CHAPTER 1
RELATIONS AND FUNCTIONS
MULTIPLE CHOICE QUESTIONS

SL.NO.	QUESTIONS
1	Let S be the set of all square in a plane with R a relation in S given by R = {(S1, S2) : S1 is congruent to S2}. Then R is (a) an equivalence relation. (b) only reflexive (c) transitive not symmetric (d) only symmetric
2	Given set A ={1, 2, 3} and a relation R = {(1, 3), (3, 1)}, the relation R will be (a) reflexive if (1, 1) is added (b) symmetric if (2, 3) is added (c) transitive if (1, 1) is added (d) symmetric if (3, 2) is added
3	The function f :[0,∞) →R given by f(x) = $\frac{x}{x+1}$ (a) f is both one-one and onto (b) f is one-one but not onto (c) f is onto but not one-one (d) neither one-one nor onto
4	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) = $x^2 + x$
5	Let A ={1,2,3} , B = {1,4,6,9} and R is a relation from A to B define by ' x is greater than y '. Then range of R is given by: (a) {1,4,6,9} (b) {4,6,9} (c) {1} (d) none of these
6	Let N be the set of all natural numbers and let R be a relation in N, defined by R = {(a, b)} : a is a factor of b }. (a) R is symmetric and transitive but not reflexive (b) R is reflexive and symmetric but not transitive (c) R is equivalence (d) R is reflexive and transitive but not symmetric
7	Let N be the set of all natural numbers and let R be a relation on N × N,defined by (a, b) R (c, d) ⇔ ad = bc. (a) R is symmetric and transitive but not reflexive (b) R is reflexive and symmetric but not transitive (c) R is equivalence (d) R is reflexive and transitive but not symmetric

8	Let A be the set of all points in a plane and let O be the origin. Let R ={(P, Q) :OP =OQ}. Then, R is (a) reflexive and symmetric but not transitive (b) reflexive and transitive but not symmetric (c) symmetric and transitive but not reflexive (d) an equivalence relation
9	If f = {(1, 2), (3, 5), (4, 1)} and g ={(2, 3), (5, 1), (1, 3)} then ($go\ f$) =? (a) {(3, 1), (1, 3), (3, 4)} (b) {(1, 3), (3, 1), (4, 3)} (c) {(3, 4), (4, 3), (1, 3)} (d) {(2, 5), (5, 2), (1, 5)}
10	Let X = {-1, 0, 1}, Y = {0, 2} and a function f : X → Y defined by $y = 2x^4$, is (a) one-one onto (b) one-one into (c) many-one onto (d) many-one into
11	Set A has 2 elements and the set B has 3 elements. Then the number of relations that can be defined from set A to set B is (a) 144 (b) 12 (c) 24 (d) 64
12	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
13	Let R be the relation in the set N given by R = {(a, b) : $a = b - 3$, $b > 6$}. Choose the correct answer. (A) (2, 4) ϵ R (B) (3, 8) ε R (C) (6, 8) ϵR (D) (4, 7) ϵ R
14	The function f : R →R, defined as $f(x) = x^2$, is (a) neither one-one nor onto (b) only onto (c) one-one (d) none of these
15	Let R be a relation defined on Z as follows: $(x, y) \epsilon R \Leftrightarrow \lvert x-y \rvert \leq 1$. Then R is: (a) Reflexive and transitive (b) Reflexive and symmetric (c) Symmetric and transitive (d) an equivalence relation
16.	Let A={1,2,3} and consider the relation R={(1,1),(2,2),(3,3),(1,2),(2,3),(1,3)}. Then R is

	(A) Reflexive but not symmetric (B) Reflexive but not transitive (C) Symmetric and transitive Neither symmetric nor transitive
17.	Let S be the set of all real numbers. Then the relation R={(a ,b):1+ab>0} on S is (A) Reflexive and symmetric but not transitive. (B) Reflexive and transitive but not symmetric. (C) Symmetric and transitive but not reflexive. Reflexive, symmetric and transitive.
18	Let R be a relation defined on Z as follows: (a, b)∈ R⇔a^2+b^2 =25. Then the domain of R is (A) {3,4,5} (B) {0,3,4,5} (C) $\{0,\pm3,\pm4,\pm5\}$ None of these
19	If A={a, b, c}, then the relation R={(b, c)} on A is (A) Reflexive only (B) Symmetric only (C) Transitive only Reflexive and transitive only.
20	Let T be the set of all triangles in the Euclidean plan and let a relation R on T be defined as a R b, if a is congruent to b, $\forall\, a, b \in T$. Then R is (A) Reflexive but not transitive (B) Transitive but not symmetric (C) Equivalence None of these
21	Which of the following statement/statements is/are correct? (A) If R and S are two equivalence relations on a set A, then R $\cap S$ is also an equivalence relation on A. (B) The union of two equivalence relations on a set is not necessarily relation on the set. (C) The inverse of an equivalence relation is an equivalence relation. All of above
22	Let f: R→ R be defined as f(x) =x^4. (A) f is one -one onto (B) f is many –one onto (C) f is one-one but not onto f is neither one-one nor onto
23	Set A has 3 elements and the set B has 4 elements then numbers of injective functions that can be defined from set A to set B is: (A) 120 (B) 24 (C) 144 64
24	Consider the set A= {4, 5}. The smallest equivalence relation (i.e. the relation with the least number of elements), is: (A) { } (B) {(4,5)} (C) {(4,4),(5,5)} {(4,5),(5,4)}
25.	If a function f:[2,∞)→B defined by f(x)=x^2 −4x +5 is a bijection , then B=

	(A) R (B) [1,∞) (C) [4,∞) [5,∞)
26.	Which of the following functions from Z to itself are bijection? (A) f(x) =x^3 (B) f(x)= x+2 (C) f(x)=2x+1 f(x)= x^2 +x
27.	A function f from the set of natural numbers to integers $f(n)=\begin{cases}\frac{n-1}{2}, & when\ n\ is\ odd\\ \frac{-n}{2}, & when\ n\ is\ even\end{cases}$ is (A) one- one but not onto (B) onto but not one-one (C) one- one and onto both neither one-one nor onto
28.	In the set Z of all integers, which of the following relation R is not an equivalence relation? (A) $x\ R\ y : if\ x \le y$ (B) $x\ R\ y : if\ x = y$ (C) $x\ R\ y : if\ x - y\ is\ an\ even\ integer$ $x\ R\ y : if\ x \equiv y(mod\ 3)$
29.	Domain of the function f(x) =$\sqrt{64-x^2}$ is (A) [-8,8] (B) [-16,16] (C) [0,4] [-5,5]
30.	Let f: R→ R be defined by f(x)=$\begin{cases} 2x & : \quad x>3\\ x^2 & : \quad 1<x\le 3\\ 3x & : \quad x\le 1\end{cases}$ Then f(-1)+f(2)+f(4) is: (A) 5 (B) 14 (C) 9 None of these
31	If $f:R\to R$ be the function defined by $f(x)=x^3+5$, then $f^{-1}(x)$ is a) $(x+5)^{1/3}$ b) $(x-5)^{1/3}$ c) $(5-x)^{1/3}$ d) $5-x$
32	Let $f:[2,\infty)\to R$ be the function defined by $f(x)=x^2-4x+5$, then the range of $f(x)$ is a) R b) $[1,\infty)$ c) $[4,\infty)$ d) $[5,\infty)$
33	If $f:R\to R$ be the function given by $f(x)=\cot x$, then $f^{-1}(1)$ is

