

# QB365 Question Bank Software Study Materials

## Relations and Functions 50 Important 1 Marks Questions With Answers (Book Back and Creative)

10th Standard

Maths

Total Marks : 50

### Multiple Choice Question

50 x 1 = 50

- 1) If  $n(A \times B) = 6$  and  $A = \{1,3\}$  then  $n(B)$  is  
(a) 1 (b) 2 **(c) 3** (d) 6
- 2)  $A = \{a,b,p\}$ ,  $B = \{2,3\}$ ,  $C = \{p,q,r,s\}$  then  $n[(A \cup C) \times B]$  is  
(a) 8 (b) 20 **(c) 12** (d) 16
- 3) If  $A = \{1, 2\}$ ,  $B = \{1, 2, 3, 4\}$ ,  $C = \{5, 6\}$  and  $D = \{5, 6, 7, 8\}$  then state which of the following statement is true..  
**(a)  $(A \times C) \subset (B \times D)$**  (b)  $(B \times D) \subset (A \times C)$  (c)  $(A \times B) \subset (A \times D)$  (d)  $(D \times A) \subset (B \times A)$
- 4) If there are 1024 relations from a set  $A = \{1, 2, 3, 4, 5\}$  to a set  $B$ , then the number of elements in  $B$  is  
(a) 3 **(b) 2** (c) 4 (d) 8
- 5) The range of the relation  $R = \{(x, x^2) \mid x \text{ is a prime number less than } 13\}$  is  
(a)  $\{2,3,5,7\}$  (b)  $\{2,3,5,7,11\}$  **(c)  $\{4,9,25,49,121\}$**  (d)  $\{1,4,9,25,49,121\}$
- 6) If the ordered pairs  $(a + 2, 4)$  and  $(5, 2a + b)$  are equal then  $(a,b)$  is  
(a)  $(2,-2)$  (b)  $(5,1)$  (c)  $(2,3)$  **(d)  $(3,-2)$**
- 7) Let  $n(A) = m$  and  $n(B) = n$  then the total number of non-empty relations that can be defined from  $A$  to  $B$  is  
(a)  $m^n$  (b)  $n^m$  **(c)  $2^{mn}-1$**  (d)  $2^{mn}$
- 8) If  $\{(a, 8), (6, b)\}$  represents an identity function, then the value of  $a$  and  $b$  are respectively  
**(a)  $(8,6)$**  (b)  $(8,8)$  (c)  $(6,8)$  (d)  $(6,6)$
- 9) Let  $A = \{1, 2, 3, 4\}$  and  $B = \{4, 8, 9, 10\}$ . A function  $f: A \rightarrow B$  given by  $f = \{(1, 4), (2, 8), (3, 9), (4,10)\}$  is a  
(a) Many-one function (b) Identity function **(c) One-to-one function** (d) Into function
- 10) If  $f(x) = 2x^2$  and  $g(x) = \frac{1}{3x}$ , then  $f \circ g$  is  
(a)  $\frac{3}{2x^2}$  (b)  $\frac{2}{3x^2}$  **(c)  $\frac{2}{9x^2}$**  (d)  $\frac{1}{6x^2}$
- 11) If  $f: A \rightarrow B$  is a bijective function and if  $n(B) = 7$ , then  $n(A)$  is equal to  
**(a) 7** (b) 49 (c) 1 (d) 14
- 12) Let  $f$  and  $g$  be two functions given by  
 $f = \{(0,1), (2,0), (3,-4), (4,2), (5,7)\}$   
 $g = \{(0,2), (1,0), (2,4), (-4,2), (7,0)\}$  then the range of  $f \circ g$  is  
(a)  $\{0,2,3,4,5\}$  (b)  $\{-4,1,0,2,7\}$  (c)  $\{1,2,3,4,5\}$  **(d)  $\{0,1,2\}$**
- 13) Let  $f(x) = \sqrt{1+x^2}$  then  
(a)  $f(xy) = f(x).f(y)$  (b)  $f(xy) \geq f(x).f(y)$  **(c)  $f(xy) \leq f(x).f(y)$**  (d) None of these
- 14) If  $g = \{(1,1), (2,3), (3,5), (4,7)\}$  is a function given by  $g(x) = ax + \beta$  then the values of  $a$  and  $\beta$  are  
(a)  $(1, 2)$  **(b)  $(2, 1)$**  (c)  $(1, 1)$  (d)  $(1, 1)$

(a) (-1, 2) (b) (2, -1) (c) (-1, -2) (d) (1, 2)

