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Total Number of Pages : 01

M.Sc.I  
FMCC603

6<sup>th</sup> Semester Regular / Back Examination 2018-19

DIFFERENTIAL EQUATION-II

BRANCH : M.Sc.I(MC)

Time : 3 Hours

Max Marks : 70

Q.CODE : F285

Answer Question No.1 which is compulsory and any FIVE from the rest.  
The figures in the right hand margin indicate marks.

- Q1 Answer the following questions :** (2 x 10)
- Solve  $\frac{dx}{x} = \frac{dy}{y} = \frac{dz}{z}$
  - Write symmetrical form of Partial Differential Equations.
  - Find  $\text{curl}(\text{grad}(xyz^2 + x^3y^4z^5))$
  - Verify for integrable  $(2x^2 + 2xy + 2xz^2 + 1) dx + dy + 2z dz = 0$
  - Difference between General solution and Particular solution
  - Solve  $z = px + qy - \log pq$
  - What is Self adjoint Equations of second order?
  - What is Green's functions ?
  - What is Orthogonalism of Eigen functions ?
  - Solve  $pq = 1$
- Q2** a) Solve the equation  $ayzdx + bzx dy + cxydz = 0$  (5)  
b) Solve  $\frac{dx}{x+z} = \frac{dy}{y} = \frac{dz}{z+y^2}$  (5)
- Q3** a) Eliminate the function  $f$  from  $z = e^{mx} f(x+y)$  (5)  
b) Prove that  $Pp + Qq = R$  (5)
- Q4** a) Solve  $Z^2 = pqxy$  (5)  
b) Find the complete integral  $p^2 + q^2 = qz$  (5)
- Q5** a) Solve  $(D + D' - 1)(D + 2D' - 3)z = 4 + 3x + 6y$  (5)  
b) Solve  $(D^2 - D')z = e^y \cos(2x+3y)$  (5)
- Q6** State and prove Monge's Method of Integrating  $Rr + Ss + Tt + U(rt - s^2) = V$  (10)
- Q7** Derive Charpit's Method for  $f(x,y,z,p,q) = 0$  (10)
- Q8 Write short answer on any TWO :** (5 x 2)
- Partial differential Equation with variable coefficient.
  - PFAFFIAN Differential Equations
  - Singular solution of Partial differential Equation