6 and 8 is (repetition of digits is not allowed)
(1) 69552 (2) 65925
(3) 65952 (4) 63952
(SSC CGL Tier-I (CBE) Exam. 29.08.2016 (IST Sitting)

145. A man has some hens and some cows. If the total number of heads of hens and cows together is 50 and the number of feet of hens and cows together is 142, then the number of cows is
(1) 21 (2) 25
(3) 27 (4) 29
(SSC CGL Tier-I (CBE) Exam. 01.09.2016 (IIIrd Sitting)

146. The least number, which when divided by 5, 6, 7 and 8 leaves a remainder 3 in each case, but when divided by 9 leaves no remainder, is :
(1) 1677 (2) 1683
(3) 2523 (4) 3363
(SSC CGL Tier-I (CBE) Exam. 02.09.2016 (IInd Sitting)

147. If the sum of the digits of any integer between 100 and 1000 is subtracted from the same integer, the resulting number is always divisible by
(1) 2 (2) 5
(3) 6 (4) 9
(SSC CGL Tier-I (CBE) Exam. 03.09.2016 (IInd Sitting)

148. The least number that must be added to 8961 to make it exactly divisible by 84 is :
(1) 27 (2) 57
(3) 141 (4) 107
(SSC CGL Tier-I (CBE) Exam. 07.09.2016 (IInd Sitting)

149. Number of composite numbers lying between 67 and 101 is :
(1) 27 (2) 24
(3) 26 (4) 23
(SSC CGL Tier-I (CBE) Exam. 08.09.2016 (IInd Sitting)

150. The least number that must be subtracted from 1294 so that the remainder when divided by 9, 11 and 13 will leave in each case the same remainder 6, is :
(1) 2 (2) 3
(3) 1 (4) 4
(SSC CGL Tier-I (CBE) Exam. 09.09.2016 (IIIrd Sitting)

151. What least value must be assigned to '*' so that the number 63576*2 is divisible by 8 ?
(1) 1 (2) 2
(3) 3 (4) 4
(SSC CGL Tier-I (CBE) Exam. 10.09.2016 (IInd Sitting)

152. The least number to be added to 13851 to get a number which is divisible by 87 is :
(1) 18 (2) 43
(3) 54 (4) 69
(SSC CGL Tier-I (CBE) Exam. 10.09.2016 (IIIrd Sitting)

153. What least value must be assigned to '*' so that the number 451 * 603 is exactly divisible by 9?
(1) 7 (2) 8
(3) 5 (4) 9
(SSC CGL Tier-I (CBE) Exam. 11.09.2016 (IIIrd Sitting)

154. The largest number of four digits exactly divisible by 88 is :
(1) 9988 (2) 9944
(3) 8888 (4) 9768
(SSC CGL Tier-I (CBE) Exam. 27.10.2016 (Ist Sitting)

155. Which of the following numbers is completely divisible by 99?
(1) 57717 (2) 57627
(3) 55162 (4) 56982
(SSC CHSL (10+2) Tier-I (CBE) Exam. 15.01.2017) (IInd Sitting)

156. The sum of all prime numbers between 58 and 68 is
(1) 179 (2) 178
(3) 187 (4) 183
(SSC CHSL (10+2) Tier-I (CBE) Exam. 16.01.2017) (IInd Sitting)

157. The product of digits of a 2-digit number is 24. If we add 45 to the number, the new number obtained is a number formed by interchanging the digits.What is the original number?
(1) 54 (2) 83
(3) 38 (4) 45
(SSC CHSL (10+2) Tier-I (CBE) Exam. 16.01.2017) (IInd Sitting)

158. The smallest number, which should be added to 756896 so as to obtain a multiple of 11, is
(1) 1 (2) 2
(3) 3 (4) 5
(SSC CGL Tier-II (CBE) Exam. 12.01.2017)

159. The product of two numbers is 48. If one number equals "The number of wings of a bird plus 2 times the number of fingers on your hand divided by the number of wheels of a Tricycle". Then the other number is
(1) 9 (2) 10
(3) 12 (4) 18
(SSC CGL Tier-II (CBE) Exam. 12.01.2017)

TYPE–III

1. One-fourth of a tank holds 135 litres of water. What part of the tank is full if it contains 180 litres of water?
(1) $\frac{2}{5}$ (2) $\frac{2}{3}$
(3) $\frac{1}{3}$ (4) $\frac{1}{6}$
(SSC CGL Exam. 04.07.1999 (Ist Sitting)

2. What is two-third of half of 369?
(1) 123 (2) 246
(3) $246\frac{3}{8}$ (4) $271\frac{3}{4}$
(SSC CGL Exam. 04.07.1999 (Ist Sitting)

3. $\frac{1}{5}$ of a number exceeds $\frac{1}{7}$ of the same number by 10. The number is :
(1) 125 (2) 150
(3) 175 (4) 200
(SSC CGL Exam. 04.07.1999 (Ist Sitting)

4. A boy was asked to find the value of $\frac{3}{8}$ of a sum of money. Instead of multiplying the sum by $\frac{3}{8}$ he divided it by $\frac{3}{8}$ and then his answer exceeded by ₹ 55. Find the correct answer ?
(1) ₹ 9 (2) ₹ 24
(3) ₹ 64 (4) ₹ 1,320
(SSC CGL Exam. 04.07.1999 (Ist Sitting)

5. In a class, $\frac{3}{5}$ of the students are girls and rest are boys. If $\frac{2}{9}$ of the girls and $\frac{1}{4}$ of the boys are absent. What part of the total number of students are present?
(1) $\frac{23}{30}$ (2) $\frac{23}{36}$
(3) $\frac{18}{49}$ (4) $\frac{17}{25}$
(SSC CGL Exam. 04.07.1999 (Ist Sitting)

6. An 85m long rod is divided into two parts. If one part is $\frac{2}{3}$ of the other part, then the longer part (in metres) is :

(1) 34 (2) $56\frac{2}{3}$

(3) 85 (4) 51

(SSC CGL Exam. 04.07.1999 (Ist Sitting)

7. Fraction between $\frac{2}{5}$ and $\frac{4}{9}$ is :

(1) $\frac{3}{7}$ (2) $\frac{2}{3}$

(3) $\frac{4}{5}$ (4) $\frac{1}{2}$

(SSC CGL Exam. 04.07.1999 (IInd Sitting)

8. $\frac{2}{3}$ of three-fourth of a number is :

(1) $\frac{1}{2}$ of the number

(2) $\frac{1}{3}$ of the number

(3) $\frac{8}{9}$ of the number

(4) $\frac{17}{12}$ of the number

(SSC CGL Exam. 04.07.1999 (IInd Sitting)

9. If 3 times a number exceeds its $\frac{3}{5}$ by 60, then what is the number ?

(1) 25 (2) 35

(3) 45 (4) 60

(SSC CGL Exam. 04.07.1999 (IInd Sitting)

10. Half of 1 per cent written as a decimal is—

(1) 0.2 (2) 0.02

(3) 0.05 (4) 0.005

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

11. A runner runs $1\frac{1}{4}$ laps of a 5 lap race. What fractional part of the race remains to be run?

(1) 15/4 (2) 4/5

(3) 5/6 (4) 2/3

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

12. The product of two fractions is $\frac{14}{15}$ and their quotient is $\frac{35}{24}$. The greater fraction is—

(1) $\frac{7}{4}$ (2) $\frac{7}{6}$

(3) $\frac{7}{3}$ (4) $\frac{4}{5}$

(SSC CGL Exam. 24.02.2002 (Ist Sitting)

13. What fraction of $\frac{4}{7}$ must be added to itself to make the sum $1\frac{1}{14}$?

(1) $\frac{7}{8}$ (2) $\frac{1}{2}$

(3) $\frac{4}{7}$ (4) $\frac{15}{14}$

(SSC CGL Exam. 24.02.2002 (Ist Sitting)

14. If $\frac{4}{5}$ of an estate be worth ₹ 16800, then the value of $\frac{3}{7}$ of it is—

(1) ₹ 90000 (2) ₹ 9000

(3) ₹ 72000 (4) ₹ 21000

(SSC CGL Exam. 24.02.2002 (Ist Sitting)

15. A boy on being asked what $\frac{6}{7}$ of a certain fraction was, made the mistake of dividing the fraction by $\frac{6}{7}$ and so got an answer which exceeded the correct answer by $\frac{13}{70}$. Find the fraction–

(1) $\frac{2}{3}$ (2) $\frac{3}{5}$

(3) $\frac{4}{5}$ (4) $\frac{7}{9}$

(SSC CGL Exam. 24.02.2002 (Ist Sitting)

16. $\frac{1}{2}$ of $\frac{3}{4}$ of a number is $2\frac{1}{2}$ of 10. What is the number?

(1) 50 (2) 60

(3) $66\frac{2}{3}$ (4) 56

(SSC CGL Exam. 24.02.2002 (Ist Sitting)

17. If one-third of one-fourth of a number is 15, then three-tenth of the number is

(1) 35 (2) 36

(3) 45 (4) 54

(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

18. Express 45 minutes as the fraction of one day.

(1) $\frac{1}{40}$ (2) $\frac{1}{32}$

(3) $\frac{1}{60}$ (4) $\frac{1}{24}$

(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

19. If 1 is added to the denominator of a fraction it becomes $\frac{1}{2}$. If 1 is added to the numerator it becomes 1. The product of numerator and denominator of the fraction is

(1) 6 (2) 10

(3) 12 (4) 14

(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

20. A student was asked to find $\frac{5}{16}$ of a number. By mistake he found $\frac{5}{6}$ of that number. His answer was 250 more than the correct answer. Find the given number.

(1) 300 (2) 480

(3) 450 (4) 500

(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

21. A number exceeds its one-fifth by 20. The number is

(1) 100 (2) 25

(3) 20 (4) 5

(SSC CPO S.I. Exam. 12.01.2003

22. Two-third of a positive number and $\frac{25}{216}$ of its reciprocal are equal. The number is

(1) $\frac{25}{144}$ (2) $\frac{5}{12}$

(3) $\frac{144}{25}$ (4) $\frac{12}{5}$

(SSC CPO S.I. Exam. 12.01.2003

23. 0.1 and $\frac{5}{8}$ of a bamboo are in mud and water respectively and the rest of length 2.75 m is above water. What is the length of the bamboo?

(1) 10 m (2) 30 m

(3) 27.5 m (4) 20 m

(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

24. A man spends $\frac{1}{3}$ of his income on food, $\frac{2}{5}$ of his income on house rent and $\frac{1}{5}$ of his income on clothes. If he still has ₹ 400 left with him, his income is
(1) ₹ 4000 (2) ₹ 5000
(3) ₹ 6000 (4) ₹ 7000
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

25. When $0.\overline{47}$ is converted as a fraction, the result is
(1) $\frac{47}{90}$ (2) $\frac{46}{90}$
(3) $\frac{46}{99}$ (4) $\frac{47}{99}$
(SSC Section Officer (Commercial Audit) Exam. 16.11.2003)

26. By how much does $\frac{6}{7/8}$ exceed $\frac{6/7}{8}$?
(1) $6\frac{1}{8}$ (2) $6\frac{3}{4}$
(3) $7\frac{3}{4}$ (4) $7\frac{5}{6}$
(SSC Section Officer (Commercial Audit) Exam. 16.11.2003) & SSC CGL Exam. 27.07.2008 (Ist Sitting)

27. If one-nineth of a certain number exceeds its one-tenth by 4, the number is
(1) 320 (2) 360
(3) 400 (4) 440
(SSC CPO S.I. Exam. 05.09.2004)

28. $0.4\overline{23}$ is equivalent to the fraction :
(1) $\frac{491}{990}$ (2) $\frac{419}{990}$
(3) $\frac{49}{99}$ (4) $\frac{94}{99}$
(SSC CPO S.I. Exam. 26.05.2005)

29. Which of the following fraction is greater than $\frac{3}{4}$ but less than $\frac{5}{6}$?
(1) $\frac{2}{3}$ (2) $\frac{1}{2}$
(3) $\frac{4}{5}$ (4) $\frac{9}{10}$
(SSC CPO S.I. Exam. 26.05.2005)

30. A tin of oil was $\frac{4}{5}$ full. When 6 bottles of oil was taken out and 4 bottles of oil was poured into it, it was $\frac{3}{4}$ full. How many bottles of oil can the tin contain ?
(1) 10 (2) 20
(3) 30 (4) 40
(SSC CPO S.I. Exam. 26.05.2005)

31. A candidate in an examination was asked to find $\frac{5}{14}$ of a certain number. By mistake he found $\frac{5}{4}$ of it. Thus, his answer was 25 more than the correct answer. The number was :
(1) 28 (2) 56
(3) 84 (4) 140
(SSC CPO S.I. Exam. 26.05.2005)

32. In an examination, a student was asked to find $\frac{3}{14}$ of a certain number, By mistake, he found $\frac{3}{4}$ of it. His answer was 150 more than the correct answer. The given number is :
(1) 500 (2) 280
(3) 240 (4) 180
(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

33. The product of two fractions is $\frac{14}{15}$ and their quotient is $\frac{35}{24}$. The greater of the fractions is
(1) $\frac{7}{4}$ (2) $\frac{7}{6}$
(3) $\frac{7}{3}$ (4) $\frac{4}{5}$
(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting)

34. If the difference between the reciprocal of a positive proper fraction and the fraction itself be $\frac{9}{20}$, then the fraction is
(1) $\frac{3}{5}$ (2) $\frac{3}{10}$
(3) $\frac{4}{5}$ (4) $\frac{5}{4}$
(SSC CPO S.I. Exam. 03.09.2006)

35. A boy was asked to find $\frac{3}{5}$ of a fraction. Instead, he divided the fraction by $\frac{3}{5}$ and got an answer which exceeded the correct answer by $\frac{32}{75}$. The correct answer is
(1) $\frac{3}{25}$ (2) $\frac{6}{25}$
(3) $\frac{2}{25}$ (4) $\frac{2}{15}$
(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

36. The rational number between $\frac{1}{2}$ and $\frac{3}{5}$ is
(1) $\frac{2}{5}$ (2) $\frac{4}{7}$
(3) $\frac{2}{3}$ (4) $\frac{1}{3}$
(SSC CPO S.I. Exam. 09.11.2008)

37. A man read $\frac{2}{5}$ th of a book on the first day. He read $\frac{1}{3}$ rd more on second day than he read on the first day. 15 pages were left for the third day. The number of pages in the book is
(1) 100 (2) 105
(3) 225 (4) 250
(SSC CPO S.I. Exam. 6.09.2009)

38. The number 0.121212.... in the form $\frac{p}{q}$ is equal to
(1) $\frac{4}{11}$ (2) $\frac{2}{11}$
(3) $\frac{4}{33}$ (4) $\frac{2}{33}$
(SSC CGL Tier-I Exam. 16.05.2010 (First Sitting)

39. $0.\overline{001}$ is equal to

(1) $\frac{1}{1000}$ (2) $\frac{1}{999}$

(3) $\frac{1}{99}$ (4) $\frac{1}{9}$

(SSC CGL Tier-I Exam. 16.05.2010 (First Sitting)

40. $1.\overline{27}$ in the form $\frac{p}{q}$ is equal to

(1) $\frac{127}{100}$ (2) $\frac{73}{100}$

(3) $\frac{14}{11}$ (4) $\frac{11}{14}$

(SSC CGL Tier-I Exam. 16.05.2010 (Second Sitting)

41. Find a number, one-seventh of which exceeds its eleventh part by 100.

(1) 1925 (2) 1825

(3) 1540 (4) 1340

(SSC CGL Tier-1 Exam 26.06.2011 (First Sitting)

42. The value of

$\frac{1}{15}+\frac{1}{35}+\frac{1}{63}+\frac{1}{99}+\frac{1}{143}$ is

(1) $\frac{5}{39}$ (2) $\frac{4}{39}$

(3) $\frac{2}{39}$ (4) $\frac{7}{39}$

FCI Assistant Grade-III Exam. 25.02.2012 (Paper-I) North Zone (Ist Sitting)

43. The number $2.\dot{5}\dot{2}$, when written as a fraction and reduced to lowest terms, the sum of the numerator and denominator is

(1) 7 (2) 29

(3) 141 (4) 349

FCI Assistant Grade-III Exam. 25.02.2012 (Paper-I) North Zone (Ist Sitting)

44. $\frac{1}{10}$ of a rod is coloured red, $\frac{1}{20}$ orange, $\frac{1}{30}$ yellow, $\frac{1}{40}$ green, $\frac{1}{50}$ blue, $\frac{1}{60}$ black and the rest is violet. If the length of the violet portion of the rod is 12.08 metres, then the length of the rod is

(1) 16 m (2) 18 m

(3) 20 m (4) 30 m

(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

45. A tree increases annually by $\frac{1}{8}$ th of its height. By how much will it increase after 2 years, if it stands today 64 cm high?

(1) 72 cm (2) 74 cm

(3) 75 cm (4) 81 cm

FCI Assistant Grade-III Exam.25.02.2012 (Paper-I) North Zone (Ist Sitting)

46. A man spends $\frac{1}{4}$ th of his income on food $\frac{2}{3}$ rd of it on house rent and the remaining income which is ₹ 630 on other commodities. Find his house rent.

(1) ₹ 5040 (2) ₹ 3520

(3) ₹ 4890 (4) ₹ 4458

(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

47. How many $\frac{1}{6}$ of together make $41\frac{2}{3}$?

(1) 125 (2) 150

(3) 250 (4) 350

(SSC CHSL DEO Entry Operator & LDC Exam. 28.11.2010 (Ist Sitting)

48. A fraction having denominator 30 and lying between $\frac{5}{8}$ and $\frac{7}{11}$ is–

(1) $\frac{18}{30}$ (2) $\frac{19}{30}$

(3) $\frac{20}{30}$ (4) $\frac{21}{30}$

(SSC CHSL DEO Entry Operator & LDC Exam. 28.11.2010 (Ist Sitting)

49. The sum of the numerator and denominator of a positive fraction is 11. If 2 is added to both numerator and denominator, the fraction is increased by $\frac{1}{24}$. The difference of numerator and denominator of the fraction is

(1) 5 (2) 3

(3) 1 (4) 9

(SSC CHSL DEO & LDC Exam. 04.12.2011 (Ist Sitting (North Zone)

50. The denominator of a fraction is 3 more than its numerator. If the numerator is increased by 7 and the denominator is decreased by 2, we obtain 2. The sum of numerator and denominator of the fraction is

(1) 5 (2) 13

(3) 17 (4) 19

(SSC CHSL DEO & LDC Exam. 04.12.2011 (Ist Sitting (East Zone)

51. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from both the numerator and the denominator. The same fraction becomes $\frac{1}{2}$ when 1 is added to both the numerator and the denominator. The sum of numerator and denominator of the fraction is

(1) 10 (2) 18

(3) 7 (4) 16

(SSC CHSL DEO & LDC Exam. 04.12.2011 (IInd Sitting (East Zone)

52. A girl was asked to multiply a number by $\frac{7}{8}$, instead she divided the number by $\frac{7}{8}$ and got the result 15 more than the correct result. The sum of the digits of the number was :

(1) 4 (2) 8

(3) 6 (4) 11

(SSC CHSL DEO & LDC Exam. 11.12.2011 (IInd Sitting (Delhi Zone)

53. A student was asked to multiply a given number by $\frac{8}{17}$. Instead, he divided the given number by $\frac{8}{17}$. His answer was 225 more than the correct answer. The given number was

(1) 64 (2) 289

(3) 136 (4) 225

(SSC CHSL DEO & LDC Exam. 11.12.2011 (Ist Sitting (East Zone)

54. If 1 is added to both the numerator and the denominator of a fraction, it becomes $\frac{1}{4}$. If 2 is added to both the numerator and the denominator of that fraction, it becomes $\frac{1}{3}$. The sum of numerator and denominator of the fraction is :

(1) 8 (2) 13

(3) 22 (4) 27

(SSC CHSL DEO & LDC Exam. 11.12.2011 (IInd Sitting (East Zone)

55. A number whose one-fifth part increased by 4 is equal to its one-fourth part diminished by 10, is :

(1) 260 (2) 280

(3) 240 (4) 270

(SSC CHSL DEO & LDC Exam. 11.12.2011 (IInd Sitting (East Zone)

56. A person gives $\frac{1}{4}$ of his property to his daughter, $\frac{1}{2}$ to his sons and $\frac{1}{5}$ for charity. How much has he given away ?

(1) $\frac{1}{20}$ (2) $\frac{19}{20}$

(3) $\frac{1}{10}$ (4) $\frac{9}{10}$

(SSC CGL Tier-I Exam. 11.11.2012, Ist Sitting)

57. In an office, there are 108 tables and 132 chairs. If $\frac{1}{6}$ of the tables and $\frac{1}{4}$ of the chairs are broken. How many people can work in the office if each person requires one table and one chair?

(1) 86 (2) 90

(3) 92 (4) 99

(SSC Multi-Tasking Staff Exam. 24.03.2013, Ist Sitting)

58. A, B, C and D purchase a gift worth ₹ 60. A pays $\frac{1}{2}$ of what others are paying, B pays $\frac{1}{3}$ of what others are paying and C pays $\frac{1}{4}$ of what others are paying. What is the amount paid by D ?

(1) ₹ 16 (2) ₹ 13

(3) ₹ 14 (4) ₹ 15

(SSC CGL Tier-I Exam. 21.04.2013)

59. In a school $\frac{1}{10}$ of the boys are same in number as $\frac{1}{4}$ of the girls and $\frac{5}{8}$ of the girls are same in number as $\frac{1}{4}$ of the boys. The ratio of the boys to girls in that school is

(1) 2 : 1 (2) 5 : 2

(3) 4 : 3 (4) 3 : 2

(SSC Constable (GD) Exam. 12.05.2013 Ist Sitting)

60. A fraction becomes $\frac{9}{11}$, if 2 is added to both the numerator and the denominator. If 3 is added to both the numerator and the denominator it becomes $\frac{5}{6}$. What is the fraction ?

(1) $\frac{7}{9}$ (2) $\frac{3}{7}$

(3) $\frac{5}{9}$ (4) $\frac{7}{10}$

(SSC CGL Tier-I Exam. 19.05.2013 Ist Sitting)

61. A rational number between $\frac{3}{4}$ and $\frac{3}{8}$ is

(1) $\frac{12}{7}$ (2) $\frac{7}{3}$

(3) $\frac{16}{9}$ (4) $\frac{9}{16}$

(SSC CGL Tier-I Exam. 19.05.2013 Ist Sitting)

62. The numerator of a fraction is 4 less than its denominator. If the numerator is decreased by 2 and the denominator is increased by 1, then the denominator becomes eight times the numerator. Find the fraction.

(1) $\frac{3}{8}$ (2) $\frac{3}{7}$

(3) $\frac{4}{8}$ (4) $\frac{2}{7}$

(SSC CGL Tier-I Exam. 19.05.2013 Ist Sitting)

63. In a class, there are 'z' students. Out of them 'x' are boys. What part of the class is composed of girls ?

(1) $\frac{x}{z}$ (2) $\frac{z}{x}$

(3) $1-\frac{x}{z}$ (4) $\frac{x}{z}-1$

(SSC CGL Tier-II Exam. 29.09.2013

64. Divide 50 into two parts so that the sum of their reciprocals is $\frac{1}{12}$.

(1) 35, 15 (2) 20, 30

(3) 24, 36 (4) 28, 22

(SSC CHSL DEO & LDC Exam. 20.10.2013)

65. A school group charters three identical buses and occupies $\frac{4}{5}$ of the seats. After $\frac{1}{4}$ of the passengers leave, the remaining passengers use only two of the buses. The fraction of the seats on the two buses that are now occupied is

(1) $\frac{8}{9}$ (2) $\frac{7}{10}$

(3) $\frac{7}{9}$ (4) $\frac{9}{10}$

(SSC CGL Tier-II Exam. 12.04.2015 (TF No. 567 TL 9)

66. $0.\overline{123}$ is equal to :

(1) $\frac{14}{333}$ (2) $\frac{41}{333}$

(3) $\frac{123}{1000}$ (4) $\frac{441}{333}$

(FCI Assistant Grade-III Exam. 05.02.2012 (Paper-I) East Zone (IInd Sitting)

67. 0.393939 ..... is equal to

(1) $\frac{39}{100}$ (2) $\frac{13}{33}$

(3) $\frac{93}{100}$ (4) $\frac{39}{990}$

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

68. $\frac{1}{11}$ is equal to

(1) 0.009 (2) $0.0\overline{9}$

(3) $0.\overline{09}$ (4) $0.0\overline{09}$

(SSC CPO S.I. Exam. 09.11.2008)

69. The decimal fraction $2.3\overline{49}$ is equal to

(1) 2326 /999 (2) 2326/990

(3) 2347/999 (4) 2347/990

(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (IInd Sitting)

70. The value of

$\frac{1}{20}+\frac{1}{30}+\frac{1}{42}+\frac{1}{56}+\frac{1}{72}+\frac{1}{90}$ is

(1) $\frac{1}{10}$ (2) $\frac{3}{5}$

(3) $\frac{3}{20}$ (4) $\frac{7}{20}$

(SSC CHSL DEO & LDC Exam. 10.11.2013, Ist Sitting)

71. $1+\frac{1}{2}+\frac{1}{4}+\frac{1}{7}+\frac{1}{14}+\frac{1}{28}$ is equal to :

(1) 2 (2) 2.5

(3) 3 (4) 3.5

(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

72. $\frac{1}{20}+\frac{1}{30}+\frac{1}{42}+\frac{1}{56}+\frac{1}{72}$

$+\frac{1}{90}+\frac{1}{110}+\frac{1}{132}$ is equal to:

(1) $\frac{1}{8}$ (2) $\frac{1}{7}$

(3) $\frac{1}{6}$ (4) $\frac{1}{10}$

(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

73. Ram left $\frac{1}{3}$ of his property to his widow and $\frac{3}{5}$ of the remainder to his daughter. He gave the rest to his son who received Rs. 6,400. How much was his original property worth ?