- 15)  $f(x) = (x + 1)^3 - (x - 1)^3$  represents a function which is  
(a) linear (b) cubic (c) reciprocal (d) **quadratic**
- 16) If  $f: \mathbb{R} \rightarrow \mathbb{R}$  is defined by  $f(x) = x^2 + 2$ , then the preimage 27 are \_\_\_\_\_  
(a) 0.5 (b) **5, -5** (c) 5, 0 (d)  $\sqrt{5}, -\sqrt{5}$
- 17)  $(x - \frac{1}{x}) = x^2 + \frac{1}{x^2}$  then  $f(x) =$   
(a)  **$x^2 + 2$**  (b)  $x^2 + \frac{1}{x^2}$  (c)  $x^2 - 2$  (d)  $x^2 - \frac{1}{x^2}$
- 18) Let  $f(x) = x^2 - x$ , then  $f(x-1) - (x+1)$  is \_\_\_\_\_  
(a)  $4x$  (b)  $2-2x$  (c)  **$2-4x$**  (d)  $4x-2$
- 19) If  $f(x) = x + 1$  then  $f(f(f(y+2)))$  is \_\_\_\_\_  
(a)  **$y + 5$**  (b)  $y + 6$  (c)  $y + 7$  (d)  $y + 9$
- 20) If  $f(x) = mx + n$ , when  $m$  and  $n$  are integers  $f(-2) = 7$ , and  $f(3) = 2$  then  $m$  and  $n$  are equal to \_\_\_\_\_  
(a) -1, -5 (b) 1, -9 (c) **-1, 5** (d) 1, 9
- 21) The function  $t$  which maps temperature in degree Celsius into temperature in degree Fahrenheit is defined Fahrenheit degree is 95, then the value of  $C$   $t(C) = \frac{9C}{5} + 32$  is \_\_\_\_\_  
(a) 37 (b) 39 (c) **35** (d) 36
- 22) If  $f(x) = \frac{1}{x}$ , and  $g(x) = \frac{1}{x^3}$  then  $f \circ g \circ g(y)$ , is \_\_\_\_\_  
(a)  $\frac{1}{y^8}$  (b)  $\frac{1}{y^6}$  (c)  $\frac{1}{y^4}$  (d)  **$\frac{1}{y^3}$**
- 23) If  $n(A) = p$ ,  $n(B) = q$  then the total number of relations that exist between  $A$  and  $B$  is \_\_\_\_\_  
(a)  $pq$  (b)  **$2^{pq}$**  (c)  $q^p$  (d)  $p^q$
- 24) If  $f(x) = 2 - 3x$ , then  $f \circ f(1 - x) = ?$   
(a)  $5x+9$  (b)  $9x-5$  (c)  **$5-9x$**  (d)  $5x-9$
- 25) If  $f(x) + f(1 - x) = 2$  then  $f(\frac{1}{2})$  is \_\_\_\_\_  
(a) 5 (b) -1 (c) -9 (d) **1**
- 26) If  $f$  is constant function of value  $\frac{1}{10}$ , the value of  $f(1) + f(2) + \dots + f(100)$  is \_\_\_\_\_  
(a)  $\frac{1}{100}$  (b) 100 (c)  $\frac{1}{10}$  (d) **10**
- 27) If  $f(x) = \frac{x+1}{x-2}$ ,  $g(x) = \frac{1+2x}{x-1}$  then  $f \circ g(x)$  is \_\_\_\_\_  
(a) Constant function (b) Quadratic function (c) Cubic function (d) **Identify function**
- 28) If  $f$  is identify function, then the value of  $f(1) - 2f(2) + f(3)$  is:  
(a) -1 (b) -3 (c) 1 (d) **0**
- 29) Coefficient of variation is a relative measure of \_\_\_\_\_  
(a) **Mean** (b) Range (c) Standard Deviation (d) Co-efficient of range
- 30) The equation of axis of symmetry of a parabola is given by \_\_\_\_\_  
(a)  **$X = b/2a$**  (b)  $X = -b/2a$  (c)  $X = b/4a$  (d)  $X = -b/4a$
- 31) The excluded value of the rational expression  $x/x^2+1$  is \_\_\_\_\_  
(a) **1** (b) -1 (c)  $\pm 1$  (d) No real excluded value