	a) $\frac{\pi}{4}$ b) $\left\{n\pi+\frac{\pi}{4}:n\in Z\right\}$ c) Does not exist d)None of these
34	Let $A=\{1,2,3\}$, define a relation R in the set A as $R=\{(1,1),(2,2),(3,3),(1,3)\}$, then which of the following ordered pairs should be added to R to make it the smallest equivalence relation ? a) $(1,3)$ b) $(3,1)$ c) $(2,1)$ d) $(1,2)$
35	Let $f:R\to R$ be a function given by $f(x)=[x] \quad \forall x\in R$, then $f(x)$ is a) One-one b) Onto c) Both one-one and onto d)Neither one-one nor onto
36	Let $f:N\to N$ be defined by $f(1)=f(2)=1$ and $f(x)=x-2, x>2$, then $f(x)$ is a) One-one onto b) Many-one onto c) One-one but not onto d)Many-one but not onto
37	If $A=\{1,2,3....,n\}$ and $B=\{a,b\}$ then the number of surjections from A into B is a) ${}^{n}P_{2}$ b) $2^{n}-1$ c) $2^{n}-2$ d) $n^{2}-n$
38	If the set A has 4 elements and set B has 5 elements , then the number of onto functions from A into B is a) 12 b)10 c) 79 d) 0
39	If the number of elements in set A is 5 and number of elements in set B is 4 then the number of one-one functions from A into B is a) 0 b) 5 c) 20 d)18
40	. If set A has 4 elements and set B has 3 elements then the number of onto functions from A into B is a) 81 b) 0 c) 36 d)45
41	. Let R be a relation on R (set of reals) defined by $R=\{(a,b):a\le b\}$, then R is a) An equivalence relation b) Reflexive , symmetric but not transitive

	c) Symmetric , transitive but not reflexive d)Reflexive, and transitive but not symmetric.
42	Let R be a relation on R (set of reals) defined by $R=\{(a,b):a\le b^2\}$, then R is a) Reflexive, and transitive but not symmetric. b) Neither reflexive nor symmetric nor transitive c) Symmetric , transitive but not reflexive d)Reflexive , symmetric but not transitive
43	Let $A=\{x\in Z:0\le x\le 10\}$ and R be a relation on A defined as $R=\{(a,b):a,b\in A,\|a-b\|\, is\, divisible\, by\, 3\}$, then the equivalence class $[2]$ is a) $\{2,5,8\}$ b) $\{0,3,8\}$ c) $\{3,6,9\}$ d)None of these.
44	A function $f:X\to Y$ is onto if and only if a) Range of f = Y b) $Range\ of\ f\ \subset\ Y$ c) $Range\ of\ f\ \supset Y$ d) $Range\ of\ f\ \neq Y$
45	. Let $f:N-\{1\}\to N$ be defined by , $f(n)=the\, highest\ prime\ factor\ of\ n$, then f is a) One-one onto b) One-one but not onto c) Neither one-one nor onto d)Onto but not one-one
46	The function f : A → B defined by f(x) = 4x + 7, x ∈ R is (a) one-one (b) Many-one (c) Odd (d) Even
47	The smallest integer function f(x) = [x] is (a) One-one (b) Many-one (c) Both (a) & (b) (d) None of these
48	Let A = R – {3}, B = R – {1}. Let f : A → B be defined by f(x)=x−2x−3. Then, (a) f is bijective (b) f is one-one but not onto (c) f is onto but not one-one (d) None of these
49	The number of bijective functions from set A to itself when A contains 106 elements is- (a) 106 (b) $(106)^2$ (c) 106! (d) 2^{106}
50	Let T be the set of all triangles in the Euclidean plane, and let a relation R on T be defined as aRb if a is congruent to b ∀ a, b ∈ T. Then R is (a) reflexive but not transitive

	(b) transitive but not symmetric (c) equivalence (d) None of these
51	The maximum number of equivalence relations on the set A = {1, 2, 3} are (a) 1(b) 2(c) 3(d) 5
52	Let us define a relation R in R as aRb if a ≥ b. Then R is (a) an equivalence relation (b) reflexive, transitive but not symmetric (c) symmetric, transitive but not reflexive (d) neither transitive nor reflexive but symmetric
53	Let A = {1, 2, 3} and consider the relation R = {(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1, 3)}. Then R is (a) reflexive but not symmetric (b) reflexive but not transitive (c) symmetric and transitive (d) neither symmetric, nor transitive
54	Let f : R → R be defind by f(x) = $\frac{1}{x}$ ∀ x ∈ R. Then f is (a) one-one (b) onto (c) bijective (d) f is not defined
54	Which of the following functions from Z into Z are bijective? (a) f(x) = x^3 (b) f(x) = x + 2 (c) f(x) = 2x + 1 (d) f(x) = x^2 + 1
55	Let R be a relation on the set N of natural numbers denoted by nRm⇔ n is a factor of m (i.e. n | m). Then, R is (a) Reflexive and symmetric (b) Transitive and symmetric (c) Equivalence (d) Reflexive, transitive but not symmetric
56	Let S = {1, 2, 3, 4, 5} and let A = S × S. Define the relation R on A as follows: (a, b) R (c, d) iff ad = cb. Then, R is (a) reflexive only (b) Symmetric only (c) Transitive only (d) Equivalence relation
57	The relation R is defined on the set of natural numbers as {(a, b) : a = 2b}. Then, R^{-1} is given by (a) {(2, 1), (4, 2), (6, 3),….} (b) {(1, 2), (2, 4), (3, 6), ……..} (c) R^{-1} is not defiend (d) None of these
58	Let g(x) = $x^2 – 4x – 5$, then (a) g is one-one on R (b) g is not one-one on R (c) g is bijective on R (d) None of these

