



**TAMIL NADU OPEN UNIVERSITY**  
Chennai-15.  
**Post Graduate Diploma in Mathematics**  
**SPOT ASSIGNMENT**

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<b>COURSE</b>	<b>COURSE CODE</b>	<b>ADMISSION YEAR</b>
<b>Algebra</b>	<b>PGDMAT – 11</b>	<b>CY 2020</b>

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**Time: 1 Hour** **Total Marks: 25**

Answer all questions:

1. If  $p(x)$  is irreducible in  $F[x]$  and if  $V$  is a root of  $p(x)$  then prove that  $F(V)$  is isomorphic to  $F'(w)$  where  $w$  is a root of  $p'(t)$ . Also prove that this isomorphism  $\sigma$  can so be chosen such that  $\sigma: F(V) \rightarrow F'(w)$ 
  1.  $v\sigma = w$
  2.  $\alpha\sigma = \alpha'$  for every  $\alpha \in F$ .
  
2. Prove that  $S_n$  is not solvable for  $n \geq 5$ .
  
3. Prove that  $F^{(n)}$  is isomorphic to  $F^{(m)}$  iff  $n = m$ .



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<b>COURSE</b>	<b>COURSE CODE</b>	<b>ADMISSION YEAR</b>
<b>Real Analysis</b>	<b>PGDMAT – 12</b>	<b>CY 2020</b>

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**Time: 1 Hour** **Total Marks: 25**

Answer all questions:

1. Prove that Uniform limit of integrable functions is integrable.
2. State and prove Rank Theorem.
3. Write a note on “Continuity and Compactness”.



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<b>COURSE</b>	<b>COURSE CODE</b>	<b>ADMISSION YEAR</b>
<b>Topology and Functional Analysis</b>	<b>PGDMAT – 13</b>	<b>CY 2020</b>

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**Time: 1 Hour**

**Total Marks: 25**

Answer all questions.

1. State and prove Hahn Banach Theorem, proving necessary result. 10 Marks
2. State and prove the Open Mapping Theorem. 10 Marks
3. Prove that every compact Hausdorff space is normal. 5 Marks