(1) ₹ 16, 000 (2) ₹ 32, 000

(3) ₹ 24, 000 (4) ₹ 1, 600

(SSC CHSL DEO & LDC Exam. 9.11.2014)

74. A number exceeds its two fifth by 75. The number is

(1) 125 (2) 112

(3) 100 (4) 150

(SSC CGL Tier-I Exam, 09.08.2015 (IInd Sitting) TF No. 4239378)

75. If the sum of two numbers, one of which is $\frac{2}{5}$ times the other, is 50, then the numbers are

(1) $\frac{115}{7}$ and $\frac{235}{7}$

(2) $\frac{150}{7}$ and $\frac{200}{7}$

(3) $\frac{240}{7}$ and $\frac{110}{7}$

(4) $\frac{250}{7}$ and $\frac{100}{7}$

(SSC CGL Tier-I Exam, 09.08.2015 (IInd Sitting) TF No. 4239378)

76. If $\frac{3}{4}$ of a number is 7 more than $\frac{1}{6}$ of the number, then $\frac{5}{3}$ of the number is :

(1) 12 (2) 20

(3) 15 (4) 18

(SSC CGL Tier-I Exam, 16.08.2015 (Ist Sitting) TF No. 3196279)

77. The vulgar fraction of $0.39\overline{39}$ is :

(1) $\frac{15}{33}$ (2) $\frac{11}{39}$

(3) $\frac{17}{39}$ (4) $\frac{13}{33}$

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (IInd Sitting) TF No. 7203752)

78. The smallest fraction, which should be added to the sum of $2\frac{1}{2}$, $3\frac{1}{3}$, $4\frac{1}{4}$ and $5\frac{1}{5}$ to make the result a whole number, is

(1) $\frac{13}{60}$ (2) $\frac{1}{4}$

(3) $\frac{17}{60}$ (4) $\frac{43}{60}$

(SSC CGL Tier-II Online Exam.01.12.2016)

79. Which of teh following fractions does not lie between $\frac{5}{6}$ and $\frac{8}{15}$?

(1) $\frac{2}{3}$ (2) $\frac{3}{4}$

(3) $\frac{4}{5}$ (4) $\frac{6}{7}$

(SSC CPO SI & ASI, Online Exam. 06.06.2016) (IInd Sitting)

80. The numerator of a fraction is multiple of two numbers. One of the numbers is greater than the other by 2. The greater number is smaller than the denominator by 4. If the denominator $7 + c$ ($c > -7$) is a constant, then the minimum value of the fraction is

(1) 5 (2) $\frac{1}{5}$

(3) –5 (4) $\frac{-1}{5}$

(SSC CGL Tier-II (CBE) Exam. 30.11.2016)

81. The sum of three numbers is 2, the 1st number is $\frac{1}{2}$ times the 2nd number and the 3rd number is $\frac{1}{4}$ times the 2nd number. The 2nd number is

(1) $\frac{7}{6}$ (2) $\frac{8}{7}$

(3) $\frac{9}{8}$ (4) $\frac{10}{9}$

(SSC CGL Tier-II (CBE) Exam. 30.11.2016)

82. If $\frac{1}{2}$ is added to a number and the sum is multiplied by 3, the result is 21. Then the number is :
(1) 6.5 (2) 5.5
(3) 4.5 (4) – 6.5
(SSC CGL Tier-I (CBE) Exam. 04.09.2016 (IIIrd Sitting)

83. If $\frac{4}{5}$ th of a number exceeds its $\frac{3}{4}$ th by 8, then the number is :
(1) 130 (2) 120
(3) 160 (4) 150
(SSC CGL Tier-I (CBE) Exam. 06.09.2016 (IIIrd Sitting)

84. A mason can build a wall in 70 hours. After 7 hours he takes a break. What fraction of the wall is yet to be built?
(1) 0.9 (2) 0.8
(3) 0.5 (4) 0.75
(SSC CHSL (10+2) Tier-I (CBE) Exam. 15.01.2017) (IInd Sitting)

85. Two baskets together have 640 oranges. If $\left(\frac{1}{5}\right)$th of the oranges in the first basket be taken to the second basket. The number of oranges in the first basket is
(1) 800 (2) 600
(3) 400 (4) 300
(SSC CGL Tier-II (CBE) Exam. 12.01.2017)

TYPE–IV

1. Arrange $\frac{4}{5}, \frac{7}{8}, \frac{6}{7}, \frac{5}{6}$ in the ascending order :
(1) $\frac{4}{5}, \frac{7}{8}, \frac{6}{7}, \frac{5}{6}$ (2) $\frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{4}{5}$
(3) $\frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}$ (4) $\frac{7}{8}, \frac{6}{7}, \frac{5}{6}, \frac{4}{5}$
(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

2. Arrange the following fractions in decreasing order :
$\frac{3}{5}, \frac{7}{9}, \frac{11}{13}$
(1) $\frac{3}{5}, \frac{7}{9}, \frac{11}{13}$ (2) $\frac{7}{9}, \frac{3}{5}, \frac{11}{13}$
(3) $\frac{11}{13}, \frac{7}{9}, \frac{3}{5}$ (4) $\frac{11}{13}, \frac{3}{5}, \frac{7}{9}$
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

3. The fractions $\frac{1}{3}, \frac{4}{7}$ and $\frac{2}{5}$ written in ascending order given by:
(1) $\frac{4}{7} < \frac{1}{3} < \frac{2}{5}$ (2) $\frac{2}{5} < \frac{4}{7} < \frac{1}{3}$
(3) $\frac{1}{3} < \frac{2}{5} < \frac{4}{7}$ (4) $\frac{4}{7} > \frac{1}{3} > \frac{2}{5}$
(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

4. Six numbers are arranged in decreasing order. The average of the first five numbers is 30 and the average of the last five numbers is 25. The difference of the first and the last numbers is :
(1) 20 (2) 25
(3) 5 (4) 30
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (Ist Sitting) TF No. 6636838)

5. The sum of three consecutive integers is 51. The middle one is :
(1) 14 (2) 15
(3) 16 (4) 17
(SSC CGL Tier-I (CBE) Exam. 09.09.2016 (IIIrd Sitting)

TYPE–V

1. The digit in unit's place of the product $81 \times 82 \times 83 \times ... \times 89$ is
(1) 0 (2) 2
(3) 6 (4) 8
(SSC Section Officer (Commercial Audit) Exam. 16.11.2003)

2. The digit in unit's place of the product $(2153)^{167}$ is :
(1) 1 (2) 3
(3) 7 (4) 9
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

3. The digit in the unit's place of the product
$(2464)^{1793} \times (615)^{317} \times (131)^{491}$ is
(1) 0 (2) 2
(3) 3 (4) 5
(SSC CPO S.I. Exam. 05.09.2004)

4. Unit digit in $(264)^{102} + (264)^{103}$ is :
(1) 0 (2) 4
(3) 6 (4) 8
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

5. The digit in the unit's place of $[(251)^{98} + (21)^{29} - (106)^{100} + (705)^{35} - 16^4 + 259]$ is :
(1) 1 (2) 4
(3) 5 (4) 6
(SSC CGL Prelim Exam. 27.02.2000 (Second Sitting)

6. The last digit of 3^{40} is
(1) 1 (2) 3
(3) 7 (4) 9
(SSC CHSL DEO & LDC Exam. 28.10.2012 (Ist Sitting)

7. What will be the unit digit in the product 7^{105} ?
(1) 5 (2) 7
(3) 9 (4) 1
(SSC Section Officer (Commercial Audit) Exam. 25.09.2005)

8. The unit digit in the expansion of $(2137)^{754}$ is
(1) 1 (2) 3
(3) 7 (4) 9
(SSC CPO S.I. Exam. 07.09.2003 & SSC Section Officer (Commercial Audit) Exam. 30.09.2007 (Second Sitting)

9. One's digit of the number $(22)^{23}$ is
(1) 4 (2) 6
(3) 8 (4) 2
(SSC CPO S.I. Exam. 09.11.2008)

10. The unit digit in the product $(122)^{173}$ is
(1) 2 (2) 4
(3) 6 (4) 8
(SSC CGL Tier-1 Exam 19.06.2011 (First Sitting)

11. The unit digit in the sum of $(124)^{372} + (124)^{373}$ is
(1) 5 (2) 4
(3) 2 (4) 0
(SSC CGL Tier-1 Exam 19.06.2011 (Second Sitting)

12. The last digit of $(1001)^{2008} + 1002$ is
(1) 0 (2) 3
(2) 4 (4) 6
(SSC CGL Tier-1 Exam 26.06.2011 (First Sitting)

13. Find the unit digit in the product $(4387)^{245} \times (621)^{72}$.
(1) 1 (2) 2
(2) 5 (4) 7
(SSC CGL Tier-1 Exam 26.06.2011 (Second Sitting)

14. The units digit of the expression $25^{6251} + 36^{528} + 73^{54}$ is

(1) 6 (2) 5

(3) 4 (4) 0

(SSC Multi-Tasking (Non-Technical) Staff Exam. 20.02.2011)

15. The unit's digit in the product $7^{71} \times 6^{63} \times 3^{65}$ is

(1) 1 (2) 2

(3) 3 (4) 4

(SSC Multi-Tasking (Non-Technical) Staff Exam. 27.02.2011)

16. The digit in unit's place of the number $(1570)^2 + (1571)^2 + (1572)^2 + (1573)^2$ is :

(1) 4 (2) 1

(3) 2 (4) 3

(SSC CHSL DEO & LDC Exam. 21.10.2012, IInd Sitting)

17. The unit digit in $3 \times 38 \times 537 \times 1256$ is

(1) 4 (2) 2

(3) 6 (4) 8

(SSC CGL Tier-II Exam. 29.09.2013

18. In a two–digit number, the digit at the unit's place is 1 less than twice the digit at the ten's place. If the digits at unit's and ten's place are interchanged, the difference between the new and the original number is less than the original number by 20. The original number is

(1) 59 (2) 23

(3) 35 (4) 47

(SSC CHSL DEO & LDC Exam. 20.10.2013)

19. The digit in unit's place of the product $49237 \times 3995 \times 738 \times 83 \times 9$ is

(1) 0 (2) 7

(3) 5 (4) 6

(SSC CHSL DEO & LDC Exam. 16.11.2014

20. By interchanging the digits of a two digit number we get a number which is four times the original number minus 24. If the unit's digit of the original number exceeds its ten's digit by 7, then original number is

(1) 29 (2) 36

(3) 58 (4) 18

(SSC CGL Tier-II Exam, 2014 12.04.2015 (Kolkata Region) (TF No. 789 TH 7)

21. There is a number consisting of two digits, the digit in the units' place is twice that in the tens' place and if 2 be subtracted from the sum of the digits, the difference is equal to $\frac{1}{6}$ th of the number. The number is

(1) 26 (2) 25

(3) 24 (4) 23

(SSC CGL Tier-II Exam, 25.10.2015, TF No. 1099685)

TYPE–VI

1. The sum of three consecutive odd natural numbers is 147. Then, the middle number is :

(1) 47 (2) 48

(3) 49 (4) 51

(SSC CGL Exam. 04.07.1999 (IInd Sitting)

2. The sum of first 20 odd natural numbers is equal to :

(1) 210 (2) 300

(3) 400 (4) 420

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

3. The sum of all natural numbers from 75 to 97 is :

(1) 1598 (2) 1798

(3) 1958 (4) 1978

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

4. The sum of all natural numbers between 100 and 200, which are multiples of 3 is :

(1) 5000 (2) 4950

(3) 4980 (4) 4900

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

5. The sum of the squares of three consecutive natural numbers is 2030. Then, what is the middle number?

(1) 25 (2) 26

(3) 27 (4) 28

(SSC CGL Exam. 27.02.2000 (IInd Sitting)

6. The sum of three consecutive odd natural numbers is 87. The smallest of these numbers is :

(1) 29 (2) 31

(3) 23 (4) 27

(SSC CGL Exam. 24.02.2002 (Ist Sitting)

7. Sum of three consecutive even integers is 54. Find the least among them.

(1) 18 (2) 15

(3) 14 (4) 16

(SSC CGL Exam. 24.02.2002 (IInd Sitting)

8. The sum of three consecutive numbers is 87. The middle number is

(1) 27 (2) 29

(3) 30 (4) 28

(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

9. What is the sum of two consecutive even numbers, the difference of whose square is 84?

(1) 38 (2) 34

(3) 42 (4) 46

(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

10. The sum of all the natural numbers from 51 to 100 is

(1) 5050 (2) 4275

(3) 4025 (4) 3775

(SSC CPO S.I. Exam. 05.09.2004)

11. The sum of all the 2-digit numbers is :

(1) 4995 (2) 4950

(3) 4945 (4) 4905

(SSC CPO S.I. Exam. 26.05.2005)

12. The sum of first 50 odd natural numbers is

(1) 1000 (2) 1250

(3) 5200 (4) 2500

(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

13. The sum of all the 3-digit numbers, each of which on division by 5 leaves remainder 3, is

(1) 180 (2) 1550

(3) 6995 (4) 99090

(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

14. The sum of all the 3-digit numbers is

(1) 98901 (2) 494550

(3) 8991 (4) 899

(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

15. Out of six consecutive natural numbers, if the sum of first three is 27, what is the sum of the other three ?

(1) 36 (2) 35

(3) 25 (4) 24

(SSC CGL Tier-I Exam. 16.05.2010 (Second Sitting)

16. Which one of the following is a factor of the sum of first twenty-five natural numbers ?
(1) 26 (2) 24
(3) 13 (4) 12
(SSC CISF ASI Exam 29.08.2010 (Paper-1)

17. The sum of all even numbers between 21 and 51 is
(1) 518 (2) 540
(3) 560 (4) 596
(SSC CISF ASI Exam 29.08.2010 (Paper-1)

18. The sum of four consecutive even numbers is 748. The smallest among them is
(1) 188 (2) 186
(3) 184 (4) 174
(SSC CISF ASI Exam 29.08.2010 (Paper-1)

19. If the sum of five consecutive integers is S, then the largest of those integers in terms of S is
(1) $\frac{S-10}{5}$ (2) $\frac{S+4}{4}$
(3) $\frac{S+5}{4}$ (4) $\frac{S+10}{5}$
(SSC CHSL DEO & LDC Exam. 04.12.2011 (Ist Sitting (East Zone)

20. The sum of all those prime numbers which are not greater than17 is
(1) 59 (2) 58
(3) 41 (4) 42
(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (IInd Sitting)

21. The sum of the squares of 3 consecutive positive numbers is 365. The sum of the numbers is
(1) 30 (2) 33
(3) 36 (4) 45
(SSC Multi-Tasking (Non-Technical) Staff Exam. 22.02.2011)

22. Find three consecutive numbers such that twice the first, three times the second and four times the third together make 191.
(1) 19, 20, 21 (2) 21, 22, 23
(3) 20, 21, 22 (4) 22, 23, 24
(SSC Multi-Tasking Staff Exam. 24.03.2013, Ist Sitting)

23. The sum of three consecutive odd natural numbers each divisible by 3 is 72. What is the largest among them?
(1) 21 (2) 24
(3) 27 (4) 36
(SSC CGL Exam. 04.07.1999 (Ist Sitting)

24. Find the sum of all positive multiples of 3 less than 50
(1) 400 (2) 404
(3) 408 (4) 412
(SSC CGL Tier-II Exam. 21.09.2014

25. What is the arithmetic mean of first 20 odd natural numbers ?
(1) 19 (2) 17
(3) 22 (4) 20
(SSC CGL Tier-I Exam, 16.08.2015 (Ist Sitting) TF No. 3196279)

26. Two positive whole numbers are such that the sum of the first number and twice the second number is 8 and their difference is 2. The numbers are :
(1) 7,5 (2) 6,4
(3) 4,2 (4) 3,5
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 06.12.2015 (IInd Sitting) TF No. 3441135)

27. The sum of three consecutive natural numbers divisible by 3 is 45. The smallest number is :
(1) 18 (2) 3
(3) 12 (4) 9
(SSC CAPFs (CPO) SI & ASI, Delhi Police Exam. 20.03.2016) (IInd Sitting)

28. The sum of three consecutive natural numbers each divisible by 5, is 225. The largest among them is
(1) 85 (2) 75
(3) 70 (4) 80
(SSC CGL Tier-I (CBE) Exam. 28.08.2016) (IInd Sitting)

TYPE–VII

1. If we write 45 as sum of four numbers so that when 2 is added to first number, 2 subtracted from second number, third multiplied by 2 and fourth divided by 2, we get the same result, then the four numbers are :
(1) 1, 8, 15, 21 (2) 8, 12, 5, 20
(3) 8, 12, 10, 15 (4)2, 12, 5, 26
(SSC CGL Exam. 04.07.1999 (IInd Sitting)

2. 12345679 × 72 is equal to :
(1) 88888888 (2) 999999998
(3) 888888888 (4) 898989898
(SSC CGL Exam. 27.02.2000 (Ist Sitting)

3. Given that $0.111 \ldots = \frac{1}{9}$; 0.444 is equal to :
(1) $\frac{1}{90}$ (2) $\frac{2}{45}$
(3) $\frac{1}{99}$ (4) $\frac{4}{9}$
(SSC CGL Exam. 27.02.2000 (Ist Sitting)

4. $8.3\dot{1} + 0.\dot{6} + 0.00\dot{2}$ is equal to:
(1) $8.9\dot{1}\dot{2}$ (2) $8.91\dot{2}$
(3) $8.97\dot{9}$ (4) $8.97\dot{9}$
(SSC CGL Exam. 24.02.2002 (Ist Sitting)

5. The value of $\left(0.\overline{63} + 0.\overline{37}\right)$ is
(1) 1 (2) $\frac{100}{99}$
(3) $\frac{99}{100}$ (4) $\frac{100}{33}$
(SSC CHSL DEO & LDC Exam. 28.10.2012 (Ist Sitting)

6. $\left(0.\overline{11} + 0.\overline{22}\right) \times 3$ is equal to
(1) 3 (2) $1.\overline{9}$
(3) 1 (4) $0.\overline{3}$
(SSC CPO S.I. Exam. 12.12.2010 (Paper-I)

7 . Find the value of
$\frac{1}{5} + 999\frac{494}{495} \times 99$
(1) 90000 (2) 99000
(3) 90900 (4) 99990
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

8. If * means adding 6 times the second number to the first number then (1 * 2) * 3 equals :
(1) 121 (2) 31
(3) 93 (4) 91
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

9. The value of $999\frac{995}{999} \times 999$ is
(1) 990809 (2) 998996
(3) 999824 (4) 998999
(SSC CGL Prelim Exam. 11.05.2003 (Ist Sitting) & (SSC CGL Prelim Exam. 27.07.2008 (IInd Sitting)

10. $1.\overline{2} \times 0.\overline{03} =$

(1) $0.\overline{04}$ (2) $0.0\overline{36}$

(3) $1.\overline{13}$ (4) $0.\overline{037}$

(SSC CPO S.I. Exam. 06.09.2009)

11. Given that

$3.718 = \frac{1}{0.2689}$; then $\frac{1}{0.0003718}$

is equal to

(1) 2689 (2) 2.689

(3) 26890 (4) 0.2689

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

12. If a and b are two distinct natural numbers, which one of the following is true ?

(1) $\sqrt{a+b} > \sqrt{a} + \sqrt{b}$

(2) $\sqrt{a+b} = \sqrt{a} + \sqrt{b}$

(3) $\sqrt{a+b} < \sqrt{a} + \sqrt{b}$

(4) $ab = 1$

(SSC CPO S.I. Exam. 16.12.2007)

13. Which one of the following numbers is **not** a square of any natural number ?

(1) 17956 (2) 18225

(3) 63592 (4) 53361

(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

14. $0.\overline{142857} \div 0.\overline{285714}$ is equal to

(1) 10 (2) 2

(3) $\frac{1}{2}$ (4) $\frac{1}{3}$

(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

15. The difference of $5.\overline{76}$ and $2.\overline{3}$ is

(1) $2.\overline{54}$ (2) $3.\overline{73}$

(3) $3.\overline{46}$ (4) $3.\overline{43}$

(SSC CISF ASI Exam 29.08.2010 (Paper-1)

16. When simplified the product

$\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right).....\left(1-\frac{1}{n}\right)$,

it becomes :

(1) $\frac{1}{n}$ (2) $\frac{2}{n}$

(3) $\frac{2(n-1)}{n}$ (4) $\frac{2}{n(n+1)}$

(SSC CGL Prelim Exam. 27.02.2000 (First Sitting)

17. $2.8\overline{768}$ is equal to

(1) $2\frac{4394}{4995}$ (2) $2\frac{292}{333}$

(3) $2\frac{9}{10}$ (4) $2\frac{878}{999}$

(SSC CPO S.I. Exam. 03.09.2006)

18. Numbers 2, 4, 6, 8, 10, ..., 196, 198, 200 are multiplied together. The number of zeros at the end of the product on the right will be equal to —

(1) 21 (2) 22

(3) 24 (4) 25

(SSC Data Entry Operator Exam. 31.08.2008)

19. 7, 77, 77, 777 ÷ 77 equals

(1) 1111 (2) 101001

(3) 10101 (4) 1010101

(SSC Data Entry Operator Exam. 02.08.2009)

20. $8.3\overline{1} + 0.\overline{6} + 0.00\overline{2}$ is equal to

(1) $8.\overline{912}$ (2) $8.91\overline{2}$

(3) $8.979\overline{9}$ (4) $8.9\overline{79}$

(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting)

21. The value of $0.\overline{2} + 0.\overline{3} + 0.\overline{32}$ is :

(1) $0.\overline{87}$ (2) $0.\overline{77}$

(3) $0.\overline{82}$ (4) $0.\overline{86}$

(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

22. The value of $\left(0.\overline{63} + 0.\overline{37}\right)$ is

(1) 1 (2) $\frac{100}{99}$

(3) $\frac{99}{100}$ (4) $\frac{100}{33}$

(SSC CHSL DEO & LDC Exam. 28.10.2012 (Ist Sitting)

23. If $\frac{51.84}{4.32} = 12$, then the value of

$\frac{0.005184}{0.432}$ is

(1) 0.12 (2) 0.012

(3) 0.0012 (4) 1.2

(SSC Assistant Grade-III Exam. 11.11.2012 (IInd Sitting)

24. The value of

$\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right).....\left(1+\frac{1}{120}\right)$ is

(1) 30 (2) 40.5

(3) 60.5 (4) 121

(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

25. Sum of two numbers is 40 and their product is 375. What will be the sum of their reciprocals?

(1) $\frac{8}{75}$ (2) $\frac{1}{40}$

(3) $\frac{75}{8}$ (4) $\frac{75}{4}$

(SSC CGL Exam. 04.07.1999 (Ist Sitting)

26. The sum and product of two numbers are 12 and 35 respectively. What will be the sum of their reciprocals?

(1) $\frac{1}{3}$ (2) $\frac{1}{5}$

(3) $\frac{12}{35}$ (4) $\frac{35}{12}$

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

27. If the sum of two numbers is 3 and the sum of their squares is 12,then their product is equal to :

(1) $\frac{3}{2}$ (2) $\frac{2}{3}$

(3) $-\frac{3}{2}$ (4) $-\frac{2}{3}$

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

28. 800 chocolates were distributed among the students of a class. East student got twice as many chocolates as the number of students in the class. The number of students in the class was :

(1) 25 (2) 30

(3) 35 (4) 20

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

29. The numbers 2, 4, 6, 8 ...., 98, 100 are multiplied together. The number of zeros at the end of the product must be :

(1) 13 (2) 12

(3) 11 (4) 10

(SSC CGL Exam. 27.02.2000 (Ist Sitting)

30. How many digits in all are required to write numbers from 1 to 50?

(1) 100 (2) 92

(3) 91 (4) 50

(SSC CGL Exam. 27.02.2000 (IInd Sitting)

31. If doubling a number and adding 20 to the result gives the same answer as multiplying the number by 8 and taking away 4 from the product, the number is :
(1) 2 (2) 3
(3) 4 (4) 6
(SSC CGL Exam. 27.02.2000 (IInd Sitting)

32. A number of friends decided to go on a picnic and planned to spend ₹ 108 on eatables. Three of them however did not turn up. As a consequence each one of the remaining had to contribute ₹ 3 extra. The number of them who attended the picnic was :
(1) 15 (2) 12
(3) 9 (4) 6
(SSC CGL Exam. 27.02.2000 (IInd Sitting)

33. The numbers 1, 3, 5,7 .., 99 and128 are multiplied together. The number of zeros at the end of the product must be :
(1) 19 (2) 22
(3) 7 (4) Nil
(SSC CGL Exam. 27.02.2000 (IInd Sitting)

34. The sum of the squares of two positive numbers is 100 and difference of their squares is 28. Find the sum of the numbers :
(1) 12 (2) 13
(3) 14 (4) 15
(SSC CGL Exam. 24.02.2002 (Ist Sitting)

35. The simplified value of
$\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right)...\left(1-\frac{1}{99}\right)\left(1-\frac{1}{100}\right)$
is
(1) $\frac{2}{99}$ (2) $\frac{1}{25}$
(3) $\frac{1}{50}$ (4) $\frac{1}{100}$
(SSC CGL Prelim Exam. 11.05.2003 (Ist Sitting) & (SSC CGL Prelim Exam. 13.11.2205 (Ist Sitting) & (SSC CGL Prelim Exam. 27.07.2008 (IInd Sitting)

36. The product of two numbers is 120. The sum of their squares is 289. The difference of these two numbers is
(1) 9 (2) 7
(3) 8 (4) 6
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

37. The sum and product of two numbers are 10 and 24 respectively. The sum of their reciprocals is
(1) $\frac{1}{2}$ (2) $\frac{5}{12}$
(3) $\frac{7}{12}$ (4) $\frac{12}{5}$
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

38. $\left(99\frac{1}{7}+99\frac{2}{7}+99\frac{3}{7}+99\frac{4}{7}+99\frac{5}{7}+99\frac{6}{7}\right)$
is equal to
(1) 603 (2) 600
(3) 598 (4) 597
(SSC CHSL DEO & LDC Exam. 28.11.2010 (IInd Sitting)

39. 380 mangoes are distributed among some boys and girls who are 85 in number. Each boy gets four mangoes and each girl gets five. The number of boys is
(1) 15 (2) 38
(3) 40 (4) 45
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

40. The product of two positive numbers is 2500. If one number is four times the other, then the sum of the two numbers is :
(1) 25 (2) 125
(3) 225 (4) 250
(SSC CGL Exam. 24.02.2002 (IInd Sitting)

41. In a two digit number if it is known that its units digit exceeds its tens digit by 2 and that the product of the given number and the sum of its digits is equal to 144, then the number is
(1) 46 (2) 42
(3) 26 (4) 24
(SSC CPO S.I. Exam. 12.01.2003)

42. In a test, 1 mark is awarded for each correct answer and one mark is deducted for each wrong answer. If a boy answers all 20 items of the test and gets 8 marks, the number of questions answered correct by him was
(1) 16 (2) 14
(3) 12 (4) 8
(SSC CPO S.I. Exam. 12.01.2003)

43. A number of boys raised ₹ 400 for a famine relief fund, each boy giving as many 25 paise coins as there were boys. The number of boys was :
(1) 40 (2) 16
(3) 20 (4) 100
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

44. Thrice the square of a natural number decreased by four times the number is equal to 50 more than the number. The number is:
(1) 4 (2) 5
(3) 10 (4) 6
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

45. The difference between two positive numbers is 3. If the sum of their squares is 369, then the sum of the numbers is :
(1) 81 (2) 33
(3) 27 (4) 25
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

46. A number consists of two digits such that the digit in the ten's place is less by 2 than the digit in the unit's place. Three times the number added to $\frac{6}{7}$ times the number obtained by reversing the digits equals 108. The sum of digits in the number is :
(1) 8 (2) 9
(3) 6 (4) 7
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

47. Of the three numbers, the second is twice the first and it is also thrice the third. If the average of three numbers is 44, the difference of the first number and the third number is :
(1) 24 (2) 18
(3) 12 (4) 6
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

48. A two digit number is five times the sum of its digits. If 9 is added to the number, the digits interchange their positions. The sum of digits of the number is :
(1) 11 (2) 9
(3) 7 (4) 6
(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

49. How many numbers less than 1000 are multiples of both 10 and 13 ?
(1) 9 (2) 8
(3) 6 (4) 7
(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

50. The number 1, 2, 3, 4, ..., 1000 are multiplied together. The number of zeros at the end (on the right) of the product must be :
(1) 30 (2) 200
(3) 211 (4) 249
(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

51. If the difference of two numbers is 3 and the difference of their squares is 39, then the larger number is
(1) 8 (2) 9
(3) 12 (4) 13
(SSC CGL Prelim Exam. 13.11.2005 (IInd Sitting) & SSC CHSL DEO & LDC Exam. 04.11.2012)

52. 7 is added to a certain number; the sum is multiplied by 5; the product is divided by 9 and 3 is subtracted from the quotient. Thus if the remainder left is 12, what was the original number ?
(1) 30 (2) 20
(3) 40 (4) 60
(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting)

53. On multiplying a number by 7, all the digits in the product appear as 3's. the smallest such number is
(1) 47649 (2) 47719
(3) 47619 (4) 48619
(SSC CPO S.I. Exam. 03.09.2006)

