10TH MATHS 1 RELATIONS AND FUNCTIONS MCQS

1) If n(A x 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 U C) x 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 x C) ⊂ (B x D) (b) (B x D) ⊂ (A x C) (c) (A x B) ⊂ (A x D) (d) (D x A) ⊂ (B x 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) | x 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 ⟶ 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 o 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 ⟶ 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 o 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) ≥ f(x).f(y) (c) f(xy) ≤ 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) = αx + β then the values of α and β are
(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 : R⟶R is defined by (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 the order pairs (a, -1) and (5, b) blongs to {(x, y) | y = 2x + 3}, then a and b are _____
(a) -13, 2 (b) 2, 13 (c) 2, -13 (d) -2,13

20) If function f : N⟶N, f(x) = 2x then the function is, then the function is _____
(a) Not one - one and not onto (b) one-one and onto (c) Not one -one but not onto
(d) one - one but not onto

21) If f(x) = x + 1 then f(f(f(y + 2))) is _____
(a) y + 5 (b) y + 6 (c) y + 7 (d) y + 9

22) 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

23) 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

24) If f(x) = ax - 2, g(x) = 2x - 1 and fog = gof, the value of a is _____

(a) 3 (b) -3 (c) $\frac{1}{3}$ (d) 13

25) If $f(x) = \frac{1}{x}$, and $g(x) = \frac{1}{x^3}$ then f o g o(y), is _____

(a) $\frac{1}{y^8}$ (b) $\frac{1}{y^6}$ (c) $\frac{1}{y^4}$ (d) $\frac{1}{y^3}$

26) 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

27) If f(x) = 2 - 3x, then f o f(1 - x) = ?

(a) 5x+9 (b) 9x-5 (c) 5-9x (d) 5x-9

28) If f(x) + f(1 - x) = 2 then $f\left(\frac{1}{2}\right)$ is _____

(a) 5 (b) -1 (c) -9 (d) 1

29) If f is constant function of value $\frac{1}{10}$, the value of f(1) + f(2) + ... + f(100) is _____

(a) $\frac{1}{100}$ (b) 100 (c) $\frac{1}{10}$ (d) 10

30) If $f(x) = \frac{x+1}{x-2}, g(x) = \frac{1+2x}{x-1}$ then fog(x) is _____

(a) Constant function (b) Quadratic function (c) Cubic function (d) Identify function

31) If f is identify function, then the value of f(1) - 2f(2) + f(3) is:

(a) -1 (b) -3 (c) 1 (d) 0

32) Coefficient of variation is a relative measure of _____

(a) Mean (b) Range (c) Standard Deviation (d) Co.efficient of range

33) 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

34) The excluded value of the rational expression x/x^2+1 is _____

(a) 1 (b) -1 (c) ± 1 (d) No real excluded value

35) a cotθθ + b cosecθθ = p and b cot θθ + a cosecθθ = 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

36) All elements of a function should have images a _____

(a) True (b) False (c) sometimes true (d) sometimes false

37) Composition of function is asssociative _____

(a) Always true (b) Never true (c) Sometimes true (d) None of these

38) A function is also called as a _____

(a) mapping (b) transformation (c) both a and b (d) none of these

39) 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}

40) If A - {1, 2}, B = {0, 1}, then A x B is _____

(a) {(1,0), (1 ,1), (2, 0), (2, 1)} (b) {(1, 0), (2, 1)} (c) {(1, 1), (1, 2), (0, 1), (0, 2)}

(d) None of these

41) If the set A has 'p' elements, B has 'q' elements, then the number of elements in A x B is _____

(a) p + q (b) p + q + 1 (c) pq (d) p^2

42) If A, B, C are any three sets, then $A \times (\dot{B} \cup C)$ is equal to _____

(a) $(A \times B) \cup (A \times C)$ (b) $(A \cup B) \cup (A \cup C)$ (c) Both (a) and (b) (d) None of these

43) 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

44) 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}

45) Let N be the set of all natural numbers and let 'R' be a relation on N defined as $\mathbf{R} = \{(x, y)/x \in N, y \in N \text{ and } \mathbf{x + 3y = 15}\}$. 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)}

46) 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}

47) A relation R is defined from {2, 3, 4, 5} to {3, 6, 7, 10} by $\mathbf{xRy} \Leftrightarrow \mathbf{x}$ 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}

48) Let R be a relation from set A to a set B, then _____

(a) $\mathbf{R} = A \cup B$ (b) $A \cap B$ (c) $R \subseteq A \times B$ (d) $R \subseteq B \times A$

49) 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

50) Let A = {x, y, z} and B = {a, b, c, d}. Which one of the following is not a function and is not a relation from A to B?

(a) {(x, a), (x, c)} (b) {(y, c), (y, d)} (c) {(z, a), (z, d)} (d) {(z, b), (y, b), (a, d)}

51) The domain of the function 'f' given by $f(x) = \frac{x^2+2x+1}{x^2-x-6}$ _____

(a) R- {3, -2} (b) R- {-3, 2} (c) R- {3, 2} (d) R - {- 3, - 2}

52) Given f(x) = $(-1)^x$ is a function from N to Z. Then the range of f is _____

(a) {1} (b) N (c) {1 ,-1} (d) Z

53) 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) $\{(x, y) : x^2 - y^2 = 1, x, y \in R\}$

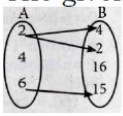
54) If $x \neq 1$ and $f(x) = \frac{x+1}{x-1}$ is areal function, then f (f(f(2))) is _____

(a) 1 (b) 2 (c) 3 (d) 4

55) If $2f(x) - 3f\left(\frac{1}{x}\right) = x^2, (x \neq 0)$ then $f(2)$ =?

(a) $\frac{-7}{4}$ (b) $\frac{5}{2}$ (c) -1 (d) None of these

56) The given diagram represents PTA _____



(a) an onto function (b) a constant function (c) an one - one function

(d) not a function

57) Let $f\left(x + \frac{1}{x}\right) = x^2 + \frac{1}{x^2}, x \neq 0$, then $\mathbf{f}(\dot{x})$ is equal to _____

(a) x^2 - 2 (b) x^2 - 1 (c) $f\left(-\frac{a}{a+1}\right)$ (d) f(a)

58) 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) $x^2 - 4x + 5$

59) Given f(2) = 3, g(3) = 2 and g(2) = 5, then (f o g) (3) =

(a) 2 (b) 3 (c) 4 (d) 5

60) Given f = {(- 2, 1), (0, 3), (4, 5)}, g = {(1, 1),(3, 3), (4, 5)} then, Domain and range of g o 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}

61) Composition of functions is commutative _____

(a) Always true (b) Never true (c) Sometimes true

62) Composition of functions is associative _____

(a) Always true (b) Never true (c) Sometimes true

63) Functions are subsets of _____.

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

64) If f:N-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

65) 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