

Chennai Mathematical Institute
Probability Theory: January-April 2014

QUIZ I

Answer all questions and show your work.

- (1) Three fast bowlers, two spin bowlers, and 4 batsmen are vying for the three remaining spots on the ODI team.
- (a) What is the probability that none of the spin bowlers are selected?
- (b) What is the probability that at least one batsmen is selected?

State the assumptions you are making.

- (2) Fourteen women and six men are interviewed for four positions at an IT firm. The firm extends offers to four of the male candidates. One of the female candidates files a case alleging discrimination on the basis of gender. Is there merit to the case? Provide a brief argument to support your answer.
- (3) Let Ω be the set of positive integers. Let $\mathcal{F} = \{C : C \text{ has finitely many points}, C \subset \Omega\}$. Is \mathcal{F} a field? Discuss why or why not.
- (4) Suppose that $\Omega \in \mathcal{F}$ and that $A, B \in \mathcal{F}$ implies $A - B = A \cap B^c \in \mathcal{F}$. Show that \mathcal{F} is a field.

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Name _____