2007 MBA - MATHEMATICS OLD QUESTION PAPER

(LCM,HCF)

TIME – 3HOUR

MARK – 100

Important Tips
H.C.F (Highest common factor) or Greatest common divisor (G.C.D) : - The H.C.F of two or more than two numbers is the greatest number that divides each of them exactly .

H.C.F can be find out by two method

(a) Factorization method : - Express each one of the given numbers as the product of prime factors, the product of least power of common prime factors gives H.C.F .
(b) Division Method : - Suppose we have to find the H.C.F of two given numbers . Divide the larger number by the smaller one . Now divide the divisor by the remainder . Repeat the process of dividing the preceeding number by the remainder last obtained till zero is obtained as remainder.
Finding the H.C.F of more than two numbers : - Suppose we have to find the H.C.F of three numbers . Then H.C.F of [(H.C.F of any two) & (third number)] gives the H.C.F of three numbers.
2. L.C.M (Least common multiple) It is the least number which is exactly divisible by each one of the given
numbers is called their L.C.M
Factorization method of Finding L.C.M ; Resolve each one of the given numbers into a product of Prime factors . Then L.C.M is the product of highiest power of all the factors .
Common Division Method (Short cut Method) of finding L.C.M :- Arrange the given numbers in any order . Divide by a number which divide exactly at least two of the given numbers and carry forward the numbers which are not divisible .
Repeat the above process till no two of the numbers are divisible by the
Same number except 1 . The product of divisor number & the undivided number is the required L.C.M of the given numbers .
Product of two numbers = Product of their H.C.F & L.C.M
Coprimes : Two numbers are said to be coprime if their
H.C.F & L.C.M of fractions : -

H.C.F = H.C.F of numerators / L.C.M of denominators
L.C.M = L.C.M of numerators / H.C.F of denominators

Problem Based on these

Q-1 Find the H.C.F of 23 (32 (5 (74 , 22 (35 (52 (73 , 23 (53 (72 .
(a) 980 (b) 1080
(c) 1180 (d) 1280
Q-2 Reduce 391 / 667 to lowest terms .
(a) 17 / 29 (b) 18 / 23
(c) 19 / 36 (d) 54 / 65
Q-3 Find the L.C.M of 16 , 24 , 36 , 54
(a) 432 (b) 453
(c) 454 (d) 465
Q-4 Find the least number exactly divisible by 12 , 15 , 20 & 27 .
(a) 540 (b) 542

(c) 546 (d) 555
Q-5 252 can be expressed as a product of primes as
(a) 2 (2 (3 (3 (7 (b) 2 (2 (2 (3 (7
(c) 3 (3 (3 (3 (7 (d) 2 (3 (3 (3 (7

Q-6 The H.C.F of 22 (33 (55 , 23 (32 (52 (7 ,
24 (34 (5 (72 (11 is
(a) 22 (32 (5 (b) 22 (32 (5(7 (11
(c) 24 (34 (55
(d) 24 (34 (55(7 (11
Q-7 The L.C.M of 23 (32 (5 (11 ,
24 (34 (52 (7 , 25 (33 (53 (72 (11 is
(a) 23 (32 (5
(b) 25 (34 (53
(c) 23 (32 (5 (7 (11
(d) 25 (34 (53 (72 (11
Q-8 The H.C.F of two numbers is 12 & their difference is 12 . The numbers are
(a) 66 , 78 (b) 70 , 82
(c) 94 , 106 (d) 84 , 96
Q-9 The product of two numbers is 2028 & their H.C.F is 13 , the number of such pair is
(a) 1 (b) 2
(c) 3 (d) 4
Q-10 The L.C.M of two numbers is 48 . The numbers are in the ratio of 2 : 3 . The sum of the numbers is
(a) 28 (b) 32
(c) 40 (d) 64
Q-11 The L.C.M of two numbers is 45 times their H.C.F . If one of the number is 125 & the sum of H.C.F & L.C.M is 1150 , the other number is
(a) 215 (b) 220
(c) 225 (d) 235
Q-12 The H.C.F of two numbers is 8 . Which one of the following can never be their L.C.M ?
(a) 24 (b) 48
(c) 56 (d) 60
Q-13 The greatest number that exactly divides 105 , 1001 & 2436 is
(a) 3 (b) 7
(c) 11 (d) 21
Q-14 Let N be the greatest number that will divide 1305 , 4665 , & 6905 , leaving the same remainder in each case . Then sum of digits in N is
(a) 4 (b) 5
(c) 6 (d) 8
Q-15 The greatest number which can divide 1356 , 1868 & 2764 leaving the same remainder 12 in each case , is
(a) 64 (b) 124
(c) 156 (d) 260
Q-16 The greatest number which on dividing 1657 & 2037 leaves remainder 6 & 5 respectively , is
(a) 123 (b) 127
(c) 235 (d) 305
Q-17 Which of the following fraction is largest ?
(a) 7/ 8 (b) 13 / 16
(c) 31/40 (d) 63 / 80
Q-18 What will be the least number which when doubled will be exactly divisible by 12 , 18 , 21 , & 30 ?
(a) 196 (b) 630
(c) 1260 (d) 2520
Q-19 The smallest fraction , which each of 6 / 7 , 5 / 14 , 10 / 21 will divide exactly is
(a) 30/7 (b) 30/98
(c) 60 / 147 (d) 50/294
Q-20 The least number of five digits which is exactly divisible by 12 , 15 , 18 is

