PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Autonomous
Siddhartha Nagar, Vijayawada–520010
Re-accredited at 'A+' by the NAAC

23MAVAL101: ELEMENTARY NUMBER THEORY

Offered to: ALL UG PROGRAMS Course Type: Value Added Course
Semester: I 45 Hours Credits: 2

Objectives: To enhance the computational skills and application skills.

Unit–I:DIVISIBILITY **15 periods**

1.1 Introduction and basic properties
1.2 Well–Orderingprinciple ,DefinitionofDivisors
1.3 Divisionalgorithmandrelatedproblems
1.4 GCD,EuclideanAlgorithm,problems

Unit –II:PRIMES **15 periods**

2.1 Relativelyprimedefinition,Euclid'sLemmaandFundamentaltheoremofArithmetics
2.2 Thenumberofdivisorsofa positive integerN
2.3 Highestpowerofaprime numbercontainingn!Problems
2.4 Bracketfunction

Unit–III:CONGRUENCES **15 periods**

3.1 Congruence modulom definition
3.2 Congruenceclasses,linearcongruencedefinition,examples,theorems,problems
3.3 Inversemodulom
3.4 Euler'sØ functiondefinitionand theorems
3.5 Fermat's little theorem and Wilson's theorem

STUDENTACTIVITIES:

1. Classroomactivities:Powerpointpresentations,Assignments
2. Libraryactivities:Visittolibraryandpreparationof notesfor assignmentproblems
3.Activities in the seminars, workshops and conferences: Participation / presentation inSeminars/workshops/conferences

CO–CURRICULARACTIVITIES:

- Quiz competitions, seminars,Groupdiscussions

Text Book: A text book of Mathematics B.A/B.ScVol– 1, V.VenkateswararaoN.Krishna Murthy BVSSSharma & S.Anjaneya Sasthry, S.Chand& Co.Ltd ,1988
Reference books: A text book of Mathematics Vol– 1, A.Anjaneyulu, DeepthiPublications,1988

Question Paper Pattern:

(a) Continuous Assessment: 15Marks
(b) Semester End Exam: 35 Marks

SEE Consists of two sections-

(i)Section A: Set 5 questions, atleast one question from each unit answer any Three out of 5 questions. Each question carries 5 Marks(5M X3=15)

(ii)Section B: Set 3 questions, one from each unit . Each question carries 10 Marks(10M X 2 =20)

MODEL QUESTION PAPER

23MAVAL101: ELEMENTARY NUMBER THEORY **SEMESTER –I**

Max. Marks: 35M **Max.Time: 2Hours**

SECTION – A

Answer any THREE of the following 3x5=15 Marks.

1. Prove that every odd integer is of the form $4n+1$ *or* $4n-1$
2. If $a,b \in Z, b \neq 0$ *and* $a = bq + r,\ 0 \leq r < |b|$ *then* Prove *that* $(a,b) = (b,r)$.
3. State and Prove Euclid's Lemma.
4. Find the highest power of 5 in $80!$.
5. Find the number of positive integers less than 25200 that are prime to 25200.

SECTION – B

Answer any TWO of the following. **2x10 =20 Marks**

6. State and Prove Fundamental theorem of arithmetic.
7. If $d = (826,1890)$ using division algorithm compute d and then express as a linear combination of 826, 1890.
8. State and Prove Wilson's theorem.

***