54. A 2-digit number is 3 times the sum of its digits. If 45 is added to the number, its digits are interchanged. The sum of digits of the number is
(1) 11 (2) 9
(3) 7 (4) 5
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

55. The numbers 2272 and 875 are divided by a 3-digit number N, giving the same remainders. The sum of the digits of N is
(1) 10 (2) 11
(3) 12 (4) 13
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

56. The sum and product of two numbers are 12 and 35 respectively. The sum of their reciprocals will be
(1) $\frac{12}{35}$ (2) $\frac{1}{35}$
(3) $\frac{35}{8}$ (4) $\frac{7}{32}$
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

57. Of the three numbers, the second is twice the first and is also thrice the third. If the average of these three numbers is 44, the largest number is
(1) 24 (2) 36
(3) 72 (4) 108
(SSC Section Officer (Commercial Audit) Exam. 30.09.2007 (Second Sitting)

58. The sum of the digits of a two digit number is 10. The number formed by reversing the digits is 18 less than the original number. Find the original number.
(1) 81 (2) 46
(3) 64 (4) 60
(SSC CPO S.I. Exam. 06.09.2009)

59. Five times of a positive integer is equal to 3 less than twice the square of that number. The number is
(1) 3 (2) 13
(3) 23 (4) 33
(SSC CPO S.I. Exam. 06.09.2009)

60. The product of two numbers is 24 times the difference of these two numbers. If the sum of these numbers is 14, the larger number is
(1) 9 (2) 8
(3) 7 (4) 10
(SSC CPO S.I. Exam. 06.09.2009)

61. The product of two numbers is 0.008. One of the number is $\frac{1}{5}$ of the other. The smaller number is
(1) 0.2 (2) 0.4
(3) 0.02 (4) 0.04
(SSC SAS Exam 26.06.2010 (Paper-1)

62. I multiplied a natural number by 18 and another by 21 and added the products. Which one of the following could be the sum?
(1) 2007 (2) 2008
(3) 2006 (4) 2002
(SSC CGL Tier-1 Exam 19.06.2011 (First Sitting)

63. If the sum of two numbers be multiplied by each number separately, the products so obtained are 247 and 114. The sum of the numbers is
(1) 19 (2) 20
(3) 21 (4) 23
(SSC CGL Tier-1 Exam 26.06.2011 (First Sitting)

64. If a and b are odd numbers, then which of the following is even ?
(1) $a + b + ab$ (2) $a + b - 1$
(3) $a + b + 1$ (4) $a + b + 2ab$
(SSC CGL Tier-1 Exam 26.06.2011 (Second Sitting)

65. If two numbers x and y separately divided by a number d, remainders obtained are 4375 and 2986 respectively. If the sum of the numbers i.e $(x+y)$ is divided by the same number d remainder obtained is 2361. The value of number d is
(1) 7361 (2) 5000
(3) 4000 (4) 2542
(SSC CPO S.I. Exam.09.11.2008)

66. A farmer divides his herd of n cows among his four sons so that the first son gets one – half the herd, the second son gets one – fourth, the third son gets one – fifth and the fourth son gets 7 cows. The value of n is
(1) 80 (2) 100
(3) 140 (4) 180
(SSC CPO S.I. Exam. 09.11.2008)

67. In an examination, a student scores 4 marks for every correct answer and loses 1 mark for every wrong answer. A student attempted all the 200 questions and scored in all 200 marks. The number of questions, he answered correctly was
(1) 82 (2) 80
(3) 68 (4) 60
(SSC CGL Tier-I Exam. 16.05.2010 (Second Sitting)

68. In an examination, a student scores 4 marks for every correct answer and loses 1 mark for every wrong answer. If he attempts all 75 questions and secures 125 marks, the number of questions he attemtpts correctly is
(1) 35 (2) 40
(3) 42 (4) 46
(SSC CGL Tier-1 Exam. 26.06.2011 (First Sitting)

69. The product of two numbers is 120 and the sum of their squares is 289. The sum of the two numbers is
(1) 23 (2)7
(3) 13 (4) 169
(SSC Data Entry Operator Exam. 31.08.2008)

70. The sum and product of two numbers are 11 and 18 respectively. The sum of their reciprocals is

(1) $\frac{2}{11}$ (2) $\frac{11}{2}$

(3) $\frac{18}{11}$ (4) $\frac{11}{18}$

(SSC Data Entry Operator Exam. 02.08.2009)

71. A man ate 100 grapes in 5 days. Each day, he ate 6 more grapes than those he ate on the earlier day. How many grapes did he eat on the first day ?

(1) 8 (2) 12

(3) 54 (4) 76

(SSC Data Entry Operator Exam. 02.08.2009)

72. Instead of multiplying a number by 0.72, a student multiplied it by 7.2. If his answer was 2592 more than the correct answer, then the original number was

(1) 400 (2) 420

(3) 500 (4) 560

(SSC Data Entry Operator Exam. 02.08.2009)

73. Of the three numbers, the sum of the first two is 55, sum of the second and third is 65 and sum of third with thrice of the first is 110. The third number is

(1) 25 (2) 30

(3) 35 (4) 28

(SSC CHSL DEO & LDC Exam. 04.12.2011 (Ist Sitting (North Zone)

74. A number consists of two digits and the digit in the ten's place exceeds that in the unit's place by 5. If 5 times the sum of the digits be subtracted from the number, the digits of the number are reversed. Then the sum of digits of the number is

(1) 11 (2) 7

(3) 9 (4) 13

(SSC CHSL DEO & LDC Exam. 04.12.2011 (IInd Sitting (North Zone)

75. In a three-digit number, the digit at the hundred's place is two times the digit at the unit's place and the sum of the digits is 18. If the digits are reversed, the number is reduced by 396. The difference of hundred's and ten's digit of the number is

(1) 1 (2) 2

(3) 3 (4) 5

(SSCCHSL DEO & LDC Exam. 04.12.2011 (IInd Sitting (East Zone)

76. If the digits in the unit and the ten's places of a three digit number are interchanged, a new number is formed, which is greater than the original number by 63. Suppose the digit in the unit place of the original number be x. Then, all the possible values of x are

(1) 7, 8, 9 (2) 2, 7, 9

(3) 0, 1, 2 (4) 1, 2, 8

(SSC CHSL DEO & LDC Exam. 11.12.2011 (Ist Sitting (East Zone)

77. The sum of a natural number and its square equals the product of the first three prime numbers. The number is

(1) 2 (2) 3

(3) 5 (4) 6

(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (Ist Sitting)

78. A man has some hens and cows. If the number of heads : number of feet = 12 : 35, find out the number of hens, if the number of heads alone is 48.

(1) 28 (2) 26

(3) 24 (4) 22

(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (Ist Sitting)

79. The length of a road is one kilometre. The number of plants required for plantation at a gap of 20 metres in both sides of the road is

(1) 102 (2) 100

(3) 51 (4) 50

(SSC CHSL DEO & LDC Exam. 28.10.2012 (Ist Sitting)

80. $999\frac{98}{99} \times 99$ is equal to :

(1) 98999 (2) 99899

(3) 99989 (4) 99998

(SSC CHSL DEO Entry Operator & LDC Exam. 28.11.2010 (Ist Sitting)

81. The sum of a two digit number and the number obtained by reversing its digits is a square number. How many such numbers are there ?

(1) 5 (2) 6

(3) 7 (4) 8

(SSC Multi-Tasking (Non-Technical) Staff Exam. 27.02.2011)

82. The value of $99\frac{95}{99} \times 99$ is

(1) 9798 (2) 9997

(3) 9898 (4) 9896

(SSC CPO S.I. Exam. 06.09.2009)

83. There are 50 boxes and 50 persons. Person 1 keeps 1 marble in every box. Person 2 keeps 2 marbles in every 2nd box, person 3 keeps 3 marbles in every third box. This process goes on till person 50 keeps 50 marbles in the 50th box. Find the total number of marbles kept in the 50th box.

(1) 43 (2) 78

(3) 6 (4) 93

(SSC FCI Assistant Grade-III Main Exam. 07.04.2013)

84. 252 m of pant cloth and 141 m of shirt cloth are available in a cloth store. To stitch one pant and one shirt, $2\frac{1}{2}$ m and $1\frac{3}{4}$ m of cloth are needed respectively. Then the approximate number of pants and shirts that can be made out of it are

(1) (80,100) (2) (100,80)

(3) (100,90) (4) (90,80)

(SSC FCI Assistant Grade-III Main Exam. 07.04.2013)

85. The number 323 has

(1) three prime factors

(2) five prime factors

(3) two prime factors

(4) no prime factor

(SSC CGL Tier-I Exam. 21.04.2013 IInd Sitting)

86. The product of two positive numbers is 2500. If one number is four times the other, the sum of the two numbers is :

(1) 25 (2) 125

(3) 225 (4) 250

(SSC CGL Exam. 24.02.2002 (IInd Sitting)

87. Mohan gets 3 marks for each correct sum and loses 2 marks for each wrong sum. He attempts 30 sums and obtains 40 marks. The number of sums solved correctly is :

(1) 15 (2) 20

(3) 25 (4) 10

(SSC CGL Tier-I Exam. 21.04.2013)

88. If $a * b = a + b + \frac{a}{b}$, then the value of 12 * 4 is :
(1) 20 (2) 21
(3) 48 (4) 19
(SSC CGL Tier-I Exam. 21.04.2013)

89. Find the maximum number of trees which can be planted, 20 metres apart, on the two sides of a straight road 1760 metres long
(1) 180 (2) 178
(3) 174 (4) 176
(SSC CGL Tier-I Exam. 21.04.2013)

90. A and B have together three times what B and C have, while A, B, C together have thirty rupees more than that of A. If B has 5 times that of C, then A has
(A) ₹ 60 (2) ₹ 65
(3) ₹ 75 (4) ₹ 45
(SSC CGL Tier-I Exam. 21.04.2013)

91. If sum of two numbers be a and their product be b, then the sum of their reciprocals is
(1) $\frac{1}{a}+\frac{1}{b}$ (2) $\frac{b}{a}$
(3) $\frac{a}{b}$ (4) $\frac{1}{ab}$
(SSC Constable (GD) Exam. 12.05.2013 Ist Sitting)

92. $\left(999\frac{999}{1000}\times 7\right)$ is equal to:
(1) $6993\frac{7}{1000}$ (2) $7000\frac{7}{1000}$
(3) $6633\frac{7}{1000}$ (4) $6999\frac{993}{1000}$
(SSC CPO S.I. Exam. 16.12.2007)

93. In a factory one out of every 9 is a female worker. If the number of female workers is 125, the total number of workers is
(1) 1250 (2) 1125
(3) 1025 (4) 1000
(SSC Constable (GD) Exam. 12.05.2013)

94. $999\frac{1}{7}+999\frac{2}{7}+999\frac{3}{7}+999\frac{4}{7}+999\frac{5}{7}+999\frac{6}{7}$
is simplified to :
(1) 5997 (2) 5979
(3) 5994 (4) 2997
(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

95. 'a' divides 228 leaving a remainder 18. The biggest two–digit value of 'a' is
(1) 70 (2) 21
(3) 35 (4) 30
(SSC CHSL DEO & LDC Exam. 20.10.2013)

96. In a division sum, the divisor is 12 times the quotient and 5 times the remainder. If the remainder is 36, then the dividend is
(1) 2706 (2) 2796
(3) 2736 (4) 2826
(SSC CHSL DEO & LDC Exam. 27.10.2013 IInd Sitting)

97. The sum of two number is 8 and their product is 15. The sum of their reciprocals is
(1) $\frac{8}{15}$ (2) $\frac{15}{8}$
(3) 23 (4) 7
(SSC CHSL DEO & LDC Exam. 28.11.2010 (IInd Sitting)

98. A number is doubled and 9 is added. If the resultant is trebled, it becomes 75. What is that number ?
(1) 6 (2) 3.5
(3) 8 (4) None of these
(SSC CGL Exam. 04.07.1999 (IInd Sitting)

99. If the operation ' * ' is defined by $a * b = a + b - ab$, then 5 * 7 equals
(1) 12 (2) –47
(3) –23 (4) 35
(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014

100. A man engaged a servant on the condition that he would pay him ₹ 90 and a turban after service of one year. He served only for nine months and received the turban and an amount of ₹ 65. The price of turban is
(1) ₹ 25 (2) ₹ 18.75
(3) ₹ 10 (4) ₹ 2.50
(SSC CHSL DEO & LDC Exam. 16.11.2014

101. If a certain number of two digits is divided by the sum of its digits, the quotient is 6 and the remainder is 3. If the digits are reversed and the resulting number is divided by the sum of the digits, the quotient is 4 and the remainder is 9. The sum of the digits of the number is
(1) 6 (2) 9
(3) 12 (4) 4
(SSC CGL Tier-II Exam, 2014 12.04.2015 (Kolkata Region) (TF No. 789 TH 7)

102. Among the following statements, the statement which is **not correct** is :
(1) Every natural number is an integer.
(2) Every natural number is a real number.
(3) Every real number is a rational number.
(4) Every integer is a rational number.
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (IInd Sitting) TF No. 7203752)

103. If $p = -0.12$, $q = -0.01$ and $r = -0.015$, then the correct relationship among the three is :
(1) $q > p > r$ (2) $p > r > q$
(3) $p > q > r$ (3) $p < r < q$
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 06.12.2015 (IInd Sitting) TF No. 3441135)

104. In an exam the sum of the scores of A and B is 120, that of B and C is 130 and that of C and A is 140. Then the score of C is :
(1) 65 (2) 75
(3) 70 (4) 60
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 06.12.2015 (IInd Sitting) TF No. 3441135)

105. What decimal of a week is an hour ?
(1) 0.0059 (2) 0.0062
(3) 0.062 (4) 0.059
(SSC CPO Exam. 06.06.2016) (Ist Sitting)

106. The value of x in the following equation is :
$0.\dot{3}+0.\dot{6}+0.\dot{7}+0.\dot{8} = x$
(1) 5.3 (2) $2\frac{3}{10}$
(3) $2\frac{2}{3}$ (4) $2.\dot{3}\dot{5}$
(SSC CAPFs (CPO) SI & ASI, Delhi Police Exam. 20.03.2016) (IInd Sitting)

7. Natu and Buchku each have certain number of oranges. Natu says to Buchku, "If you give me 10 of your oranges, I will have twice the number of oranges left with you". Buchku replies,"If you give me 10 of your oranges, I will have the same number of oranges as left with you". What is the number of oranges with Natu and Buchku, respectively ?
(1) 50, 20 (2) 70, 50
(3) 20, 50 (4) 50, 70
(SSC CGL Tier-II (CBE) Exam. 12.01.2017)

SHORT ANSWERS

TYPE-I

1. (4)	**2.** (1)	**3.** (4)	**4.** (4)
5. (4)	**6.** (4)	**7.** (4)	**8.** (2)
9. (1)	**10.** (2)	**11.** (2)	**12.** (2)
13. (2)	**14.** (3)	**15.** (4)	**16.** (4)
17. (4)	**18.** (2)	**19.** (1)	**20.** (2)
21. (1)	**22.** (2)		

TYPE-II

1. (2)	**2.** (4)	**3.** (4)	**4.** (1)
5. (2)	**6.** (2)	**7.** (2)	**8.** (2)
9. (2)	**10.** (2)	**11.** (4)	**12.** (1)
13. (3)	**14.** (2)	**15.** (4)	**16.** (2)
17. (4)	**18.** (2)	**19.** (3)	**20.** (4)
21. (2)	**22.** (3)	**23.** (2)	**24.** (4)
25. (2)	**26.** (4)	**27.** (4)	**28.** (3)
29. (4	**30.** (3)	**31**. (1)	**32.** (4)
33. (3)	**34.** (4	**35.** (3)	**36.** (4)
37. (4)	**38.** (3)	**39.** (1)	**40.** (1)
41. (*)	**42.** (3)	**43.** (2)	**44.** (2)
45. (3)	**46.** (4)	**47.** (4	**48.** (2)
49. (4)	**50.** (1)	**51.** (4)	**52.** (3)
53. (2)	**54.** (3)	**55.** (2)	**56.** (2)
57. (3)	**58.** (2)	**59.** (3)	**60.** (4)
61. (1)	**62.** (1)	**63.** (1)	**64.** (4
65. (1)	**66.** (4)	**67.** (1)	**68.** (3)
69. (3)	**70.** (3)	**71.** (2)	**72.** (2)
73. (1)	**74.** (2)	**75.** (1)	**76.** (4)
77. (2)	**78.** (3)	**79.** (2)	**80.** (4)
81. (3)	**82.** (1)	**83.** (3)	**84.** (1)
85. (2)	**86.** (2)	**87.** (2)	**88.** (3)
89. (3)	**90.** (3)	**91.** (3)	**92.** (4)
93. (4)	**94.** (4)	**95.** (2)	**96.** (4)
97. (2)	**98.** (1)	**99.** (4)	**100.** (2)
101. (3)	**102.** (1)	**103.** (2)	**104.** (2)
105. (2)	**106.** (3)	**107.** (1)	**108.** (1)
109. (2)	**110.** (1)	**111.** (3)	**112.** (3)
113. (2)	**114.** (2)	**115.** (3)	**116.** (4)
117. (4)	**118.** (2)	**119.** (2)	**120.** (4)
121. (2)	**122.** (2)	**123.** (3)	**124.** (3)
125. (2)	**126.** (4)	**127.** (4)	**128.** (3)
129. (1)	**130.** (3)	**131.** (3)	**132.** (2)
133. (4)	**134.** (2)	**135.** (1)	**136.** (2)
137. (3)	**138.** (2)	**139.** (2)	**140.** (1)
141. (1)	**142.** (2)	**143.** (3)	**144.** (3)
145. (1)	**146.** (2)	**147.** (4)	**148.** (1)
149. (1)	**150.** (3)	**151.** (3)	**152.** (4)
153. (2)	**154.** (2)	**155.** (1)	**156.** (3)
157. (3)	**158.** (3)	**159.** (3)	

TYPE-III

1. (3)	**2.** (1)	**3.** (3)	**4.** (2)
5. (1)	**6.** (4)	**7.** (1)	**8.** (1)
9. (1)	**10.** (4)	**11.** (1)	**12.** (2)
13. (1)	**14.** (2)	**15.** (2)	**16.** (3)
17. (4)	**18.** (2)	**19.** (1)	**20.** (2)
21. (2)	**22.** (2)	**23.** (1)	**24.** (3)
25. (4)	**26.** (2)	**27.** (2)	**28.** (2)
29. (3)	**30.** (4)	**31**. (1)	**32.** (2)
33. (2)	**34.** (3)	**35.** (2)	**36.** (2)
37. (3)	**38.** (3)	**39.** (2)	**40.** (3)
41. (1)	**42.** (1)	**43.** (4)	**44.** (1)
45. (4)	**46.** (1)	**47.** (3)	**48.** (2)
49. (3)	**50.** (2)	**51.** (1)	**52.** (4)
53. (3)	**54.** (1)	**55.** (2)	**56.** (2)
57. (2)	**58.** (2)	**59.** (2)	**60.** (1)
61. (4)	**62.** (2)	**63.** (3)	**64.** (2)
65. (4)	**66.** (2)	**67.** (2)	**68.** (3)
69. (2)	**70.** (3)	**71.** (1)	**72.** (3)
73. (3)	**74.** (1)	**75.** (4)	**76.** (2)
77. (4)	**78.** (4	**79.** (4)	**80.** (4)
81. (2)	**82.** (1)	**83.** (3)	**84.** (1)
85. (3)			

TYPE-IV

1. (3)	**2.** (3)	**3.** (3)	**4.** (2)
5. (4)			

TYPE-V

1. (1)	**2.** (3)	**3.** (1)	**4.** (1)
5. (2)	**6.** (1)	**7.** (2)	**8.** (4)
9. (3)	**10.** (1)	**11.** (4)	**12.** (2)
13. (4)	**14.** (4)	**15.** (4)	**16.** (1)
17. (4)	**18.** (4)	**19.** (1)	**20.** (1)
21. (3)			

TYPE-VI

1. (3)	**2.** (3)	**3.** (4)	**4.** (2)
5. (2)	**6.** (4)	**7.** (4)	**8.** (2)
9. (3)	**10.** (4)	**11.** (4)	**12.** (4)
13. (4)	**14.** (2)	**15.** (1)	**16.** (3)
17. (2)	**18.** (3)	**19.** (4)	**20.** (2)
21. (2)	**22.** (3)	**23.** (3)	**24.** (3)
25. (4)	**26.** (3)	**27.** (3)	**28.** (4)

TYPE-VII

1. (2)	**2.** (3)	**3.** (4)	**4.** (3)
5. (2)	**6.** (3)	**7.** (2)	**8.** (2)
9. (2)	**10.** (4)	**11.** (1)	**12.** (3)
13. (3)	**14.** (3)	**15.** (4)	**16.** (2)
17. (2)	**18.** (3)	**19.** (4)	**20.** (3)
21. (1)	**22.** (2)	**23.** (2)	**24.** (3)
25. (1)	**26.** (3)	**27.** (3)	**28.** (4)
29. (3)	**30.** (3)	**31**. (3)	**32.** (3)
33. (3)	**34.** (3)	**35.** (3)	**36.** (2)
37. (2)	**38.** (4)	**39.** (4)	**40.** (2)
41. (4)	**42.** (2)	**43.** (1)	**44.** (2)
45. (3)	**46.** (3)	**47.** (3)	**48.** (2)
49. (4)	**50.** (4)	**51.** (1)	**52.** (2)
53. (3)	**54.** (2)	**55.** (1)	**56.** (1)
57. (3)	**58.** (3)	**59.** (1)	**60.** (2)
61. (4)	**62.** (1)	**63.** (1)	**64.** (4)
65. (2)	**66.** (3)	**67.** (2)	**68.** (2)
69. (1)	**70.** (4)	**71.** (1)	**72.** (1)
73. (3)	**74.** (3)	**75.** (2)	**76.** (1)
77. (3)	**78.** (2)	**79.** (1)	**80.** (1)
81. (4)	**82.** (4)	**83.** (4)	**84.** (2)
85. (3)	**86.** (2)	**87.** (2)	**88.** (4)
89. (2)	**90.** (2)	**91.** (3)	**92.** (4)
93. (2)	**94.** (1)	**95.** (1)	**96.** (3)
97. (1)	**98.** (3)	**99.** (3)	**100.** (3)
101. (3)	**102.** (3)	**103.** (4)	**104.** (2)
105. (1)	**106.** (3)	**107.** (2)	

EXPLANATIONS

TYPE-I

1. (4) $\frac{7}{6} = 1.166$; $\frac{7}{9} = 0.777$

$\frac{4}{5} = 0.8$ and $\frac{5}{7} = 0.714$

Therefore, the smallest number is $\frac{5}{7}$

2. (1) $\frac{9}{13} = \frac{9 \times 4}{13 \times 4} = \frac{36}{52}$

$\frac{17}{26} = \frac{17 \times 2}{26 \times 2} = \frac{34}{52}$

$\frac{33}{52} = \frac{33}{52}$

Among these $\frac{33}{52}$ is the smallest

Again, $\frac{28}{29} = \frac{56}{58} > \frac{33}{52}$

3. (4) The smallest possible three-place decimal number = 0.001

4. (4) $\frac{8}{15}, \frac{14}{33}, \frac{7}{13}, \frac{11}{13}$

$\frac{8}{15} = 0.53\overline{3}$

$\frac{14}{33} = 0.\overline{42}$

$\frac{7}{13} = 0.538$

$\frac{11}{13} = 0.846$

$\therefore \frac{11}{13} > \frac{7}{13} > \frac{8}{15} > \frac{14}{33}$

5. (4) $\frac{8}{25} = 0.32$, $\frac{7}{23} = 0.30$

$\frac{11}{23} = 0.47$, $\frac{14}{53} = 0.26$

$\therefore \frac{14}{53}$ is the smallest fraction.

6. (4) The decimal equivalents of :

$\frac{6}{7} = 0.857$, $\frac{5}{6} = 0.833$,

$\frac{7}{8} = 0.875$, $\frac{4}{5} = 0.8$

Obviously, 0.875 is the greatest.

$\therefore \frac{7}{8}$ is the largest fraction.

7. (4) The smallest number of 5 digits = 10000

Now,

476)10000(21
952
480
476
4

$\therefore$ Required number = 10000 + (476 – 4)

= 10000 + 472 = 10472

8. (2) $\frac{15}{16} = 0.94$; $\frac{19}{20} = 0.95$

$\frac{24}{25} = 0.96$; $\frac{34}{35} = 0.97$

9. (1) $\frac{2}{3} = 0.67$; $\frac{5}{6} = 0.83$

$\frac{11}{15} = 0.73$; $\frac{7}{8} = 0.875$

10. (2) Decimal equivalents :

$\frac{4}{9} = 0.\dot{4}$; $\sqrt{\frac{9}{49}} = \frac{3}{7} = 0.43$

$0.\dot{4}\dot{5}$; $(0.8)^2 = 0.64$

$\therefore$ Least number = 0.43

$= \sqrt{\frac{9}{49}}$

11. (2) $0.9 = \frac{9}{10}$; $0.\overline{9} = \frac{9}{9} = 1$,

$0.0\overline{9} = \frac{9}{90} = \frac{1}{10}$;

$0.\overline{09} = \frac{9}{99} = \frac{1}{11}$

12. (2) $\frac{2}{7} = 0.286$; $\frac{1}{3} = 0.33$

$\frac{5}{6} = 0.833$; $\frac{3}{4} = 0.75$

13. (2) The smallest number of 5 digits = 10000

Remainder on dividing 10000 by 123 = 37

$\therefore$ Required number

= 10000 + (123 – 37) = 10086

14. (3) $(0.1)^2 = 0.01$

$\sqrt{0.0121} = \sqrt{0.11 \times 0.11} = 0.11$

$\sqrt{0.0004} = 0.02$

$\Rightarrow 0.01 < 0.02 < 0.11 < 0.12$

15. (4) LCM of 3, 2 and 6 = 6

$\therefore (3)^{\frac{1}{3}} = (3^2)^{\frac{1}{6}} = (9)^{\frac{1}{6}}$

$2^{\frac{1}{2}} = \left(2^3\right)^{\frac{1}{6}} = (8)^{\frac{1}{6}}$

$(1)^{\frac{1}{6}} = 1$; $(6)^{\frac{1}{6}} = (6)^{\frac{1}{6}}$

16. (4) 5 A 7
3 3 5
8 B 2

$\Rightarrow$ A $\rightarrow$ 1, 2, 3, 4, 5 &
B $\rightarrow$ 5, 6, 7, 8,9
8B2 is exactly divisible by 3.
$\therefore$ 8 + B + 2 = multiple of 3
$\therefore$ B = 5 or 8 $\Rightarrow$ A = 1 or 4

17. (4) If the number be x, then

$x - 31 = 75 - x$

$\Rightarrow 2x = 75 + 31 = 106$

$\Rightarrow x = 53$

18. (2) $0.7 + \sqrt{0.16}$

= 0.7 + 0.4 = 1.1

$1.02 - \frac{0.6}{24}$

= 1.02 – 0.025

= 0.995

$1.2 \times 0.83 = 0.996$

$\sqrt{1.44} = 1.2$

Hence, the greatest number

$= \sqrt{1.44}$

19. (1) $\frac{2}{3} = 0.66$

$\frac{3}{5} = 0.6$

$\frac{8}{11} = 0.73$

$\frac{11}{17} = 0.65$

20. (2) Let the three fractions be p, q and r, where $p < q < r$.

