B.R. Ambedkar Bihar University, Muzaffarpur
Directorate of Distance Education
P.G. 2nd Semester Examination 2016 (Semester 2015-17)
Subject:- Mathematics
Assignment / Internal Assessment (दत्त कार्य)
(Answer all the questions) Full Marks = 30
Paper-V

1. Define range of a projection. Prove that two projections E and F have the same range if an only if EF = F and FE=E.

2. State and prove Sylvester's Theorem.

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Paper-VI

1. Define Analytic and Regular functions. State and prove that necessary and sufficient conditions for f(z) to be analytic.

2. State and prove Morera's theorem.

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Paper-VII

1. Solve the following reducing equations into one equation of higher order.
   (i) $dx/dt = y$, $dy/dt = x$
   (ii) $dx/dt = 3x-2y$, $dy/dt = 2x-y$.

2. State and prove Peano's Existence theorem and its corollary.

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Paper-VIII

1. If X is any set, then prove that
   Card $P(X) = 2^{\text{Card } X}$, P(X) being the powerset of X.

2. State and prove well-ordering theorem.