59	Let A = {x : -1 ≤ x ≤ 1} and f : A → A is a function defined by f(x) = x |x| then f is (a) a bijection (b) injection but not surjection (c) surjection but not injection (d) neither injection nor surjection
60	If A={5,6,7} and let R={(5,5),(6,6),(7,7),(5,6),(6,5),(6,7),(7,6)}. Then R is (A) Reflexive,symmetricbutnotTransitive (B) Symmetric,transitivebutnotreflexive (C) Reflexive,Transitivebutnotsymmetric (D) anequivalencerelation
61	LetRbearelationdefinedonZasfollows: (a,b) ∈ R ⇔ a^2+b^2 =25. Then Domain of R is (A) {3,4,5} (B) {0,3,4,5} (C) (0,±3,±4,±5} (D) None of these
62	Themaximumnumberof equivalencerelationsonthe setA={a ,b ,c}is (A) 1 (B) 2 (c) 3 (D) 5
63	LetRbeareflexiverelationonafinitesetAhavingnelementsandlettherebemorderedpairs in R, then (A) m<n (B) m>n (C) m=n (D) None of these
64	The number of elements in set A is 3. The number of possible relations and let there can be defined on A is (A) 8 (B) 512 (C) 64 (D) 4
65	N is the set of all natural numbers and R is a relation on N×N defined by (a,b) R (c,d) if and only if a+d=b+c, then R is (A) only reflexive (B) only symmetric (C) only transitive (D) equivalence relation
66	The relation R defined on the set A={1,2,3,4,5}, by R={(a,b) : $\|a^2 - b^2\| > 16$} is given by (A) (1,1), (2,1), (3,1), (4,1), (2,3)} (B) {(2,2), (3,2),(4,2),(2,4)} (c) (3,3), (4,3), (5,4), (3,4)} (D) none of these
67	LetRbearelationonthesetNofnaturalnumbersdefinedbyaRbifandonlyif adivides b. ThenRis (A) ReflexiveandSymmetric (B) TransitiveandSymmetric (C) Equivalence (D) Reflexive and Transitive but not symmetric
68	ConsiderthesetA={4,5}.Thesmallestequivalencerelation(i.etherelationwiththeleast number ofelements), is (A) {∅} (B) {(4,5)} (C) {(4,4), (5,5),} (D) (4,5), (5,4)}
69	LetP={a, b, c}.ThenthenumberofEquivalencerelationscontaining(a, b)is (A) 1 (B) 2 (C) 3 (D) 4
70	Let {1,2,3} and consider the relation R={(1,1), (2,2), (3,3), (1,2), (2,3), (1,3)}. Then R is (A) Reflexive but not symmetric (B) reflexive but not transitive (C) Symmetric and transitive (D) neither symmetric, nor transitive

71	Let A={1,2,3,..n} and B={a,b}. Then the number of surjections from A to B is (A) n!/(n-2)! (B) 2^n-2 (C) 2^n-1 (D) None of these
72	Let f: R→R be defined by f(x) =1/x ,∀x∈R. Then f is (A) one-one (B) onto (C) Bijective (D) f is not defined
73	Which of the following functions from Z into Z are bijectons? (A) f(x) = x^3 (B) f(x) = x+2 (C) f(x) =2x+1 (D) f(x) =x^2+1
74	Let f : R→R be defined as f(x) =3x. Choose the correct answer. (A) f is one-one onto (B) f is many-one onto (C) f is one-one but onto (D) f is neither one-one nor onto
75	The maximum number of equivalence relations on the set A ={1, 2, 3} are (A) 1 (B) 2 (C) 3 (D) 5
76	If A = {1, 2, 3} and consider the relation R = {(1,1), (2,2), (3,3), (1,2), (2,3), (1,3)}, then R is (A) reflexive but not symmetric (B) reflexive but not transitive (C) symmetric and transitive (D) neither symmetric nor transitive
77	If f : R ⟶R be defined by $f(x) = \frac{1}{x}, \forall\, x \in R$, then f is (A) one-one (B) onto (C) bijective (D) f is not defined
78	Let A = {1, 2, 3, 4} and B = {1, 2}, then number of onto functions from A to B is (A) 14 (B) 16 (C) 12 (D) 8
79	The function f : R ⟶R defined by $f(x) = 2^x + 2^{\|x\|}$ is (A) one – one and onto (B) many one and onto (C) one – one and into (D) many one and into
80	The function f : R ⟶R defined by f(x) = (x – 1)(x – 2)(x – 3) is (A) one-one but not onto (B) onto but not one-one (C) both one-one and onto (D) neither one-one nor onto

81	Let $f(x) = x^2$ and $g(x) = 2^x$. Then the solution set of the equation fog (x) = gof (x) is (A) R (B) {0} (C) {0, 2} (D) None of these
82	If $g(x) = x^2 + x - 2$ and $\frac{1}{2} gof\ (x) = 2x^2 - 5x + 2$, then f(x) is equal to (A) 2x – 3 (B) 2x + 3 (C) $2x^2 + 3x + 1$ (D) $2x^2 - 3x - 1$
83	The inverse of the function f (x) = 3x – 5, $x \in R$ is (A) $\frac{1}{3x-5}$ (B) $\frac{x+5}{3}$ (C) $\frac{1}{3x+5}$ (D) $\frac{1}{5x-3}$
84	Let $f : R - \{\frac{3}{5}\} \to R - \{\frac{3}{5}\}$ be function defined by $f(x) = \frac{3x+2}{5x-3}$ for all $x \in R - \{\frac{3}{5}\}$. Then f^{-1} equals (A) f (B) 2f (C) 3f (D) 5f
85	Let $f(x) = \frac{x-1}{x+1}$. Then fof^{-1} is (A) x (B) $\frac{1}{x}$ (C) $x + 1$ (D) $\frac{2}{x+1}$
86	Let f (x) = sin x + cos x and g(x) = x^2 – 1. Then the domain in which gof (x) is invertible (A) $[-\frac{\pi}{4}, \frac{\pi}{4}]$ (B) $[0, \frac{\pi}{4}]$ (C) $[-\frac{\pi}{2}, \frac{\pi}{2}]$ (D) $[0, \frac{\pi}{2}]$
87	Let f : R $\longrightarrow$ R be a function defined by $f(x) = \frac{x^2 - 8}{x + 2}$. Then f is (A) one-one but not onto (B) one-one and onto (C) onto but not one-one (D) neither one-one nor onto
88	Let f : R $\longrightarrow$ R be given by f(x) = x^2 – 3. Then f^{-1} is given by (A) $\sqrt{x + 3}$ (B) $\sqrt{x} + 3$ (C) $x + \sqrt{3}$ (D) $\sqrt{x} + \sqrt{3}$
89	Which of the following functions from A = $\{x : -1 \leq x \leq 1\}$ to itself are bijection? (A) $f(x) = \frac{x}{2}$