According to the question,

$$\frac{r}{p} = \frac{7}{6} \Rightarrow r = \frac{7}{6}p$$

Again, middle fraction

$$= q = \frac{7}{6} - \frac{1}{3} = \frac{7-2}{6} = \frac{5}{6}$$

$$\therefore p + q + r = 2\frac{11}{24}$$

$$\Rightarrow p + \frac{5}{6} + \frac{7}{6}p = \frac{59}{24}$$

$$\Rightarrow p + \frac{7p}{6} = \frac{59}{24} - \frac{5}{6}$$

$$\Rightarrow \frac{6p+7p}{6} = \frac{59-20}{24} = \frac{39}{24}$$

$$\Rightarrow 13p = \frac{39}{24} \times 6 = \frac{39}{4}$$

$$\Rightarrow p = \frac{39}{4 \times 13} = \frac{3}{4}$$

21. (1) Decimal equivalents of fractions :

$$\frac{4}{3} = 1.3$$

$$\frac{-2}{9} = -0.2$$

$$\frac{-7}{8} = -0.875$$

$$\frac{5}{12} = 0.42$$

$\therefore -0.875 < -0.2 < 0.42 < 1.3$

i.e., $\frac{-7}{8} < \frac{-2}{9} < \frac{5}{12} < \frac{4}{3}$

22. (2) On making denominators equal,

$$\frac{3}{5} = \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$$

$$\frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15}$$

$$\frac{11}{15} = \frac{11}{15}$$

$$\therefore \frac{9}{15} < \frac{10}{15} < \frac{11}{15}$$

$$\Rightarrow \frac{3}{5} < \frac{2}{3} < \frac{11}{15}$$

TYPE-II

1. (2) Required remainder = remainder got when 63 is divided by 29 = 5

2. (4) $\frac{1}{0.04} = \frac{100}{4} = 25$

3. (4) The number (x y z x y z) can be written, after giving corresponding weightage of the places at which the digits occur, as

100000 x + 10000y + 1000z + 100x + 10y + z

= 100100x + 10010y + 1001z

= 1001 (100x + 10y + z)

Since 1001 is a factor, the number is divisible by 1001.

7 × 11 × 13 = 1001

As the number is divisible by 1001, it will also be divisible by all three namely, 7, 11 and 13 and not by only one of these because all three are factors of 1001.

So, the answer is 1001.

4. (1) 1000 = (45 × 22) + 10

$\therefore$ 45 – 10 = 35 to be added.

So, the smallest number to be added to 1000 to make the sum exactly divisible by 45 is 35.

5. (2) Number = $xy\ xy\ xy$

$= xy \times 10000 + xy \times 100 + xy$

$= xy\ (10000 + 100 + 1)$

$= xy \times 10101$

6. (2) Quotient = 16

Divisor = 25 × 16 = 400

and remainder = 80

Dividend = Divisor × quotient + Remainder

= 400 × 16 + 80

= 6400 + 80 = 6480

7. (2) Let the numbers be x and y.

$\therefore$ xy = 11520

and $\frac{x}{y} = \frac{9}{5}$

$$\therefore xy \times \frac{x}{y} = 11520 \times \frac{9}{5}$$

$\Rightarrow x^2 = 2304 \times 9$

$\Rightarrow x = \sqrt{2304 \times 9}$

$\Rightarrow 48 \times 3 = 144$

From $\frac{x}{y} = \frac{9}{5}$ we have

$$y = \frac{5 \times 144}{9} = 80$$

$\therefore$ Required difference

= 144 – 80 = 64

8. (2) **Rule :** When the second divisor is factor of first divisor, the second remainder is obtained by dividing the first remainder by the second divisor.

Hence, on dividing 29 by 8, the remainder is 5.

9. (2) Let the given number be x. Then,

$$\left(x \times \frac{3}{2}\right) - \left(x \div \frac{3}{2}\right) = 10$$

$$\Rightarrow \frac{3}{2}x - \frac{2}{3}x = 10$$

$$\Rightarrow \frac{9x - 4x}{6} = 10$$

$\Rightarrow 5x = 60 \Rightarrow x = 12$

10. (2) Here, 52 is a multiple of 13. Hence, the required remainder is obtained on dividing 45 by 13.

Required remainder = 6.

11. (4) $\frac{13}{4} \times \frac{2}{3} - \left(\frac{9}{4} - \frac{5}{3}\right) \times \frac{3}{4}$

$$= \frac{13}{6} - \left(\frac{27-20}{12}\right) \times \frac{3}{4}$$

$$= \frac{13}{6} - \frac{7}{12} \times \frac{3}{4} = \frac{13}{6} - \frac{7}{16}$$

$$= \frac{104-21}{48} = \frac{83}{48}$$

12. (1) Let number (dividend) be X.

$\therefore$ X = 296 × Q + 75 where Q is the quotient and can have the values 1, 2, 3 etc.

= 37 × 8 × Q + 37 × 2 + 1

= 37 (8Q + 2) + 1

Thus we see that the remainder is 1.

[Remark : When the second divisor is a factor of the first divisor, the second remainder is obtained by dividing the first remainder by the second divisor. Hence, divide 75 by 37, the remainder is 1**]**.

13. (3) The least number X in this case will be determined as follows:

4	X
5	Y – 1
	1 – 4

Y = 5 × 1 + 4 = 9

X = 4 × Y + 1 = 4 × 9 + 1 = 37
Now,

5	37		
4	7	–	2
	1	–	3

Hence, the respective remainders are 2, 3.

14. (2) Remainder = 4
$\Rightarrow$ Divisor = 3 × 4 = 12
Again, divisor = 4 × quotient
$\Rightarrow$ 4 × quotient = 12

$$\Rightarrow \text{Quotient} = \frac{12}{4} = 3$$

$\Rightarrow$ Dividend = 3 × 12 + 4 = 40

15. (4) Let the required number of persons be x.
According to the question,
$2x^2 = 3042$

$$\text{or } x^2 = \frac{3042}{2} = 1521$$

$$\text{or } x = \sqrt{1521} = 39$$

16. (2) Number just greater than 3 which is divisible by 7 = 7
Number just smaller than 200 which is divisible by 7 = 196
Here, $a = 7$, $a_n = 196$,
$d = 7$, $n = 8$
$\therefore a_n = a + (n-1)d$
$\Rightarrow 196 = 7 + (n-1) \times 7$

$$\Rightarrow n - 1 = \frac{196 - 7}{7} = 27$$

$\Rightarrow n = 27 + 1 = 28$
Note : We can find the answer after dividing 200 by 7. The quotient is our answer.

17. (4) Sum of first 60 numbers

$$= \frac{60(60+1)}{2} = \frac{60 \times 61}{2} = 1830$$

The number 1830 is divisible by 61.

18. (2) The least number (dividend) x is obtained as follows :

3	x
2	$y-1$
	$1-1$

$y = 2 \times 1 + 1 = 3$
$x = 3 \times 3 + 1 = 10$
When we divide 10 by 6, the remainder = 4

19. (3) Let the numbers be x and y and x is greater than y.
As given,
$xy = 9375$ ....(i)
Again,

$$\frac{x}{y} = 15$$

$\Rightarrow x = 15y$
$\therefore$ From equation (i),
$15y \times y = 9375$

$$\Rightarrow y^2 = \frac{9375}{15} = 625$$

$$\Rightarrow y = \sqrt{625} = 25$$

$\therefore x = 15y = 15 \times 25 = 375$
$\therefore x + y = 375 + 25 = 400$

20. (4) On dividing the given number by 119, let k be the quotient and 19 as remainder.
Then, number = $119k + 19$
$= 17 \times 7k + 17 \times 1 + 2$
$= 17(7k + 1) + 2$
Hence, the given number when divided by 17, gives $(7k + 1)$ as quotient and 2 as remainder.

21. (2) By the Binomial expansion we have
$(x+1)^n = x^n + {}^nc_1 x^{n-1} + {}^nc_2 x^{n-2} + \ldots\ldots + {}^nc_{n-1} x + 1$
Here, each term except the last term contains x. Obviously, each term except the last term is exactly divisible by x.
Following the same logic,
$7^{19} = (6+1)^{19}$ has each term except last term divisible by 6.
Hence, $7^{19} + 2$ when divided by 6 leaves remainder
$= 1 + 2 = 3$

22. (3) Here, 357 is exactly divisible by 17.
$\therefore$ Required remainder = Remainder obtained on dividing 39 by 17 = 5

23. (2) Number = 269 × 68
$= 269 \times (67 + 1)$
$= 269 \times 67 + 269$
Clearly, remainder is obtained on dividing 269 by 67 that is 1.

24. (4) The remainder will be same.
On dividing 9 by 6, remainder = 3
On dividing 81 by 6, remainder = 3

25. (2) Here, 893 is exactly divisible by 47.
Hence, the required remainder is obtained on dividing 193 by 47.
$\therefore$ Remainder = 5

26. (4) Let the least number be x.

13	x	Remainder
5	y	1
	1	3

$y = 5 \times 1 + 3 = 8$
$x = 13 \times 8 + 1 = 105$
On dividing 105 by 65, remainder = 40

27. (4) A number will be exactly divisible by 18 if it is divisible by 2 and 9 both. Clearly 65043 is not divisible by 2.
$\therefore$ Required number = 65043

28. (3) $\times\times\times)\,6\,4\,3\,2\,9\,(\times\times\times$
$\times\times\times$.....(i)
$\overline{1\,7\,5\,2}$
$\times\times\times\times$.....(ii)
$\overline{\times 1\,1\,4\,9}$
$\times\times\times\times$.....(iii)
$\overline{\times\,2\,1\,3}$

Number at (i) = 643 – 175 = 468
Number at (ii) = 1752 – 114
= 1638
Number at (iii) = 1149 – 213
= 936
Clearly, 468, 1638 and 936 are multiples of 234 and 234 > 213.
$\therefore$ Divisor = 234

29. (4) Let the quotient be Q and the remainder be R. Then
Divisor = 7 Q = 3 R

$$\therefore Q = \frac{3}{7}R = \frac{3}{7} \times 28 = 12$$

$\therefore$ Divisor = 7 Q = 7 × 12 = 84
$\therefore$ Dividend = Divisor × Quotient + Remainder = 84 × 12 + 28 = 1008 + 28 = 1036

30. (3) Required divisor
= 3 + 4 – 2 = 5

31. (1) Let the number be $10x + y$
After interchanging the digits, the number obtained = $10y + x$
According to the question,
Resulting number
$= 10x + y + 10y + x$
$= 11x + 11y$
$= 11(x + y)$ which is exactly divisible by 11.

32. (4) If the quotient in the first case be x.
Then, number = $5x + 3$
On Squaring, the number
= $(5x + 3)^2$
= $25x^2 + 30x + 9$
On dividing by 5, remainder
= 9 – 5 = 4

33. (3) Here, the first divisor 192 is a multiple of second divisor 16.
∴ Required remainder
= remainder obtained by dividing 54 by 16 = 6

34. (4) If the first divisor be a multiple of the second divisor, then required remainder = remainder obtained by dividing the first remainder (36) by the second divisor (17) = 2

35. (3) First number (X) = $17x + 13$
Second number (Y) = $17y + 11$

$$\therefore \frac{X+Y}{17} = \frac{17(x+y)}{17} + \frac{13+11}{17}$$

∴ Required remainder
= Remainder obtained on dividing
11 + 13 i.e. 24 by 17 = 7

36. (4) Here, the first divisor (221) is a multiple of second divisor (13) Hence, required remainder
= remainder obtained on dividing 64 by 13 = 12

37. (4) Required remainder = Remainder obtained by dividing 2^2 by 5.
Remainder = 4

38. (3) $3^1 = 3$; $3^2 = 9$; $3^3 = 27$; $3^4 = 81$; $3^5 = 243$
i.e. unit's digit is repeated after index 4.
Remainder after dividing 21 by 4 = 1
∴ Unit's digit in the expansion of $(3)^{21} = 3$
∴ Remainder after dividing by 5 = 3

39. (1) Here, the first divisor i.e. 49 is multiple of second divisor i.e. 7.
∴ Required remainder = Remainder obtained on dividing 32 by 7 = 4

40. (1) Here, the first divisor (36) is exactly divisible by the second divisor (12).
∴ Required remainder
= Remainder obtained after 19 is divided by 12 = 7

41. (*) If $(x \pm 1)^n$ is divided by x, the remainder is $(\pm 1)^n$,
Now, $9^6 - 11 == (8 + 1)^6 - 11$
When it is divided by 8,
remainder = + 1 – 11 = – 10
When – 10 is divided by 8, remainder = – 2 i.e. – 2 + 8 = 6

42. (3) $(17)^{200} = (18 - 1)^{200}$
We know that
$(x + a)^n$
$= x^n + nx^{n-1}.a +$

$$+\frac{n(n-1)}{1\times 2}x^{n-2}a^2$$

$$+\frac{n(n-1)(n-2)}{1\times 2\times 3}x^{n-3}a^3 + \ldots\ldots + a^n$$

We see that all the terms on the R.H.S. except a^n has x as one of its factor and hence are divisible by x. So, $(x + a)^n$ is divisible by x or not will be decided by a^n.
Let x = 18, a = – 1
and n = 200
∴ $(18 - 1)^{200}$ is divisible by 18 or not will depend on $(-1)^{200}$ as all other terms in its expansion will be divisible by 18 because each of them will have 18 as one of their factors.
$(-1)^{200} = 1$ (∵ 200 is even)
1 is not divisible by 18 and is also less than 18.
∴ 1 is the remainder.

43. (2) $2^{31} = \left(2^8\right)^4 \div 2 = (256)^4 \div 2$

$$= \frac{\ldots\ldots 6}{2} = \ldots\ldots 3$$

Clearly, the remainder will be 3 when divided by 5.
Illustration :
23 ÷ 5 gives remainder = 3
83 ÷ 5 gives remainder = 3

44. (2) Let the number be x.

$$\therefore \frac{x+12}{6} = 112$$

$\Rightarrow x + 12 = 672$
$\Rightarrow x = 672 - 12 = 660$

$$\therefore \text{Correct answer} = \frac{660}{6} + 12$$

= 110 + 12 = 122

45. (3) Here, 387 is a multiple of 43.
∴ Remainder obtained on dividing 48 by 43 i.e. 5 is the required remainder.

46. (4) If two numbers are separately divided by a certain divisor (d) leaving remainders r_1 and r_2, then remainder after their sum is divided by the same divisor.
$= r_1 + r_2 - d$
= 21 + 28 – 33 = 16

47. (4) Divisor = 5 × Remainder
= 5 × 46 = 230

$$\text{Quotient} = \frac{230}{10} = 23$$

∴ Dividend = Divisor × Quotient + Remainder
= 230 × 23 + 46
= 5290 + 46 = 5336

48. (2) Required remainder
= 16 – 12 = 4
(because 24 is a multiple of 12.)

49. (4) $2^{6n} - 4^{2n} = \left(2^6\right)^n - \left(4^2\right)^n$
$= 64^n - 16^n$
which is divisible by 64 – 16 = 48

50. (1) $4^{61} + 4^{62} + 4^{63}$
$= 4^{61}(1 + 4 + 4^2)$
$= 4^{61} \times 21$ which is divisible by 3.

51. (4) Let the unknown number be x.
∴ $71 \times x + 47 = 98 \times 7$
$\Rightarrow 71x = 686 - 47 = 639$

$$\Rightarrow x = \frac{639}{71} = 9 = 3 \times 3$$

52. (3) Of the given alternatives,
When 64 is divided by 3, remainder = 1
When 65 is divided by 5, remainder = 0

53. (2) Here, the first divisor (91) is a multiple of second divisor (13).
∴ Required remainder = Remainder obtained on dividing 17 by 13 = 4

54. (3) $x + y = 120$ ..... (i)

$$\frac{x}{y} = 5$$

$\Rightarrow x = 5y$
From, equation (i),
$5y + y = 120$
$\Rightarrow 6y = 120 \Rightarrow y = 20$
∴ $x = 120 - 20 = 100$
∴ Difference = 100 – 20 = 80

55. (2) Here, 280 is a multiple of 35.
∴ Required remainder
= Remainder obtained on dividing 115 by 35 = 10

56. (2) Here, first divisor (175) is a multiple of second divisor (25).
$\therefore$ Required remainder = Remainder obtained on dividing 132 by 25 = 7

57. (3) We have to find such numbers which are divisible by 12 (LCM of 4 and 6).
Number of numbers divisible by 12 and lying between 1 to 600
$= \frac{600}{12} - 1 = 49$
Number of numbers divisible by 12 from 1 to 100 $= \frac{100}{12} = 8$
$\therefore$ Required answer
$= 49 - 8 = 41$

58. (2) $(x-2)$ is a factor of polynomial $P(x) = x^3 + x^2 - 5x + \lambda$.
$\therefore P(2) = 0$ (i.e., on putting $x = 2$)
$\Rightarrow 2^3 + 2^2 - 5 \times 2 + \lambda = 0$
$\Rightarrow 8 + 4 - 10 + \lambda = 0$
$\Rightarrow \lambda + 2 = 0$
$\Rightarrow \lambda = -2$

59. (3) Required Number
$= 100x + 10y + z$
$\because 10y + z = 6m$
$\therefore$ Number $= 100x + 6m$, where m is a positive integer.
$= 2(50x + 3m)$

60. (4) If the first part be x, then second part $= 37 - x$.
$\therefore x \times 5 + (37 - x)\,11 = 227$
$\Rightarrow 5x + 407 - 11x = 227$
$\Rightarrow 6x = 407 - 227 = 180$
$\Rightarrow x = 30$
$\therefore$ Second part = 7

61. (1) $3^1 = 3$, $3^2 = 9$,
$3^3 = 27$, $3^4 = 81$
i.e. the unit's digit = odd number
$\therefore$ Hence, both numbers are divisible by 2.

62. (1) LCM of 4, 5 and 6 = 60
Quotient on dividing 800 by 60 = 13
Quotient on dividing 400 by 60 = 6
$\therefore$ Required answer = 13 – 6 = 7
Method 2 :
First number greater than 400 that is divisible by 60 = 420
Smaller number than 800 that is divisible by 60 = 780
It is an Arithmetic Progression with common difference = 60
By $t_n = a + (n-1)d$
$780 = 420 + (n-1) \times 60$
$\Rightarrow (n-1) \times 60 = 780 - 420$
$= 360$
$\Rightarrow (n-1) = 360 \div 60 = 6$
$\Rightarrow n = 6 + 1 = 7$

63. (1) The no. is of the form $(425x + 45)$ First divisor (425) is multiple of second divisor (17).
$\therefore$ Required remainder
= Remainder obtained on dividing 45 by 17 = 11

64. (4) Here, the first divisor (289) is a multiple of second divisor (17).
$\therefore$ Required remainder = Remainder obtained on dividing 18 by 17 = 1

65. (1) $n = 6q + 4$
$2n = 12q + 8$
Dividing 8 by 6 the remainder = 2

66. (4) If the remainder be x, then $(11284 - x)$ and $(7655 - x)$ are divisible by three digit number.
i.e. $(11284 - x) - (7655 - x)$
$= 3629$ is divisible by that number.
$3629 = 19 \times 191$
Hence, required number = 191
Sum of digits = 1 + 9 + 1 = 11

67. (1) Divisor $= 6 \times 2 = 12$
Again, Divisor = 3 × quotient
$\therefore$ Quotient $= \frac{12}{3} = 4$
Dividend $= 12 \times 4 + 2$
$= 48 + 2 = 50$

68. (3) $2^{16} - 1 = (2^8)^2 - 1$
$= (2^8+1)(2^8-1)$
$= (256 + 1)(256 - 1)$
$= 257 \times 255$ which is exactly divisible by 17.

69. (3)
$$\begin{array}{r} 11)803642(73058 \\ \underline{77} \\ 33 \\ \underline{33} \\ \times 64 \\ \underline{55} \\ 92 \\ \underline{88} \\ 4 \end{array}$$
$\therefore$ The required number
$= 11 - 4 = 7$

Method 2 :
Sum of digits at odd places = 2 + 6 + 0 = 8, sum of digits at even places = 4 + 3 + 8 = 15. For divisibility by 11, difference i.e., (15 – 8) = 0 or mutiple of 11.
$\therefore$ The required number = 7

70. (3) $5^{71} + 5^{72} + 5^{73}$
$= 5^{71}(1 + 5 + 5^2)$
$= 5^{71} \times 31$ which is exactly divisible by 155.

71. (2) $[n] < n$ (integer); $(n) > n$ (integer)
$\therefore$ Expression
$= 2 \times 1 - 2 \div 1 + 2 = 2$

72. (2) Required number
$= 1.1 - 0.01 = 1.09$

73. (1) $999\ \frac{998}{999} \times 999$
$= \left(999 + \frac{998}{999}\right) \times 999$
$= 999^2 + 998$
$= (1000 - 1)^2 + 998$
$= 1000000 - 2000 + 1 + 998$
$= 998999$

74. (2) Expression
$= 2^{71}(1 + 2 + 4 + 8)$
$= 2^{71} \times 15 = 2^{71} \times 3 \times 5$
Which is exactly divisible by 10.

75. (1) Let required number be x.
$\therefore 0.022 \times x = 66$
$\Rightarrow x = \frac{66}{0.022} = 3000$

76. (4) $3^{25} + 3^{26} + 3^{27} + 3^{28}$
$= 3^{25}(1 + 3 + 3^2 + 3^3)$
$= 3^{25}(1 + 3 + 9 + 27)$
$= 3^{25} \times 40$, which is clearly divisible by 30.

77. (2) $\therefore$ Required sum
$= 0.34\overline{67} + 0.13\overline{33} = 0.48\overline{01}$

Illustration =
$$\begin{array}{r|c|c} 0.34 & 67 & 67 \\ \underline{0.13} & \underline{33} & \underline{33} \\ 0.48 & 01 & 00 \end{array}$$

78. (3) **Tricky Approach**
Taking approximate values, we have
$\frac{3 \times 4126 \times 3}{64 \times 2835} = 0.2046 \approx 0.2$

79. (2) Expression
$= \frac{1}{7} + \left(999 + \frac{692}{693}\right) \times 99$
$= \frac{1}{7} + 999 \times 99 + \frac{692}{693} \times 99$

$= \frac{1}{7} + (1000 - 1)\ 99 + \frac{692}{7}$

$= \frac{1}{7} + \frac{692}{7} + 99000 - 99$

$= \frac{693}{7} + 99000 - 99$

$= 99 + 99000 - 99 = 99000$

80. (4) $x^n - a^n$ is exactly divisible by $(x-a)$ if n is odd.
$\therefore (49)^{15} - (1)^{15}$ is exactly divisible by 49–1 = 48, that is a multiple of 8.

81. (3) $a^4 - b^4 = (a^2)^2 - (b^2)^2 = (a^2 + b^2)(a^2 - b^2) = (a^2 + b^2)(a + b)(a - b)$
Let $a = 3$, $b = 1$
$\therefore$ Required number
$= (3 + 1)(3 - 1) = 8$

82. (1) Let $m = n = p$ and $m - n = 2p$
$m + n = 2p$
$\therefore\ (m - n)(m + n) = 4p^2$
$\Rightarrow\ m^2 - n^2 = 4p^2$

83. (3) A number is divisible by 9, if sum of its digits is divisible by 9. Let the number be x.
$\Rightarrow 5 + 4 + 3 + 2 + x + 7$
$= 21 + x$
$\therefore\ x = 6$

84. (1) A number is divisible by 9 if the sum of its digits is divisible by 9.
Here, 6 + 7 + 0 + 9 = 22
Now, 22 + 5 = 27, which is divisible by 9. Hence 5 must be added to 6709.

85. (2) A number is divisible by 9 and 6 both, if it is divisible by LCM of 9 and 6 i.e., 18. Hence, the numbers are 108, 126, 144, 162, 180, 198.

86. (2) First 3–digit number divisible by 6 = 102
Last such 3-digit number =996
$\therefore 996 = 102 + (n - 1)\ 6$
$\Rightarrow\ (n - 1)6 = 996 - 102 = 894$

$\Rightarrow\ n - 1 = \frac{894}{6} = 149$

$\Rightarrow\ n = 150$

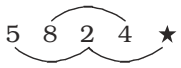
87. (2) $n^3 - n = n(n^2 - 1)$
$= n(n + 1)(n - 1)$
For $n = 2$, $n^3 - n = 6$

88. (3) $n^3 - n = n(n + 1)(n - 1)$
$n = 1$, $n^3 - n = 0$
$n = 2$, $n^3 - n = 2 \times 3 = 6$
$n = 3$, $n^3 - n = 3 \times 4 \times 2 = 24$
$n = 4$, $n^3 - n = 4 \times 5 \times 3 = 60$
$60 \div 6 = 10$

89. (3) Number $= 100x + 10y + z$
Sum of digits $= x + y + z$
Difference $= 100x + 10y + z - x - y - z$
$= 99x + 9y = 9(11x + y)$

90. (3) divisible by (11×13)

91. (3) Any number is divisible by 11 when the differences of alternative digits is 0 or multiple of 0, 11 etc. Here,



$5 + 2 + \star = 7 + \star$
$8 + 4 = 12$
$\therefore\ \star = 12 - 7 = 5$

92. (4) A number is divisible by 11, if the difference of the sum of its digits at odd places and the sum of its digits of even places, is either 0 or a number divisible by 11.
$\therefore (5 + 9 + * + 7) - (4 + 3 + 8) = 0$ or multiple of 11
$\Rightarrow 21 + * - 15$
$\therefore * + 6 =$ a multiple of 11
$\therefore * = 5$

93. (4) A number is divisible by 11, if the difference of sum of its digits at odd places and the sum of its digits at even places is either 0 or a number divisible by 11.
Difference
$= (4 + 3 + 7 + 8) - (2 + 8 + \star)$
$= 22 - 10 - \star$
$= 12 - \star$
Clearly, $\star = 1$

94. (4) A number is divisible by 11 if the difference of the sum of digits at odd and even places be either zero or multiple of 11.
If the middle digit be 4, then 24442 or 244442 etc are divisible by 11.

95. (2) $n^2(n^2 - 1) = n^2(n + 1)(n - 1)$
Now, we put values $n = 2, 3.....$
When $n = 2$
$\therefore n^2(n^2 - 1) = 4 \times 3 \times 1 = 12$, which is a multiple of 12
When n = 3.
$n^2(n^2 - 1) = 9 \times 4 \times 2 = 72$,
which is also a multiple of 12. etc.

96. (4) Let the unit digit be x and ten's digit be y.
$\therefore$ Number
$= 1000y + 100x + 10y + x$
$= 1010y + 101x = 101(10y + x)$
Clearly, this number is divisible by 101, which is the smallest three-digit prime number.

97. (2) The least number of 5 digits = 10000

```
41)10000(243
   82
  ---
  180
  164
  ---
   160
   123
   ---
    37
```

$\therefore$ Required number
$= 10000 + (41 - 37)$
$= 10004$

98. (1) $2^{96} + 1 = (2^{32})^3 + 1^3$
$= (2^{32} + 1)(2^{64} - 2^{32} + 1)$
Clearly, $2^{32} + 1$ is a factor of $2^{96} + 1$

99. (4) For $n = 1$
$n^4 + 6n^3 + 11n^2 + 6n + 24$
$= 1 + 6 + 11 + 6 + 24 = 48$
For $n = 2$
$n^4 + 6n^3 + 11n^2 + 6n + 24$
$= 16 + 48 + 44 + 12 + 24$
$= 144$ which is divisible by 48.
Clearly, 48 is the required number.

