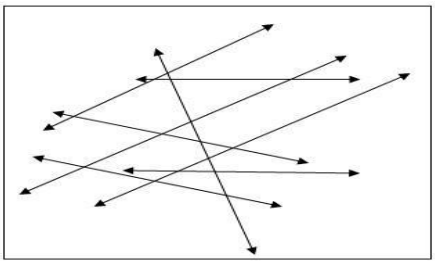
CLASS-XII
CHAPTER-01
RELATION AND FUNCTION
01 MARK TYPE QUESTIONS

Q. No.	QUESTION	MARK
1	Let A be the set of all human beings of a joint family living in TATA NAGAR. Then the relation defined as: R = {(x, y) : x is wife of y} is --------- (a) reflexive (b) symmetric (c) transitive (d) none of these	1
2	Let A be the set of all human beings living in a joint family in Cuttack.  Then the relation in set A defined as: R = {(x, y) : x is father of y} is ---------- (a) reflexive (b) symmetric (c) transitive (d) none of these	1
3	Let L be the set of all lines in XY-plane and R be the relation in L defined as R = {L_1, L_2): L_1 is parallel to L_2}.  Which of the following lines related to the line $3x - y - 1$=0. (a) $6x - y + 1 = 0$ (b) $6x - 2y - 3 = 0$ (c) $3x + y + 1 = 0$ (d) $9x + 3y + 5 = 0$	1
4	Let A = {1, 2, 3}. Then number of equivalence relations containing (1, 2), (2,3) and (1, 3) is -------- -- (a) 1 (b) 2 (c) 3 (d) 4	1

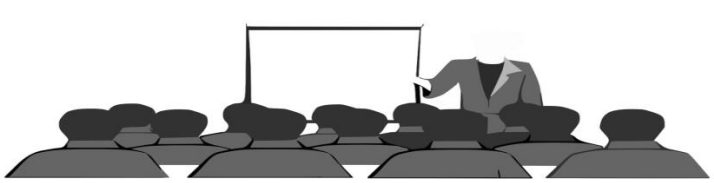
5	Consider a group consisting four friends.  Then the number of symmetric relations defined in that group is ---------- (a) 2^4 (b) 2^{10} (c) 2^{16} (c) 2^{12}	1
6	Jim and Jeny are solving some problems on relations and functions. Jim has a set A containing four natural numbers and Jeny has a set B containing three alphabets.  Jim wants to find the number of all possible onto functions from A to B. What will be his answer? (a) 3^4 (b) 4_{P_3} (c) 0 (d) 36	1
7	The function f: N→N defined by f(x) = x – 1 and f(1) = f(2) = 1 for every x > 2 is (a) One-one and onto (b) One-one but not onto (c) Onto but not one-one (d) Neither one-one nor onto	1
8	Let A be the set of all 50 students of Class X in a school. Let f : A → N be function defined by f (x) = roll number of the student x. (a) f is neither one-one nor onto. (b) f is one-one but not onto (c) f is not one-one but onto (d) none of these	1
9	For real numbers x and y, define xRy if and only if $x - y + \sqrt{2}$ is an irrational number. Then the relation R is ---------- (a) reflexive only (b) reflexive, symmetric but not transitive (c) equivalence relation (d) neither reflexive nor symmetric nor transitive	1
10	Assertion(A): If n (A) =p and n (B) = q then the number of relations from A to B is 2^{pq}. Reason(R): A relation from A to B is a subset of AXB. Which of the following options is correct? (a) Both A and R are true and R is correct explanation of A (b) Both A and R are true and R is not the correct explanation of A (c) A is true but R is false (d) A is false but R is true	1

11	Let R be a relation on the set N given by R = {(a, b) : a = b - 2, b > 6}. Then (a) (2, 4) $\in$ R (b) (3, 8) $\in$ R (c) (6, 8) $\in$ R (d) (8, 7) $\in$ R	1
12	Which of the following is not an equivalence relation on Z? (a) a R b $\Leftrightarrow$ a + b is an even integer (b) a R b $\Leftrightarrow$ a − b is an even integer (c) a R b $\Leftrightarrow$ a < b (d) a R b $\Leftrightarrow$ a = b	1
13	Let A = {1, 2, 3}. Then, the number of relations containing (1, 2) and (1, 3) which are reflexive and symmetric but not transitive is- a)1 b)2 c)3 d)4	1
14	The relation 'R' in N × N such that (a, b) R (c, d) <=> a+d = b+c a) reflexive but not symmetric b) reflexive and transitive but not symmetric c) an equivalence relation d) none of these	1
15	If A = {1, 2, 3}, B = {1, 4, 6, 9} and R is a relation from A to B defined by 'x is greater than y'. The range of R is {1, 4, 6, 9} {4,6,9} {1} None of these	1
16	f : R ----> R given by f(x) = x + $\sqrt{x^2}$ (a)Injective (b) surjective (c) bijective (d) none of these	1
17	The function f : R $\rightarrow$ R defined by f(x) = 2x + 2|x| is (a) one-one and onto (b) many-one and onto (c) one-one and into (d) many-one and into	1
18	The range of the function f (x) = ${}^{7-x}P_{x-3}$ is (a) {1, 2, 3, 4, 5} (b) {1, 2, 3, 4, 5, 6} (c) {1, 2, 3, 4} (d) {1, 2, 3}	1