	(B) $g(x) = \sin(\frac{\pi x}{2})$ (C) $h(x) = \|x\|$ (D) k(x) = x^2
90	If A = {5,6,7} and let R ={(5,5),(6,6),(7,7),(5,6),(6,5),(6,7),(7,6). Then R is (a) Reflexive, symmetric but not Transitive (b) Symmetric, transitive but not reflexive (c) Reflexive, Transitive but not symmetric an equivalence relation
91	Let R be a relation defined on Z as follows: (a,b)€ R⇔$a^2+b^2=25$ then domain of R is (a) {3,4,5} (b) {0,3,4,5} (c) {0,±3,±4,±5} None of these
92	The maximum number of equivalence relationsonthe set A= {1 , 2 , 3}is (a) 1 (b) 2 (c) 3 5
93	Consider the set A= {1, 2}.The relation on A which is symmetric but neither transitive nor reflexive is (a) {(1,1) (2,2) } (b) { } (c) {(1,2)} { (1,2) (2,1) }
94	If A ={d,e,f} and let R={(d,d),(d,e),(e,d),(e,e)},then R is (a) Reflexive, symmetric but notTransitive (b) Symmetric, transitive but not reflexive (c) Reflexive, Transitive but not symmetric an equivalence relation
95	Let R be a reflexive relation on a finite set A having n elements and let there be m ordered pairs in R,then (a) m < n (b) m > n (c) m = n none of these
96	The number of elements in set A is 3.The number of possible relations that can be defined on A is (a) 8 (b) 4 (c) 64 512
97	The number of elements in Set A is 3.The number of possible reflexive relations that can be defined in A is (a) 64 (b) 8 (c) 512 4
98	The number of elements in set P is 4.The number of possible symmetric relations that can be defined on Pis

	(a) 16 (b) 32 (c) 512 1024
99	Let P = {a,b,c}.Then the number of Equivalence relations containing (a,b) is (a) 1 (b) 2 (c) 3 4
100	A relation R on a set A is said to be reflexive if (i) $\forall\ a \in A, (a, a) \in R$ (ii) If $(a, b) \in R \Rightarrow$ (b, a) $\in R$ (iii) If $(a, b) \in R\ and$ (b, c) $\in R \Rightarrow$ (a, c) $\in R$ (iv) a$\in A \Rightarrow (a, a) \in R$
101	If R = {2,3} is a relation on the set {1,2,3) then R is (i) Reflexive (ii) Symmetric (iii) Transitive Equivalence
102	If a relation R on the set {4,5,6} be defined by R = {(4,5), (5,4), (4,4)} then R is (i) Reflexive (ii) Symmetric (iii) Transitive (iv) Symmetric and transitive
103	If a relation R on the set A = {3,4,5} be defined by R = {(3,4),(4,3),(3,3),(4,4)} then R is (i) Reflexive (ii) Symmetric (iii) Transitive (iv) Symmetric and transitive
104	R is a relation on a set A = {1,2} them R is reflexive if (i) (1,1) $\in R$ (ii) (2,2) $\in R$ (iii) {(1,1), (2,2)} $\in R$ (iv) $(1,1), (2,2) \in R$
105	The relation R = {(5,5), (6,6), (7,7)} defined on the set {5,6,7} is (i) Reflexive only (ii) Symmetric only (iii) Transitive only (iv) An Equivalence relation
106	If R = {(a, b): 2 divides (a – b)} be the equivalence relation on the set A = {0,1,2,3,4,5} then the equivalence class [0] is given by (i) {0,2,4} (ii) {1,3,5} (iii) {2,4} (iv) {3,5}

107	If R be the relation perpendicular on the set of lines then R is (i) Reflexive (ii) Symmetric (iii) Transitive (iv) An equivalence relation
108	The function f: $[0,\infty) \rightarrow [0,1)$ be defined by f(x) = $\frac{x}{1+x}$ then f is (i) One-one and onto (ii) One-one but not onto (iii) Onto but not one-one (iv) Neither one-one nor onto
109	The function f: [-1,1]→ R defined by f(x) = $\frac{x}{x+2}$ is (i) One-one and onto (ii) One-one but not onto (iii) Onto but not one-one (iv) Neither one-one nor onto
110	The function f: N→ N defined by f(x) = x – 1 and f (1) = f (2) = 1 for every x > 2 is (i) One-one and onto (ii) One-one but not onto (iii) Onto but not one-one Neither one-one nor onto
111	Let E = {1,2,3,4} and F = {1,2} then the number of functions from E to F is (i) 14 (ii) 16 (iii) 12 (iv) 8
112	Which of the following functions from Z →Z is onto (i) f(x) = x^3 (ii) f(x) = 2x + 1 (iii) f(x) = x + 2 (iv) f(x) = $x^2 + 1$
113	If A = {1,2,3,4} and B = {3,5,7,8,9} and f: A→B be defined by f (x)= 2x+ 1 then f is (i) One-one and onto (ii) One-one but not onto (iii) Onto but not one-one (iv) Neither one-one nor onto
114	If R be the relation on Z defined by R = {(a, b): ab > -1} then R is (i) Reflexive and transitive but not symmetric (ii) Symmetric and transitive but not reflexive (iii) Reflexive and symmetric but not transitive An equivalence relation
115	Let A = {x,y,z}. Then the number of equivalence relations containing (y,z) and (z,y) is (A) 1

	(B) 2 (C) 3 (D) 4
116	The number of relations on a set having 3 elements is (A) 512 (B) 8 (C) 16 (D) 32
117	A one - one function f : {a,b,c} →{a,b,c} is (A) onto (B) not onto (C) not bijective (D) none of these
118	A real function from R to R defined by f(x) = 7 – 6x is (A) one - one (B) onto (C) one – one and onto function (D) neither one – one nor onto
119	A real function from R to R defined by f(x) = $\|x\|$ + 1 is A) one - one (B) onto (C) one – one and onto function (D) neither one – one nor onto
120	The number of bijective functions from set A to itself when A contains 6 elements is (A) 6 (B) 6! (C) 6^2 (D) 2^6
121	The maximum number of equivalence relations on the set A = {p,q,r} is (A) 1 (B) 2 (C) 3 (D) 5
122	Which of the following function from Z to Z is bijective? (A) f(x) = x + 2 (B) f(x) = 2x + 1 (C) f(x) = x^2 + 1 (D) f(x) = x^3
123	The relation R = {(1,1), (2,2)} defined on the set A = {1,2,3} is (A) transitive (B) not transitive (C) reflexive (D) not symmetric
124	The greatest integer function f(x) = [x] defined from R to R is (A) injective function (B) surjective function (C) bijective function (D) neither injective nor surjective function
125	If n(A) = m and n(B) = n, then then number of relations from A to B is