100. (2) When we divide 1000 by 225, quotient = 4
When we divide 5000 by 225, quotient = 22
$\therefore$ Required answer = 22 – 4 = 18

101. (3) $(n^3 - n)(n - 2)$
$= n(n - 1)(n + 1)(n - 2)$
When $n = 3$,
Number $= 3 \times 2 \times 4 = 24$

102. (1) LCM of 16 and 18 = 144
Multiple of 144 that is less than 1500 = 1440

103. (2) The largest 4-digit number = 9999

```
345)9999(28
    690
   ----
    3099
    2760
    ----
     339
```

$\therefore$ Required number = 345 – 339 = 6

104. (2) $4^{61} + 4^{62} + 4^{63} + 4^{64}$
$= 4^{61}(1 + 4 + 4^2 + 4^3)$
$= 4^{61}(1 + 4 + 16 + 64)$
$= 4^{61} \times 85$
Which is a multiple of 10.

105. (2) Let the number be $10x + y$

where $y < x$.

Number obtained by interchanging the digits = $10y + x$

$\therefore$ Difference = $10x + y - 10y - x$

$= 9x - 9y = 9(x - y)$

Hence, the difference is always exactly divisible by 9.

106. (3) Check through option

$$\frac{303375}{25} = \frac{303375 \times 4}{25 \times 4}$$

$$= \frac{1213500}{100} = 12135$$

A number is divisible by 25 if the last two digits are divisible by 25 or zero.

107. (1) $307 \times 32 = 9824$

$307 \times 33 = 10131$

$\therefore$ Required number

$= 10131 - 9999 = 132$

108. (1) $a = 4011$, $b = 3989$

$\therefore ab = 4011 \times 3989$

$= (4000 + 11)(4000 - 11)$

$= (4000)^2 - (11)^2$

$= 16000000 - 121$

$= 15999879$

109. (2) Expression $= 3^{2n} + 9n + 5$

$= (3^{2n} + 9n + 3) + 2$

$= 3(3^{2n-1} + 3n + 1) + 2$

Clearly, remainder = 2

110. (1) $12x - 61 \le 6 \Rightarrow 12x \le 61 + 6$

$$\Rightarrow 12x < 67 \Rightarrow x \le \frac{67}{12}$$

$\Rightarrow x < 6$ (Approx.)

111. (3) Resulting number = 3957 + 5349 – 7062 = 2244 which is divisible by 4, 3 and 11.

$2244 \div 4 = 561$

$2244 \div 3 = 748$

$2244 \div 11 = 204$

112. (3) Prime numbers between 80 and 90.

= 83 and 89

$\therefore$ Required product = 83×89

= 7387

113. (2) When $n = 2$,

$6^n - 1 = 6^2 - 1 = 36 - 1 = 35$

When, n = an even number,

$a^n - b^n$ is always divisible by $(a^2 - b^2)$.

114. (2) Total number of marbles = $x + x + 3 + x - 3 = 3x$

$\therefore 3x = 15 \Rightarrow x = 5$

115. (3)

Bucket + full water = 17 kg.

Bucket + $\frac{1}{2}$ water = 13.5 kg.

– – –

$$\frac{1}{2} \text{ water} = 3.5 \text{ kg.}$$

$\therefore$ Water = $2 \times 3.5 = 7$ kg.

$\therefore$ Weight of empty bucket

$= 17 - 7 = 10$ kg.

116. (4) A cow and a hen each has a head.

If the total number of cows be x, then

Number of hens = $180 - x$

A cow has four legs and a hen has two legs.

$\therefore (180 - x) \times 2 + 4x = 420$

$\Rightarrow 360 - 2x + 4x = 420$

$\Rightarrow 2x = 420 - 360 = 60$

$$\Rightarrow x = \frac{60}{2} = 30$$

117. (4) On putting $n = 1$

$n(n+1)(n+2) = 1 \times 2 \times 3 = 6$

118. (2) $2736 \div 24 = 114$

Hence, first divisor (2736) is a multiple of second divisor (24).

$\therefore$ Required remainder

= Remainder obtained on dividing 75 by 24 = 3

119. (2) 5 E9 + 2 F8 + 3 G7 = 1114

Value of 'F' will be maximum if the values of E and G are minimum.

$\therefore$ 509 + 2 F8 + 307 = 1114

$\Rightarrow$ 2 F8 = 1114 – 509 – 307 = 298

$\Rightarrow$ F = 9

120. (4) Let four numbers be a, b, c and d respectively.

$\therefore a + b + c + d = 48$ .....(i)

and,

$a + 5 = b + 1 = c - 3 = d - 7 = x$ (let)

$\therefore a = x - 5$; $b = x - 1$,

$c = x + 3$, $d = x + 7$

From equation (i),

$x - 5 + x - 1 + x + 3 + x + 7 = 48$

$\Rightarrow 4x + 4 = 48$

$\Rightarrow 4x = 48 - 4 = 44$

$$\Rightarrow x = \frac{44}{4} = 11$$

$\therefore a = x - 5 = 11 - 5 = 6$

$b = x - 1 = 11 - 1 = 10$

$c = x + 3 = 11 + 3 = 14$

$d = x + 7 = 11 + 7 = 18$

121. (2) 27) 2055 (76

189

165

162

3

$\therefore$ Required number = 27 – 3 = 24

122. (2) Sum of first n natural numbers

$$= \frac{n(n+1)}{2}$$

$\therefore$ Required average

$$= \frac{n(n+1)}{2 \times n} = \frac{n+1}{2}$$

123. (3) Here, the first divisor (361) is a multiple of second divisor (19).

$\therefore$ Required remainder = Remainder obtained on dividing 47 by 19 = 9

124. (3) Largest number = 3995

Smallest number = 3005

Difference = 3995 – 3005 = 990

125. (2) Let the numbers be x and y.

According to the question,

$x + y = 75$

$x - y = 25$

$\because (x+y)^2 - (x-y)^2 = 4xy$

$\Rightarrow 75^2 - 25^2 = 4xy$

$\Rightarrow 4xy = (75 + 25)(75 - 25)$

$\left[\because a^2 - b^2 = (a+b)(a-b)\right]$

$\Rightarrow 4xy = 100 \times 50$

$$\Rightarrow xy = \frac{100 \times 50}{4} = 1250$$

126. (4) Required difference

$= 97 - 2 = 95$

127. (4) $xy = 24$

$\therefore (x, y)$

$= (1 \times 24), (2 \times 12), (3 \times 8), (4 \times 6)$

$\therefore$ Minimum value of $(x + y)$

$= 4 + 6 = 10$.

128. (3) Let the 3–digit number be $100x + 10y + z$.

Sum of the digits = $x + y + z$

According to the question,

Difference

$= 100x + 10y + z - (x + y + z)$

$= 99x + 9y$

$= 9(11x + y)$

Clearly, it is a multiple of 3 and 9.

129. (1) Let the numbers be x and y where $x > y$.

According to the question,

$(x + y) - (x - y) = 30$

$\Rightarrow x + y - x + y = 30$

$\Rightarrow 2y = 30$

$\Rightarrow y = \frac{30}{2} = 15$

$\therefore xy = 900$

$\Rightarrow 15x = 900$

$\Rightarrow x = \frac{900}{15} = 60$

130. (3) According to the question,
Divisor (d) = 5r = 5 × 46 = 230
Again, Divisor (d) = 10 × Quotient (q)
$\Rightarrow 230 = q \times 10$

$\Rightarrow q = \frac{230}{10} = 23$

$\therefore$ Dividend = Divisor × Quotient + Remainder
= 230 × 23 + 46
= 5290 + 46 = 5336

131. (3) Divided = 44 × 432 = 19008

```
31) 19008 (613
    186
    ---
     40
     31
    ---
     98
     93
    ---
      5
```

$\therefore$ Remainder = 5

132. (2) Here, first divisor (729) is a multiple of second divisor (27).
$\therefore$ Required remainder = Remainder got on dividing 56 by 27 = 2.

133. (4) Smallest number of six digits
= 100000

```
108) 100000 (925
     972
     ---
     280
     216
     ---
      640
      540
      ---
      100
```

$\therefore$ Required number
= 100000 + (108 – 100)
= 100008

134. (2) Let the number be x.
According to the question,

$x + 25 = 3x - 3$

$\Rightarrow 3x - x = 25 + 3$

$\Rightarrow 2x = 28 \Rightarrow x = 14$

135. (1) $334 \times 545 \times 7p$ is divisible by 3340.

$\Rightarrow 334 \times 5 \times 109 \times 7 \times p$, is divisible by $334 \times 2 \times 5$

Clearly, $p = 2$

136. (2) Let the number be a.
According to the question,

$a + \frac{1}{a} = 2$

$\Rightarrow a^2 + 1 = 2a \Rightarrow a^2 - 2a + 1 = 0$

$\Rightarrow (a - 1)^2 = 0 \Rightarrow a - 1 = 0$

$\Rightarrow a = 1$

137. (3) $\because$ First divisor (56) is a multiple of second divisor (8).
$\therefore$ Required remainder
= Remainder obtained after dividing 29 by 8 = 5

138. (2) Let the number be x.
According to the question,

$x - 4 = \frac{21}{x}$

$\Rightarrow x^2 - 4x = 21$

$\Rightarrow x^2 - 4x - 21 = 0$

$\Rightarrow x^2 - 7x + 3x - 21 = 0$

$\Rightarrow x(x - 7) + 3(x - 7) = 0$

$\Rightarrow (x + 3)(x - 7) = 0$

$\Rightarrow x = 7$ because $x \neq -3$.

139. (2) Let quotient be 1.
$\therefore n = 4 \times 1 + 3 = 7$
$\therefore 2n = 2 \times 7 = 14$,
On dividing 14 by 4, remainder = 2

140. (1) Divisor = 555 + 445 = 1000
Quotient = (555 – 445) × 2
= 110 × 2 = 220
Remainder = 30
$\therefore$ Dividend = Divisor × Quotient + Remainder
= 1000 × 220 + 30 = 220030

141. (1) According to the question,
Divisor = 2 × remainder
= 2 × 80 = 160
Again, 4 × quotient = 160

$\Rightarrow$ Quotient = $\frac{160}{4} = 40$

$\therefore x$ = Divisor × Quotient + remainder
= 160 × 40 + 80 = 6480

142. (2) Here, first divisor (342) is a multiple of second divisor (18).
i.e. 342 ÷ 18 = 19
$\therefore$ Required remainder
= Remainder on dividing 47 by 18 = 11

143. (3) Let second number = x.
$\therefore$ First number = $3x$

Third number = $\frac{2}{3} \times 3x$

$= 2x$
According to the question,
$3x + x + 2x = 252$
$\Rightarrow 6x = 252$

$\Rightarrow x = \frac{252}{6} = 42$

144. (3) Five-digit numbers formed by 2, 5, 0, 6 and 8 :
Largest number = 86520
Smallest number = 20568
Required difference
= 86520 – 20568 = 65952

145. (1) Let the number of cows be x.
$\because$ A hen or a cow has only one head.
$\therefore$ Number of hens = $50 - x$
A hen has two feet.
A cow has four feet.
According to the question,
$4x + 2(50 - x) = 142$
$\Rightarrow 4x + 100 - 2x = 142$
$\Rightarrow 2x = 142 - 100 = 42$

$\Rightarrow x = \frac{42}{2} = 21$

146. (2) Firstly, we find LCM of 5, 6, 7 and 8.

2	5, 6, 7, 8
	5, 3, 7, 4

$\Rightarrow$ LCM = 2 × 5 × 4 × 3 × 7= 840
Required number
= $840x + 3$ which is exactly divisible by 9.
Now, $840x + 3$
= $93x \times 9 + 3x + 3$
When $x = 2$ then $840x + 3$, is divisible by 9.
$\therefore$ Required number
= 840 × 2 + 3 = 1683

147. (4) A 3–digit number
= $100x + 10y + z$
Sum of digits = $x + y + z$
Difference
= $100x + 10y + z - x - y - z$
= $99x + 9y = 9(11x + y)$ i.e., multiple of 9.

148. (1)
```
 84 ) 8961 (106
      84
      --
      561
      504
      ---
      ×57  ⇒ Remainder
```

$\therefore$ Required number = 84 – 57
= 27

149. (1) Number of numbers lying between 67 and 101
$\Rightarrow 101 - 67 - 1 = 33$
Prime numbers $\Rightarrow$ 71, 73, 79, 83, 89 and 97 = 6
$\therefore$ Composite numbers
$= 33 - 6 = 27$

150. (3) LCM of 9, 11 and 13
$= 9 \times 11 \times 13 = 1287$
$\therefore$ Required lowest number that leaves 6 as remainder
$= 1287 + 6 = 1293$
$\therefore$ Required answer
$= 1294 - 1293 = 1$

151. (3) A number is divisible by 8 if number formed by the last three digits is divisible by 8.
$\therefore$ If * is replaced by 3, then $632 \div 8 = 79$

152. (4) 87) 13851 (159
87
515
435
801
783
18
$\therefore$ Required number
$= 87 - 18 = 69$

153. (2) If the sum of the digits of a number be divisible by 9, the number is divisible by 9.
Sum of the digits of 451 * 603
$= 4 + 5 + 1 + * + 6 + 0 + 3$
$= 19 + *$
If $* = 8$, then $19 + 8 = 27$ which is divisible by 9.

154. (2) The largest 4-digit number = 9999
88) 9999 (113
88
119
88
319
264
55 $\Rightarrow$ Remainder
$\therefore$ Required number
$= 9999 - 55 = 9944$

155. (1) A number is divisible by 99 if it is divisible by 9 and 11 both.
Sum of the digits of the number 57717
$= 5 + 7 + 7 + 1 + 7 = 27$ which is divisible by 9.
Difference between the sum of digits at odd and even places = $(7 + 7 + 5) - (7 + 1)$
$= 19 - 8 = 11$ which is a multiple of 11.
$\therefore$ Required number = 57717

156. (3) Prime numbers between 58 and 68 $\Rightarrow$ 59, 61 and 67
$\therefore$ Required sum = $59 + 61 + 67$
$= 187$

157. (3) Let the two digit number be $10x + y$.
According to the question,
$xy = 24$ .... (i)
and, $10x + y + 45 = 10y + x$
$\Rightarrow 10y + x - 10x - y = 45$
$\Rightarrow 9y - 9x = 45$
$\Rightarrow 9(y - x) = 45$
$\Rightarrow y - x = \frac{45}{9} = 5$ ... (ii)
$\therefore (x + y)^2 = (y - x)^2 + 4xy$
$= 5^2 + 4 \times 24$
$= 25 + 96 = 121$
$\Rightarrow x + y = \sqrt{121} = 11$ ... (iii)
On adding equations (ii) and (iii),
$y - x + x + y = 5 + 11$
$\Rightarrow 2y = 16 \Rightarrow y = 8$
$\therefore xy = 24 \Rightarrow 8x = 24$
$\Rightarrow x = \frac{24}{8} = 3$
$\therefore$ Required number $= 10x + y = 10 \times 3 + 8 = 38$

4. (3) A number is divisible by 11 if the difference between the sum of digits at odd places and that at even places is either zero or a multiple of 11.
Sum of the digits at odd places = $6 + 8 + 5 = 19$
Sum of the digits at even places $= 9 + 6 + 7 = 22$
$\therefore$ Required number=22–19 = 3

6. (3) According to the question,
First number $= \frac{2 + 2 \times 5}{3}$
$= \frac{12}{3}$
$= 4$
$\therefore$ Second number $= \frac{48}{4} = 12$

TYPE-III

1. (3) $\because$ 135 Litres = $\frac{1}{4}th$ part
180 Litres $= \frac{1}{4} \times \frac{180}{135} = \frac{1}{3}$

2. (1) $? = 369 \times \frac{1}{2} \times \frac{2}{3} = 123$

3. (3) Let the number be x.
$\therefore$ According to question,
$\frac{x}{5} - \frac{x}{7} = 10 \Rightarrow \frac{7x - 5x}{35} = 10$
$\Rightarrow \frac{2x}{35} = 10$
$\Rightarrow x = \frac{10 \times 35}{2} = 175$

4. (2) Let the amount be ₹ x
$\therefore$ According to question,
$\frac{8}{3}x - \frac{3}{8}x = 55$
$\Rightarrow \frac{64x - 9x}{24} = 55$
$\Rightarrow \frac{55x}{24} = 55$ or, x = ₹ 24

5. (1) Let the total number of students in a class be x
$\therefore$ According to question,
Number of girls $= \frac{3}{5}x$
and number of boys $= x - \frac{3x}{5}$
$= \frac{2}{5}x$
Number of girls who are absent
$= \frac{3}{5} \times \frac{2}{9}x = \frac{6x}{45}$
and number of boys who are absent
$= \frac{2}{5} \times \frac{1}{4} \times x = \frac{x}{10}$
$\therefore$ Total number of students who are present
$= x - \frac{6x}{45} - \frac{x}{10}$
$= \frac{(90 - 12 - 9)x}{90}$
$= \frac{69x}{90} = \frac{23x}{30}$
Therefore, the $\frac{23}{30}$ part of the students are present in the class.

6. (4) Let the longer part be x
$\therefore$ According to question,
Shortest part $= \frac{2x}{3}$
$\therefore x + \frac{2}{3}x = 85m$
$\Rightarrow \frac{3x + 2x}{3} = 85$
$\Rightarrow \frac{5x}{3} = 85$
$\therefore x = 51m$

7. (1) $\frac{2}{5}$ and $\frac{4}{9} = 0.40$ and 0.44
Fraction between these two
$= \frac{3}{7} = 0.42$

8. (1) $\frac{2}{3} \times \frac{3}{4} = \frac{1}{2}$

9. (1) Suppose required number is x Then,

$$3x - \frac{3x}{5} = 60 \Rightarrow \frac{12x}{5} = 60$$

$$\Rightarrow x = \frac{60 \times 5}{12} = 25$$

10. (4) $\frac{1}{2}$ of 1%

$$= \frac{1}{2} \times \frac{1}{100} = \frac{0.01}{2} = 0.005$$

11. (1) Remaining race

$$= 5 - 1\frac{1}{4} \text{ laps}$$

$$= 5 - \frac{5}{4} \text{laps} = \frac{15}{4} \text{laps}$$

12. (2) Given

$$\frac{a}{b} \times \frac{c}{d} = \frac{14}{15} \quad \text{...(i)}$$

$$\frac{a}{b} \times \frac{d}{c} = \frac{35}{24} \quad \text{...(ii)}$$

Now multiplying both the equations

$$\frac{ac}{bd} \times \frac{ad}{bc} = \frac{14}{15} \times \frac{35}{24}$$

$$\Rightarrow \frac{a^2}{b^2} = \frac{49}{36} \Rightarrow \frac{a}{b} = \frac{7}{6}$$

$$\therefore \frac{c}{d} = \frac{14}{\frac{15}{7}} = \frac{4}{5}$$

But the greater fraction is $\frac{7}{6}$.

13. (1) Let the fraction be x.

$$\therefore \frac{4x}{7} + \frac{4}{7} = \frac{15}{14}$$

$$\Rightarrow \frac{4x}{7} = \frac{15}{14} - \frac{4}{7} = \frac{15-8}{14} = \frac{1}{2}$$

$$\Rightarrow x = \frac{1}{2} \times \frac{7}{4} = \frac{7}{8}$$

14. (2) Let the value of estate be ₹ x
According to the question

$$\frac{4}{5} \text{ of } x = 16800$$

$$\therefore x = \frac{16800 \times 5}{4} = ₹\ 21000$$

$$\therefore \frac{3}{7} \text{ of the value } = 21000 \times \frac{3}{7}$$

$$= 3000 \times 3 = ₹\ 9000$$

15. (2) Let the fraction = x
According to the question;

$$\frac{6}{7} \text{of } x = \frac{x}{\frac{6}{7}} - \frac{13}{70}$$

$$\Rightarrow \frac{6x}{7} = \frac{7x}{6} - \frac{13}{70}$$

$$\Rightarrow \frac{7x}{6} - \frac{6x}{7} = \frac{13}{70}$$

$$\Rightarrow \frac{49x - 36x}{42} = \frac{13}{70}$$

$$\Rightarrow \frac{13x}{42} = \frac{13}{70}$$

$$\therefore x = \frac{13 \times 42}{70 \times 13} = \frac{3}{5}$$

16. (3) Let the number is x.
According to the question

$$\frac{1}{2} \text{of} \frac{3}{4} \text{of } x = 2\frac{1}{2} \text{ of } 10$$

$$\Rightarrow \frac{3x}{8} = \frac{5}{2} \times 10$$

$$\Rightarrow x = \frac{5 \times 10 \times 8}{3 \times 2} = \frac{200}{3} = 66\frac{2}{3}$$

17. (4) Let the number be x.

$$\therefore \frac{x}{3 \times 4} = 15$$

$$\Rightarrow x = 15 \times 3 \times 4 = 180$$

Now, required number

$$= \frac{3}{10} x = \frac{3}{10} \times 180 = 54$$

18. (2) 1 day = 24 × 60 minutes
∴ Required fraction

$$= \frac{45}{24 \times 60} = \frac{1}{32}$$

19. (1) Let the numerator = x and denominator = y
∴ Fraction

$$= \frac{x}{y} \text{ and } \frac{x}{y+1} = \frac{1}{2}$$

$$\Rightarrow 2x = y + 1 \Rightarrow x = \frac{y+1}{2}$$

$$\frac{x+1}{y} = 1 \Rightarrow x + 1 = y$$

$$\Rightarrow \frac{y+1}{2} + 1 = y$$

$$\Rightarrow \frac{y+1+2}{2} = y$$

$$\Rightarrow y + 3 = 2y \Rightarrow y = 3$$

$$x + 1 = 3 \Rightarrow x = 2$$

$$\therefore xy = 2 \times 3 = 6$$

20. (2) Let the number = x

$$\therefore x \times \frac{5}{6} - x \times \frac{5}{16} = 250$$

$$\Rightarrow \frac{40x - 15x}{48} = 250$$

$$\Rightarrow \frac{25x}{48} = 250$$

$$\Rightarrow x = \frac{250 \times 48}{25} = 480$$

21. (2) Let the number be x.
According to the question,

$$x = \frac{x}{5} + 20 \Rightarrow x - \frac{x}{5} = 20$$

$$\Rightarrow \frac{4x}{5} = 20$$

$$\Rightarrow x = \frac{20 \times 5}{4} = 25$$

22. (2) Let the number be x.

$$\therefore \frac{2}{3} x = \frac{25}{216x} \Rightarrow x^2 = \frac{25 \times 3}{2 \times 216}$$

$$\therefore x = \sqrt{\frac{25 \times 3}{2 \times 216}} = \sqrt{\frac{25}{144}} = \frac{5}{12}$$

23. (1) Let the length of bamboo be x metres.
∴ Length of bamboo above water

$$= x - \frac{x}{10} - \frac{5x}{8}$$

$$= \frac{40x - 4x - 25x}{40} = \frac{11x}{40}$$

According to the question,

$$\frac{11x}{40} = 2.75$$

$$\Rightarrow x = \frac{2.75 \times 40}{11} = 10 \text{ metres.}$$

24. (3) Let the man's income be ₹ x
According to the question,

$$x - \frac{x}{3} - \frac{2x}{5} - \frac{1x}{5} = 400$$

$$\text{or } x\left(1 - \frac{1}{3} - \frac{2}{5} - \frac{1}{5}\right) = 400$$

or $x\left(\frac{15-5-6-3}{15}\right)=400$

or $x\times\frac{1}{15}=400$

or $x = 15\times400 = ₹\ 6000$

25. (4) $0.\overline{47}=\frac{47}{99}$

26. (2) $\frac{6}{\frac{7}{8}}=\frac{6\times8}{7}=\frac{48}{7}$

$\frac{\frac{6}{7}}{8}=\frac{6}{7\times8}=\frac{3}{28}$

$\therefore$ Required difference

$=\frac{48}{7}-\frac{3}{28}$

$=\frac{192-3}{28}=\frac{189}{28}=\frac{27}{4}=6\frac{3}{4}$

27. (2) Let the number be x.
According to the question

$\frac{x}{9}-\frac{x}{10}=4$

$\Rightarrow\frac{10x-9x}{90}=4$

$\Rightarrow x = 90\times4 = 360$

28. (2) $0.4\overline{23}=\frac{423-4}{990}=\frac{419}{990}$

29. (3) Decimal equivalent of :

$\frac{3}{4}=0.75$ and $\frac{5}{6}=0.833$

Now, $\frac{2}{3}=0.66$, $\frac{1}{2}=0.5$,

$\frac{4}{5}=0.8$ and $\frac{9}{10}=0.9$

Clearly, $\frac{4}{5}$ lies between $\frac{3}{4}$ and $\frac{5}{6}$.

30. (4) Let the tin contain x bottles of oil.
As given,

$\frac{4}{5}x-6+4=\frac{3}{4}x$

$\Rightarrow\frac{4}{5}x-\frac{3}{4}x=2$

$\Rightarrow\left(\frac{16-15}{20}\right)x=2$

$\Rightarrow\frac{x}{20}=2$

$\Rightarrow x = 2\times20 = 40$

$\therefore$ The tin can contain 40 bottles.

31. (1) Let the required number be x.
As given,

$\Rightarrow x\times\frac{5}{4}-x\times\frac{5}{14}=25$

$\Rightarrow5x\left(\frac{1}{4}-\frac{1}{14}\right)=25$

$\Rightarrow5x\left(\frac{7-2}{28}\right)=25\Rightarrow5x\times\frac{5}{28}=25$

$\Rightarrow x=\frac{25\times28}{5\times5}=28$

32. (2) Let the number be x.
Then,

$\frac{3}{4}x-\frac{3}{14}x=150$

$\Rightarrow\frac{21x-6x}{28}=150$

$\Rightarrow15x = 28\times150$

$\Rightarrow x=\frac{28\times150}{15}=280$

33. (2) Let the fractions be x and y, where $x > y$

$\therefore xy=\frac{14}{15}$ and $\frac{x}{y}=\frac{35}{24}$

$\therefore xy\times\frac{x}{y}=\frac{14}{15}\times\frac{35}{24}$

$\Rightarrow x^2=\frac{49}{36}$

$\Rightarrow x=\frac{7}{6}$

34. (3) The required fraction is $\frac{4}{5}$,

because $\frac{5}{4}-\frac{4}{5}=\frac{25-16}{20}=\frac{9}{20}$

35. (2) Let the fraction be x,
According to the question,

$\frac{x}{\frac{3}{5}}-x\times\frac{3}{5}=\frac{32}{75}$

$\Rightarrow\frac{5x}{3}-\frac{3x}{5}=\frac{32}{75}$

$\Rightarrow\frac{25x-9x}{15}=\frac{32}{75}$

$\Rightarrow\frac{16x}{15}=\frac{32}{75}$

$\Rightarrow x=\frac{32}{75}\times\frac{15}{16}=\frac{2}{5}$

Correct answer $=\frac{2}{5}\times\frac{3}{5}=\frac{6}{25}$

36. (2) Required number

$=\frac{3+1}{2+5}=\frac{4}{7}$ or

$\frac{1}{2}=0.5;\frac{3}{5}=0.6$

$\frac{4}{7}=0.57$

Clearly, $0.5 < 0.57 < 0.6$

37. (3) Let the number of pages in the book be x.
According to the question,

$\frac{2x}{5}+\frac{2x}{5}+\frac{x}{3}\times\frac{2}{5}+15=x$

$\Rightarrow\frac{4x}{5}+\frac{2x}{15}+15=x$

$\Rightarrow\frac{12x+2x+225}{15}=x$

$\Rightarrow 15x = 14x + 225$
$\Rightarrow 15x - 14x = 225$
$\Rightarrow x = 225$

38. (3) 0.121212 ....

$=0.\overline{12}=\frac{12}{99}=\frac{4}{33}$

39. (2) $0.\overline{001}=\frac{1}{999}$

40. (3) $1.\overline{27}=1\frac{27}{99}=1\frac{3}{11}=\frac{14}{11}$

41. (1) Let the number be x.

