



TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)
Delhi Road, Moradabad (U.P)

COURSE HANDOUT

Programme: BCA

4th semester

Course: Advance Algebra and Data Geometry

Course Code: TGC408

(30 Sessions, Each Session for 60 Minutes)

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A. Course Perspective

This course will be taught in **4th semester of 3 years (BCA) program**. This course will cover Advance Modern Mathematics, Algebra, and Geometry etc along with higher data sufficiency and problem solving.

B. Programme Specific Outcomes:

On completion of the programme (**Quantitative Aptitude skill enhancement**), the students will be:

PS01: - Applying calculating skills to solve mathematical problems.

PS02: - Operating proficiently in mathematical skills.

PS03: - Implementing their reasoning and thinking skills.

PS04: - Executing their data management skills.

PS05: - Solving problems related to analytical skills in logical and critical thinking.

C. The Course Outcomes (COs).

| Course Outcomes | On Completion of the course, the students will be: |
|------------------------|--|
| CO1 | Recognizing the rules of Crypt-arithmetic and relate them to find out the solutions. |
| CO2 | Illustrating the different concepts of Height and Distance and Functions. |
| CO3 | Employing the concept of higher-level reasoning in Clocks, Calendars and Puzzle Problems. |
| CO4 | Correlating the various arithmetic and reasoning concepts in checking sufficiency of data. |

D. Course Outline:

| | | |
|---------------|--|----------------|
| Unit-1 | Clock and Calendars Introduction, Angle based, faulty Clock, Interchange of hands, Introduction of Calendars, Leap Year, Ordinary Year | 5 Hours |
| Unit-2 | Set Theory Introduction, Venn Diagrams basics, Venn Diagram – 3 sets, 4-Group Venn Diagrams | 4 Hours |
| Unit-3 | Height and Distance Basic concept, Word problems | 3 Hours |
| Unit-4 | Function Introduction to Functions, Even and Odd Functions, Recursive | 3 Hours |
| Unit-5 | Problem Solving Introduction, Puzzle based on 3 variables, Puzzle based on 4 variables | 6 Hours |
| Unit-6 | Data Sufficiency Introduction, Blood relation based, direction based, ranking based | 5 Hours |
| Unit-7 | Crypt-Arithmetic Introduction of Crypt Arithmetic, Mathematical operations using Crypt Arithmetic, Company Specific Pattern | 4 Hours |

E. Session Plan:

| Sess ions Nos. | Topics | Pedagogy/ Teaching Methods | References | Session Outcome (Bloom's Taxonomy) (L) | Course Outcome (COs) |
|----------------------|---|----------------------------------|------------|---|----------------------------|
| 1. | Clocks, angle between hands, gain and loss | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 3 |
| 2 | Calendars, concept of odd days, finding day, reaching date, | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 3 |
| 3. | Miscellaneous question on clocks and calendars | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 3 |
| 4. | Set Theory, Venn diagram, 2 variables | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 2 |
| 5. | Set Theory, Venn diagram, 3 variables | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 2 |
| 6. | Concept of heights and distance | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 2 |
| 7. | Height and Distance Word problems | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 2 |
| 8. | Functions | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 2 |
| 9. | Recursive Functions | C & T, Q | 1, 2, 3, 4 | 1, 2, 3, 4 | 2 |
| 10. | Problem solving based on 2 variables, | C & T, Q | 5, 6 | 1, 2, 3, 4 | 3 |
| 11. | Based on 3 variables, distribution type | C & T, Q | 5, 6 | 1, 2, 3, 4 | 3 |
| 12. | Based on multidimensional data | C & T, Q | 5, 6 | 1, 2, 3, 4 | 3 |
| 13. | DS introduction | C & T, Q | 5, 6 | 1, 2, 3, 4 | 4 |
| 14. | DS based on Blood Relation | C & T, Q | 5, 6 | 1, 2, 3, 4 | 4 |
| 15. | DS based on Ranking | C & T, Q | 5, 6 | 1, 2, 3, 4 | 4 |
| 16. | DS based on Direction | C & T, Q | 5, 6 | 1, 2, 3, 4 | 4 |
| 17. | Crypt Arithmetic Introduction | C & T, Q | 5, 6 | 1, 2, 3, 4 | 1 |
| 18. | Crypt arithmetic and its addition operator | C & T, Q | 5, 6 | 1, 2, 3, 4 | 1 |
| 19. | Multiplication operator | C & T, Q | 5, 6 | 1, 2, 3, 4 | 1 |
| 20. | With symbols | C & T, Q | 5, 6 | 1, 2, 3, 4 | 1 |