(a) 10010 (b) 10015
(c) 10020 (d) 10080
Q-21 The greatest number of four digits which is divisible by 15 , 25 , 40 , 75 is
(a) 9000 (b) 9400
(c) 9600 (d) 9800
Q-22 The least number which is a perfect square & is divisible by each of the numbers 16 , 20 & 24 is
(a) 1600 (b) 3600
(c) 6400 (d) 14400
Q-23 The smallest number which when diminished by 7 , is divisible by 12 , 16 , 18 , 21 & 28 is
(a) 1008 (b) 1015
(c) 1022 (d) 1032
Q-24 The least number which when increased by 5 is divisible by each one of 24 , 32 , 36 & 54 is
(a) 427 (b) 859
(c) 869 (d) 4320
Q-25 The least number , which when divided by 12 , 15 , 20 & 54 leaves in each case a remainder of 8 , is
(a) 504 (b) 536
(c) 544 (d) 548
Q-26 The largest four digit number which when divided by 4 , 7 or 13 leaves a remainder of 3 in each case is
(a) 8739 (b) 9831
(c) 9834 (d) 9893
Q-27 The least multiple of 7 , which leaves a remainder of 4 , when divided by 6 , 9 , 15 & 18 is
(a) 74 (b) 94
(c) 184 (d) 364
Q-28 The least number , which when divided by 48 , 60 , 72 , 108 , & 140 leaves 38 , 50 , 62 , 98 & 130 as remainders respectively , is
(a) 11115 (b) 15110
(c) 15120 (d) 15210
Q-29 Find the least multiple of 23 , which when divided by 18 , 21 , & 24 leaves remainders 7 , 10 , & 13 respectively .
(a) 3002 (b) 3013
(c) 3024 (d) 3036
Q-30 The least number which when divided by 5 , 6 , 7 , 8 leaves a remainder 3 , but when divided by 9 leaves no remainder , is
(a) 1677 (b) 1683
(c) 2523 (d) 3363

Answer

1(a) , 2(a) , 3(a) , 4 (a) , 5(a) , 6(a) , 7 (d) , 8 (d) , 9 (b)
10 (c) , 11 (c) , 12 (d) , 13 (b) , 14 (a) , 15 (a) , 16 (b) ,
17 (a) , 18 (b) , 19 (a) , 20 (d) , 21(c) , 22 (b) , 23 (b) ,
24 (b) , 25 (d) , 26 (b) , 27 (d) , 28 (b) , 29 (b) , 30 (b)

Explanation

Q-1 The prime numbers common to given number are 2 , 5 & 7 , therefore H.C.F = 22 (5 (72 = 980
Q-2 H.C.F of 391 & 667 is 23 .
On dividing the numerator & denominator by 23 , we get 391 / 667 =
(391/23) / (667/23) = 17 / 29
Q-3 solve
Q-4 i.e find the L.C.M of 12 , 15 , 20 , 27.
Q-5 252 = 2 (2 (3 (3 (7 .
Q-6 H.C.F = product of lowest power of common factors = 22 (32 (5

