The Open University of Sri Lanka
Department of Mathematics
B.Sc/ B.Ed Degree Programme
Open Book Test - 2017/ 2018
Pure Mathematics– Level 05
PEU5302– Combinatorics

DURATION: ONE HOUR

Date: 17 – 06 – 2018 **Time: 10.30 a.m. – 11.30 a.m.**

ANSWER ALL QUESTIONS

01. In each of the following cases, find the number of positive integers with:
    (i) n-digits, [05 mark]
    (ii) three-digits with the middle digit nine and which are divisible by three, [10 mark]
    (iii) the sum of the digits of four-digit number is at most 35. [10 mark]

02. A manager wants to schedule his working days so that at least one of Saturday and Sunday be off. If he wants to work five days a week, in how many ways can he choose the days that he will work? [15 mark]

03. In how many ways can five boys and five girls stand in a line so that no two boys or no two girls stand next to each other? [10 mark]
    If they stand in a circular arrangement with the same condition, in how many ways can they be stand? [10 mark]

04. A person has six rose flowers, five enthorian flowers and four orchid flowers. In how many different ways can the person plant those flowers in a row of a home garden? [10 mark]

05. 1450 buses per day come to a main bus stand in a commercial city in a country.
    Show that there are two buses that must come within a minute of each other. [15 mark]

06. Is it possible to choose two of any seven natural numbers such that their difference is divisible by four? Justify your answer. [15 mark]