MANIPAL UNIVERSITY JAIPUR
SCHOOL OF COMPUTING AND IT
B.Tech. III Semester Second Sessional Examinations, November 2017
Branch: CSE / IT /CCE
MA1307-Engineering Mathematics-III
(OPEN BOOK)

Duration: 1 hour **Max. Marks: 15**

Instructions:

- All questions are compulsory.
- Missing data if any may be assumed suitably.
- Maximum three units of Books/Spiral Bound Notes/ Note Books are allowed.

1.	How may permutations can be made with the letters of the word "MANIPAL" under the following conditions: (i) Vowels occur together (ii) All Vowels are together and all Consonants are together (iii) Vowels and consonants occur alternately	[3]
2.	Is $A=\left\{\begin{bmatrix}1 & m\\ 0 & 1\end{bmatrix} / m \in N\right\}$ a Monoid with respect to multiplication of matrices? Justify your answer.	[2]
3.	Fill the missing entries in the following multiplication table of a group $(\{1, 5, 7, 11, 13, 17\}, \times_{18})$	[4]

$\times_{18}$	1	5	7	11	13	17
1	1	_	_	_	_	_
5	_	7	_	1	_	_
7	_	17	13	_	_	11
11	_	_	5	13	17	_
13	_	11	1	_	7	_
17	_	13	_	7	5	_

Further calculate the order of elements 17 and 7. Also find the subgroup generated by 13.

4.	Let $f=\begin{pmatrix}1 & 2 & 3 & 4\\ 2 & 1 & 4 & 3\end{pmatrix}$ and $g=\begin{pmatrix}1 & 2 & 3 & 4\\ 3 & 1 & 4 & 2\end{pmatrix}$ be the element of permutation group S_4. Compute $f^{-1}og^{-1}$. What is the nature of permutations f and g (even/odd)?	[3]
5.	Simplify the following Boolean expression $(x'+y).(yz')'.z'$ and hence find Conjunctive Normal Form	[3]