19	Which of the following functions from Z to itself are bijections? (a) $f(x) = x^3$ (b) $f(x) = x + 2$ (c) $f(x) = 2x + 1$ (d) $f(x) = x^2 + x$	1
20	if a function $f : [2, \infty) \rightarrow B$ defined by $f(x) = x^2 - 4x + 5$ is a bijection, then B = (a) R (b) $[1, \infty)$ (c) $[4, \infty)$ (d) $[5, \infty)$	1
21	In an assembly line, let us consider two machines A & B working in an arranged manner. If the machine were setup in such a manner that the materials input in machine B is the product of materials obtained from the machine A. Then, what type of work can this be considered as: (a) Binary function (b) Bijective function (c) Composition of function (d) Trivial relation	1
22	When we apply for any qualifying examinations like SSB, NET, etc.., we were provided with an application ID number. In order to have confidentiality, each ID were assigned with the password provided by the board in-charge of the examination, which is to be inserted at the time of examination. What type of function is found in this example? (a) One-one onto function (b) One-one into function (c) One-one function (d) None of these	1
23	While shopping in the market, we use many methods of calculation (namely addition, subtraction, multiplication, division). We observe that we mainly use two numbers to use these operators. Even when there are three numbers, we first use the first two umbers and the result is then used along with third number. Thus, addition, subtraction, multiplication, division are considered to be binary operators. Assume that the numbers you have come across belong to the natural number. Then, which of the following statement is false according to the above condition? (a) Addition & subtraction are binary operators in N. (b) Subtraction & division are not binary operators in N. (c) Addition is binary operators in N. (d) Multiplication is binary operator in N.	1
24	Assertion-Reason Based Question: Each question consists of two statements, namely, Assertion (A) and Reason (R). Mark your answer as per the codes provided below: (1) Both A and R are true and R is the correct explanation of A. (2) Both A and R are true but R is not the correct explanation of A. (3) A is true but R is false.	1

	(4) A is false but R is true. Assertion (A): If we consider two function f & g, and the outcome of f become the input of g, for it to be called composition of function. Reason (R): Two function f & g is a composite function (i.e., gof) exists iff range of f is a subset of domain of g.	
25	Consider two machine A & B, for it to be working in an arranged manner, the materials of B come from the product/output of machine A. if we change the method of inserting the material i.e.., if the material A gets its material directly from the product of machine B. Then, could the machine work in the same manner as before? (a) No, the machine will not work for the second case in the same manner as before. (b) Yes, it will work. (c) No, it will not work because the composition of two function is not commutative in nature. (d) Can't say	1
26	Let us consider a group of all prime number and a group of all even numbers. So, when we construct a pair containing the data from both the group. What type of relation did we get? (a) Reflexive relation (b) Symmetric relation (c) Transitive relation (d) Equivalence relation	1
27	During a lecture session provided by Pawan sir on topic sets, he has pointed out main topics along with some frequently asked question. If we consider all the concept provided by him to be in a group and the outcome contains all the doubts asked by the students. Then, according to the above-mentioned concept, which of the following statements is consider to be false? (a) The group contain all the provided concept can be called domain of the relation. (b) The unsolved question asked by the students is called codomain of the relation. (c) The group containing all the provided concept can be called codomain of the relation (d) The range of the relation is all those questions related to concept being taught by sir.	1
28	In order to make ice-cream, we need milk, sugar, water & any food essence to be put in the ice-cream maker. The expected outcome will be obviously ice-cream of that particular food essence. Which of the following represent this given example? (a) Function (b) Relation (c) Trivial relation (d) None of these	1
29	In order to maintain the voltage, we need stabilizers. In stabilizers, whatever measurement of voltage like for example 200V, 220V, 240V, even 260V of voltage is passed, the output will always be 240V, because the work of the stabilizer is to give a constant voltage in return. This is example shows what type of function? (a) One-one function (b) One-many function (c) Onto function (d) Many-one function	1
30	Assertion-Reason Based Question:	1