- 32)  $a \cot \theta + b \operatorname{cosec} \theta = p$  and  $b \cot \theta + a \operatorname{cosec} \theta = q$  then  $p^2 - q^2$  is equal to \_\_\_\_\_  
**(a)  $a^2 - b^2$**  (b)  $b^2 - a^2$  (c)  $a^2 + b^2$  (d)  $b - a$
- 33) All elements of a function should have images a \_\_\_\_\_  
**(a) True** (b) False (c) sometimes true (d) sometimes false
- 34) Composition of function is associative \_\_\_\_\_  
**(a) Always true** (b) Never true (c) Sometimes true (d) None of these
- 35) A function is also called as a \_\_\_\_\_  
 (a) mapping (b) transformation **(c) both a and b** (d) none of these
- 36) If  $n(A) = p$ ;  $n(B) = q$ ; then the total number of relations that exist between A and B is \_\_\_\_\_  
 (a)  $2^p$  (b)  $2^q$  **(c)  $2^{p+q}$**  (d)  $2^{pq}$
- 37) If the set A has 'p' elements, B has 'q' elements, then the number of elements in  $A \times B$  is \_\_\_\_\_  
 (a)  $p + q$  (b)  $p + q + 1$  **(c)  $pq$**  (d)  $p^2$
- 38) Let  $A = \{a, b, c, d\}$ ,  $B = \{b, c, d, e\}$ , then  $n\{(A \times B) \cap (B \times A)\} =$  \_\_\_\_\_  
 (a) 3 (b) 6 **(c) 9** (d) None of these
- 39) If A is the set of even numbers less than 8 and B is the set of prime numbers less than 7, then the number of relations from A to B is \_\_\_\_\_  
**(a)  $2^9$**  (b)  $9^2$  (c)  $3^2$  (d)  $2^{9-1}$
- 40) Let N be the set of all natural numbers and let 'R' be a relation on N defined as  $\mathbf{R} = \{(x, y) / x \in N, y \in N \text{ and } x + 3y = 15\}$ . Then R as set of ordered pairs is \_\_\_\_\_  
 (a)  $\{(3, 4), (5, 3), (9, 2), (13, 2)\}$  (b)  $\{(3, 5), (2, 7), (9, 2), (12, 1)\}$  **(c)  $\{(3, 4), (6, 3), (9, 2), (12, 1)\}$**   
 (d)  $\{(4, 5), (7, 3), (4, 5), (4, 2)\}$
- 41) If  $n(A) = p$ ,  $n(B) = q$  then the total number of relations that exist between A and B is \_\_\_\_\_  
 (a)  $2^p$  (b)  $2^q$  (c)  $2^{p+q}$  **(d)  $2^{pq}$**
- 42) A relation R is defined from  $\{2, 3, 4, 5\}$  to  $\{3, 6, 7, 10\}$  by  $\mathbf{xRy} \Leftrightarrow x$  is relatively prime to y Then, domain of R is  
 (a)  $\{2, 3, 5\}$  (b)  $\{3, 5\}$  (c)  $\{2, 3, 4\}$  **(d)  $\{2, 3, 4, 5\}$**
- 43) If  $f(x) = 2x^2 + bx + c$  and  $f(0) = 3$  and  $f(2) = 1$ , then  $f(1)$  is equal to \_\_\_\_\_  
 (a) -2 **(b) 0** (c) 1 (d) 3
- 44) Which of the following are functions?  
 (a)  $\{(x, y) : y^2 = x, x, y \in R\}$  **(b)  $\{(x, y) : y = |x|, x, y \in R\}$**  (c)  $\{(x, y) : x^2 + y^2 = 1, x, y \in R\}$   
 (d)  $\{(x, y) : x^2 - y^2 = 1, x, y \in R\}$
- 45) If  $f(x) = x - 2$ ,  $g(x) = \sqrt{x^2 + 1}$ , then  $(g \circ f)(x) = ?$   
 (a)  $\sqrt{x^2 + 1} - 2$  **(b)  $\sqrt{x^2 + 4x + 5}$**  (c)  $x^2 - 1$  (d)  $x^2 - 4x + 5$
- 46) Given  $f(2) = 3$ ,  $g(3) = 2$  and  $g(2) = 5$ , then  $(f \circ g)(3) =$   
 (a) 2 **(b) 3** (c) 4 (d) 5
- 47) Given  $f = \{(-2, 1), (0, 3), (4, 5)\}$ ,  $g = \{(1, 1), (3, 3), (4, 5)\}$  then, Domain and range of  $g \circ f$  \_\_\_\_\_  
 (a)  $D = \{3, 0\}$ ,  $R = \{-2, 1\}$  (b)  $D = \{3, -2\}$ ,  $R = \{1, 5\}$  **(c)  $D = \{-2, 0\}$ ,  $R = \{1, 3\}$**  (d)  $D = \{-2, 1\}$ ,  $R = \{0, 3\}$
- 48) Functions are subsets of \_\_\_\_\_.

**(a) Relation** (b) Cartesian Product (c) Range (d) Function

49) If  $f:N \rightarrow R$  is defined by  $f(n)=2^n$ , then the range of the function is

**(a) Set of all even positive integers** (b)  $N$  (c)  $R$  (d) A subset of set of all even positive integers

50) An example for a function which is not a relation (Domain- $R$ , codomain- $R$ ) is

(a)  $y=x$  (b)  $y=x-1$  (c)  $y=x^2$  **(d) Not possible**