	(A) mn (B) m + n (C) 2^{mn} (D) m^n
126	A relation R = {(a,a,),(a,b),(b,a)} defined on a set A = {a,b}is (A) reflexive but not transitive (B) transitive and symmetric (C) transitive (D) symmetric but not reflexive
127	The number of one - one functions from A = (1,2,3,4,5....n) to itself is (A) n (B) n^2 (C) 2^n (D) n!
128	Consider a set A = (x,y). The equivalence relation on A with least number of elements is (A) {} (B) {(x,x)} (C) {(x,y),(y,x)] (D) {(x,x),(y,y)]
129	Number of reflexive relations on the set A = {1,2} is (A) 1 (B) 2 (C) 4 (D) 8
130	If set A ={1, 2, 3} and a relation R = {(1, 2), (2, 1)}, the relation R will be (A) reflexive if (1, 1) is added (B) symmetric if (2, 3) is added (C) transitive if (1, 1) is added (D) symmetric if (3, 2) is added
131	If set A = {a, b, c). An identity relation in set A is (A) R = {(a, b), (a, c)} (B) R = {(a, a), (b, b), (c, c)} (C) R = {(a, a), (b, b), (c, c), (a, c)} (D) R= {(c, a), (b, a), (a, a)}
132	Set A has 3 elements and the set B has 4 elements. Then the number of injective functions that can be defined from set A to set B is (A) 144 (B) 12 (C) 24 (D) 64
133	The maximum number of equivalence relations on the set A = {1, 2, 3} are (A) 1 (B) 2 (C) 3 (D) 5

134	Given triangles with sides T_1 : 3, 4, 5; T_2 : 5, 12, 13; T_3 : 6, 8, 10; T_4 : 4, 7, 9 and a relation R in set of triangles defined as R = {(Δ_1, Δ_2) : Δ_1 is similar to Δ_2}. Which trianglesbelong to the same equivalence class? (A) T_1 and T_2 (B) T_2 and T_3 (C) T_1 and T_3 (D) T_1 and T_4
135	Let R be a relation on the set L of lines defined as R = { (L_1, L_2) : L_1 is perpendicular to L_2 } then relation R is (A) reflexive and symmetric (B) symmetric and transitive (C) equivalence relation (D) symmetric
136	If relation R in the set {1,2,3} given by R = {(1,1), (2, 2), (3, 3), (1, 2), (2, 3)} is (A) reflexive (B) symmetric (C) transitive (D) equivalence relation
137	Let A = {1, 2, 3} and consider the relation R = {(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1, 3)}. Then R is (A) reflexive but not symmetric (B) reflexive but not transitive (C) symmetric and transitive (D) neither symmetric, nor transitive
138	Which of the following functions from Z into Z are bijective? (A) $f(x) = x^3$ (B) $f(x) = x + 2$ (C) $f(x) = 2x + 1$ (D) $f(x) = x^2 + 1$
139	The function f : R → R defined as $f(x) = x^4$ then (A) f is one-one onto (B) f is many-one onto (C) f is one-one but not onto (D) f is neither one-one nor onto
140	The function f : R → R defined as f(x) = 3x then (A) f is one-one onto (B) f is many-one onto (C) f is one-one but not onto (D) f is neither one-one nor onto
141	The function f : R → R defined as f(x) = |x| then (A) f is one-one onto (B) f is many-one onto (C) f is one-one but not onto (D) f is neither one-one nor onto
142	Let A = R −{3} and B = R−{1}. Consider the function f : A → B defined by f(x) = $\left(\frac{x-2}{x-3}\right)$ Then

	(A) f is one-one onto (B) f is many-one onto (C) f is one-one but not onto (D) f is neither one-one nor onto
143	The signum function f : R → R Given function is $f(x) = \begin{cases} 1, \text{ if } x > 0 \\ 0, \text{ if } x = 0 \\ -1, \text{ if } x < 0 \end{cases}$ Then f is (A) one-one onto (B) many-one onto (C) one-one but not onto (D) neither one-one nor onto
144	If R is a relation from the non –empty set A to a non –empty set B, then R=AUB b) R =AUB c) R =AXBd) R is the subset of AXB
145	let R be the relation defined on NXN by the rule (a,b) R (c,d) implies a+d =b+c, then R is a) Reflexive b) symmetric c) transitive d) all of these
146	The domain of the function f={(1,3),(3,5),(2,6) } is a)1,3 and 2 b) {1,3,2} c) {3,5,6} d)3,5 and 6
147	The smallest integer function f(x)=[x] is One-one b) many-one c) both d) none of these
148	Let X= { 0,1,2,3} and Y={ -1,0,1,4,9} and a function f:X a) One-one onto b) one –one into c) many one onto d) many one into
149	Let X= [-1,0,1}, Y= {0,2} and a function f:X→Y defined by $y=2x^4$,is a) One-one onto b) one –one into c) many one onto d) many one into
150	The function f(x)=$\sqrt{3}$sin2x-cos2x+4 is one-onein the interval a)[-π/2,π/2] b)[-π/4,π/4] c)[-π/6,π/3] d)[-π,π]
151	Let R be an equivalence relation on a finite set A having n elements. Then ,the number of ordered Pair in R is a) <n b) >or= n c) < or =n d)none of these
152	If R and R' are the symmetric relation on a set A then the relation R∩R' is a)Reflexive b) symmetric c) Transitive d) none of these
153	Let R be the relation on the set of all real numbers defined by aRbiffIa-bI$\leq$ 1 . then ,R is a) Reflexive andTransitive b) symmetric only c) Transitive only d) anti symmetric only
154	Which of the following functions is one-one? a) 3-x/3+x b) $\sqrt{x}$ c)x^2+1 d) none of these
155	If f(x)=x^2-3x+1 and f(2k) =2f(k) , then k is equal to a) $\sqrt{2}$ b)- 1/$\sqrt{3}$ c) - 1/$\sqrt{2}$ or-1/$\sqrt{2}$ d) none of these
156	Let f:R→R be defined by f(x)= 1/x for all x elements of R. then f is a) One-one b) onto c) bijective d) none of these
157	If a relation R on the set {1,2,3} be defined by R= {(1,2)}, then R is a) Reflexive b) transitive c) symmetric d) none of these
158	The maximum number of equivalence relations on the set A={1,2,3} are