Q-7 L.C.M = Product of highiest powers of prime factors = 25 (34 (53 (72 (11
Q-8 Out of the given numbers , the two with H.C.F 12 & difference 12 are 84 & 96.
Q-9 Let the numbers be 13 a & 13 b . then 13a (13 b = 2028 (ab = 12 . Now , coprime with product 12 are (1 , 12) & (3 , 4) So, the required numbers are (13 (1 , 13 (12) & (13 (3 , 13 (4) , therefore there are two such pairs .
Q-10 Let the numbers be 2x & 3x . Then their L.C.M = 6x . So 6x = 48 or x = 8 therefore the numbers are 16 & 24 , required sum is 16 + 24 = 40 .
Q-11 Let H.C.F be h & L.C.M l . then l = 45h , & l + h = 1150 , 45 h + h = 1150 or h = 25 . so l = 1150 – 25 = 1125
Q-12 H.C.F of two numbers divides their L.C.M . exactly . clearly , 8 is not a factor of 60 .
Q-13 H.C.F of 2436 & 1001 is 7 . Also H.C.F of 105 & 7 is 7 . therefore H.C.F of 105 , 1001 & 2436 is 7 .
Q-14 N = H.C.F of (4665 – 1305) , (6905 – 4665) , (6905 – 1305) (H.C.F of 3360 , 2240 & 5600 = 1120.
Q-15 N = H.C.F of (1356 – 12) , (1868 – 12) , (2764 – 12) (H.C.F of 1344 , 1856 & 2752 = 64.
Q-16 N = H.C.F of (1657 – 6) , (2037 – 5) (H.C.F of 1651 , 2032 = 127.
Q-17 L.C.M of 8 , 16 , 40 & 80 = 80 .
7/8 = 70/80 ; 13/16 = 65/80 ; 31/40 = 62/80 .
since 70/80 > 63/80 > 65/80 > 62/80 , so
7/8 > 63 /80 > 13/16 > 31/40.
So 7/8 is the largest .
Q-18 L.C.M of 12 , 18 , 21 , 30 is 1260
Therefore required number is 1260 / 2 = 630
Q-19 Required fraction = L.C.M of 6/7 , 5/14 , 10/21= L.C.M of 6 , 5 , 10 / H.C.F of 7, 14 , 21
Q-20 Least number of five digit is 10000 . L.C.M of 12 , 15 & 18 is 180 . On dividing 10000 by 180 , the remainder is 100 .
Required number is 10000 + (180 – 100) = 10080
Q-21 Greatest number of 4 digits is 9999 . L.C.M of 15 , 25 , 40 , 75 is 600 . On dividing 9999 by 600 , the remainder is 399 . Required number is (9999 – 399) 9600 .
Q-22 The least number divisible by 16 , 20 , 24 = L.C.M of 16 , 20 , 24 = 240 = 2 (2 (2 (2 (3 (5 , to make it perfect square it must be multiplied by 3 (5 , therefore required number is 240 (3 (5 .
Q-23 Required number = (L.C.M of 12 , 16 , 18 21 , 28) + 7 1008 + 7 = 1015 .
Q-24 Required number = (L.C.M 24 , 32 , 36 , 54) – 5 = 864 – 5 = 859 .
Q-25 Required number = (L.C.M of 12 , 15 , 20 , 54) + 8 = 540 + 8 = 548
Q-26 Greatest number of four digit is 9999 . L.C.M of 4 , 7 , 13 is 364.
On dividing 9999 by 364 , remainder obtained is 171 .
Therefore greatest number of four digits divisible by 4 , 7 & 13 = (9999 – 171) = 9828 Hence required number = 9828 + 3 = 9831.
Q-27 L.C.M of 6 , 9 , 15 , 18 is 90 .
Let required number is 90m + 4 , which is multiple of 7 . Least value of m for which (90m + 4) is divisible by 7 is m = 4 , therefore required number is 90 (4 + 4 = 364 .
Q-28 Here (48 – **38) = 10 , (60 – 50) = 10**