**Assignment-2**

**Q.1) Give an example of a number sequence test question and explain how to solve it?**

* A number sequence test is a type of cognitive assessment that measures a person's ability to identify and continue numerical patterns or sequences. These tests typically consist of a series of numbers arranged in a specific order, and the test-taker is asked to identify the pattern or rule that governs the sequence and then continue it by providing the next number(s) in the sequence.
* **Examples:**
* **2, 4, 6, 8, .....**
* **Ans:** 10
* **1, 4, 9, 16, 25, ...**
* **Ans:** 36
* **0, 1, 1, 2, 3, 5, 8, ...**
* **Ans:** 13
* **3, 9, 27, 81, 243, ...**
* **Ans:** 729

**Q.2) What is Mathematical Reasoning? What are its two major types?**

* **Mathematical reasoning:** Refers to the process of using logical thinking, assumptions, and critical analysis to solve mathematical problems. It involves a mathematical concepts and relationships to understand and solve problems in different areas of mathematics, such as algebra, geometry, calculus, and statistics. Mathematical reasoning involves identifying patterns, formulating hypotheses, and drawing conclusions based on evidence and logical arguments. **For example,** using algebraic equations to solve for unknown variables or using geometric theorems to prove mathematical statements involves mathematical reasoning.
* **In terms of mathematics, reasoning can be of two major types which are:** Inductive Reasoning, Deductive Reasoning**.**

1. **1.Inductive Reasoning**: In the Inductive method of mathematical reasoning, the validity of the statement is checked by a certain set of rules and then it is generalized.

* **Example of Inductive Reasoning:**
* **Statement:** The cost of goods is Rs 10 and the cost of labour to manufacture the item is Rs. 5. The sales price of the item is Rs. 50.
* **Reasoning:** From the above statement, it can be said that the item will provide a good profit for the stores selling it.

1. **Deductive Reasoning:** In deductive reasoning, we apply the rules of a general case to a given statement and make it true for particular statements.

* **Example of Deductive Reasoning:**
* **Statement:** Pythagoras Theorem holds true for any right-angled triangle.
* **Reasoning:** If triangle XYZ is a right triangle, it will follow Pythagorean Theorem.

**Q.3) What is Bloom’s Taxonomy and what are its different levels explain each in detail?**

* **Bloom Taxonomy**: Bloom's taxonomy was developed to provide a common language for teachers to discuss and exchange learning and assessment methods i.e it is used as a framework for categorizing educational goals and objectives. It was created by Benjamin Bloom in the 1950s and revised by a group of educators in the 2000s. The framework organizes learning objectives into six hierarchical levels, which are arranged in order of complexity and specificity, with each level building upon the previous one:

1. **Remembering:** This level involves the ability to recall or recognize information, ideas, or concepts.

* **Examples** include recalling facts, identifying vocabulary words, and recognizing familiar faces.

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| Using Bloom's Taxonomy to Write Effective Learning Outcomes ... |

1. **Understanding:** This level involves the ability to explain the meaning of information, ideas, or concepts.

* **Examples** include explaining a scientific concept, summarizing a story, and interpreting a graph.

1. **Applying:** This level involves the ability to use or apply information, ideas, or concepts in a new situation or context.

* **Examples** include using a mathematical formula to solve a problem, applying a new language in a conversation, and using a computer program to design a graphic.

1. **Analyzing:** This level involves the ability to break down or examine information, ideas, or concepts into smaller parts and understand how they relate to each other.

* **Examples** include identifying cause-and-effects, categorizing data, and comparing and contrasting different perspectives.

1. **Evaluating:** This level involves the ability to make judgments or evaluations based on criteria and standards.

* **Examples** include students make judgments about the value of ideas, items, materials, and more.

1. **Creating:** This level involves the ability to generate or create new ideas, products, or solutions.

* **Examples** include designing a new product, composing a piece of music, and developing a new strategy for a business.
* Overall, Bloom's taxonomy provides a useful framework for educators to design learning activities and assessments that align with specific learning objectives and help students develop higher-order thinking skills.

**Q.4) What is analytical reasoning? What are the steps involved in it?**

* **Analytical Reasoning:** Analytical reasoning is a cognitive skill that involves breaking down complex informationinto smaller components in order to understand it better and draw conclusions.It is a fundamental aspect of critical thinking and problem-solving that is applicable to awide range of disciplines, including science, business, law, and engineering.Critical thinking is a kind of thinking in which you question, analyse, interpret, evaluate andmake a judgement about what you read, hear, say, or write.
* **Analytical reasoning involves the following steps:**
* **Identifying the problem or issue**: This involves defining the problem or issue at hand and determining the scope of the analysis.
* **Gathering information**: This involves collecting data and information relevant to the problem or issue, often using various sources and methods.
* **Analyzing information:** This involves examining and evaluating the information gathered, identifying patterns and relationships, and drawing inferences.
* **Drawing conclusions:** This involves making logical conclusions based on the analysis conducted, and assessing the validity and reliability of these conclusions.
* **Formulating Recommendations**: This involves using the conclusions and analysis to develop practical solutions or recommendations that can be implemented to address the problem or issue.

