CONCEPT APPLICATION LEVEL - I [Subjective Questions]

Q.1 Solve the following equations

(i) $-2\left(\frac{3}{2}x+2\right)=1$ (ii) $2y+\frac{1}{2}=\frac{3}{2}$ (iii) $\frac{x}{4}+3=7$

(iv) $\frac{3x-1}{5}-\frac{x}{7}=3$ (v) $\frac{y+7}{3}=1+\frac{3y-2}{5}$ (vi) $\frac{2x-3}{5}+\frac{x+3}{4}=\frac{4x+1}{7}$

(vii) $\frac{3}{4}(7x-1)-\left(2x-\frac{1-x}{2}\right)=x+\frac{3}{2}$ (viii) $\frac{x+2}{x-2}=\frac{7}{3}$

Q.2 The fifth part of a number when increased by 5 equals its fourth part decreased by 5. Find the number.

Q.3 Divide 184 into two parts such that one-third of one part may exceed one-seventh of the other part by 8.

Q.4 Hari Babu left one-third of his property to his son, one-fourth to his daughter and the remainder to his wife. If his wife's share is Rs. 18000, what was the worth of his total property ?

Q.5 The numerator of a fraction is 4 less than the denominator. If 1 is added to both its numerator and denominator, it becomes $\frac{1}{2}$. Find the fraction.

Q.6 A man travelled $\frac{3}{5}$ of his journey by rail, $\frac{1}{4}$ by a taxi , $\frac{1}{8}$ by a bus and the remaining 8 km on foot. What is the length of his total journey.

Q.7 Rahim's father is three times as old as Rahim. If the sum of their ages is 56 years, find their ages.

Q.8 Ram's father is thrice as old as Ram was 2 years ago. Five years from now, Ram's father will be 6 years more than 2 times of Ram's age. What is Ram's present age ?

Q.9 The population of town A is 4800 more than town B. If 3100 people move from town B to town A, the population of town A will be 11 times that of town B. Find the sum of the original population of the two towns .

Q.10 Solve : $\frac{y-8}{3}=\frac{7-4y}{7}$ and check the result.

Q.11 Of the three numbers, second is twice the first and is also thrice the third. If the average of the three numbers is 44, the largest number will be ?

CONCEPT APPLICATION LEVEL - II [Previous Years Questions]

Q.1 Solve for x: $15(x-9)-2(x-12)+5(x+6)=0$ **[IMO-2013]**

(A) -3 (B) $\frac{1}{2}$ (C) $\frac{9}{2}$ (D) 4

Q.2 A man is five times as old as his son. He will be three times as old as his son after 10 years. Find their present ages. **[IMO-2013]**

(A) 10 years, 50 years (B) 8 years, 40 years
(C) 12 years, 60 years (D) 6 years, 30 years

Q.3 Solve for X : $\frac{1}{5}(x-8)+\frac{4+x}{4}+\frac{x-1}{7}=7-\frac{23-x}{5}$: **[IMO-2013]**

(A) 7 (B) 8 (C) 5 (D) 9

Q.4 Form an equation of the form $ax+b=C$, where a, b and c are constants, such that the solution of the equation is $x=4$. **[IMO-2013]**

(A) $2x+5=15$ (B) $7x+2=10$ (C) $5x+4=16$ (D) $3x+4=16$

Q.5 Select the INCORRECT step in simplification of

$2(x+1)=3(2x-2)$

Step-1 : $2x+2=6x-6$ (open brackets)
Step-2 : $6x-2x=2+6$ (combining like terms)
Step 3 : $4x=8$
Step-4 : $x=2$ (multiplying by 4 both sides) **[IMO-2014]**

(A) Step - 2 (B) Step- 4 (C) Step - 3 (D) Step - 1

Q.6 Sum of two numbers is 45. One is twice the other.
(a) If smaller number is $2\overline{)21}$, find the other number.
(b) Find the equation formed.
(c) Find the numbers. **[IMO-2014]**

	(a)	(b)	(c)
(A)	$2l$	$l+2l=45$	10,35
(B)	$2l$	$l+2l=45$	15.30
(C)	$l+2$	$45+l+2=l$	15,30
(S)	$l/2$	$45+l/2-l=0$	25,20

Q.7 If 9 is added to four times a number, it becomes the same as 3 is subtracted from five times the same number. This fact can be represented as _____ **[IMO-2014]**

(A) $5x+9=4x+3$ (B) $9x+4=3x-5$ (C) $9+4x=3-5x$ (D) $4x+9=5x-3$

Q.8 Find the cost of 3 notebooks and 1 magazine in terms of y, if the cost of 1 notebook is M 2y and that of 1 magazine is M (y + 3). **[IMO-2015]**