	Each question consists of two statements, namely, Assertion (A) and Reason (R). Mark your answer as per the codes provided below: (1) Both A and R are true and R is the correct explanation of A. (2) Both A and R are true but R is not the correct explanation of A. (3) A is true but R is false. (4) A is false but R is true. Assertion (A): If we consider two function R and N containing the roll number and name of Class X students. We observe that while compositing R & N, to get RoN, first R then N is applied, while in reverse process, first the reverse process of N is applied and then reverse process of R is applied. Both the process is applicable. Reason (R): Inverse is defined only for the function which is onto function.	
31	Raju has a unique type of ludo die on which each number of {1,2,3} appear on two faces of the die then Maximum number of equivalence relations on the set A={1,2,3} are ?  **(A)** 1 **(B)** 2 **(C)** 3 **(D)** 5	1
32	Ramesh has two natural number i.e. a and b and fix a relation R between a and b which is given mathematically as R ={(a,b) :a=b-2,b>6} then What is your view about type of R? (A) Reflexive (B) Symmetric only (C) Non-Transitive (D) Equivalence	1
33	A students have 3 pen and 4 pencil. Then number of injective mapping that can be defined from set of pen to set of pencil is. (A) 144 (B) 24 (C) 12 (D) 64	1
34	The function $f: N \to N$ is defined by $f(n) = \begin{cases} \frac{n+1}{2}; if\ n\ is\ odd. \\ \frac{n}{2}; if\ n\ is\ even. \end{cases}$ The function $f\ is.$ **(A)** Bijective **(B)** One-one but not onto (C) Onto but not one-one (D) Neither one-one nor onto	1
35	A teacher of Maths defines a function in front of the students of class-12 such that $f: R \to R$ is defined by $f(x) = 4 + 3\cos x$ and ask them to check the type of function.	1

	 **(A)** Bijective (B) One-one but not onto (C) Onto but not one-one (D) Neither one-one nor onto	
36	The function $f: R \to R$ is defined by $f(x) = 2 + x^2$ is **(A)** Neither one-one nor onto **(B)** Not One-one (C) One-one (D) Not onto.	1
37	Two students are playing a game "They count the number of students in two different class in their school" A there are four relation defined on these sets as follow which of the following is the reflexive relation.  (A) R ={(x,y) ; x>y x,y>N} (B) R ={(x,y) ;x.yis the square number x,y>N} (C) R ={(x,y) ;x+y=10 ; x,y>N} (D) R ={(x,y) ;x+4y=10 ; x,y>N}	1
38	Let L denotes the set of all straight line in a plane. Let a relation R defined by l R m if and only if l is perpendicular to m. **(A)** Reflexive **(B)** Symmetric only **(C)** Non-Transitive **(D)** None of these	1
39	The following questions consist of two statements-Assertion (A) and Reason (R).Answer these questions selecting the appropriate option given bellow: (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not correct explanation for A (c) A is true and R is false. (d) A is false and R is true. Assertion (A): Let A ={1,2,3} then the relation on A as R={(1,2),(2,1)} R is not transitive relation	1

	Reason (R) :A relation R defined on a non empty set A is said to be transitive relation if (a,b), (b,c) ϵ R $\Rightarrow$ (a,c) ϵ R	
40	The following questions consist of two statements-Assertion (A) and Reason (R).Answer these questions selecting the appropriate option given bellow: (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not correct explanation for A (c) A is true and R is false. (d) A is false and R is true. Assertion (A): Let $f: R \to R$ such that $f(x) = x^2$ the function f is an onto function. Reason (R) : A function Let $g: A \to B$ is said to be onto function if g(A)=B ie.range of g=B	1
41	Let R be a relation on the set N given by R = { (a,b) : a = b-2,b > 6} then, **(a)** (2,4) $\in R$ (b) (3,8) $\in R$ (c) (6,8) $\in R$ (d) (8,7) $\in R$	1
42	If A ={ a,b,c} then the relation R ={(b,c)} on A is **(a)** Reflexive only (b) Symmetric only (c) Transitive only (d) reflexive & transitive only	1
43	The relation R in NXN such that (a,b) R (c,d) $\rightarrow$ a+d = b+c is **(a)** Reflexive but not symmetric (b) reflexive & transitive but not Symmetric (c) Equivalence relation (d) none of these	1
44	The relation S defined on the set R of all real number by the rule a S b iff a $\geq$ b is (a) An equivalence relation (b) reflexive & transitive but not Symmetric (c) Symmetric, transitive & but not reflexive (d) Neither transitive nor reflexive but symmetric	1
45	The maximum number of equivalence relations on the set A = { 1,2,3} is **(a)** 1 (b) 2 (c) 3 (d) 5	1
46	The function f: f:R $\rightarrow$ R ,given by f(x)=cosx is **(a)** One-one (b) many one (c) onto (d) neither one-one nor onto	1
47	Let R be the relation on N defined by x+2y=8. The domain of R is **(a)** {2,4,8} (b) {2,4,6,8} (c) {2,4,6} (d) {1,2,3,4}	1
48	If A{1,2,3}, B={1,4,6,9} and R be the relation from A to B defined by "x greater than y". The range of R is **(a)** {1,4,6,9} (b) {4,6,9} (c) {1} (d) none of these	1
49	If R is the largest equivanence relation on a set A & S in any relation on A then **(a)** $R \subset S$ (b) S$\subset R$ (c) $R = S$ (d) none of these	1
50	The function f:N $\rightarrow$ N ,given by f(x) = $\begin{cases} \frac{n+1}{2} & ,if\ n\ is\ odd \\ \frac{n}{2} & ,if\ n\ is\ even \end{cases}$ is **(a)** One-one (b) many one -onto (c) onto (d) many one -into	1

