DRAVIDIAN UNIVERSITY

Directorate of Distance Education (DDE)

KUPPAM – 517 426:: A.P.

Course: II year MSC (Maths)

Paper – I Topology and Functional Analysis

Question Paper for Assignment

Answer any THREE of the following FIVE Questions.

3x10=30

1. a) Let X be a Topological space and $A \subset X$ prove

   That (1) $\bar{A} = A \cup D(A)$

   (2) A is closed iff $A \supset D(A)$

   b) State and prove Lindelof Theorem

2. a) State and prove Tychonff's Theorem and Heine Borel Theorem?

   b) Prove that a topological space is compact if every basic open cover has a finite subcover?

3. a) Prove that Letm be a closed Linear subspace of a Normed Linear space N. If the nom of a coset $x + M$ in the quotient space N/M is defined by $\| x + M \| = Inf\{\| x + m \| : m \in M\}$ $the \frac{N}{M} is\ a\ Normed\ space$. Further move if N is a Banach space. Then N/M is a Banach Space?

   b) State and prove Hahn Banach theorem?

4. a) State and Prove closed graph Theorem?

   b) State and Prove open mapping Theorem?

5. a) State and Prove uniform Boundedness Theorem?

   b) Let T be an operator on a Banach space B. Then T has an Inverse T^{-1} if any if T^* has an Inverse $(T^*)^{-1}$ and $(T^*)^{-1}=(T^{-1})^*$

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Paper – II Measure and Integration

Question Paper for Assignment

Answer any THREE of the following FIVE Questions.

3x10=30

1. (a) Define a Equivalence relation. Axiom of choice, Zorm'slex?

   (b) Define a Borel set and prove that for a set of real numbers E. its closure $\underset{E}{\leftrightarrow}$ is closed set that contains E in the sense that if F is closed and E $\leq$ F. Then $\underset{E}{\leftrightarrow} \leq$ F?

2. (a) Define a outer measure. Prove that every outer measure is its length?

   (b) State and prove countable subadditivity?

3. (a) Prove that f is measure function and F =g a.e then g is measurable?

   (b) State and prove Egoroff's theorem ?

4. (a) State and prove Bounded Convergence theorem ?

   (b) Let f be a bounded function defined on [a,b] if f is primann Integrable on [a,b]. Then it is measurable and R $\int_a^b f\,dx = \int_a^b f\,dx$?

5. (a) State and prove Fatou's lemma?

   (b) State and prove monotenic Convergence theorem?

Set - 1

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Paper – III Analytic Number Theory (or) Discreate Mathematics

Question Paper for Assignment

Answer any THREE of the following FIVE Questions.

3x10=30

1. (a) Define a Euler's Constant?

   (b) State and Prove Euler's Summation formula?

2. (a) For All $x \geq 1$ Prove that
   $\sum d(n) + x\,logx + (2c-1)x + 0(\sqrt{x})\, n \leq x$

   (b) State and Prove Legendre's Identity?

3. Prove that for every Integer n $\geq$ 2, we have $\frac{1}{6}\ \frac{n}{logn} < \pi(n) < 6\frac{n}{Log\ n}$

4. State and Prove Selberg's Asymptotic Formula?

5. State and Prove Shapiro's Tauberian Theorem?

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Paper – IV Computer Algorithm and Problems Solving

Question Paper for Assignment

Answer any THREE of the following FIVE Questions.

3x10=30

1. Write an algorithm of Fibonacci sequence?
2. Draw a flowchart of Fibonacci sequence?
3. Write an algorithm that accepts a positive integer and reverses the order of its digits?
4. Write an algorithm to a given randomly ordered array of n elements?
5. Define the constructor of loops and Termination of loops?

Set - 1

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Paper – V

C and Data Structures

Question Paper for Assignment

Answer any THREE of the following FIVE Questions.

3x10=30

1. (a) Write the Syntax of loop operations provide in the C languages?
   (b) Write a Program using while loop to reverse the digits of the given number?
2. (a) Explain about 'C' language character set ?
   (b) Give an explanation about increment and Decrement Operators?
3. (a) Explain about Storage Classes?
   (b) About in a Multi- Dimensional array? Give Syntax of Multi Dimensional array?
4. (a) Write down the differences between library functions and user – defined functions?
   (b) Write a program using a single – subscripted variable to evaluate the following Expressions:

   Total= $\sum_{i=1}^{10} x:^{2}$

   The values of $X_1 X_2$ ----------, X_{10} are read from the terminal.

5. (a) What are the benefits of Points to the C Programmers?
   (b) Write a program using pointers to complete the sum of all elements stored in an array?