(A) M (3y + 3) (B) M (6y + 3) (C) M (7y + 3) (D) M (8y + 3)

Q.9 The solution of which of the following equations is neither a fraction nor an integer ? **[IMO-2015]**

(A) 2x + 6 = 0 (B) 3x – 5 = 0 (C) 5x – 8 = x + 4 (D) 4x + 7 = x + 2

Q.10 For which equation (s) is x = 3 a solution ? **[IMO-2016]**

I. 2x – 5 + 3x = 10 II. $\frac{-x+7}{2} = 2$

III. 4x – 11 = 17 IV. 9 = – (x – 1) + 11

(A) I only (B) I and II (C) I, II and III (D) I, II and IV

Q.11 Four years ago, Sidak was 14 years old. Her brother was thrice her age. What will be their total age in n years ? **[IMO-2016]**

(A) (56 + 2n) years (B) (64 + 2n) years (C) (60 + n) years (D) (68 + n) years

Q.12 If $47.2506 = 4A + \frac{7}{B} + 2C + \frac{5}{D} + 6E$, then the value of 5A + 3B + 6C + D + 3E is **[IOM-2016]**

(A) 53.6003 (B) 53.603 (C) 153.6003 (D) 213.0003

Q.13 The denominator of a rational number is greater than its numerator by 6. If the numerator is increased by 5 and the denominator is decreased by 3 then the number obtained is $\frac{5}{4}$. Find the rational number. **[IOM-2016]**

(A) $\frac{5}{11}$ (B) $\frac{13}{19}$ (C) $\frac{11}{17}$ (D) $\frac{7}{13}$

Q.14 Match each of the entries in column I with the appropriate entries in column II. **[IOM-2016]**

	Column I		**Column II**
a.	$\frac{2y}{3} - 5 = 3$	**i.**	$\frac{1}{2}$
b.	–4(2 + y) = 8	**ii.**	2
c.	4+3(y + 2 = 16	**iii.**	8
d.	$7y + \frac{19}{2} = 13$	**iv.**	12
e.	4 + 5(y – 1) = 39	**v.**	– 4

(A) a-iv, b-v, c-ii, d-iii, e-i (B) a-iv, b-v, c-iii, d-ii, e-i

(C) a-iv, b-v, c-ii, d-i, e-iii (D) a-ii, b-v, c-i, d-ii, e-iii

CONCEPT APPLICATION LEVEL - III

SECTION - A

FILL IN THE BLANKS

1. If 14 is added to a number , their sum becomes 35, then number is _____
2. $\frac{1}{6}x - 7 = 4$, then x = _____
3. A mathematical statement equating two quantities is called an _____

SECTION - B

TRUE / FALSE

1. The same number can be added, subtracted or multiplied on both the sides of the equation.
2. $3x + 2 = 9$ is a linear equation in one variable
3. The solution of the equation $2(x-6) = 20$ is $x = 4$

SECTION - C

MULTIPLE CHOICE QUESTIONS

Q.1 The sum of five consecutive odd numbers is 1185, what are the numbers ?
(A) 231, 233, 235, 237, 239 (B) 229, 231, 233, 235, 237
(C) 233, 235, 237, 239, 241 (D) None of these

Q.2 The sum of one half, one third and one fourth of a number exceed the number itself by 12. The number is :
(A) 72 (B) 144 (C) 180 (D) 244

Q.3 If $\frac{2x - 3/4}{9x + 4/7} = \frac{1}{4}$ then x = ?
(A) $\frac{25}{7}$ (B) $-\frac{25}{7}$ (C) $\frac{23}{7}$ (D) $-\frac{23}{7}$

Q.4 If twice a certain number is diminished by five, the result is equal to twelve added to the number. Find the number :
(A) 18 (B) 16 (C) 15 (D) 17

Q.5 The difference between two numbers is 642. When the greater is divided by the smaller, the quotient is 8 and the remainder is 19. The numbers are :
(A) 89 and 731 (B) 92 and 734 (C) 87 and 729 (D) 85 and 727

Q.6 Solve : $\frac{x+b}{a-b} = \frac{x-b}{a+b}$.
(A) a (B) 2a (C) – a (D) – 2a

Q.7 "I am a number. Tell my identity. Take me twelve times over, and add a fifty ! To reach a double century, you still need thirty !" Who am I ?

(A) 10 (B) 12 (C) 20 (D) 24

Q.8 Solve : $\frac{y-1}{3} - \frac{y-2}{4} = 1$.

