As Per NEP 2020

University of Mumbai

Syllabus for	
Basket of OE (Scheme I)	
Board of Studies in Mathematics	
UG First Year Programme	
Semester	I
Title of Paper	Credits
I) Logic and Data Interpretation – I	2
II)	
III)	
From the Academic Year	2024-25

Name of the Course: Logic and Data Interpretation – I (OE – II)

Sr. No.	Heading	Particulars
1	**Description the course:** **Including but Not limited to:**	This course deals with the Logical Thinking and Data Interpretation, that forms an essential component of Most of the Competitive and Entrance Examinations, such as Banking, Management Entrance, UPSC/MPSC, SET/NET, GMAT/GRE to quote a few. The nature of the problems and the difficulty level of the questions is quite high and a person appearing for such exams is expected to have a thorough understanding of the concepts, to have ability to think logically, and to be able to interpret the data, presented in different manner.
2	**Vertical :**	Open Elective
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives (CO):** This course revises the basic mathematical concepts learned during school career. However, the problems asked in this course would be mostly advanced and indirect, and would demand broader and critical thinking. The course aims to enhance the reasoning power and logical thinking of the learners and nurture their intellect so as to make them competent across all competitive exams. CO1. To reinforce the basic math concepts and ideas within the learners CO2. To enhance the reasoning power of the learners and make them think over and apply concepts/formulae to solve math problems of indirect nature, thereby developing their problem-solving capacity. CO3. To develop logical thinking of the learners CO4. To make learners competent across all competitive and entrance examinations.	
8	**Course Outcomes (OC):** After completion of the course, the learners will be able to OC1: think logically about the given sequence of numbers/alphabets/symbols OC2: understand the odd/unfit element amongst the set of various elements OC3: develop logical thinking to obtain relations between two people	

OC4: understand the directions, angles between any two angles

OC5: get a general idea about the concept of coding a message and how to decode a coded message

OC6: develop logical thinking to check whether or not the given information is sufficient to answer a question.

| 9 | **Modules:-** |

Module 1: Fundamentals of Logical thinking - I

1. Number/Letter/Symbol Series:
  * Given a finite sequence of numbers, the learners are expected to find a simple rule (difference between or the ratio of consecutive numbers, square-quantities, cube-quantities, recursive rules etc) that binds all the numbers and be able to fill in the gap either at the end or at the beginning or in between.
  * Given a finite sequence of objects, made up of sets of alphabets/symbols, the learners are expected to observe the pattern that is visible in each set of letters/symbols and be able to predict the missing object/s
2. Odd Man Out:
  * Given a finite sequence of numbers, the learners are expected to find a simple rule that binds all but one and be able to find out the odd one
  * Given a finite sequence of objects, made up of sets of alphabets/symbols, the learners are expected to observe the pattern that fits each except one and be able to find out the miss-fit object
3. Relations:
  * Understanding the terms in relations such as mother, father, son, daughter, grand-mother, grand-father, grandson, grand-daughter, brother, sister, siblings, mother-in-law, father-in-law, cousin, nephew, niece, husband, wife, life- partner, spouse, uncle, aunt.
  * Forming a tree/diagram based on the information given, vertical aligning of different generations, definite symbols to be used for different people viz. square for male, circle for female, triangle for those whose gender is not specified and cannot be determined, double arrow (↔) for siblings and equality (=) for married couples

[The problems to be asked should be of varied levels of difficulty. A few ones based on directly applying a given formula may be asked at the beginning; however, the latter ones should demand critical analysis of the given information and a thoughtful selection of the method/formula to solve the same.]

Module 2: Fundamentals of Logical Thinking - II

1. Directions:
  * The eight directions and their names
  * The angles between any two directions
  * Revision of simple Pythagorean triplets such as (3-4-5), (6-8-10), (5-12-13), (7-24-25), (8-15-17), (9-12-15), (10-24-26), and their use in finding the distance between two points, say A and B when AC and CB are perpendicular, Revision of 45-45-90 triangle.

	2. Coding and Decoding
	    • Alphabet Coding, Numerical Coding, Symbol based Coding, Values Coding, Substitution Coding
	    • Deciphering a given Coding
	3. Data Sufficiency:
	    • The concept/idea of Data Sufficiency, for example, the lengths of all the sides are sufficient to find the area of a triangle but not of a quadrilateral
	    • Problems based on insufficient data and finding the minimal info needed to obtain the answer (In such case, not the final answer, but the minimal additional required information is to be found out) – The problems may be based on elementary mathematics or day-to-day situations.

10	**Text Books** 1 A Modern Approach To Verbal & Non-Verbal Reasoning, R. S. Agarwal 2. Quantitative Aptitude for Competitive Examinations, R. S. Agarwal 3. Logical and Analytical Reasoning: Useful for All Competitive Exams, A. K. Gupta
11	**Reference Books** 1. How To Crack Test of Reasoning In All Competitive Exams, Jaikishan and Premkishan 2. Maths Book For Competitive Exams, Vikas Bhalla **3.** Reasoning For Competitive Examinations, Nishit K Sinha
	Scheme of the Examination

	The performance of the learners shall be evaluated into two parts.
	    • Internal Continuous Assessment of 20 marks for each paper.
	    • Semester End Examination of 30 marks for each paper.
	    • Separate head of passing is required for internal and semester end examination.

12	**Internal Continuous Assessment: 40%**
	Semester End Examination: 60%

13	**Continuous Evaluation through:** Quizzes, Class Tests, presentations, projects, role play, creative writing, assignments etc. (at least 3)		

Sr. No.	Particulars	Marks
1	A class test of 10 marks is to be conducted during each semester in an Offline	10

		mode.	
	2	Project on any one topic related to the syllabus or a quiz (offline/online) on one of the modules.	05
	3	Seminar/ group presentation on any one topic related to the syllabus.	05

Paper pattern of the Test (Offline Mode with One hour duration):
Q1: Definitions/Fill in the blanks/ True or False with Justification.
(04 Marks: 4 x 1).
Q2: Attempt any 2 from 3 descriptive questions. (06 marks: 2 × 3)

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Format of Question Paper:
The semester-end examination will be of 30 marks of one hour duration covering the entiresyllabus of the semester.

Note: Attempt any TWO questions out of THREE.			
Q.No.1	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks
Q.No.2	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks
Q.No.3	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks

Sign of the BOS Chairman	Sign of the Offg. Associate Dean	Sign of the Offg. Dean
Dr. Bhausaheb S Desale	Dr. Madhav R. Rajwade	Prof. Shivram S. Garje
The Chairman, Board of Studies in Mathematics	Faculty of Science & Technology	Faculty of Science & Technology

Signatures of Team Members

Sr.No	Name	Signature
1.		
2.		
3.		

4.		
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