$\therefore\frac{x}{7}-\frac{x}{11}=100$

$\Rightarrow\frac{11x-7x}{11\times7}=100$

$\Rightarrow4x = 77\times100$

$\Rightarrow x=\frac{77\times100}{4}=1925$

42. (1) $\frac{1}{15}+\frac{1}{35}+\frac{1}{63}+\frac{1}{99}+\frac{1}{143}$

$=\frac{1}{3\times5}\times\frac{1}{5\times7}+\frac{1}{7\times9}$

$+\frac{1}{9\times11}+\frac{1}{11\times13}$

$=\frac{1}{2}\left(\frac{1}{3}-\frac{1}{5}+\frac{1}{5}-\frac{1}{7}+\frac{1}{7}-\frac{1}{9}+\frac{1}{9}-\frac{1}{11}+\frac{1}{11}-\frac{1}{13}\right)$

$=\frac{1}{2}\left(\frac{1}{3}-\frac{1}{13}\right)=\frac{1}{2}\left(\frac{13-3}{39}\right)=\frac{5}{39}$

43. (4) $2.\dot{5}\dot{2} = 2\frac{52}{99}=\frac{250}{99}$

$\therefore$ Required sum
= 250 + 99 = 349

44. (1) Let the length of the rod be x metres. According to the question,

$x-\left(\frac{x}{10}+\frac{x}{20}+\frac{x}{30}+\frac{x}{40}+\frac{x}{50}+\frac{x}{60}\right)$
=12.08

$\Rightarrow x\left[1-\left(\frac{60+30+20+15+12+10}{600}\right)\right]$
= 12.08

$\Rightarrow x\left(1-\frac{147}{600}\right)=12.08$

$\Rightarrow x\left(\frac{600-147}{600}\right)=12.08$

$\Rightarrow x\times\frac{453}{600}=12.08$

$\Rightarrow x=\frac{12.08\times600}{453}$ =16 m.

45. (4) Height of tree after 1 year

$=64+64\times\frac{1}{8}=72$ cm

Height of tree after 2 years

$=72+72\times\frac{1}{8}$

= 72 + 9 = 81 cm

46. (1) Suppose total income
= ₹ x

$\therefore\ x-\frac{x}{4}-\frac{2x}{3}=630$

$\frac{x}{12}=630\ \ \therefore x=7560$

$\therefore$ House rent $=\frac{2}{3}\times7560$

= ₹ 5040

47. (3) Required answer

$=\frac{\frac{125}{3}}{\frac{1}{6}}=\frac{125}{3}\times6=250$

48. (2) $\frac{5}{8}=0.625$; $\frac{7}{11}=0.636$

$\frac{20}{30}=0.666\ldots$; $\frac{19}{30}=0.633\ldots$

49. (3) Let numerator be x, then denominator = $11-x$.

$\therefore$ Fraction = $\frac{x}{11-x}$

Again, $\frac{x+2}{11-x+2}$

$=\frac{x}{11-x}+\frac{1}{24}$

$\Rightarrow\frac{x+2}{13-x}-\frac{x}{11-x}=\frac{1}{24}$

$\Rightarrow\frac{11x-x^2+22-2x-13x+x^2}{(13-x)(11-x)}$

$=\frac{1}{24}$

$\Rightarrow\frac{22-4x}{(13-x)(11-x)}=\frac{1}{24}$

$\Rightarrow 528-96x=143-24x+x^2$
$\Rightarrow x^2+72x-385=0$
$\Rightarrow x^2+77x-5x-385=0$
$\Rightarrow x(x+77)-5(x+77)=0$
$\Rightarrow (x-5)(x+77)=0\Rightarrow x=5$
$\therefore$ Denominator = 11 – 5 = 6
$\therefore$ Difference = 6 – 5 = 1

50. (2) Let the original fraction be $\frac{x}{x+3}$.

$\therefore\ \frac{x+7}{x+3-2}=2$

$\Rightarrow x+7=2x+2$
$\Rightarrow x=7-2=5$
$\therefore$ Required sum = $x+x+3$
$=2x+3=10+3=13$

51. (1) Let the original fraction be $\frac{x}{y}$.

$\therefore\ \frac{x-1}{y-1}=\frac{1}{3}\Rightarrow 3x-3=y-1$

$\Rightarrow 3x-y=2$ .....(i)

Again, $\frac{x+1}{y+1}=\frac{1}{2}\Rightarrow 2x+2=y+1$

$\Rightarrow 2x-y=-1$ ....(ii)

From equation (i) – (ii)
$3x-y-2x+y=2+1$
$\Rightarrow x=3$
From equation (i)
$3\times3-y=2\Rightarrow y=9-2=7$
$\Rightarrow x+y=3+7=10$

52. (4) Let the number be x.

$\frac{\frac{x}{7}}{8}-\frac{7x}{8}=15$

$\Rightarrow\frac{8x}{7}-\frac{7x}{8}=15$

$\Rightarrow\frac{64x-49x}{56}=15$

$\Rightarrow\frac{15x}{56}=15$

$\Rightarrow x=56$
$\therefore$ Sum of the digit = 5 + 6 = 11

53. (3) Let the given number be x.

$\therefore\ \frac{\frac{x}{8}}{17}-\frac{8x}{17}=225$

$\Rightarrow\frac{17x}{8}-\frac{8x}{17}=225$

$\Rightarrow\frac{289x-64x}{136}=225$

$\Rightarrow\frac{225x}{136}=225\Rightarrow x=136$

54. (1) Let the original fraction be $\frac{x}{y}$.

$\therefore\ \frac{x+1}{y+1}=\frac{1}{4}$

$\Rightarrow 4x+4=y+1$
$\Rightarrow 4x-y=-3$ ...(i)
In case II,

$\frac{x+2}{y+2}=\frac{1}{3}$

$\Rightarrow 3x+6=y+2$
$\Rightarrow 3x-y=-4$ ...(ii)
By (i) – (ii),
$4x-y-3x+y=-3+4$
$\Rightarrow x=1$
From (i),
$4\times1-y=-3\Rightarrow y=7$
$\therefore x+y=1+7=8$

55. (2) Let the number be x.

$\therefore \frac{x}{5}+4=\frac{x}{4}-10$

$\Rightarrow \frac{x}{4}-\frac{x}{5}=10+4=14$

$\Rightarrow \frac{5x-4x}{20}=14$

$\Rightarrow x = 20 \times 14 = 280$

56. (2) Part of the property given away

$=\frac{1}{4}+\frac{1}{2}+\frac{1}{5}$

$=\frac{5+10+4}{20}=\frac{19}{20}$

57. (2) Unbroken tables

$=\frac{5}{6}\times 108 = 90$

Unbroken chairs $=\frac{3}{4}\times 132 = 99$

Unbroken pairs = 90

58. (2) A + B + C + D = 60

$A=\frac{B+C+D}{2}$

$\Rightarrow 3A = 60 \Rightarrow A = ₹\ 20$

$B=\frac{A+C+D}{3}$

$\Rightarrow 4B = 60 \Rightarrow B = ₹\ 15$

$C=\frac{A+B+D}{4}$

$\Rightarrow 5C = 60 \Rightarrow B = ₹\ 12$

D = 60 – (20 + 15 + 12) = ₹ 13

59. (2) If the number of boys be x, and that of girls be y, then

$\frac{x}{10}=\frac{y}{4}\Rightarrow\frac{x}{y}=\frac{10}{4}=\frac{5}{2}=5:2$

60. (1) Solve this question by options.

Original fraction $=\frac{7}{9}$

Adding 2 to numerator and denominator, fraction $=\frac{9}{11}$

Adding 3 to numerator and denominator, fraction $=\frac{10}{12}$

$=\frac{5}{6}$, which is correct.

61. (4) $\frac{3}{4}=\frac{3\times4}{4\times4}=\frac{12}{16}$

$\frac{3}{8}=\frac{6}{16}$

$\therefore \frac{6}{16},\frac{7}{16},\frac{8}{16},\frac{9}{16},\frac{10}{16},\frac{11}{16},\frac{12}{16}$

$\therefore$ Required rational number

$=\frac{9}{16}$

$\frac{12}{9},\frac{7}{3},\frac{16}{9}$ are all greater than 1, only $\frac{9}{16}<1$, hence it is the obvious choice)

62. (2) Original fraction $=\frac{x-4}{x}$

In case II,

$8(x-4-2)=x+1$

$\Rightarrow 8x-48=x+1$

$\Rightarrow 7x=49 \quad \Rightarrow x=7$

$\therefore$ Original fraction

$=\frac{7-4}{7}=\frac{3}{7}$

63. (3) Boys = x

Girls = $z-x$

$\therefore$ Part of girls $=\frac{z-x}{z}=1-\frac{x}{z}$

64. (2) First part = x,

Second part = $50-x$

$\therefore \frac{1}{x}+\frac{1}{50-x}=\frac{1}{12}$

Put values of x from the given options. Otherwise

$\Rightarrow \frac{50-x+x}{x(50-x)}=\frac{1}{12}$

$\Rightarrow x(50-x) = 600$

$\Rightarrow x^2-50x+600=0$

$\Rightarrow x^2-30x-20x+600=0$

$\Rightarrow x(x-30)-20(x-30)=0$

$\Rightarrow (x-20)(x-30)=0$

$\Rightarrow x = 20$ or 30

65. (4) Number of seats in each bus = 10 (let)

Total passengers $=\frac{30\times4}{5}=24$

$\frac{1}{4}$ of the passengers leave the bus.

Remaining passengers

$=24\times\frac{3}{4}=18$

$\therefore$ Required answer

$=\frac{18}{20}=\frac{9}{10}$

66. (2) $0.\overline{123}=\frac{123}{999}=\frac{41}{333}$

67. (2) 0.393939 .....

$=0.\dot{3}\dot{9}=\frac{39}{99}=\frac{13}{33}$

68. (3) $\frac{1}{11}=0.0909\ldots\ldots=0.\overline{09}$

69. (2) $2.3\overline{49}=\frac{2349-23}{990}$

$=\frac{2326}{990}$

70. (3) Expression

$=\frac{1}{20}+\frac{1}{30}+\frac{1}{42}+\frac{1}{56}+\frac{1}{72}+\frac{1}{90}$

$=\frac{1}{4\times5}+\frac{1}{5\times6}+\frac{1}{6\times7}+$

$\frac{1}{7\times8}+\frac{1}{8\times9}+\frac{1}{9\times10}$

$=\left(\frac{1}{4}-\frac{1}{5}\right)+\left(\frac{1}{5}-\frac{1}{6}\right)\ldots\ldots+\left(\frac{1}{9}-\frac{1}{10}\right)$

$=\frac{1}{4}-\frac{1}{10}=\frac{5-2}{20}=\frac{3}{20}$

71. (1) $?=1+\frac{1}{2}+\frac{1}{4}+\frac{1}{7}+\frac{1}{14}+\frac{1}{28}$

$=\frac{28+14+7+4+2+1}{28}$

$=\frac{28+28}{28}=2$

72. (3) Expression

$=\frac{1}{20}+\frac{1}{30}+\frac{1}{42}+\ldots.+\frac{1}{132}$

$=\frac{1}{4\times5}+\frac{1}{5\times6}+\frac{1}{6\times7}+\ldots.+\frac{1}{11\times12}$

$=\frac{1}{4}-\frac{1}{5}+\frac{1}{5}-\frac{1}{6}+\frac{1}{6}-\frac{1}{7}+\ldots.+\frac{1}{11}-\frac{1}{12}$

$=\frac{1}{4}-\frac{1}{12}=\frac{3-1}{12}=\frac{2}{12}=\frac{1}{6}$

73. (3) The original property with Ram = ₹ x (let)

$\therefore$ Wife's share = Rs. $\frac{x}{3}$

Remaining property

$= x - \frac{x}{3} =$ ₹ $\frac{2x}{3}$

Daughter's share = $\frac{2x}{3} \times \frac{3}{5}$

= ₹ $\frac{2x}{5}$

Son's share = $\frac{2x}{3} - \frac{2x}{5}$

$= \frac{10x - 6x}{15} =$ ₹ $\frac{4x}{15}$

$\therefore \frac{4x}{15} = 6400$

$\Rightarrow 4x = 6400 \times 15$

$\Rightarrow x = \frac{6400 \times 15}{4} =$ ₹ 24000

74. (1) Let the number be x.
According to the question,

$x - \frac{2x}{5} = 75$

$\Rightarrow \frac{5x - 2x}{5} = 75$

$\Rightarrow \frac{3x}{5} = 75$

$\Rightarrow x = \frac{75 \times 5}{3} = 125$

75. (4) First number = x (let)

$\therefore$ Second number = $\frac{2x}{5}$

$\therefore x + \frac{2x}{5} = 50$

$\Rightarrow \frac{5x + 2x}{5} = 50$

$\Rightarrow 5x + 2x = 50 \times 5$

$\Rightarrow 7x = 250$

$\Rightarrow x = \frac{250}{7}$

$\therefore$ Second number

$= \frac{2}{5} \times \frac{250}{7} = \frac{100}{7}$

76. (2) Let the number be x.
According to the question,

$\frac{3x}{4} - \frac{x}{6} = 7$

$\Rightarrow \frac{9x - 2x}{12} = 7$

$\Rightarrow 7x = 12 \times 7$

$\Rightarrow x = \frac{12 \times 7}{7} = 12$

$\therefore \frac{5x}{3} = \frac{5}{3} \times 12 = 20$

77. (4) $0.39\overline{39} = 0.\overline{39}$

$= \frac{39}{99} = \frac{13}{33}$.

78. (4) $2\frac{1}{2} + 3\frac{1}{3} + 4\frac{1}{4} + 5\frac{1}{5}$

$= (2 + 3 + 4 + 5) + \left(\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}\right)$

$= 14 + \left(\frac{30 + 20 + 15 + 12}{60}\right)$

$= 14 + \frac{77}{60} = 14 + 1\frac{17}{60}$

$= 15\frac{17}{60}$

$\therefore$ Required answer = $1 - \frac{17}{60} = \frac{60 - 17}{60} = \frac{43}{60}$

79. (4) $\frac{5}{6} = 0.83$

$\frac{8}{15} = 0.53$

$\frac{6}{7} = 0.86$

Clearly, $0.53 < 0.83 < 0.86$

80. (4) Let the first number be x.
$\therefore$ Second number = $x + 2$
According to the question,
$x + 2 = 7 + c - 4 = 3 + c$
$\Rightarrow x = 1 + c$
$\therefore$ Fraction
$= \frac{x(x+2)}{7+c} = \frac{(1+c)(3+c)}{7+c}$
For the minimum value,
$-3 < c < -1$
$\therefore c = -2$
$\therefore$ Required value of fraction = $-\frac{1}{5}$

81. (2) Let second number be x.

$\therefore$ First number = $\frac{x}{2}$

Third number = $\frac{x}{4}$

$\therefore x + \frac{x}{2} + \frac{x}{4} = 2$

$\Rightarrow \frac{4x + 2x + x}{4} = 2$

$\Rightarrow 7x = 8 \Rightarrow x = \frac{8}{7}$

82. (1) Let the number be x.
According to the question,

$\left(x + \frac{1}{2}\right) \times 3 = 21$

$\Rightarrow x + \frac{1}{2} = \frac{21}{3} = 7$

$\Rightarrow x = 7 - \frac{1}{2} = \frac{13}{2} = 6.5$

83. (3) Let the number be x.
According to the question,

$\frac{4x}{5} - \frac{3x}{4} = 8$

$\Rightarrow \frac{16x - 15x}{20} = 8$

$\Rightarrow \frac{x}{20} = 8$

$\Rightarrow x = 20 \times 8 = 160$

84. (1) $\because$ A mason makes a wall in 70 hours.
$\therefore$ Part of wall built by the mason in 7 hours = $\frac{7}{70}$

$= \frac{1}{10}$

$\therefore$ Remaining part = $1 - \frac{1}{10}$

$= \frac{9}{10} = 0.9$

85. (3) Let the number of oranges in the first basket be x.
$\therefore$ Number of oranges in the second basket = $640 - x$
According to the question,

$x - \frac{x}{5} = 640 - x + \frac{x}{5}$

$= 640 - \left(x - \frac{x}{5}\right)$

$\Rightarrow \frac{4x}{5} = 640 - \frac{4x}{5}$

$\Rightarrow \frac{4x}{5} + \frac{4x}{5} = 640$

$\Rightarrow \frac{8x}{5} = 640 \Rightarrow 8x = 640 \times 5$

$\Rightarrow x = \frac{640 \times 5}{8} = 400$

TYPE-IV

1. (3) Firstly, we express every fraction in decimal form.

$\frac{4}{5} = 0.8$; $\frac{7}{8} = 0.875$

$\frac{6}{7} = 0.857$

$\frac{5}{6} = 0.833 = 0.8\dot{3}$

So, $\frac{4}{5} < \frac{5}{6} < \frac{6}{7} < \frac{7}{8}$

2. (3) The decimal equivalent of

$\frac{3}{5} = 0.6, \frac{7}{9} = 0.777..,....$

$\frac{11}{13} = 0.846$

Obviously, $0.846 > 0.\dot{7} > 0.6$

∴ The required decreasing order

$= \frac{11}{13}, \frac{7}{9}, \frac{3}{5}$

3. (3) $\frac{1}{3} = 0.333....$,

$\frac{4}{7} = 0.5714$, $\frac{2}{5} = 0.4$

Clearly,

$0.\overline{33} < 0.4 < 0.5714$

$\therefore \frac{1}{3} < \frac{2}{5} < \frac{4}{7}$

4. (2) Numbers are :

$a > b > c > d > e > f$

According to the question,

$a + b + c + d + e = 5 \times 30$

$= 150$ --- (i)

$b + c + d + e + f = 5 \times 25$

$= 125$ --- (ii)

By equation (i) – (ii)

$a - f = 150 - 125 = 25$

5. (4) Let the numbers be x, $x + 1$ and $x + 2$.

$\therefore\ x + x + 1 + x + 2 = 51$

$\Rightarrow 3x + 3 = 51$

$\Rightarrow 3x = 51 - 3 = 48$

$\Rightarrow x = \frac{48}{3} = 16$

∴ Middle number = 16 + 1= 17

TYPE-V

1. (1) The digit in unit's place = unit's digit in the product $1 \times 2 \times 3 \times .... \times 9 = 0$.

2. (3) Unit's digit in $3^4 = 1$

So, unit digit in $3^{164} = 1$

Now, unit's digit in $(2153)^{167}$

= unit digit in 3^{167}

= unit digit in $3^3 = 7$

3. (1)(4) $(4)^{2m}$ gives 6 at unit digit.

$(4)^{2m+1}$ gives 4 at unit digit.

$(5)^n$ gives 5.

The same is the case with 1.

∴ Required digit = Unit's digit in the product of $4 \times 5 \times 1 = 0$

4. (1) Unit digit in $(264)^4$ i.e.

$4 \times 4 \times 4 \times 4$ is 6

∴ Unit digit in

$(264)^{100}$ is also 6.

Now, $(264)^{102} = (264)^{100} \times (264)^2$

= (Unit digit 6) × (Unit digit 6)=36

∴ Unit digit is 6

Similarly,

$(264)^{103} + (264)^{100} \times (264)^3$

Unit digit Unit digit

6 4

Unit digit

4

Therefore, the unit digit in $(264)^{102} + (264)^{103}$ is 6 + 4 = 10 i.e. 0.

5. (2) $(251)^{98} = ...1$

$(21)^{29} = ...1$

$(106)^{100} = ...6$

$(705)^{35} = ...5$

$(16)^4 = ...6$

$259 = ...9$

∴ Required answer = 1 + 1 – 6 + 5 – 6 + 9 = 16 – 12 = 4

6. (1) $3^1 = 3$; $3^2 = 9$; $3^3 = 27$;

$3^4 = 81$; $3^5 = 343$; .....

∴ Remainder on dividing 40 by 4 = 0

∴ Unit's digit in $3^{40} = 1$

7. (2)

Unit digit

$7^1 \Rightarrow \boxed{7}$

$7^2 \Rightarrow 9$

$7^3 \Rightarrow 3$ 4

$7^4 \Rightarrow 1$

$7^5 \Rightarrow 7$

$7^1 \Rightarrow \boxed{7}$

4) 105 (26

8

25

24

1

8. (4) Expression = $(2137)^{754}$

Unit's digit in 2137 = 7

Now, $7^1 = 7$, $7^2 = 49$, $7^3 = 343$, $7^4 = 2401$, $7^5 = 16807$, ...

Clearly, after index 4, the unit's digit follow the same order.

Dividing index 754 by 4 we get remainder = 2

∴ Unit's digit in the expansion of $(2137)^{754}$ = Unit's digit in the expansion of $(2137)^2 = 9$

9. (3) Unit's digit in the expansion of $(22)^{23}$

= Unit's digit in the expansion of $(2)^{23}$

Now,

$2^1 = 2$

$2^2 = 4$

$2^3 = 8$

$2^4 = 16$

$2^5 = 32$

i.e. 2 repeats itself after the index 4.

On dividing 23 by 4, remainder = 3

∴ Unit's digit in $(2)^{23}$

= Unit's digit in $(2)^3 = 8$

10. (1) $2^1 = 2$; $2^2 = 4$;

$2^3 = 8$; $2^4 = 16$; $2^5 = 32$

∴ Unit digit in the product of $(122)^{173}$

= Unit digit in $(122)^1 = 2$

(1 = remainder when 173 is divided by 4).

11. (4) $4^1 = 4$; $4^2 = 16$; $4^3 = 64$; $4^4 = 256$; $4^5 = 1024$

Remainder on dividing 372 by 4 = 0

Remainder on dividing 373 by 4 = 1

∴ Required unit digit

= Unit digit of the sum of 6 + 4 = 0

12. (2) Last digit of $(1001)^{2008} + 1002$ = 1 + 2 = 3

13. (4) $7^1 = 7$; $7^2 = 49$; $7^3 = 343$;

$7^4 = 2401$; $7^5 = 16807$

i.e. The unit's digit repeats itself after power 4.

Remainder after we divide 245 by 4 = 1

∴ Unit's digit in the product of $(4387)^{245} \times (621)^{72}$ = Unit's digit in the product of $(4387)^1 \times (621)^{72}$ = 7 × 1 = 7

14. (4) Unit digit in the expansion of 25^{6251}

= Unit digit in the expansion of $5^{6251} = 5$

$36^{528} \equiv$ Unit digit in $6^{528} = 6$

Now, $3^1 = 3$, $3^2 = 9$, $3^3 = 27$; $3^4 = 81$, $3^5 = 243$....

$\therefore 73^{54} = 73^{52} \times 73^2$

$\equiv 3^2 = 9$

$\therefore$ Required digit = Unit's digit of the sum 5 + 6 + 9 = 0

15. (4) $7^1 = 7$, $7^2 = 49$, $7^3 = 343$, $7^4 = 2401$

$3^1 = 3$, $3^2 = 9$, $3^3 = 27$, $3^4 = 81$

i.e. the digit at unit's place gets repeated after power 4. Unit 6 remains same for any power.

$\therefore$ Required unit's digit

= Unit's digit in the product of $7^3 \times 6 \times 3^1 = 4$

16. (1) Unit's digit in $(1570)^2 = 0$

Unit's digit in $(1571)^2 = 1$

Unit's digit in $(1572)^2 = 4$

Unit's digit in $(1573)^2 = 9$

$\therefore$ Required unit's digit

= Unit's digit (0 +1+4 + 9) = 4

17. (4) Unit's digit in 3 × 38 × 537 × 1256

= Unit's digit in 3 × 8 × 7 × 6

= 4 × 2 = 8

18. (4) Ten's digit = x

Unit's digit = $2x - 1$

$\therefore$ Original number

= $10x + (2x - 1)$

= $12x - 1$

New number = $10(2x - 1) + x$

= $20x - 10 + x = 21x - 10$

$\therefore (21x - 10) - (12x + 1)$

= $12x - 1 - 20$

$\Rightarrow 9x - 9 = 12x - 21$

$\Rightarrow 3x = 12 \Rightarrow x = 4$

$\Rightarrow$ Original number = $12x - 1$

= 12 × 4 − 1 = 47

[check through options].

19. (1) Required unit's digit

= Unit's digit in the product of 7 × 5 × 8 × 3 × 9 = 0

20. (1) Let the two–digit number be $10x + y$ where $x < y$.

Number obtained on reversing the digits = $10y + x$

According to the question,

$10y + x = 4(10x + y) - 24$

$\Rightarrow 40x + 4y - 10y - x = 24$

$\Rightarrow 39x - 6y = 24$

$\Rightarrow 13x - 2y = 8$ ....(i)

Again, $y - x = 7$

$\Rightarrow y = x + 7$ ....(ii)

$\therefore 13x - 2(x + 7) = 8$

$\Rightarrow 13x - 2x - 14 = 8$

$\Rightarrow 11x = 14 + 8 = 22$

$\Rightarrow x = \frac{22}{11} = 2$

From equation (ii),

$y - 2 = 7 \Rightarrow y = 2 + 7 = 9$

$\therefore$ Number = $10x + y = 10 \times 2 + 9 = 29$

21. (3) Ten's digit of original number = x

$\therefore$ Unit's digit = $2x$

$\therefore$ Number = $10x + 2x = 12x$

According to the question,

$3x - 2 = \frac{1}{6} \times 12x$

$\Rightarrow 3x - 2 = 2x$

$\Rightarrow 3x - 2x = 2$

$\Rightarrow x = 2$

$\therefore$ Number = $12x = 12 \times 2 = 2 = 24$

TYPE-VI

1. (3) $\therefore$ x + x + 2 + x + 4 = 147

$\Rightarrow$ 3 x + 6 = 147

$\Rightarrow$ 3 x = 147 − 6 = 141

$\Rightarrow x = \frac{141}{3} = 47$

$\therefore$ Middle Number

= x + 2 = 47 + 2 = 49

2. (3) Series of first 20 odd natural numbers is an arithmetic progression with 1 as the first term and the common difference 2.

Sum of n terms in arithmetic progression is given by.

$S_n = \frac{1}{2}n[2a + (n-1)d]$

Where a : First term

d : common difference

$\therefore S_{20} = \frac{1}{2} \times 20[(2 \times 1) + (20 - 1) \times 2]$

= 10 [2 + 38]=10 × 40 = 400

Note : Sum of first n consecutive odd numbers = n^2

3. (4) Series of all natural numbers from 75 to 97 is in A.P. whose first term,

a = 75, last term, $l = 97$

If number of terms be n, then

$a_n = a + (n-1)d$

$\Rightarrow 97 = 75 + (n - 1)$

$\Rightarrow n = 97 - 74 = 23$

$S_n = \frac{n}{2}(a + l)$

$S_{23} = \frac{23}{2}(75 + 97)$

$= \frac{23}{2} \times 172 = 1978$

4. (2) Numbers divisible by 3 and lying between 100 and 200 are : 102, 105,..... 198

Let number of terms = n

$\therefore$ 198 = 102 + $(n-1)$ 3

$\Rightarrow n - 1 = \frac{198 - 102}{3} = 32$

$\Rightarrow n = 33$

$\therefore S = \frac{n}{2} = (a + l)$

$= \frac{32}{2}(102 + 198) = 4950$

5. (2) Let the three consecutive natural numbers be x, x + 1 and x + 2.