	a) 1 b) 2 c) 3 d) 5
159	Greatest integer function f(x) = [x] is (a) One-one (b) Many-one (c) Both (a) & (b) (d) None of these
160	Which of the following functions from ℤ into ℤ are bijective? (a) $f(x) = x^3$ (b) f(x) = x + 2 (c) f(x) = 2x + 1 (d) $f(x) = x^2 + 1$
161	Let T be the set of all triangles in the Euclidean plane, and let a relation R on T be defined as aRb if a is congruent to b ∀ a, b ∈ T. Then R is (a) reflexive but not transitive relation (b) transitive but not symmetric relation (c) equivalence relation (d) None of these
162	Let A = {1, 2, 3} and consider the relation R = {(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1, 3)}. Then R is (a) reflexive , transitive but not symmetric (b) reflexive but not transitive (c) symmetric and transitive (d) neither symmetric, nor transitive
163	Total number of equivalence relations defined in the set S = {a, b, c} is (a) 5 (b) 3! (c) 3^2 (d) 3
164	If ℕ be the set of all-natural numbers, consider f : ℕ → ℕ such that f(x) = 2x, ∀ x ∈ℕ, then f is (a) one-one onto (b) one-one into (c) many-one onto (d) None of these
165	If $f(x) + 2f(1 - x) = x^2 + 2$ ∀ x ∈ R, then f(x) =___________ (a) $x^2 - 2$ (b) 1 (c) $(x - 2)^2/3$ (d) None of these
166	Consider the non-empty set consisting of children is a family and a relation R defined as aRb If a is brother of b. Then R is (a) symmetric but not transitive (b) transitive but not symmetric (c) neither symmetric nor transitive (d) both symmetric and transitive
167	Let a relation T on the set ℝ of real numbers be T = {(a, b) : 1 + ab < 0, a,b∈ℝ }. Then from among the ordered pairs (1, 1), (1, 2), (1, -2), (2, 2), the only pair that belongs to T is_____. (a) (2, 2) (b) (1, 1) (c) (1, -2) (d) (1, 2)
168	Let C = {(a, b): $a^2 + b^2 = 1$; a, b ∈ R} a relation on R, set of real numbers. Then C is (a) Equivalence relation (b) Reflexive (c) Transitive (d) Symmetric
169	Number of relations that can be defined on the set A = {a, b, c, d} is________ (a) 2^3 (b) 4^4 (c) 4^2 (d) 2^{16}
170	Which one of the following relations on set of real numbers is an equivalence relation? (a) a R b ⇔ a ≥ b (b) a R b ⇔ |a| = |b| (c) a R b ⇔ a > b (d) a R b ⇔ a < b
171	R is an equivalent relation on the set A ={1,2,3,4,5} defined by R={(x,y) : $\|x - y\|$ is even} Then find the class[1] (a) {1} (b) {1,3,5} (c) {2,4} (d) {1,3)

172	The number of bijective functions from set A to itself when A contains 105 elements is (a) 105 (b) $(105)^2$ (c) 105! (d) 2*105
173	Let f: $\mathbb{R} \to \mathbb{R}$ be defined by $f(x)=x^4$. Then f(x) will be (a) one-one onto (b) one-one into (c) many-one onto (d) many-one into
174	The relation R in the set $\{1,2,3\}$ defined by $R=\{(1,3),(1,1),(3,1)\}$ 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.
175	The domain of the function $f(x)=\frac{1}{\sqrt{\lvert x\rvert - x}}$ is : (a) $(-\infty,\infty)$ (b) $(0,\infty)$ (c) $(-\infty,0)$ (d) $(-\infty,\infty)-\{0\}$
176	Let R be the relation over the set $N \times N$ and is defined by $(a,b)R(c,d) \Rightarrow a+d=b+c$. Then R is: (a) Reflexive only (b) Symmetric only (c) Transitive only (d) An equivalence relation.
177	Let $A=\{a,b,c\}$. Then the relation $R=\{(1,3)\}$ in A is : (a) Symmetric only (b) Transitive only (c) Symmetric and transitive only (d) None of these.
178	Let L be the set of all straight lines in the Euclidean plane. Two lines l_1 and l_2 are said to be related by the relation R iff $l_1 \parallel l_2$. Then the relation R is : (a) Reflexive (b) Symmetric (c) Transitive (d) d)Equivalence
179	Let $A=\{a,b,c\}$. Which of the following is not an equivalence relation in A? (a) $R_1=\{(a,b),(b,c),(a,c),(a,a)\}$ (b) $R_2=\{(c,b),(c,a),(c,c),(b,b)\}$ (c) $R_3=\{(a,a),(b,b),(c,c),(a,b)\}$ (d) None of these.
180	Let W denote the words in the English dictionary. Define the relation R by $R=\{(x,y)\in W\times W : the\,words\; x\; and\; y\; have\; at\; least\; one\; letter\; common\}$. Then R is : (a) Not reflexive, symmetric and transitive (b) reflexive, symmetric and not transitive (c) reflexive, symmetric and transitive

	(d) reflexive, not symmetric and transitive.
181	The function $f: R \to R$ defined by $f(x) = 2^x + 2^{\|x\|}$ is (a) One one and onto (b) Many-one and onto (c) One-one and into (d) None of these.
182	A function f from the set of natural numbers to integers defined by $f(n) = \begin{cases} \frac{n-1}{2}, & when\ n\ is\ odd \\ \frac{-n}{2}, & when\ n\ is\ even \end{cases}$ is (a) Neither one-one nor onto (b) One-one but not onto (c) One-one and onto both (d) Onto but not one-one
183	Which of the following functions from Z to itself is bijection (a) $f(x) = x^3$ (b) $f(x) = x + 2$ (c) $f(x) = 2x + 1$ (d) $f(x) = x^2 + 2$
184	Let function $f: R \to R$ defined by $f(x) = \frac{e^{\|x\|} - e^{-x}}{e^x + e^{-x}}$. Then (a) f is a bijection (b) f is an injection only (c) f is a surjection only (d) f is neither an injection nor a surjection.
185	If the set A contains 5 elements and the set B contains 6 elements, then the number of one-one and onto mappings from A to B is (a) 720 (b) 120 (c) 0 (d) None of these
186	Let $f: R \to R$ be defined as $f\begin{cases} 2x, if\ x > 3 \\ x^2, if\ 1 < x \leq 3 \\ 3x, if\ x \leq 1 \end{cases}$, then the value of $f(-1) + f(2) + f(4)$ is (a) 9 (b) 14 (c) 5 (d) None of these.
187	If $f: [2, \infty) \to X$ is defined by $f(x) = 4x - x^2$. Then f is invertible if $X =$ (a) $[2, \infty)$ (b) $(-\infty, 2]$ (c) $(-\infty, 4]$ (d) $[4, \infty)$
188	Let T be the set of all triangle in the plane, and let a relation on T is defined as aRb if a is