L1= Remember, L2= Understand, L3= Apply, L4= Analyzing

Pedagogy/Teaching Method:

C&T:-Chalk & Talk; S/P:-Slides/PPT; Videos; SEM: Seminar; Demo; CHART; ET/GL: Expert Talk/Guest Lecture; QUIZ; CPS: Class room problem solving; GD:-Group discussion; RTCS: Real time case studies; JAR:-Journal article review; PD:-Poster design; OL:-Online lecture/Google class room; Industrial Visit (IV), Assignment (ASG), Quiz/Puzzle (Q), Brain storming (BS), Think-Pair-Share (TPS), Certification(CERT), SIM: Simulation, P/G: Pledge/Greeting, Q/R: Quotes, references, LS:

Literature Survey, RW: Report Writing, MM: Model making, PED: Professional/ethical dilemma, Coding, Activity/Event, FV: Filed Visit etc.

F. Evaluation Scheme:

Evaluation Scheme: Faculty led Continuous Evaluation

- a. 40 marks for CA1 + CA2 + CA3 + CA4
- b. 10 marks for attendance.
- c. 50 marks for final external exams.

G. Alignment/Mapping of COs: (Course Articulation Matrix)

(a) CO Mapping with Assessment tools:

| Course Outcomes | CA1 | CA2 | CA3 | CA4 |
|-----------------|-----|-----|-----|-----|
| CO1 | ✓ | | | ✓ |
| CO2 | | | ✓ | ✓ |
| CO3 | ✓ | ✓ | | |
| CO4 | | ✓ | ✓ | |

(b) Mapping /Alignment of COs with POs (Programme Articulation Matrix)

| Programme Outcomes | CO1 | CO2 | CO3 | CO4 |
|--------------------|-----|-----|-----|-----|
| PSO 1 | 3 | 2 | | |
| PSO 2 | 1 | 3 | 3 | |
| PSO 3 | | | 1 | 3 |
| PSO 4 | | | 2 | 3 |
| PSO 5 | | | 1 | 3 |

1 = the strength of correlation between CO and PO is Weak,

2= strength of correlation between CO and PO is Medium,

3= strength of correlation is High

H. References

Text / Reference Books:

R-1: Arun Sharma: - How to Prepare for Quantitative Aptitude

R-2: Quantitative Aptitude by R.S. Agrawal

R-3: M Tyra: Quicker Maths

R-4: Nishith K Sinha: - Quantitative Aptitude for CAT

R-5: Logical Reasoning by Nishith K Sinha

R-6: Verbal and Non-Verbal Reasoning by R.S. Agrawal

Web References:

W-1: <https://www.sawaal.com/aptitude-reasoning/quantitative-aptitude-arithmetic-ability/percentage-questions-and-answers.html>

W-2: <https://www.indiabix.com/aptitude/percentage/>

W-3: <https://www.indiabix.com/aptitude/questions-and-answers/>

W-4: <https://www.ambitionbox.com/topics/aptitude/questions-and-answers>

I. Additional Readings

Lofoya.com, gmatclub.com, cracku.in, handakafunda.com, tathagat.mba, Indiabix.com

J. Student's roles & responsibilities Guidelines:

Guidelines: All students must read these guidelines carefully and understand them fully:

1. All students must be seated in the class within 05 minutes of the commencement of the session. The class room will be bolted from inside after this time period.
2. He/ She is expected to read all topics/cases etc. before coming to the class.
3. All students are expected to participate actively in discussions that take place in the class room.
4. He/ She will have to maintain 100 % attendance in the class.
5. He/ She will submit all types of assignments within given time frame.
6. He/ She will work in team & contribute to the team functions.
7. He/ She will be asked to teach in his/her class.
8. He/ She will actively engage himself/herself in all classroom activities. Student will be responsible him/herself for his/her absence.
9. He will come in the class properly dressed and neatly trimmed hair and clean shaven. The dress code is: As per university decided.

K. Contact details & Interaction Timing

Contact Person: Chandrabhushan Kumar Sinha

E Mail ID: chandra.ctld@tmu.ac.in

Contact Days & Time: Every Friday and Saturday of the week between 12 noon-2:00 pm and 4:00-4:45 pm.