(A) 7 (B) 8 (C) 12 (D) 10

Q.9 Age of father is 30 years more than his son. 5 years ago father's age was three times the son's age. Find their ages.

(A) 20, 50 (B) 30,60 (C) 40, 70 (D) 50,80

Q.10 The denominator of a fraction is greater than numerator by 6. If 3 is added to numerator and 2 is subtracted from denominator, the fraction becomes $\frac{6}{7}$, then the equation so formed is :

(A) $\frac{x+4}{x+3} = \frac{6}{7}$ (B) $\frac{x+3}{x+4} = \frac{6}{7}$ (C) $\frac{x}{x+6} + \frac{3}{-2} = \frac{6}{7}$ (D) $\frac{x}{x+6} + \frac{-2}{3} = \frac{6}{7}$

Q.11 If $\frac{3x-5}{2} = \frac{5.005}{2.002}$, then x =

(A) $\frac{5}{3}$ (B) $\frac{10}{3}$ (C) $\frac{12.5}{3}$ (D) 0

Q.12 The sum of seven consecutive natural numbers is 1617. How many of these numbers are not prime :

(A) 4 (B) 2 (C) 5 (D) 7

Q.13 Three angles of a quadrilateral have the same measure. If the measure of the forth angle is 150º. Find the measure of other angles.

(A) 50º (B) 70º (C) 75º (D) 65º

Q.14 $2x + 3 = 3x - 1$, then the value of x is

(A) x = 1/3 (B) $x = -3/2$ (C) $x = 4$ (D) $x = 2$

Q.15 $2x - 3 = 2$. If we apply transposition on (–3) then we get

(A) 2x = 2–3 (B) $2x = 2+3$ (C) $2x - 2 = 3$ (D) $2x+2 = 3$

Q.16 If $5x - \frac{3}{4} = 2x - \frac{2}{3}$, then the value of x is

(A) $\frac{1}{12}$ (B) $\frac{1}{4}$ (C) $\frac{1}{36}$ (D) 36

Q.17 If $2z+\frac{8}{3}=\frac{1}{4}z+5$, then the value of z is

(A) 3 (B) 4 (C) $\frac{3}{4}$ (D) $\frac{4}{3}$

Q.18 If $(2n+5)=3(3n-10)$, then the value of n is

(A) 5 (B) 3 (C) $\frac{2}{5}$ (D) $\frac{2}{3}$

Q.19 If $\frac{x-1}{x+1}=\frac{7}{9}$, then the value of x is

(A) 6 (B) 7 (C) 8 (D) 10

Q.20 The ratio of two numbers is a : b, If first of them is x, then other is:

(A) $\frac{ab}{x}$ (B) $\frac{b}{ax}$ (C) $\frac{b}{a+b}x$ (D) $\frac{bx}{a}$

SECTION - D

MATCH THE COLUMNS

Q.1

	Column A	Column B	
1.	9 Subtracted from no. is 15. The no. is	(a)	5
2.	A no. multiplied by itself is 16, the no. is	(b)	3
3.	$\frac{7-x}{14}=0$, then x is	(c)	24
4.	$7y = 35$, y is	(d)	4
5.	Thrice a no. decreased by 7 gives 2 the no. is	(e)	7

ANSWERS

CONCEPT APPLICATION LEVEL - I [Subjective Questions]

1. (i) $x = \frac{-5}{3}$ (ii) $y = \frac{1}{2}$ (iii) $x = 16$ (iv) $x = 7$ (v) $y = \frac{13}{2}$

   (vi) $x = \frac{-1}{11}$ (vii) $x = 1$ (viii) $x = 5$

2. 200 3. 72, 112 4. 43200 5. 3/7 6. 320

7. 42 years. 8. 17 yrs. 9. 13200 10. $y = \frac{77}{19}$ 11. 72

CONCEPT APPLICATION LEVEL - II [Previous Years Questions]

1.	C	2.	A	3.	B	4.	D	5.	B	6.	B	7.	D
8.	C	9.	D	10.	B	11.	B	12.	C	13.	A	14.	C

CONCEPT APPLICATION LEVEL - III

SECTION - A

1. 21 2. 66 3. equality

SECTION - B

1. True 2. True 3. False

SECTION - C

1.	C	2.	B	3.	B	4.	D	5.	A	6.	C	7.	A
8.	D	9.	A	10.	B	11.	B	12.	A	13.	B	14.	C
15.	B	16.	C	17.	D	18.	A	19.	C	20.	D		

SECTION - D

1. 1-(c); 2-(d); 3-(e); 4-(a); 5-(b)