SECTION A   2 x 4 = 8

1) HCF and LCM are widely used in number system especially in real numbers in finding relationship between different numbers and their general forms. Also, product of two positive integers is equal to the product of their HCF and LCM. Based on the above information answer the following questions.

(i) If two positive integers x and y are expressible in terms of primes as $x = p^2q^3$ and $y = p^3q$, then which of the following is true?

(a) HCF = pq2 x LCM   **(b) LCM = pq2 x HCF**
(c) LCM = p2q x HCF   **(d) HCF = p2q x LCM**

(ii) A boy with collection of marbles realizes that if he makes a group of 5 or 6 marbles, there are always two marbles left, then which of the following is correct if the number of marbles is p?

(a) p is odd **(b) p is even** **(c) p is not prime** **(d) both (b) and (c)**

(iii) Find the largest possible positive integer that will divide 398, 436 and 542 leaving remainder 7, 11, 15 respectively.

(a) 3 **(b) 1** **(c) 34** **(d) 17**

(iv) Find the least positive integer which on adding 1 is exactly divisible by 126 and 600.

(a) 12600 **(b) 12599** **(c) 12601** **(d) 12500**

(v) If A, B and C are three rational numbers such that 85C - 340A :::109, 425A + 85B = 146, then the sum of A, B and C is divisible by

(a) 3 (b) 6 (c) 7 (d) 9

Answer : **(i) (b):** LCM of x and y = p^3q^3 and HCF of x and y = p^2q Also, LCM = pq^2 x HCF.

(ii) (d): Number of marbles = 5m + 2 or 6n + 2.
Thus, number of marbles, p = (multiple of 5 x 6) + 2
= 30k + 2 = 2(15k + 1)
= which is an even number but not prime

(iii) (d): Here, required numbers
= HCF (398 - 7, 436 - 11, 542 -15)
= HCF (391,425,527) = 17

(iv) (b): LCM of 126 and 600 = 2 x 3 x 21 x 100 = 12600 The least positive integer which on adding 1 is exactly divisible by 126 and 600 = 12600 - 1 = 12599

(v) (a): Here 8SC - 340A = 109 and 425A + 85B = 146 On adding them, we get 85A + 85B + 85C = 255 ~ A + B + C = 3, which is divisible by 3.

2) Aditya works as a librarian in Bright Children International School in Indore. He ordered for books on English, Hindi and Mathematics. He received 96 English books, 240 Hindi Books and 336 Maths books. He

wishes to arrange these books in stacks such that each stack consists of the books on only one subject and the number of books in each stack is the same. He also wishes to keep the number of stacks minimum.

(a) Find the number of books in each stack.
(i) 24   (ii) 48   (iii) 54   (iv)72
(b) Find the total number of stacks formed.
(i) 7   (ii) 10   (iii) 14   (iv) 16
(c) How many stacks of Mathematics books will be formed?
(i) 7   (ii) 8   (iii) 9   (v) 10
(d) If the thickness of each English book is 3 cm, then the height of each stack of English books is
(i) 120   (ii) 124 (iii) 136 (iv) 144 cm   cm   cm   cm
(e) If each Hindi book weighs 1.5 kg, then find the weight of books in a stack of Hindi books.
(i) 24   (ii) 48   (iii) 72   (iv) 96 kg   kg   kg   kg

Answer : **(a) (ii)**
$96 = 2^5 \times 3$
$240 = 2^4 \times 3 \times 5$
(b) (iii)
Total number of books = 96 +240+336=672
Number of books in each stack = 48
$\therefore$ Number of stacks formed $-= \dfrac{672}{48} = 14$

(c) (i)
Number of mathmatics books = 336
Number of stacks of mathematics books formed = $\dfrac{336}{48}$
= 7
(d) (iv)
Number of books in each stack of english books = 48
Thickness of each english book = 3 cm
$\therefore$ Height of each stack of english books = (48X3) cm
= 144cm
(e) (iii)
Number of books in a stack of hindi books = 48
Weight of each hindi book = 1.5kg
$\therefore$ The weight of books in a stack of hindi books
= (48X1.5)kg = 72kg