M.M. ENGINEERING COLLEGE, MULLANA (AMBALA)

DEPARTMENT OF CSE

Tutorial / Assignment Sheet No. : 1.5

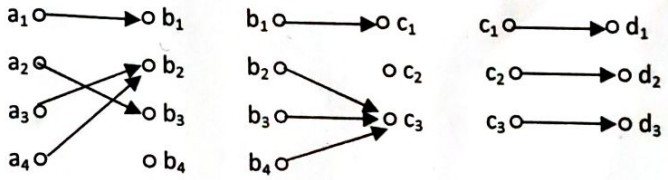
Branch / Semester: CSE / 4th **Course Name:** Discrete Mathematics **Course Code:** BCSE-508

Topics covered: Sum and Product of Functions, Bijective functions, Inverse and Composite Function (Unit-1)

Date of Release: 06.02.2021 **Last date of submission:** 12.02.2021 **Total Marks:** 30

Assignment Outcomes:

i) Able to explain function and its types.
ii) Able to apply composition of functions, sum and product of functions.
iii) Able to solve various problems related to Functions.

Q. No.	"All Questions are compulsory"	Marks
1.	If $f(x) = 2x$ and $g(x) = 2x$, then $(f \circ g)(x) = ?$	2
2.	If $f = \{(1, 1), (2, 3), (3, 1), (4, 2)\}$, and $g = \{(1, 2), (2, 3), (3, 1), (4, 2)\}$, then $g \circ f = ?$	2
3.	Let $g \circ f = (x + 1 / x)\ 2$. Find out f(x) and g (x).	2
4.	Three functions f, g & h where $h = g \circ f$ is given by:  Compute: i) $g \circ f$ ii) $h \circ (g \circ f)$ iii) $(h \circ g) \circ f$	6
5.	Construct an example to show that for two functions f & g from A to A, in general $f \circ g \neq g \circ f$.	2
6.	Let f be a function from $X = \{x_1, x_2, \ldots\ldots, x_n\}$ to $Y = \{y_1, y_2, \ldots\ldots, y_n\}$. Derive the no. of distinct functions from X to Y.	2
7.	Two real valued functions defined on same domain can be added & multiplied just like numbers i.e. $(f_1 + f_2)(x) = f_1(x) + f_2(x)$ & $(f_1 * f_2)(x) = f_1(x) * f_2(x)$. Use this fact to compute the following values (where $f_1(x) = x + 1$; $f_2(x) = x^2 + 1$ and these functions are defined by [R→R]) : i) $(f_1 + f_2)(x)$ ii) $(f_1 * f_2)(x)$	6
8.	Let $f(x) = x^2 - 1$. Find f (S) if $S = \{-5, -3, -1, 1, 2, 3\}$.	
9.	If a set A has n elements then i) How many functions are possible from A to A? ii) How many Bijections from A to A?	2 2
10.	Write a short note on inverse function. Explain it with suitable example.	2
		2

Note for students: Students are required to submit handwritten solutions of given assignment / tutorial sheet on or before Last date of submission otherwise penalty in terms of deduction in marks will be made as per following rule:

If submitted on or before last date then Deduction of marks = 0
If submission delayed by (1-7) days then Deduction of marks = 5
If submission delayed by (8-14) days then Deduction of marks = 10
If submission delayed by more than 15 days then Deduction of marks = 12.5