Class - VI **Primes and Composites - Solutions** 1. Conceptual 2. Prime number between 1 and 20 are '8' they are 2,3,5,7,.... 3. factors of 97 are-1 and 97 . 97 is prime number. 4. No. of prime numbers between 1 and 100 are 25 they are 2,3,5,7,11,13,17,19,23,29,31,37,41,43,47,53,59,61,67,71,73,79,83,89,97 Key - D - correct 5.  $183 = 61 \times 3$ 183 is composite number 6. 5 = 2 + 3where 2,3 are prime numbers 7. Conceptual Option (B) - Answer Since 2 is even prime. i.e; all primes are not odd. The number of pairs twin primes between 1 and 100 = 8 8. (41,43) (3,5), (5,7), (11,13), (17,19), (29,31), (59,61), (71,73) Key - B 9. Since 29-23 & 2 Key - C 10. D. Conceptual 11. 53, 59 are prime numbers 12. C.Conceptual 13. A. 2 is even prime number 14. B.  $69 = 23 \times 3$ 15. A. 100 = 59 + 411 is neither prime nor composite 16. Least prime number = 217. Least composite number = 2+4 = 618. Key : a-q, b-t, c-r, d-q Change column - II P) 48 q) 49 r) 24 s) 25 t) 74

## LEARNER'S TASK

- 1. Conceptual
- 2. Conceptual
- 3. Conceptual
- 4. Conceptual

5. Conceptual 6. Conceptual 7. Conceptual 8. Conceptual 9. Conceptual Least odd number = 1 10. Greatest odd number below 100 = 99  $\therefore 1+99 = 100$ JEE MAIN LEVEL 1. Factors of 51 are 51, 17, 3, 1 no. of factors of 51 are 4. 2. Conceptual - (13,17,19) - prime triplet, key-A 3. Factors of 43 are 43, 1 : 43 + 1 = 444. Conceptual Conceptual 5. Conceptual 6. Least prime number = 27. Least even number = 2Least odd number = 1  $\therefore 2 + 2 + 1 = 5$ 8. Sum of digits in units place 7+2+2 = 11 odd : 2367 + 3592 + 4572 is odd 9. Product of digits 8,8 in units place is even Product of digits 3,8 in units place is even ∴ key = B 10. 21 101, 103, 107, 109, 113, 127, 131, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199 11. Sum of prime numbers between 30 and 40 31+37 = 68 12. Conceptual  $a^2-b^2 = (a-b)(a+b)$ 13.  $a^{2}+b^{2}+2ab = (a+b)^{2}$ from options  $6^2 = 36$  $5^2 = 25$  $7^2 = 49$  are composite numbers · Kev - D 14. From options 53 is prime number 5+3 = 8, 5x3 = 15∴ Key - C 15.  $2^{\kappa}+1$  is a prime number from option A) K = 1 $2^{1}+1 = 3$  $2^2 + 1 = 5$ K = 2 B) K = 2  $2^2 + 1 = 5$ K = 3  $2^{3}+1 = 9$  $2^{1}+1 = 3$ C) K =1 K= 3  $2^{3}+1 = 9$ D) K = 4  $2^4 + 1 = 17$ K = 5 $2^{5}+1 = 33$ 

From option A) 3,5 are prime numbers  $\therefore$  Key - A

## **ADVANCED LEVEL**

- 1. Conceptual even =  $2n ((n \in N), odd = 2n + 1 (n \in W))$
- 2. Conceptual
- 3. Prime factors of 63 are 3, 7.



- 4. I  $\rightarrow$  3 + 5+ 7 = 15; 3, 5, 7 are primes. II  $\rightarrow$  3(7) + 2(19) = 59 7, 19 are primes. Statement I & II are true. Statement II is not correct explanation of statement I.  $\therefore$  Key - B 5. Change option (D) - All. Factors of 20 are 20, 10, 5, 4, 2, 1
- Factors of 20 are 20, 10, 5, 4, 2, 1 Factors of 6 are 6, 3, 2, 1 Factors of 15 are 15, 5, 3, 1



6.

2, 3, 7 are prime factors of 84.

7. 4 - 1, 6 - 1, 8 - 1(3, 5, 7)  $\rightarrow$  Prime triplet.

8 Least factor of any number = 1

 $\therefore 1 - 1 = 0.$ 

- 9. Let  $\begin{bmatrix} T & o \\ a & b \end{bmatrix}$  is a prime number.
  - $\therefore$  10a + b is a prime number.
    - то ba
  - b a is a prime number (after reversing) 10b + a is prime number.
    - $\therefore 10a + b + 11b + a = 110$
    - $\therefore 11a + 11b = 110$ 
      - a + b = 10
    - $\therefore$  Possible values of a and b are 7 & 3.
    - $\therefore$  73 and 37 are prime numbers and 73 + 37 = 110.
- 10. a) Greatest prime less than 42 is 41.
  - b) Number of twin prime pairs below 50 are 5
  - (3, 5), (5, 7), (11, 13), (17, 19), (29, 31)
  - c) Sum of prime numbers below 15 is 41.
  - 2 + 3 + 5 + 7 + 11 + 13 = 41
  - d) Two digit composite numbers lie between 9 and 100
  - $\therefore$  Key : a-q, b-s, c-q, d-r.