

Register Number:

**Date:25-04-2017**

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

**B.Sc. MATHEMATICS - IV SEMESTER**

**SEMESTER EXAMINATION: APRIL 2017**

**MT 415 - Mathematics IV**

**Time- 1 ½ hrs. Max Marks-35**

**This question paper has one printed page**

**Answer any seven questions. (7x5=35)**

1. Prove that, a subgroup of the group is normal in if and only if the product of any two right cosets of in  is again a right coset of in.
2. Define Kernel of a homomorphism and let be a homomorphism from the group into with Kernel Then, prove that is one-one if and only if where is the identity element of 
3. If be an isomorphism of a group onto a group and is an element of , then order ofequals the order of .
4. State and prove Cayley’s theorem.
5. Find the fourier series for the function 
6. Find the fourier series for the function 
7. Find the fourierhalf range sine series for the function 
8. Expand by Taylor’s theorem for the first six terms in the neighborhood of the point (0,0).
9. Examine the extreme value for the function 
10. Find the volume of the largest rectangular parallelepiped that can be inscribed in the ellipsoid 

MT-415-A-17