INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

Department of Mathematics

MA 203

Class Quiz (Div. I and II)

Date: 15th October 2007 | Max. Marks: 5

Name : | Roll Number :

Div. & Tut. Batch: | Time : 15 minutes

Q.1 Consider the sequence (f_n) of real-valued functions on $[0, \pi/2]$ defined by

$$f_n(x) = (\sin x)^n \quad \text{for} \quad x \in [0, \pi/2].$$

Determine if this sequence is uniformly convergent on $[0, \pi/2]$. Justify your answer.

[2 marks]

Q.2 Determine if the following improper integral is convergent. Justify your answer.

$$\int_0^\infty \frac{2}{x^2 + \sqrt{x}}\, dx.$$

[2 marks]

Q.3 Let $P_n(x)$ denote the nth Legendre polynomial. Determine the value of $P_n(-1)$ for each nonnegative integer n.

[1 mark]