	congruent to $b \forall a, b \in T$. Then R is (A)reflexive but not transitive (B)transitive but not symmetric (C) equivalence relation (D)None of these
189	Consider the non- empty set consisting of children in a family and a relation R define as aRb if a is sister of b . then R is (A) Symmetric but not Transitive (B) Transitive but not symmetric (C) neither symmetric nor transitive (D) both symmetric and transitive
190	If a relation R on a set $\{1,2,3,4\}$ be defined by R$\{(1,2)\}$, then R is (A) reflexive (B) Transitive (C) symmetric (D) none of these
191	Let a Relation R is defined in R as aRb if $a \geq b$. Then R is (A) an equivalence relation (B)reflexive, transitive but not symmetric (C)symmetric, transitive but not reflexive (D)neither transitive nor reflexive but symmetric
192	Let A=$\{1,2,3\}$ and consider the relation R= $\{(1,1),(2,2),(3,3),(1,2),(2,3),(1,3)\}$. Then R is (A)reflexive but not symmetric (B) reflexive but not transitive (C) symmetric and transitive (D) neither symmetric nor transitive
193	The function $f: A \rightarrow B$ defined by f(X) = 4x+7 , $x \in R$is (A) one-one (B) Many one (C) odd (D) Even
194	The Smallest Integer function f(x) = $[x]$ is (A) one-one(B) many one(C) both (A) and (B)(D) none of these
195	If f: $R \rightarrow R$, g: $R \rightarrow R$ and h: $R \rightarrow R$ is such that f(X)= x^2, g(x) = tan(x) and h(x) = log(x), then the value of h o(gof) (x), if x=$\frac{\sqrt{\Pi}}{2}$ will be (A)0(B)1(C)-1(D)10
196	If f(x) =$\frac{(3x+2)}{(5x-3)}$, then (fof)(x) is (A) x(B) -x(C) f(x)(D) -f(x)
197	Which of the following functions from Z to Z are bijective ? (A) f(x) = x^3(B) f(x) = x+2(C) f(x) = 2x+1(D) f(x) = x^2+1
198	Let f: $R-\left(\frac{3}{5}\right) \rightarrow R$ be defined by f(x) = $\frac{3x+2}{5x-3}$. Then (A) f^{-1}(x)= f(x)(B) f^{-1}(x)= -f(x)(C) (fof)x=-x(D) f^{-1}(x)= $\frac{1}{19}$ f(x)

199	Which one of the following functions is not invertible ? (A) $f: R \to R, \mathrm{f(x)} = 3\mathrm{x}+1$ (B) $f: R \to [0,\infty), f(x) = x^2$ (C) $f: R^+ \to R^+, f(\mathrm{x}) = \frac{1}{x^2}$ (D)none of these
200	If f : R → R defined by f(x) = $\frac{2x-7}{4}$ is an invertible function, then find f^{-1}. (A) $\frac{4x+5}{2}$ (B) $\frac{4x+7}{2}$ (C) $\frac{3x+2}{2}$ (D) $\frac{9x+3}{5}$
201	Let A= {1,2,3} then the number of relation containing (1,2) and (1,3) which are reflexive and symmetric but not transitive is (a) 1 (b) 2 (c) 3 (d) 4
202	Let $f: R \to R$ be defined as $f(x) = 3x$, then f is (a) one-one onto (b) Many one onto (c) One - one but not onto (d) Neither one-one nor onto
203	The function $f: R \to R$ defined as $f(x) = x^2 + 2$ is (a) one-one (b) onto (c) One - one but not onto (d) Neither one-one nor onto
204	If R is a relation on the set A = {a,b,c} given by $R = \{(a,a),(b,b),(c,c)\}$, then R is(a) Reflexive only (b) Symmetric only (c) Transitive only (d) equivalence
205	Let R be a relation on N defined as $x + 4y = 21$, the domain of R is (a) {1,5,9,13,17} (b) {4,8,12,16} (c) {1,3,5,7,9} (d) {1,5,9,13}
206	The relation R in $N \times N$ defined by $(a,b)R(c,d) \Leftrightarrow a+d = b+c$ is Reflexive but not symmetric (b) Reflexive but not transitive (c) Reflexive and transitive but not symmetric (d) Equivalence relation
207	Let $f: R \to R$ be defined by $f(x) = \frac{1}{x}$ $\forall x \in R$, then f is (a) one- one but not onto (b) onto but not one - one (c) Bijective (d) Not defined
208	Let A ={ 1,2,3} and consider the relation $R = \{(1,1),(2,2),(3,3),(2,3),(1,3)\}$, then R is (a) Reflexive but not symmetric (b) reflexive but not transitive (c) symmetric and transitive (d) Neither symmetric nor transitive
209	The set of all elements related to 1 in the set $\{x \in Z : 0 \le x \le 12\}$, where relation R is defined by $R = \{(a,b) : \|a-b\|$ is a multiple of 4 } is (a) {2,4,6} (b) {1,5,9} (c) {1,7,12} (d) None of the above
210	Let R be the equivalence relation in the set A = { 0,1,2,3,4,5} given by $R = \{(a,b):$ 2 divides $a-b$ } , then the equivalence class {0} is (a) {3,5} (b) {1,2} (c) {2,4} (d) {1,3}
211	The function $f: R \to R$ given by $f(x) = \cos x$, $x \in R$ is (a) one- one but not onto (b) onto but not one-one (c) bijective (d) neither one –one nor onto
212	If A = { a,b,c } then the number of equivalence relation is (a) 1 (b) 5 (c) 3 (d) 2
213	If $R = \{(x,y) : x^2 + y^2 = 4$, $x, y \in Z\}$ is a relation of Z , then the domain of R is (a) {0,1,2} (b) {-2,-1,0,1,2} (c) { -2,-1,1,2} (d) { 1,2}
214	The function $f: R-\{3\} \to R-\{1\}$ given by $f(x) = \frac{x-2}{x-3}$ is

