## NUMBER SYSTEM

**1.** The digit at the $100^{th}$ place in the decimal representation of $\frac{6}{7}$, is :

(A) 1      (B) 2
(C) 4      (D) 5

**2.** The number of positive n in the range $12 \leq n \leq 40$ such that the product $(n-1)(n-2)....3.2.1$ is not divisible by n is :

(A) 5      (B) 7
(C) 13      (D) 14

**3.** The positive integers A, B, A – B and A + B are all prime numbers. The sum of these four primes is

(A) even      (B) divisible by 3
(C) divisible by 5      (D) prime

**4.** Total number of factors of $(3 \times 5)^{12} (2 \times 7)^{10} (10)^{25}$ is :

(A) 47      (B) 94
(C) 72      (D) 144144

**Directions: (5 to 9)** Read the following information carefully and answer the questions given below.

In a big hostel, there are 1,000 rooms. In that hostel only even numbers are used for room numbers, i.e. the room numbers are 2, 4, 6, ...., 1998, 2000. All the rooms have one resident each. One fine morning, the warden calls all the residents and tells them to go back to their rooms as well as multiples of their room numbers. When a guy visits a room and finds the door open, he closes it, and if the door is closed, he opens it, All 1,000 guys do this operation. All the doors were open initially.

**5.** The last room that is closed is room number?

(A) 1936      (B) 2000
(C) 1922      (D) None of these

**6.** The $38^{th}$ room that is open is room number :

(A) 80      (B) 88
(C) 76      (D) None of these

**7.** If only 500 guys, i.e. residents of room number 2 to 1000 do the task, then the last room that is closed is room number

(A) 2000      (B) 1936
(C) 1849      (D) None of these

**8.** In the case of the previous question, how many rooms will be closed in all ?

(A) 513      (B) 31
(C) 13      (D) 315

**9.** If you are a lazy person, you would like to stay in a room whose number is :

(A) more than 500      (B) more than 1000

**10.** If $(2^{32} + 1)$ is divisible by a certain number then which of the following is also divisible by that number.

(A) $(2^{16} - 1)$      (B) $2^{16} + 1$
(C) $2^{96} + 1$      (D) None of these

**11.** $1^{13} + 2^{13} + 3^{13} + ... + 60^{13}$ is divisible by :

(A) 61      (B) 63
(B) 65      (D) 59

**12.** A number when divided by 342 gives a remainder 47. When the same number is divided by 19, what would be the remainder ?

(A) 3      (B) 5
(C) 9      (D) None of these

**13.** In a number system, the product of 44 and 11 is 3414. The number 3111 of this system, when converted to the decimal number system, becomes :

(A) 406      (B) 1086
(C) 213      (D) 691

**14.** What is remainder when $7^{84}$ is divided by 2402?
(A) 1          (B) 6
(C) 2401      (D) None of these

**15.** What is the remainder when $30^{40}$ is divided by 17?
(A) 1          (B) 16
(C) 13        (D) 4

**16.** A number when divided successively by 4 and 5 leaves remainders 1 and 4 respectively. When it is successively divided by 5 and 4, then the respective remainders will be :
(A) 1, 2       (B) 2, 3
(C) 3, 2       (D) 4, 1

**17.** Find out (A + B + C + D) such that AB × CB = DDD, where AB and CB are two–digit numbers and DDD is a three–digit number.
(A) 21        (B) 19
(C) 17        (D) 18

**18.** If $\frac{1}{3}\log_3 M + 3\log_3 N = 1 + \log_{0.008} 5$, then :

(A) $M^9 = \dfrac{9}{N}$       (B) $N^9 = \dfrac{9}{M}$

(C) $M^3 = \dfrac{3}{N}$       (D) $N^9 = \dfrac{3}{M}$

**19.** Three friends, returning from a movie, stopped to eat at a restaurant. After dinner, they paid their bill and noticed a bowl of mints at the front counter. Sita took 1/3 of the mints, but returned four because she had a monetary pang of guilt. Fatima then took 1/4 of what was left but returned three for similar reasons. Eswari then took half of the remainder but threw two back into the bowl. The bowl had only 17 mints left when the raid was over. How many mints were originally in the bowl?
(A) 38        (B) 31
(C) 41        (D) 48

**20.** A set of consecutive positive integers beginning with 1 is written on the blackboard. A student came and erased one number. The average of the remaining numbers is $35\frac{7}{17}$. What was the number erased?
(A) 7        (B) 8
(C) 9        (D) None of these

| ANSWER KEY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Q.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **Ans.** | A | B | D | D | C | B | A | A | B | C |
| **Q.** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
| **Ans.** | A | C | A | C | A | B | A | B | D | C |