$\therefore$ According to question,

$x^2 + (x + 1)^2 + (x + 2)^2 = 2030$

or $x^2 + x^2 + 2x + 1 + x^2 + 4x + 4 = 2030$

or $3x^2 + 6x + 5 = 2030$

or $3x^2 + 6x - 2025 = 0$

or $x^2 + 2x - 675 = 0$

or $x^2 + 27x - 25x - 675 = 0$

x (x + 27) − 25 (x + 27) = 0

or (x − 25) (x + 27) = 0

$\therefore$ x = 25 and − 27

$\therefore$ Required number = x + 1

= 25 + 1 = 26

6. (4) Let the three odd consecutive natural numbers be x, x + 2 and x + 4.

$\therefore$ According to the question

x + x + 2 + x + 4 = 87

or 3x + 6 = 87

or 3x = 81 $\therefore$ x = 27

$\therefore$ Smallest number = 27

7. (4) Let three consecutive even integers be 2x, 2x + 2 and 2x + 4 respectively.

$\therefore$ 2x + 2x + 2 + 2x + 4 = 54

$\Rightarrow$ 6x + 6 = 54

$\Rightarrow$ 6x = 54 − 6 = 48

$\Rightarrow$ x = 8

$\therefore$ The least even number

= 2 × 8 = 16

8. (2) Let three consecutive natural numbers be x, $x+1$, $x+2$.
According to the question,
$x + x + 1 + x + 2 = 87$
$\Rightarrow 3x + 3 = 87$
$\Rightarrow 3x = 84 \Rightarrow x = \frac{84}{3} = 28$
$\therefore$ Middle number = 28 + 1 = 29
OR, $\frac{87}{3} = 29$

9. (3) $(x+2)^2 - x^2 = 84$
or $x^2 + 4x + 4 - x^2 = 84$
or $4x = 84 - 4 = 80$
or $x = \frac{80}{4} = 20$
$\Rightarrow x + 2 = 20 + 2 = 22$
$\therefore$ The required sum
= 20 + 22 = 42

10. (4) We have,
$1 + 2 + 3 \ldots\ldots\ldots + n$
$= \frac{n(n+1)}{2}$
$\therefore 51 + 52 + \ldots\ldots + 100$
= (1 + 2 + ... 100) – (1 + 2 + ... + 50)
$= \frac{100 \times 101}{2} - \frac{50 \times 51}{2}$
= 5050 – 1275 = 3775

11. (4) The two-digit numbers are :
10, 11, 12, ... 97, 98, 99
We know that,
$1+ 2 + 3 + 4 + \ldots\ldots + n$
$= \frac{n(n+1)}{2}$
$\therefore$ Required sum = (1 + 2 + 3 + ...+ 99)–(1+2+ ..... + 9)
$= \frac{99(99+1)}{2} - \frac{9(9+1)}{2}$
= 4950 – 45 = 4905

12. (4) S = 1 + 3 + 5 + ... to 50 terms
Here, $a = 1$
$d = 3 - 1 = 2$
$n = 50$
$\therefore\ S = \frac{n}{2}[2a + (n-1)d]$
$= \frac{50}{2}[2 \times 1 + (50-1) \times 2]$
= 25 (2 + 98) = 25 × 100
= 2500

13. (4) According to the question,
First number $= a = 103$
Last number $= l = 998$
$\therefore$ If the number of such numbers be n, then,
$998 = 103 + (n-1) \times 5$
$\Rightarrow (n-1) \times 5 = 998 - 103 = 895$
$\Rightarrow n - 1 = \frac{895}{5} = 179$
$\Rightarrow n = 180$
$\therefore\ S = \frac{n}{2}(a + l)$
$= \frac{180}{2}(103 + 998)$
= 90 × 1101 = 99090

14. (2) First 3 – digit number = 100
Last 3 – digit number = 999
Number of terms = 900
$\therefore\ S = \frac{n}{2}[a + l]$
$= \frac{900}{2}[100 + 999]$
= 450 × 1099 = 494550

15. (1) $x + x + 1 + x + 2 = 27$
$3x + 3 = 27$
$3x = 24$
$x = 8$
$\therefore$ Three consecutive no's whose sum is 27 are 8, 9,10. Hence, next 3 consecutive no's having 36 as sum are 11, 12 and 13

16. (3) $\because 1 + 2 + 3 + \ldots + n = \frac{n(n+1)}{2}$
$\therefore 1 + 2 + 3 + .. + 25$
$= \frac{25(25+1)}{2} = 25 \times 13$
Hence, 13 is a factor of required sum.

17. (2) 22 + 24 + 26 + ... + 50
= 2 (11 + 12 + 13 + ... + 25)
= 2 [(1 + 2 + 3 + ... + 25)
– (1 + 2 + 3 ... + 10)]
$= 2\left(\frac{25 \times 26}{2} - \frac{10 \times 11}{2}\right)$
= 2 (325 – 55) = 2 × 270 = 540
Method 2 :
Tricky Approach
Sum of first n even numbers
$= n(n + 1)$
$\therefore$ Required sum = Sum of 25 even numbers from 1 to 50 – sum of 10 even numbers from 1 to 20
= 25×26 – 10 × 11 = 650 – 110
= 540

18. (3) $x + x + 2 + x + 4 + x + 6 = 748$
$\Rightarrow 4x + 12 = 748$
$\Rightarrow 4x = 748 - 12 = 736$
$\Rightarrow x = \frac{736}{4} = 184$

19. (4) Sum of five consecutive integers = S
$\therefore$ Third integer = $\frac{S}{5}$
$\therefore$ Largest integer = $\frac{S}{5} + 2$
$= \frac{S+10}{5}$

20. (2) Prime numbers upto 17
$\Rightarrow$ 2, 3, 5, 7, 11, 13, 17
$\therefore$ Required sum = 2 + 3 + 5 + 7 + 11 + 13 + 17 = 58

21. (2) $10^2 + 11^2 + 12^2$
= 100 + 121 + 144 = 365
$\therefore$ Required sum =10 + 11 + 12 = 33

22. (3) Numbers = x, $x+1$ and $x+2$
$\therefore\ 2x + 3x + 3 + 4x + 8 = 191$
$\Rightarrow 9x = 191 - 11 = 180$
$\Rightarrow x = 20$
$\therefore$ Numbers = 20, 21 and 22

23. (3) Let the numbers be 3x, 3x + 3 and 3x + 6
$\therefore$ 3x + 3x + 3 + 3x + 6 = 72
$\Rightarrow$ 9x + 9 = 72
$\Rightarrow$ 9x = 72 – 9 = 63
$\Rightarrow x = \frac{63}{9} = 7$
$\therefore$ Largest number
= 3x + 6 = 3 × 7 + 6 = 27

24. (3) Sum of all multiples of 3 upto 50
= 3 + 6 + ... + 48
= 3 (1 + 2 + 3 + ... + 16)
$= \frac{3 \times 16(16+1)}{2} = 3 \times 8 \times 17$
= 408
$\left[\because 1 + 2 + 3 + \ldots\ldots + n = \frac{n(n+1)}{2}\right]$

25. (4) Sum of first n odd natural numbers $= n^2 = (20)^2 = 400$
$\therefore$ Required average = $\frac{400}{20} = 20$

26. (3) Let the numbers be x and y.
According to the question,
$x + 2y = 8$ .... (i)
$x - y = 2$ ..... (ii)
By equation (i) – (ii),
$2y + y = 8 - 2$
$\Rightarrow 3y = 6 \Rightarrow y = 2$
From equation (ii),
$x - 2 = 2 \Rightarrow x = 4$

27. (3) Let the numbers be : $3x$, $3x+3$ and $3x+6$

According to the question,

$3x + 3x + 3 + 3x + 6 = 45$

$\Rightarrow 9x + 9 = 45$

$\Rightarrow 9x = 45 - 9 = 36$

$\Rightarrow x = \frac{36}{9} = 4$

$\therefore$ The smallest number

$= 3x = 3 \times 4 = 12$

28. (4) Let the required largest number be x.

According to the question,

$x + x - 5 + x - 10 = 225$

$\Rightarrow 3x - 15 = 225$

$\Rightarrow 3x = 225 + 15 = 240$

$\therefore x = \frac{240}{3} = 80$

TYPE-VII

1. (2) Check through options

The numbers are : 8, 12, 5, 20

2. (3) $12345679 \times 72 = 888888888$

3. (4) Given : $0.111..... = \frac{1}{9}$

$0.444..... = 4 \times 0.111....$

$= 4 \times \frac{1}{9} = \frac{4}{9}$

4. (3) $8.3\dot{1} = 8\frac{31-3}{90}$

$= 8\frac{28}{90} = \frac{748}{90}$

$0.\dot{6} = \frac{6}{9}$

$0.00\dot{2} = \frac{2}{900}$

$\therefore 8.3\dot{1} + 0.\dot{6} + 0.00\dot{2}$

$= \frac{748}{90} + \frac{6}{9} + \frac{2}{900}$

$= \frac{7480 + 600 + 2}{900} = \frac{8082}{900}$

$= 8 = \frac{8082}{900} = 8\ \frac{979-97}{900}$

$= 8.97\dot{9}$

5. (2) Expression $= 0.\overline{63} + 0.\overline{37}$

$= \frac{63}{99} + \frac{37}{99} = \frac{100}{99}$

6. (3) Expression

$= \left(0.\overline{11} + 0.\overline{22}\right) \times 3$

$= \left(\frac{11}{99} + \frac{22}{99}\right) \times 3$

$= \frac{33}{99} \times 3 = \frac{99}{99} = 1$

7. (2) $\frac{1}{5} + \left(999 + \frac{494}{495}\right) \times 99$

$= \frac{1}{5} + \left(999 + 1 - \frac{1}{495}\right) \times 99$

$= \frac{1}{5} + 999 \times 99 + 99 - \frac{99}{495}$

$= \frac{1}{5} + 98901 + 99 - \frac{1}{5} = 99000$

8. (2) $(1 * 2) * 3 = (1 + 2 \times 6) * 3$

$= 13 * 3 = (13 + 3 \times 6)$

$= 13 + 18 = 31$

9. (2) The given expression

$= 999\frac{995}{999} \times 999$

$= \left(999 + \frac{995}{999}\right)999$

$= 999 \times 999 + \frac{995}{999} \times 999$

$= (1000 - 1)\ 999 + 995$

$= 999000 - 999 + 995$

$= 999000 - 4 = 998996$

10. (4) Expression $= 1.\overline{2} \times 0.\overline{03}$

$= 1\frac{2}{9} \times \frac{3}{99} = \frac{11}{9} \times \frac{3}{99} = \frac{1}{27}$

$= 0.\overline{037}$

11. (1) $3.718 = \frac{1}{0.2689}$ (Given)

$\therefore \frac{1}{0.0003718} = \frac{10000}{3.718}$

$= 0.2689 \times 10000 = 2689$

12. (3) $\left(\sqrt{a+b}\right)^2 = a + b$

$\left(\sqrt{a} + \sqrt{b}\right)^2 = a + b + 2\sqrt{ab}$

Here, $a + b < a + b + 2\sqrt{ab}$

Clearly, $\sqrt{a+b} < \sqrt{a} + \sqrt{b}$

13. (3) $\sqrt{18225} = 135$,

$\sqrt{17956} = 134$

$\sqrt{63592} = 252.17$

In a perfect square number 2 never comes at the unit's place.

14. (3) $0.\overline{142857} \div 0.\overline{285714}$

$= \frac{142857}{999999} \div \frac{285714}{999999}$

$= \frac{142857}{285714} = \frac{1}{2}$

15. (4) $5.\overline{76} - 2.\overline{3}$

$= 5 + \frac{76}{99} - 2 - \frac{3}{9} = 3 + \frac{76}{99} - \frac{3}{9}$

$= 3 + \frac{76-33}{99} = 3 + \frac{43}{99} = 3.\overline{43}$

16. (2) $\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right).....\left(1-\frac{1}{n}\right)$

$= \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times ..... \times \frac{n-1}{n} = \frac{2}{n}$

We observe that denominator of a term cancels with the numerator of the succeeding term

17. (2) $2.8\overline{768} = 2\frac{8768-8}{9990}$

$= 2\frac{8760}{9990} = 2\frac{292}{333}$

18. (3) When we multiply 2 and 5 (at unit place) we get a zero

$\therefore$ Number of zeros = The number of zeros in the end in the product of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190 and 200 = 24

19. (4) $77777777 \div 77 = 1010101$

20. (3) Expression

$= 8.3\overline{1} + 0.\overline{6} + 0.00\overline{2}$

$= 8.31\overline{1}$

$+0.66\overline{6}$

$+0.00\overline{2}$

$8.97\overline{9}$

21. (1) $0.\bar{2} + 0.\bar{3} + 0.\overline{32}$

$= \frac{2}{9} + \frac{3}{9} + \frac{32}{99}$

$= \frac{22+33+32}{99} = \frac{87}{99} = 0.\overline{87}$

22. (2) Expression = $0.\overline{63} + 0.\overline{37}$

$= \frac{63}{99} + \frac{37}{99} = \frac{100}{99}$

23. (2) $\frac{51.84}{4.32} = \frac{5184}{432} = 12$

$\therefore \quad \frac{0.005184}{0.432} = \frac{5184}{432} \times \frac{1}{1000}$

$= \frac{12}{1000} = 0.012$

24. (3)

$\left(\frac{2+1}{2}\right)\left(\frac{3+1}{3}\right)\left(\frac{4+1}{4}\right)....\left(\frac{120+1}{120}\right)$

$= \frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times .....\times \frac{121}{120}$

$= \frac{121}{2} = 60.5$

25. (1) Let x and y be the two numbers. Then,

xy = 375 and x + y = 40

$\therefore$ Sum of reciprocals $= \frac{x+y}{xy}$

$= \frac{40}{375} = \frac{8}{75}$

26. (3) Let the two numbers be x and y.

$\therefore$ x + y = 12 and xy = 35

$\frac{1}{x} + \frac{1}{y} = \frac{y+x}{xy} = \frac{12}{35}$

27. (3) Let two numbers be x and y.

x + y = 3

$x^2 + y^2 = 12$

$\Rightarrow (x + y)^2 = (3)^2$

$\Rightarrow x^2 + y^2 + 2xy = 9$

$\Rightarrow 12 + 2xy = 9$

$\Rightarrow 2xy = -3$

$\Rightarrow xy = -\frac{3}{2}$

28. (4) Let the number of students be n.

So, each of n students got 2n chocolates

Total no. of chocolates

$= (2n) \times n = 800$

$\Rightarrow 2n^2 = 800$

$\Rightarrow n^2 = 400 \Rightarrow n = 20$

29. (3) A product gets 0 at its end when

(i) a multiple of 5 is multiplied by an even number or

(ii) a multiple of 10 is multiplied by any number.

All the given numbers are even and do not contain any multiple of 5. So, zeros at the end of the product will come only on multiplications by multiples of 10.

Multiples of 10 that lie in the given range from 2 to 100 are 10, 20, 30, 40,50, 60, 70, 80, 90 and 100. Each of these multiples will yield one zero except 100 which will yield two zeros at the end of the product.

$\therefore$ Total no. of zeros at the product = 9 + 2 = 11

30. (3) Number of digits from 1 to 9 = 9

Number of digits used in writing from 10 to 50

$= 41 \times 2 = 82$

$\therefore$ Total digits = 82 + 9 = 91

31. (3) Let the number be x.

$\therefore$ According to question,

2x + 20 = 8x – 4

or 8x – 2x = 20 + 4

or 6x = 24

$\therefore$ x = 4

32. (3) Let the original number of friends be *x*.

$\therefore \quad \frac{108}{x-3} - \frac{108}{x} = 3$

$\Rightarrow 108\left(\frac{x - x + 3}{x(x-3)}\right) = 3$

$\Rightarrow x(x - 3) = 108$

$\Rightarrow x^2 - 3x - 108 = 0$

$\Rightarrow x^2 - 12x + 9x - 108 = 0$

$\Rightarrow (x - 12) + 9(x - 12) = 0$

$\Rightarrow (x - 12)(x + 9) = 0$

$\Rightarrow x = 12$ as $x \neq -9$

$\therefore$ The number of friends who attended the picnic

$= 12 - 3 = 9$

33. (3) In 2m × 5n, the number of zeros

= n when m ≥ n

= m when m < n

Here, $128 = 2^7$

In 1 × 3 × 5 × 7 × ... × 99

multiples of 5 are 5, 15, 25, 35, 45, 55, 65, 75, 85, 95 (= 5^{10})

Clearly, 7 zeros will be found in the product.

34. (3) According to question

$x^2 + y^2 = 100$ ...(i)

$x^2 - y^2 = 28$ ...(ii)

Adding both the equations

$x^2 + y^2 = 100$

$x^2 - y^2 = 28$

$2x^2 = 128$

$\Rightarrow x^2 = 64 \quad \therefore x = 8$

From the equation (i)

$y^2 = 100 - 64 \quad \therefore y = 6$

So, x + y = 8 + 6 = 14

35. (3) $\frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times ... \times \frac{98}{99} \times \frac{99}{100}$

$= \frac{2}{100} = \frac{1}{50}$

36. (2) Let the numbers be *x* and *y*.

$xy = 120$

$x^2 + y^2 = 289$

$(x - y)^2 = x^2 + y^2 - 2xy$

$= 289 - 2 \times 120 = 289 - 240 = 49$

$\therefore x - y = 7$

37. (2) Let the numbers be x and *y*.

$\therefore x + y = 10$ and $xy = 24$

$\therefore \quad \frac{x+y}{xy} = \frac{1}{y} + \frac{1}{x} = \frac{10}{24} = \frac{5}{12}$

38. (4) Expression $= 99 + \frac{1}{7} + 99 + \frac{2}{7}$

$+ 99 + \frac{3}{7} + ... + 99 + \frac{6}{7}$

$= (99 \times 6) + \left(\frac{1}{7} + \frac{2}{7} + \frac{3}{7} + \frac{4}{7} + \frac{5}{7} + \frac{6}{7}\right)$

$= 594 + \left(\frac{1+2+3+4+5+6}{7}\right)$

$= 594 + \frac{21}{7} = 594 + 3 = 597$

39. (4) Let number of boys = *x*

and number of girls = 85 – *x*

According to the question,

$x \times 4 + (85 - x) \times 5 = 380$

$\Rightarrow 4x + 425 - 5x = 380$

$\Rightarrow x = 45$

40. (2) Let one of the positive numbers be x.
$\therefore$ The other will be 4x
Now, $4x \times x = 2500$
$\Rightarrow x^2 = 2500 \div 4 = 625$
$\therefore x = \sqrt{625} = 25$
$\therefore$ Sum of the two numbers
$= 5x = 5 \times 25 = 125$

41. (4) Let the ten's digit be x
$\therefore$ Unit's digit = x + 2
Therefore, the two digit number
$= 10x + x + 2$
$= 11x + 2$ ...(i)
Again,
$(11x + 2)(x + x + 2)$
$= 144$
$\Rightarrow (11x + 2)(2x + 2) = 144$
$(11x + 2)(x + 1) = 72$
$\Rightarrow 11x^2 + 2x + 11x + 2 = 72$
$\Rightarrow 11x^2 + 13x - 70 = 0$
$\Rightarrow 11x^2 - 22x + 35x - 70 = 0$
$\Rightarrow 11x(x - 2) + 35(x - 2) = 0$
$\Rightarrow (x - 2)(11x + 35) = 0$

$$\Rightarrow x = 2, -\frac{35}{11}$$

But $x = -\frac{35}{11}$ is not admissible.
$\therefore$ The number = 11x + 2
$= 11 \times 2 + 2 = 24$

42. (2) Let the number of correct answers be x
$\therefore$ The no. of incorrect answers
$= 20 - x$
According to the question,
$x - (20 - x) = 8$
$\Rightarrow x - 20 + x = 8$
$\Rightarrow 2x = 28 \Rightarrow x = 14$

43. (1) Let the number of boys = x
$\therefore$ Number of 25 paise coins= x^2
According to question,

$$\frac{25}{100} \times x^2 = 400$$

$$\Rightarrow \frac{x^2}{4} = 400 \Rightarrow x^2 = 1600$$

$$\Rightarrow x = \sqrt{1600} = 40$$

44. (2) Let the number be x.
According to the question,
$3 \times x^2 - 4 \times x = x + 50$
$\Rightarrow 3x^2 - 5x - 50 = 0$
$\Rightarrow 3x^2 - 15x + 10x - 50 = 0$
$\Rightarrow 3x(x - 5) + 10(x - 5) = 0$
$\Rightarrow (x - 5)(3x - 10) = 0$

$$\Rightarrow x = 5 \text{ or } \frac{-10}{3}$$

But the number is natural.

$$\therefore x \neq \frac{-10}{3}$$

Hence, the required number = 5.

45. (3) Let the number be x and y and $x > y$.
$x - y = 3$ ...(i)
$x^2 + y^2 = 369$ ...(ii)
From equation (i)
$x - y = 3$
$\Rightarrow (x - y)^2 = 3^2$
$\Rightarrow x^2 + y^2 - 2xy = 9$
$\Rightarrow 2xy = (x^2 + y^2) - 9$
$= 369 - 9 = 360$
From equation (ii)
Now, $(x + y)^2 = x^2 + y^2 + 2xy$
$= 369 + 360 = 729$

$$\therefore x + y = \sqrt{729} = 27$$

$\therefore$ Required sum = 27

46. (3) Let the unit's digit be x.
$\therefore$ Ten's digit = $x - 2$
$\therefore$ Number = $10(x - 2) + x$
$= 10x - 20 + x = 11x - 20$
New number obtained after reversing the digits
$= 10x + x - 2 = 11x - 2$
According to the question,

$$3(11x - 20) + \frac{6}{7}(11x - 2) = 108$$

$$\Rightarrow (11x - 20) + \frac{2}{7}(11x - 2) = 36$$

$\Rightarrow 77x - 140 + 22x - 4 = 252$
$\Rightarrow 99x = 252 + 144$

$$\Rightarrow x = \frac{396}{99} = 4$$

$\therefore$ Number = $11x - 20$
$= 11 \times 4 - 20 = 24$
$\therefore$ Sum of digits = 2 + 4 = 6

47. (3) Let the first number be x.
$\therefore$ Second number = $2x$,

and third number = $\frac{2x}{3}$

Now, $x + 2x + \frac{2x}{3} = 44 \times 3$

$$\Rightarrow \frac{3x + 6x + 2x}{3} = 132$$

$\Rightarrow 11x = 132 \times 3$

$$\Rightarrow x = \frac{132 \times 3}{11} = 36$$

$\therefore$ Required difference

$$= x - \frac{2x}{3} = \frac{x}{3} = \frac{36}{3} = 12$$

48. (2) Let the two digit number be $10y + x$.
According to the question,
$10y + x = 5(x + y)$
$\Rightarrow 10y + x - 5x - 5y = 0$
$\Rightarrow 5y - 4x = 0$ ....(i)
And,
$10y + x + 9 = 10x + y$
$\Rightarrow 9x - 9y = 9$
$\Rightarrow x - y = 1$ ... (ii)
From equation (i),
$\Rightarrow 5y - 4(1 + y) = 0$ [From (ii)]
$\Rightarrow 5y - 4 - 4y = 0$
$\Rightarrow y = 4$
$\therefore$ From equation (ii),
$x = 4 + 1 = 5$
$\therefore$ Number = $10 \times 4 + 5 = 45$
$\therefore$ Sum of digits = 4 + 5 = 9

49. (4) The number of multiples of 130 are obtained by dividing 1000 by 130. The quotient i.e. 7 gives the result.

50. (4) Zeros are obtained if there is any zero at the end of any multiplicand and if 5 or multiple of 5 are multiplied by any even number. i.e. $(5)^n (2)^m$ has n zeros if $n < m$ or m zeros if $m < n$
Now, we obtain the index of 5 as follows :

$$\text{Index} = \left[\frac{1000}{5}\right] + \left[\frac{1000}{5^2}\right] + \left[\frac{1000}{5^3}\right] + \left[\frac{1000}{5^4}\right]$$

$= 200 + 40 + 8 + 1 = 249.$
Certainly, n will be less than m.
$\therefore$ Number of zeros = 249

51. (1) Let the numbers be a and b, where $a > b$
According to the question,
$a - b = 3$ ...(i)
$a^2 - b^2 = 39$
$\Rightarrow (a + b)(a - b) = 39$

$$\Rightarrow a + b = \frac{39}{a - b} = \frac{39}{3} = 13$$

$\Rightarrow a + b = 13$ ...(ii)
Adding equations (i) and (ii)
$2a = 16 \Rightarrow a = 8$

52. (2) Check through options
$20 \rightarrow 20 + 7 = 27 \rightarrow 27 \times 5$
$= 135 \rightarrow 135 \div 9$
$= 15 \rightarrow 15 - 3 = 12$
OR, We will solve the problem from the opposite side.
Here the remainder is 12.
$12 + 3 = 15$
$15 \times 9 = 135$
$135 \div 5 = 27$
$27 - 7 = 20$
$\therefore$ The original number was 20.

53. (3) Let the smallest number be x.
$\therefore x \times 7 = 33333....$

$$\Rightarrow x = \frac{33333....}{7} = 47619$$

54. (2) Let the two digit number be = $10x + y$.
According to the question,
$10x + y = 3(x + y)$
$\Rightarrow 10x + y = 3x + 3y$
$\Rightarrow 10x + y - 3x - 3y = 0$
$\Rightarrow 7x - 2y = 0$ ...(i)
and,
$10x + y + 45 = 10y + x$
$\Rightarrow 10y + x - 10x - y = 45$
$\Rightarrow 9y - 9x = 45$
$\Rightarrow 9(y - x) = 45$
$\Rightarrow y - x = 5$ ...(ii)
$2 \times$ (ii) + (i) we have
$2y - 2x + 7x - 2y = 10$

$$\Rightarrow 5x = 10 \Rightarrow x = \frac{10}{5} = 2$$

From equation (ii),
$y - 2 = 5 \Rightarrow y = 2 + 5 = 7$
$\therefore$ Number = $10x + y$
$= 2 \times 10 + 7 = 27$
$\therefore$ Sum of digits = 2 + 7 = 9

55. (1) Let the remainder in each case be x.
Then, $(2272 - x)$ and $(875 - x)$ are exactly divisible by that three digit number.
Hence, their difference $[(2272 - x) - (875 - x)] = 1397$ will also be exactly divisible by the said divisor (N).
Now, $1397 = 11 \times 127$
Since both 11 and 127 are prime numbers, N is 127.
$\therefore$ Sum of digits = 1+ 2 + 7 = 10

56. (1) Let the numbers be x and y respectively.
$\therefore x + y = 12$ and $xy = 35$

$$\therefore \frac{1}{x} + \frac{1}{y} = \frac{x + y}{xy} = \frac{12}{35}$$

57. (3) Let the third number be x.
$\therefore$ Second number = $3x$

$$\text{First number} = \frac{3}{2}x$$

According to the question,

$$\frac{3x}{2} + 3x + x = 44 \times 3$$

$$\Rightarrow \frac{3x + 6x + 2x}{2} = 44 \times 3$$

$$\Rightarrow 11x = 88 \times 3$$

$$\Rightarrow x = \frac{88 \times 3}{11} = 24$$

$\therefore$ The largest number
$= 3x = 3 \times 24 = 72$

58. (3) Let the two digit number be $10x + y$ where $x > y$.
Here, $x + y = 10$ ...(i)
and, $10x + y - 10y - x = 18$
$\Rightarrow 9x - 9y = 18$
$\Rightarrow 9(x - y) = 18$
$\Rightarrow x - y = 2$ ...(ii)
Solving equations (i) and (ii),
$x = 6$ and $y = 4$
$\therefore$ Number = $10 \times 6 + 4 = 64$

59. (1) Let the positive integer be x.
$\therefore 2x^2 - 5x = 3$
$\Rightarrow 2x^2 - 5x - 3 = 0$
$\Rightarrow 2x^2 - 6x + x - 3 = 0$
$\Rightarrow 2x(x - 3) + 1(x - 3) = 0$
$\Rightarrow (x - 3)(2x + 1) = 0$

$\therefore x = 3$ and $x = -\frac{1}{2}$ is not admissible.