51	The relation R on the set $A = \{a, b, c\}$ given by $R = \{(a, b), (b, a), (c, c)\}$ is (a) symmetric and transitive, but not reflexive (b) reflexive and symmetric, but not transitive (c) symmetric, but neither reflexive nor transitive (d) an equivalence relation	1
52	The number of reflexive relations on a set A consisting of n elements is equal to (a) 2^{n^2} (b) n^2 (c) $2^{n(n-1)}$ (d) $n^2 - n$	1
53	The number of symmetric relations on set $\mathrm{A} = \{1, 2, 3, 4\}$ is (a) 2^{10} (b) 2^6 (c) 2^{12} (d) 2^{16}	1
54	The number of equivalence relations in the set $\{1, 2, 3\}$ containing the elements (1, 2) and (2, 1) is (a) 0 (b) 1 (c) 2 (d) 3	1
55	The maximum number of equivalence relation on the set $A = \{1, 2, 3\}$ (a) 1 (b) 2 (c) 3 (d) 5	1
56	Set A contains 5 elements and set B contains 6 elements, then the number of one-one mapping from A to B is (a) 720 (b) 120 (c) 6^5 (d) 5^6	1
57	The function $f: R \to R$ defined as $f(x) = x^3$ is (a) one-one but not onto (b) not one-one but onto (c) neither one-one nor onto (d) one-one and onto	1
58	Let $A = \{1, 2, 3, \ldots \ldots n\}$ and $B = \{a, b\}$. Then the number of surjections from A into B is (a) n_{P_2} (b) $2^n - 2$ (c) $2^n - 1$ (d) none of these	1
59	The function $f: R \to R$ defined by $f(x) = 4 + 3\cos x$ is (a) bijective (b) one-one but not onto (c) onto but not one-one (d) neither one-one nor onto	1
60	Which of the following functions from Z to Z is a bijection? (a) $f(x) = x^2$ (b) $g(x) = x + 2$ (c) $f(x) = 2x + 1$ (d) $f(x) = x^2 + 1$	1

ANSWER
CHAPTER-01
RELATION AND FUNCTION
01 MARK TYPE QUESTIONS

Q.No	**ANSWERS**	**Mark**
1	(c) transitive	1
2	(d) none of these	1
3	(b) $6x - 2y - 3 = 0$	1
4	(a) 1	1
5	(b) 2^{10}	1
6	(d) 36	1
7	(c) Onto but not one-one	1
8	(b) f is one-one but not onto	1
9	(a) reflexive only	1
10	(a) Both A and R are true and R is correct explanation of A	1
11	c	1
12	c	1
13	a	1
14	c	1
15	c	1
16	d	1
17	c	1
18	d	1
19	b	1
20	b	1
21	(c)	1
22	(a)	1
23	(a)	1
24	(1)	1
25	(c)	1
26	(c)	1
27	(c)	1
28	(a)	1
29	(d)	1
30	(3)	1
31	D	1
32	C	1
33	B	1
34	C	1
35	D	1

36	A	1
37	B	1
38	D	1
39	A	1
40	A	1
41	**C**	1
42	c	1
43	c	1
44	b	1
45	d	1
46	d	1
47	c	1
48	c	1
49	b	1
50	b	1
51	c	1
52	c	1
53	a	1
54	c	1
55	d	1
56	a	1
57	d	1
58	b	1
59	d	1
60	b	1