

Assignment 1

Abhishek Ajit Sabnis

14 January 2022

Q49

Given 30 questions in a mcq exam. Each student marks the answer randomly and independently.

Thus, probability that A marks option a) is $1/4$

$$P(A = a) = 1/4 \quad (1)$$

$$\Rightarrow P((A = a) \cup (B = a) \cup (C = a)) = \frac{1}{4} * \frac{1}{4} * \frac{1}{4} \quad (2)$$

But there are 4 options that can be marked by students - a,b,c,d. Thus the probability that all students mark same option is -

$P(\text{All students mark same for one question}) =$

$$= \frac{1}{4} * \frac{1}{4} * \frac{1}{4} * 4 = \frac{1}{16} \quad (3)$$

There are total 30 questions. Thus, the probability(p) that all students mark same for all questions is -

$$p = \frac{1}{16^{30}} = 4^{-60} \quad (4)$$