14MAP05

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION JUNE 2018
(Second Semester)

Branch – **MATHEMATICS**

COMPLEX ANALYSIS

Time: Three Hours Maximum: 75 Marks

Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 15 = 75)

1 a State and prove Cauchy's theorem for rectangle.

OR

b State and prove Cauchy's integral formula.

2 a Evaluate $\int_0^{\pi} \frac{d\theta}{a+\cos\theta}$, $a > 1$.

OR

b Evaluate $\int_0^{\pi} \log \sin\theta \, d\theta$.

3 a State and prove Weierstrass theorem.

OR

b State and prove Mittag – Leffler theorem.

4 a State and prove Riemann – Mapping theorem.

OR

b State and prove Schwarz – Christoffel formula.

5 a Show that any two bases of the same module are connected by a unimodular transformation.

OR

b Show that the zeros $a_1, a_2, \ldots a_n$ and $b_1, b_2, \ldots b_n$ of an elliptic function satisfy

$a_1 + a_2 + \ldots\ldots + a_n = b_1 + b_2 + \ldots\ldots + b_n$ (Mod M).

c Show that the sum of the residues of an elliptic function is zero.

Z-Z-Z END