

MSC PHYSICS
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1588/MP1

MAY 2008

Paper I — MATHEMATICAL PHYSICS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

All questions carry equal marks.

(5 × 20 = 100)

1. (a) (i) State and prove Stoke's theorem.
(ii) Verify Stoke's theorem for the vector $F = (z, x, y)$ taken over the half of the sphere $x^2 + y^2 + z^2 = a^2$ lying above the xy plane.

Or

(b) (i) Define subgroups, classes, cosets and invariant subgroups of a group.

(ii) Define conjugate classes of a group. Show that all the elements of a class have the same order and the same character.

2. (a) (i) Explain convergence and divergence of a series.

(ii) Explain Cauchy's integral test.

(iii) Check whether the following series is convergent or not. $f(x) = \sum_{n=1}^{\infty} \frac{n^2}{3^n}$

Or