	(a) one- one but not onto (b) onto but not one-one (c) bijective (d) neither one –one nor onto
215	The function $f : R \to R$ given by $f(x) = x - [x]$ is (a) one- one but not onto (b) onto but not one-one (c) bijective (d) neither one –one nor onto
216	Let f:R→R be defined by f(x) = $\frac{1}{x}$, $\forall\, x \in$R then f is- (a) one-one (b) onto (c) bijective (d) f is not defined
217	Let f:R→R be defined by $f(x) = \begin{cases} 2x, & x > 3 \\ x^2, & 1 < x \le 3 \\ 3x, & x \le 1 \end{cases}$ then $f(-1)+f(2)+f(4)$ is (a) 9 (b) 14 (c) 5 (d) none of these
218	Let R be a relation on the set N of natural numbers defined by n R m if n divides m then R is- (a) Reflexive and symmetric. (b) Transitive and symmetric. (c) Equivalence. (d) Reflexive, transitive but not symmetric.
219	Consider the set A = {1, 2, 3} & R be the smallest equivalence relation an A, then R is equal to (a) {(1, 1), (2, 2)} (b) {(1, 1), (2, 2), (3 3)} (c) {(1, 1), (2, 2), (3, 3), (1, 2), (2, 1)} (d) None of these
220	If A = {a, b, c, d} and f = {(a, b), (b, d), (c, a), (d, c)} then *f* is (a) onto but not one-one (b) one-one but not onto (c) one-one onto (d) many one onto
221	Which of the following functions from z to z are bijections? (a) f(x) = x^3 (b) f(x) = x+2 (c) f(x) = 2x+1 (d) f(x) = x^2+1
222	Set A has 3 elements and the set B has 4 elements. Then the number of injective mappings that can be defined from A to B is- (a) 144 (b) 12 (c) 24 (d) 64
223	Let A = {1, 2, 3} and consider the relation R = {(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1, 3)} then R is (a) reflexive but not symmetric (b) reflexive but not transitive (c) symmetric and transitive (d) neither symmetric nor transitive
224	If R denotes the set of all real numbers then the function f: R →R defined by f (x) = $\|x\|$ is (a) one-one only (b) onto only (c) bijective (d) neither one- one nor onto
225	Let f : R → R be defined by f (x) = x^2 + 1 then pre-image of 17 and – 3, respectively, are (a) ϕ, {4, - 4 } (b) { 3, - 3}ϕ (c) {4, - 4}, ϕ (d) {4, - 4}, {2, - 2}
226	Let T be the set of all triangles in the Euclidean plane, and let a relation R on T be defined as a R b if a is congruent to b $\forall$ a, b ∈ T. then R is (a) reflexive but not transitive

	(b) transitive but not symmetric (c) equivalence (d) none of these
227	The relation R={(x, x^3):x is a prime number less than 7} in roster form is- (a) {(2, 8), (3, 27), (5, 125), (7, 343)} (b) {(2, 8), (3, 27)} (c) {(2, 8), (3, 27), (5, 125)} (d) None of these
228	The range of the function y = $\frac{1}{2-\sin 3x}$ is (a) $\left(\frac{1}{3}, 1\right)$ (b) $\left[\frac{1}{3}, 1\right)$ (c) $\left[\frac{1}{3}, 1\right]$ (d) None of these
229	Let A={x, y, z} and B={1, 2}, then the number of relations from A to B is (a) 32 (b) 64 (c) 128 (d) 8
230	Let N be the set of all natural numbers and the function f :N →N be defined by f (n) = 2n + 3, ∀ n∈ ℕ. then f is (a) surjective (b) Injective (c) bijective (d) none of these

ANSWERS

QUESTION NUMBER	ANSWER	QUESTION NUMBER	ANSWER	QUESTION NUMBER	ANSWER	QUESTION NUMBER	ANSWER	QUESTION NUMBER	ANSWER
1	A	51	D	101	C	151	B	201	A
2	C	52	B	102	B	152	B	202	A
3	B	53	A	103	D	153	A	203	D
4	B	54	D	104	D	154	C	204	D
5	C	55	B	105	D	155	C	205	A
6	D	56	D	106	A	156	D	206	D
7	C	57	D	107	B	157	B	207	D
8	D	58	B	108	A	158	D	208	A
9	B	59	B	109	B	159	B	209	B
10	D	60	A	110	C	160	B	210	C
11	D	61	C	111	B	161	C	211	D
12	B	62	D	112	C	162	A	212	B
13	D	63	C	113	B	163	A	213	B
14	A	64	B	114	C	164	B	214	C
15	B	65	D	115	B	165	C	215	D
16	A	66	D	116	A	166	B	216	A
17	A	67	D	117	A	167	C	217	A
18	C	68	C	118	C	168	D	218	D
19	C	69	B	119	D	169	D	219	B
20	C	70	A	120	B	170	B	220	C
21	D	71	B	121	D	171	A	221	B
22	D	72	D	122	A	172	C	222	C
23	B	73	B	123	A	173	D	223	A
24	C	74	A	124	D	174	A	224	D

25	B	75	D	125	C	175	C	225	C
26	B	76	A	126	D	176	D	226	C
27	C	77	D	127	D	177	B	227	C
28	A	78	D	128	D	178	D	228	C
29	A	79	C	129	C	179	D	229	B
30	C	80	B	130	C	180	B	230	B
31	B	81	C	131	B	181	C		
32	B	82	A	132	C	182	C		
33	A	83	B	133	D	183	B		
34	B	84	A	134	C	184	D		
35	D	85	A	135	D	185	C		
36	B	86	A	136	A	186	A		
37	C	87	D	137	A	187	C		
38	D	88	D	138	B	188	C		
39	A	89	B	139	D	189	B		
40	C	90	A	140	A	190	B		
41	D	91	C	141	D	191	B		
42	B	92	D	142	A	192	A		
43	A	93	D	143	D	193	A		
44	A	94	B	144	D	194	B		
45	C	95	C	145	D	195	A		
46	A	96	D	146	B	196	A		
47	B	97	A	147	B	197	B		
48	A	98	D	148	B	198	A		
49	C	99	B	149	C	199	D		
50	C	100	A	150	C	200	B		

Prepared by : PGT(Maths) of BHUBANESWAR REGION, GUWAHATI REGION, KOLKATA REGION, SILCHAR REGION, RANCHI REGION & TINSUKIA REGION

Vetted by : BHUBANESWAR REGION