J.E.E. Main/ Advanced Foundation - XI Maths Worksheet

Time: 60 min **Chapter#2 : Relations & Functions** **Full Marks:**

Q.1	Let A = {1,2} and B = {3,4}.Write A×B. How many subsets will A×B have? List them.
Q.2	Let A = {1,2,3,…..,14}. Define a relation R from A to A by R = {(x,y) : 3x-y = 0, where x,y∈A}. Write down its domain, co-domain and range.
Q.3	**If $f(x) = x^2$, find $\frac{f(1.2) - f(1)}{1.2 - 1}$.**
Q.4	**Find the inverse of the function of $x = \frac{3 - 5y}{2y - 7}$.**
Q.5	If n(A) = 3 and n(B) = 3, then find n(A B). (1 mark)
Q.6	Let R be a relation from Q to Q defined by R = {(a,b):a,b∈Q and a-b∈Z}.Show that (a) (a,a)∈R for all a∈Q (b) (a,b)∈R implies that (b,a)∈R (c) (a,b)∈R and (b,c)∈R implies that (a,c)∈R.
Q.7	Let A = {9, 10, 11, 12, 13} and let f: A → N be defined by f(n) = the highest prime factor of n. Find the range of f. (3 marks)
Q.8	**Find the domain of the function $f(x) = \frac{x^2 + 2x + 1}{x^2 - 8x + 12}$**
Q.9	Let A = {1, 2, 3, 4} and B = {10, 12, 13, 14, 20}. Whether f: A B defined by f(1) = 10, f(2) = 12, f(3) = 13 is a function? (1 mark)
Q.10	Find the domain and the range of the real function f defined by f (x) = |x – 1|. (2 marks)
Q.11	Examine the relation : R={(2,1),(3,1),(4,1)} and state whether it is a function or not?
Q.12	A function f is defined by f(x) = 3x-4. Write down the value of f(5) and f(-7).
Q.13	**Write the domain of the function $f(x) = \frac{x + 1}{x^2 + 6x + 5}$.**
Q.14	Let A = {1, 2, 6, 8} and let R be a relation on A defined by {(a, b): a, b A, b is exactly divisible by a} (2 marks) a) Write R in roster form. b) Find the domain of R. c) Find the range of R.
Q.15	If f and g are two functions such that f(x) = 5x + 2 and $g(x) = x^2 + 3$, then find f + g and f – g. (2 marks)
Q.16	**Write the domain of the function , $f(x) = \frac{x^2 - 2x + 3}{x^2 - x - 20}$**
Q.17	A function f is defined by f(x) = 2x – 5. Write down the values of (2 marks) (i) f(0), (ii) f(7), (iii) f(–3)
Q.18	**If $f(x) = x^2 - \frac{1}{x^2}$, then find the value of : $f(x) + f\left(\frac{1}{x}\right)$.**
Q.19	Under which condition a relation f from A to B is said to be a function? (1 mark)
Q.20	If $A = \{a_1, a_2\}$ and $B = \{b_1, b_2, b_3\}$, then write A × B.