60. (2) Let the first number be x.
$\therefore$ Second number = $14 - x$
$\therefore x(14 - x) = 24(x - 14 + x)$
$\Rightarrow x(14 - x) = 24(2x - 14)$
$\Rightarrow 14x - x^2 = 48x - 336$
$\Rightarrow x^2 + 34x - 336 = 0$
$\Rightarrow x^2 + 42x - 8x - 336 = 0$
$\Rightarrow x(x + 42) - 8(x + 42) = 0$
$\Rightarrow (x + 42)(x - 8) = 0$
$\therefore x = 8$ as $x \neq -42$
$\therefore$ Second number = $14 - 8 = 6$
$\therefore$ Larger number = 8
Note : It is preferable to solve it by oral calculation with the help of given alternatives.

61. (4) If the first number be x, then

$$\text{Second number} = \frac{x}{5}$$

$$\therefore x \times \frac{x}{5} = 0.008$$
$\Rightarrow x^2 = 0.008 \times 5 = 0.04$
$\therefore x = \sqrt{0.04} = 0.2$
$\therefore$ Smaller number

$$= \frac{0.2}{5} = 0.04$$

62. (1) Let the natural numbers be x and y.
$\therefore$ Required sum = $18x + 21y$
$= 3(6x + 7y)$
Hence, the sum is divisible by 3.
$\therefore$ Required answer = 2007

63. (1) Let the numbers be x and y.
$\therefore x(x + y) = 247$
and $y(x + y) = 114$
$\Rightarrow x^2 + xy = 247$ and $xy + y^2 = 114$
On adding;
$x^2 + xy + xy + y^2 = 247 + 114$
$\Rightarrow x^2 + 2xy + y^2 = 361$
$\Rightarrow (x + y)^2 = 19^2 \Rightarrow x + y = 19$

64. (4) The sum of two odd numbers is even. The same is the case with their product.
$\therefore a + b + 2ab$ = Even number

65. (2) $d = 4375 + 2986 - 2361$
$= 5000$

66. (3) According to the question,

$$\left(\frac{n}{2} + \frac{n}{4} + \frac{n}{5}\right) + 7 = n$$

$$\Rightarrow \left(\frac{10n + 5n + 4n}{20}\right) + 7 = n$$

$$\Rightarrow \frac{19n}{20} + 7 = n$$

$$\Rightarrow n - \frac{19n}{20} = 7 \Rightarrow \frac{n}{20} = 7$$

$\Rightarrow n = 20 \times 7 = 140$

67. (2) If the number of correct answers be x, then
$x \times 4 - 1.(200 - x) = 200$
$\Rightarrow 4x - 200 + x = 200$
$\Rightarrow 5x = 400$

$$\Rightarrow x = \frac{400}{5} = 80$$

68. (2) Let the number of correct answers be x.
$\therefore x \times 4 - (75 - x) \times 1 = 125$
$\Rightarrow 4x - 75 + x = 125$
$\Rightarrow 5x = 125 + 75 = 200$

$$\therefore x = \frac{200}{5} = 40$$

69. (1) Let the numbers be a and b.
According to the question,
$ab = 120$ ... (i)
and $a^2 + b^2 = 289$ ... (ii)
$\therefore (a+b)^2 = a^2 + b^2 + 2ab$
$= 289 + 2 \times 120$
$= 289 + 240 = 529$
$\therefore a + b = \sqrt{529} = 23$

70. (4) Let the numbers be x and y.
According to the question,
$x + y = 11$ ....(i)
$xy = 18$ ...(ii)
Dividing equation (i) by equation (ii)

$$\frac{x+y}{xy} = \frac{1}{y} + \frac{1}{x} = \frac{11}{18}$$

71. (1) Let number of grapes eaten on the first day be x.
$\therefore x + x + 6 + x + 12 + x + 18 + x + 24 = 100$
$\Rightarrow 5x + 60 = 100$
$\Rightarrow 5x = 100 - 60 = 40$

$$\Rightarrow x = \frac{40}{5} = 8$$

72. (1) Let the original number be x.
According to the question
$7.2 \times x - 0.72 \times x = 2592$
$\Rightarrow x(7.2 - 0.72) = 2592$
$\Rightarrow x \times 6.48 = 2592$

$$\Rightarrow x = \frac{2592}{6.48}$$

$$= \frac{2592 \times 100}{648} = 400$$

73. (3) Let the numbers be x, y and z.
$\therefore x + y = 55$ ....(i)
$y + z = 65$ ....(ii)
$3x + z = 110$ ....(iii)
By equation (iii) – (ii),
$3x - y = 110 - 65 = 45$ ....(iv)
By equation (i) + (iv),
$4x = 45 + 55 = 100$
$\Rightarrow x = 25$
From equation (iii),
$75 + z = 110$
$\Rightarrow z = 110 - 75 = 35$

74. (3) Let unit's digit be x.
Ten's digit $= x + 5$
Number $= 10(x + 5) + x$
$= 11x + 50$
Again,
$11x + 50 - 5(2x + 5)$
$= 10x + x + 5$
$\Rightarrow 11x + 50 - 10x - 25 = 11x + 5$
$\Rightarrow 10x = 20 \Rightarrow x = 2$
$\therefore$ Required sum
$= 2x + 5 = 2 \times 2 + 5 = 9$

75. (2) Let the number be $100(2x) + 10y + x = 201x + 10y$ .....(i)
$\therefore 2x + y + x = 18$
$\Rightarrow 3x + y = 18$ .....(ii)
When the digits are reversed, number
$= 100(x) + 10y + 2x$
$= 102x + 10y$ .....(iii)
$\therefore 201x + 10y - 102x - 10y = 396$
$\Rightarrow 99x = 396 \Rightarrow x = 4$
$\therefore$ From equation (i)
$3 \times 4 + y = 18$
$\Rightarrow y = 18 - 12 = 6$
$\therefore$ Required difference $= 2x - y = 2 \times 4 - 6 = 2$

76. (1) Let the two digit number be $10y + x$ where $x > y$
$\therefore 10x + y - 10y - x = 63$
$\Rightarrow 9x - 9y = 63$
$\Rightarrow x - y = 7$
$\therefore x = 7, 8, 9$ and $y = 0, 1, 2$

77. (3) Let the required number be x.
$\therefore x^2 + x = 2 \times 3 \times 5$
$\Rightarrow x^2 + x - 30 = 0$
$\Rightarrow x^2 + 6x - 5x - 30 = 0$
$\Rightarrow x(x + 6) - 5(x + 6) = 0$
$\Rightarrow (x - 5)(x + 6) = 0$
$\Rightarrow x = 5$

78. (2) Number of hens $= x$
$\therefore$ Number of cows $= 48 - x$
$\therefore 2x + (48 - x) \times 4 = 35 \times 4$
$\Rightarrow 2x + 192 - 4x = 140$
$\Rightarrow 2x = 192 - 140 = 52$
$\Rightarrow x = 26$

79. (1) Length of the road = 1000 metre
Number of plants on one side of the road $= \frac{1000}{20} + 1 = 51$
$\therefore$ Total number of plants
$= 2 \times 51 = 102$

80. (1) $\left(999 + \frac{98}{99}\right) \times 99$
$= 999 \times 99 + 98$
$= (1000 - 1)\,99 + 98$
$= 99000 - 99 + 98 = 98999$

81. (4) If the number be $10x + y$ then number obtained by reversing the digits $= 10y + x$.
$\therefore 10x + y + 10y + x = 11(x + y)$
If $x + y = 11$ the possible pairs are = (2, 9), (3, 8), (4, 7) and (5, 6)
$\therefore$ Required answer = 8

82. (4) Expression
$= \left(99 + \frac{95}{99}\right) \times 99$
$= 99 \times 99 + 95$
$= 99(100 - 1) + 95$
$= 9900 - 99 + 95 = 9896$

83. (4) Marbles in the 50th box will be kept by 1st, 2nd, 5th, 10th, 25th and 50th persons.
[There are the factors of 50].
$\therefore$ Number of marbles
$= 1 + 2 + 5 + 10 + 25 + 50 = 93$

84. (2) Number of pants

$$= \frac{252}{2\frac{1}{2}} = \frac{252 \times 2}{5} = 100$$

Number of shirts

$$= \frac{141 \times 4}{7} \approx 80$$

85. (3) $323 = 17 \times 19$

86. (2) Let one of the positive number be x.
$\therefore$ The other will be 4x
Now, $4x \times x = 2500$
$\Rightarrow x^2 = 2500 \div 4 = 625$
$\therefore x = \sqrt{625} = 25$
$\therefore$ Sum of the two numbers
$4x + x = 5x = 5 \times 25 = 125$

87. (2) If the number of correct sums be x, then,
$x \times 3 - (30 - x) \times 2 = 40$
$\Rightarrow 3x - 60 + 2x = 40$
$\Rightarrow 5x = 60 + 40 = 100$
$\Rightarrow x = 20$

88. (4) $a * b = a + b + \frac{a}{b}$

$$\therefore 12 * 4 = 12 + 4 + \frac{12}{4}$$

$= 16 + 3 = 19$

89. (2) Number of trees on each side of the road
[+1 because we would start with a tree]

$$= \frac{1760}{20} + 1 = 88 + 1 = 89$$

$\therefore$ Required answer
$= 89 \times 2 = 178$

90. (2) A + B= 3 (B + C)
A + B + C = A + 30
B = 5 C
$\therefore$ A + B = 3 (B + C)
$\Rightarrow$ A + 5C = 18C $\Rightarrow$ A = 13C
$\therefore$ A + B + C = A + 30
13C + 5C + C = 13C + 30
$\Rightarrow$ 6C = 30
$\Rightarrow$ C = 5
$\Rightarrow$ A = 13 × 5 = ₹ 65

91. (3) If the numbers be x and y, then
$x + y = a$ and $xy = b$

$$\therefore \frac{1}{y}+\frac{1}{x}=\frac{x+y}{xy}=\frac{a}{b}$$

92. (4) $999\ \frac{999}{1000} \times 7$

$$= \left(999+\frac{999}{1000}\right)\times 7$$

$$= 6993+\frac{6993}{1000}$$

$$= 6993 + 6\ \frac{993}{1000}$$

$$= 6993 + 6 + \frac{993}{1000}$$

$$= 6999\ \frac{993}{1000}$$

93. (2) Total number of workers
= 125 × 9 = 1125

94. (1) Expression

$$= 999\frac{1}{7}+999\frac{2}{7}+\ldots+999\frac{6}{7}$$

$$= \left(999+\frac{1}{7}\right)+\left(999+\frac{2}{7}\right)+\ldots\ldots$$

$$+\left(999+\frac{6}{7}\right)$$

$$= (6\times 999)+\left(\frac{1}{7}+\frac{2}{7}+\frac{3}{7}+\ldots+\frac{6}{7}\right)$$

$$= 5994+\left(\frac{1+2+3+4+5+6}{7}\right)$$

$$= 5994 + \frac{21}{7} = 5994 + 3 = 5997$$

95. (1) 228 = 70 × 3 + 18

96. (3) Divisor = 5 × remainder
= 5 × 36 = 180
Again, Divisor = 12 × quotient
$\therefore$ 180 = 12 × quotient

$$\therefore \text{Quotient} = \frac{180}{12} = 15$$

$\therefore$ Dividend = Divisor × Quotient + Remainder
= 180 × 15 + 36
= 2700 + 36 = 2736

97. (1) If the numbers be x and y, then
$x + y = 8$ ..... (i)
$xy = 15$ ..... (ii)
Dividing equation (i) by (ii)

$$\frac{x+y}{xy}=\frac{8}{15} \Rightarrow \frac{x}{xy}+\frac{y}{xy}=\frac{8}{15}$$

$$\Rightarrow \frac{1}{y}+\frac{1}{x}=\frac{8}{15}$$

98. (3) Suppose number is x.
$\therefore$ 3 (2x + 9) = 75
$\Rightarrow$ 6x + 27 = 75
$\Rightarrow$ 6x = 48 $\Rightarrow$ x = 8

99. (3) $\because a * b = a + b - ab$
$\therefore$ 5 * 7 = 5 + 7 – 5 × 7 = 12 – 35
= – 23

100. (3) 12 months' salary
= ₹ 90 + turban
$\therefore$ 9 months' salary

$$= (₹\ 90 + \text{turban}) \times \frac{9}{12}$$

$$= ₹\ 90 \times \frac{3}{4} + \frac{3}{4}\ \text{turban}$$

$$= ₹\ \frac{135}{2} + \frac{3}{4}\ \text{turban}$$

$$\therefore ₹\ \frac{135}{2} + \frac{3}{4}\ \text{turban}$$

= ₹ 65 + turban

$$\therefore \frac{1}{4}\ \text{turban} = \frac{135}{2} - 65 = ₹\ \frac{5}{2}$$

$$\therefore \text{Turban} \Rightarrow \frac{5}{2}\times 4 = ₹\ 10$$

101. (3) Let the number be $10x + y$.
Dividend = Divisor × quotient + remainder
$\therefore$ $10x + y = 6(x + y) + 3$
$\Rightarrow$ $10x + y = 6x + 6y + 3$
$\Rightarrow$ $10x - 6x + y - 6y = 3$
$\Rightarrow$ $4x - 5y = 3$ ....(i)
Again, $10y + x = 4 (x + y) + 9$
$\Rightarrow$ $10y + x = 4x + 4y + 9$
$\Rightarrow$ $6y - 3x = 9$
$\Rightarrow$ $2y - x = 3$ ....(ii)
$\therefore$ By equation (i) + 4 × (ii),
$4x - 5y = 3$
$8y - 4x = 12$
$3y = 15$
$\Rightarrow$ $y = 5$
From equation (ii),
$2 \times 5 - x = 3 \Rightarrow$
$x = 10 - 3 = 7$
$\therefore$ Sum of digits = $x + y = 7 + 5 = 12$

102. (3) Every rational number is a real number.

103. (4) 0.01 < 0.015 < 0.12
$\Rightarrow$ – 0.01 > – 0.015 > – 0.12
$\Rightarrow p < r < q$

104. (2) A + B = 120
B + C = 130
C + A = 140
On adding,
2 (A + B + C) = 120 + 130 + 140 = 390

$$\Rightarrow \text{A + B + C} = \frac{390}{2} = 195$$

$\therefore$ Marks obtained by C = Marks obtained by (A + B + C) – Marks obtained by (A + B)
= 195 – 120 = 75

105. (1) Required answer

$$= \frac{1}{7\times 24} = \frac{1}{168} = 0.0059$$

106. (3) $x = 0.\dot{3} + 0.\dot{6} + 0.\dot{7} + 0.\dot{8}$

$$= \frac{3}{9}+\frac{6}{9}+\frac{7}{9}+\frac{8}{9}$$

$$= \frac{3+6+7+8}{9} = \frac{24}{9} = \frac{8}{3} = 2\frac{2}{3}$$

107. (2) Let the number of oranges with Natu be x.
Number of oranges with Buchku = y
Case I,
$x + 10 = 2 (y - 10)$
$\Rightarrow$ $x + 10 = 2y - 20$
$\Rightarrow$ $2y - x = 20 + 10 = 30$ ..(i)
Case II,
$y + 10 = x - 10$
$\Rightarrow$ $x - y = 10 + 10 = 20$ ... (ii)
On adding equations (i) and (ii),
$2y - x + x - y = 30 + 20$
$\Rightarrow$ $y = 50$
From equation (ii),
$x - 50 = 20$
$\Rightarrow$ $x = 50 + 20 = 70$

TEST YOURSELF

1. 64329 is divided by a certain number, the successive remainders being 175, 114 and 213 respectively. What are the divisor and the quotient respectively ?
(1) 234 and 274 (2) 224 and 268
(3) 468 and 232 (4) 218 and 274

2. The sum of the first two of three consecutive odd numbers is 33 more than the third number. What is the second number ?
(1) 35 (2) 37
(3) 39 (4) 33

3. A rational number between $\frac{1}{2}$ and $\frac{3}{5}$ is :
(1) $\frac{2}{5}$ (2) $\frac{3}{5}$
(3) $\frac{11}{20}$ (4) None of these

4. How many numbers are there between 99 and 1000 such that the digit 8, occupies the unit's place?
(1) 64 (2) 74
(3) 82 (4) None of these

5. One third of the boys and one half of the girls of a college participate in a social work project. If the number of participating students is 300 out of which 100 are boys, what is the total number of students in the college?
(1) 500 (2) 700
(3) 800 (4) None of these

6. Find the unit's digit in the product of 437, 82, 28, 45 and 47.
(1) 0 (2) 1
(3) 2 (4) 3

7. What will be the digit at unit's place in the value of $(2467)^{153}$?
(1) 9 (2) 7
(3) 3 (4) 1

8. What will be the unit's digit in the value of $(3127)^{173}$?
(1) 9 (2) 1
(3) 3 (4) 7

9. What will be the unit's digit in the product of $(2467)^{153} \times (341)^{72}$?
(1) 3 (2) 1
(3) 7 (4) 9

10. Find the number of prime factors in $30^7 \times 22^5 \times 34^{12} \times 12^5$.
(1) 70 (2) 65
(3) 29 (4) 69

11. Find the number of prime factors in the product of $25^{12} \times 10^7 \times 14^7$.
(1) 50 (2) 52
(3) 51 (4) 54

12. A certain number when successively divided by 8 and 11 leaves remainder 3 and 7 respectively. Find the remainder if the same number is divided by 88.
(1) 57 (2) 51
(3) 59 (4) 61

13. A certain number on being divided successively by 9, 11 and 13 leaves remainder 8, 9 and 8 respectively. What are the remainders when the same number be divided by reversing the order of divisors?
(1) 10, 1, 6 (2) 10, 6, 2
(3) 10, 3, 3 (4) 9, 3, 2

14. A certain number when successively divided by 3, 5 and 8 leaves remainder 1, 2, 3 respectively. Find the remainders when the same number is divided by reversing the divisors.
(1) 3, 2, 1 (2) 4, 1, 1
(3) 4, 2, 2 (4) 1, 4, 1

15. If the sum of the digits of any number, lying between 100 and 1000 is subtracted from the number, then the difference is always divisible by
(1) 7 (2) 9
(3) 11 (4) 6

16. Find the least number of five digits which is divisible by 666.
(1) 10656 (2) 10665
(3) 10566 (4) 15066

17. Find the nearest number to 56586 which is exactly divisible by 552.
(1) 58666 (2) 56856
(3) 58656 (4) 85656

18. Find the number nearest to 77685 which is exactly divisible by 720.
(1) 78680 (2) 77700
(3) 77760 (4) 78960

19. Find the number nearest to 12199 which is exactly divisible by the product of the first four prime numbers.
(1) 12229 (2) 122208
(3) 12280 (4) 12180

20. Find the greatest number of 4 digits and the least number of 5 digits which when divided by 789 leave a remainder 5 in each case.
(1) 9473, 10262 (2) 9573, 10362
(3) 9673, 10462 (4) 9676, 10465

SHORT ANSWERS

1. (1)	**2.** (2)	**3.** (3)	**4.** (4)
5. (2)	**6.** (1)	**7.** (2)	**8.** (4)
9. (3)	**10.** (1)	**11.** (2)	**12.** (3)
13. (1)	**14.** (2)	**15.** (2)	**16.** (1)
17. (2)	**18.** (3)	**19.** (4)	**20.** (1)

EXPLANATIONS

1. (1) × × ×) 64329 (× × ×
$\underline{\times\times\times}$
175
Here, 643 – 175 = 468
∴ Divisor = 468 or 234

234) 64329 (274
$\underline{468}$
1752
$\underline{1638}$
1149
$\underline{936}$
213

Divisor = 234
Quotient = 274

2. (2) $x + x + 2 = x + 4 + 33$
$\Rightarrow x + 2 = 37$

3. (3) Required number
$= \frac{\frac{1}{2} + \frac{3}{5}}{2} = \frac{5+6}{20} = \frac{11}{20}$

4. (4) Such numbers between 99 and 200 = 10
Total numbers = 90

5. (2) Total number of students
= 100 × 3 + 400 = 700

6. (1) The unit's digits in 437, 82, 28, 45 and 47 are 7, 2, 8, 5 and 7 respectively.
The product of 7, 2, 8, 5 and 7 = 7 × 2 × 8 × 5 × 7 = 3920
Since the unit's digit in 3920 is 0, hence, the unit digit of 437 × 82 × 28 × 45 × 47 will also be zero.

7. (2) The given number = $(2467)^{153}$
Here, the unit's digit in 2467 is 7 that repeats itself after 4 times

Now, we divide index by 4.

$$4\ )\ 153\ (\ 38$$
$$\underline{12}$$
$$33$$
$$\underline{32}$$
$$1$$

Here the remainder is 1.
The unit's digit in the value of $(2467)^{153}$ will be same as $(7)^1 = 7$

8. (4) Here the unit's digit of 3127 is 7 and the index is 173
So, if we divide 173 by 4, the remainder is 1.
$\therefore$ The required unit's digit $= (7)^1 = 7$

9. (3) The unit's digit in $(2467)^{153}$ = The unit's digit in $(7)^{153}$ = The unit's digit in $(7)^1 = 7$
and the unit's digit in $(341)^{72} = 1$
Because for any index to 1, the value of unit's digit will be 1.
$\therefore$ The unit's digit in the product of $(2467)^{153} \times (341)^{72} = 7 \times 1 = 7$

10. (1) We break each base number into prime factors.
Now, $30^7 = (2 \times 3 \times 5)^7 = 2^7 \times 3^7 \times 5^7$
$22^5 = (2 \times 11)^5 = 2^5 \times 11^5$
$34^{12} = (2 \times 17)^{12} = 2^{12} \times 17^{12}$
$12^5 = (3 \times 2 \times 2)^5 = 3^5 \times 2^5 \times 2^5$
$\therefore 30^7 \times 2^2 \times 34^{12} \times 12^5 = 2^7 \times 3^7 \times 5^7 \times 2^5 \times 11^5 \times 2^{12} \times 17^{12} \times 3^5 \times 2^5 \times 2^5$
$= 2^{7+5+12+5+5} \times 3^{7+5} \times 5^7 \times 11^5 \times 17^{12}$
$= 2^{34} \times 3^{12} \times 5^7 \times 11^5 \times 17^{12}$
$\therefore$ The required number of prime factors
$= 34 + 12 + 7 + 5 + 12 = 70$

11. (2) We break each base number into prime factors.
Now, 25^{12}
$= (5 \times 5)^{12} = 5^{12} \times 5^{12}$
$10^7 = (2 \times 5)^7 = 2^7 \times 5^7$
and , $14^7 = (2 \times 7)^7 = 2^7 \times 7^7$
$\therefore 25^{12} \times 10^7 \times 14^7 = 5^{12} \times 5^{12} \times 2^7 \times 5^7 \times 2^7 \times 7^7$
$= 5^{12+12+7} \times 2^{7+7} \times 7^7 = 5^{31} \times 2^{14} \times 7^7$
$\therefore$ Number of prime factors= 31 + 14 + 7 = 52

12. (3) It is to be noted that $88 = 8 \times 11$
Here, $d_1 = 8$, $d_2 = 11$, $r_1 = 3$, $r_2 = 7$.
Where d_1, d_2 are divisors and r_1 and r_2 are respective remainders.
$\therefore$ Required remainder $= d_1 r_2 + r_1$
$= 8 \times 7 + 3 = 56 + 3 = 59$

13. (1) We proceed to find the number that is least as mentioned below.

9	z		
11	y	–	8
13	x	–	9
	1	–	8

$x = 13 \times 1 + 8 = 21$
$y = 11x + 9 = 11 \times 21 + 9 = 231 + 9 = 240$
$z = 9y + 8 = 9 \times 240 = 8 = 2160 + 8 = 2168.$
Now, divide 2168 by 13, 11 and 9.

13	2168		
11	166	–	10
9	15	–	1
	1	–	6

Hence, the remainders are 10, 1 and 6 respectively.
Remark : To determine the least number, we have taken the last quotient as 1.

14. (2) This problem can be solved by determining true or complete remainder and dividing it by reversing the order of divisors.
True remainder $= d_1 d_2 r_3 + d_1 r_2 + r_1$
Here, $d_1 = 3$, $d_2 = 5$, $r_1 = 1$, $r_2 = 2$, $r_3 = 3$
$\therefore$ **True** remainder $= 3 \times 5 \times 3 + 3 \times 2 + 1 = 45 + 6 + 1 = 52$
Now, we divide 52 by 8, 5 and 3

8	52		
5	6	–	4
3	1	–	1
	0		1

Hence, the remainders are 4, 1 and 1.

15. (2) Any number between 100 and 1000 may be written as $100m + 10n + K$ where $0 < m < 9$, $0 < n < 9$ and $0 < K < 9$.
$\therefore (100m + 10n + K) - (m + n + K)$
$= 99m + 9n$
$= 9 (11m + n)$ = multiplie of 9.
Hence divisible by 9.

16. (1) The least number of five digits = 10000
Now, we divide 10000 by 666

$$666)\ 10000\ (15$$
$$\underline{666}$$
$$3340$$
$$\underline{3330}$$
$$10$$

Here, we have 10 as remainder. Therefore, the least number to be added to the least number of 5 digits, i.e., 10000 to get the least number of 5 digits which is exactly divisible by 666 is 666–10 or 656.
Hence, the required number = 10000 + 656 = 10656.

17. (2) We divide 56586 by 552

$$552)\ 56586\ (102$$
$$\underline{552}$$
$$1386$$
$$\underline{1104}$$
$$282$$

$\therefore R = 282$
$D = 552$
$\therefore D - R = 552 - 282 = 270$
Here, $(D - R) < R$
So, we get the required number by adding $(D - R)$ to the dividend.
Therefore, the number nearest to 56586 that is exactly divisible by 552 is
56586 + 270 = 56856

18. (3) We divide 77685 by 720

$$720\ )\ 77685\ (107$$
$$\underline{720}$$
$$5685$$
$$\underline{5040}$$
$$645$$

Here, $D - R = 720 - 645 = 75 < R$.
$\therefore$ The required number
$= 77685 + 75 = 77760$

19. (4) As we know, the first four prime numbers are 2, 3, 5, 7
Their product $= 2 \times 3 \times 5 \times 7 = 210$
Now, we divide 12199 by 210

$$210)\ 12199\ (58$$
$$\underline{1050}$$
$$1699$$
$$\underline{1680}$$
$$19$$

Here, $D - R = 210 - 19 = 191$
So, $(D - R) > R$.
Hence, the required number
$= 12199 - R = 12199 - 19$
$= 12180$

20. (1) The greatest number of 4 digits = 9999
Now, we divide 9999 by 789

$$789)\ 9999\ (12$$
$$\underline{789}$$
$$2109$$
$$\underline{1578}$$
$$531$$

Thus, when 9999 – 531= 9468 is divided by 789, no remainder is left.
The required greatest number of 4 digits = 9468 + 5 = 9473
The least number of 5 digits = 10000

$$789)\ 10000\ (12$$
$$\underline{789}$$
$$2110$$
$$\underline{1578}$$
$$532$$

Remainder = 532
$\therefore$ The least number of 5 digits exactly divisible by 789
$= 10000 + (789 - 532)$
$= 10000 + 257 = 10257$
$\therefore$ The required number
$= 10257 + 5 = 10262$
Remark : If 532 is subtracted from 10000 the number obtained 9468 is exactly divisible by 789 but in that case, the number will not be of 5 digits but of 4 digits. ■■■