**Q.5) What is intelligence? List out the aspects of the intelligence and explain any two?**

* **Intelligence:** The word intelligence is derived from a Latin verb “Intellegere” which means understanding. Intelligence is the ability to acquire and apply a knowledge. It involves a range of cognitive processes, including perception, attention, memory, language, and problem-solving. Intelligence is also influenced by factors such as motivation, personality traits, and environmental factors, such as education and cultural experiences. According to Alfred Binet intelligence is the ability for judgement or common sense. Throndike defines intelligence as one’s capacity to deal effectively with situations.
* **Jean Piaget:** Intelligence is the ability to adapt to surrounding.
* **According to David wechslers (1977):** The intelligence is the global capacity to think rationally, act purposefully and deal effectively with the environment.
* **Aspects of Intelligence:** The three aspects of successful intelligence are-
* **Analytical or componential thinking** is required to solve problems and to judge the quality ideas.
* **Creative or experiential intelligence** is required to formulate good problems and ideas in the first place.
* **Practical or contextual intelligence** is needed to use the ideas and their analysis in an effective way in one’s everyday life.

1. **Verbal-linguistic intelligence:** This refers to the ability to use language effectively, including the ability to understand and express complex ideas and feelings through written and spoken communication.
2. **Logical-mathematical intelligence:** This involves the ability to think logically, analyze problems, and use mathematical and scientific reasoning to solve complex problems.

**Q.6) What does the term speed calculation mean and what are the shortcuts and tricks used to perform speed calculations?**

* **Speed calculations:** Speed calculation is the ability to perform mathematical calculations quickly and accurately, without the use of external aids such as calculators or pen and paper. Speed calculation involves a combination of mental arithmetic skills and strategies, including estimation, breaking down calculations into smaller parts, and using patterns and shortcuts.
* **Some common shortcuts and tricks used in speed calculation include:**

1. Using rounding to estimate results:
2. Memorizing multiplication tables and common formulas
3. Simplifying fractions by finding common factors

* **Steps to follow:**
* Find the greatest common factor (GCF) of the numerator and denominator.
* Divide both the numerator and denominator by GCF.
* **Example:** 12/18 = ?

1. Using the distributive property to simplify calculations:

* **Example:** **i.** 2\* (x+5) = 16

**ii.** 5(9.96) = ?

**iii.** 7(8.2) = ?

1. Using mental math tricks, such as adding or subtracting from both sides of an equation to simplify it.

**Q.7) What is the Reminder Theorem? Find the Reminder’s of the below polynomial’s by using both the reminder theorem as well as by regular method.**

* **Reminder :** The remaining value after division is called reminder. So, it is the process of division. **Ex: 5/2**
* **Why we need reminder theorem?**
* Because division of simple number or digit is a easier but difficult for polynomials.
* **Reminder Theorem:** Let p(x) be any polynomial of degree greater than or equal to one and let (a) be any real number. If p (x) is divided by the liner polynomial (x –a) then the reminder is p(a)

1. **If p(x) = 3x^2 + x -1 is divided by (x-1) find the reminder?**

* If p(x) = 3x^2 + x - 1 is divided by (x-1), we substitute x=1 into p(x) and evaluate:

p(1) = 3(1)^2 + (1) - 1 = 3 + 1 - 1 = **3 OR 4x - 1.**

Therefore, the remainder when p(x) is divided by (x-1) is 3.

1. **If p(x) = x^3+ 2x^2+x+ 5 is divided by (x-2) find the reminder?**

* If p(x) = x^3 + 2x^2 + x + 5 is divided by (x-2), we substitute x=2 into p(x) and evaluate:

p(2) = (2)^3 + 2(2)^2 + 2 + 5 = 8 + 8 + 2 + 5 = **23 OR 7x + 5.**

Therefore, the remainder when p(x) is divided by (x-2) is 23.

1. **If p(x) = X^3 + x^2 -3x + 8 is divided by (x-1) find the reminder?**

* If p(x) = x^3 + x^2 - 3x + 8 is divided by (x-1), we substitute x=1 into p(x) and evaluate:

p(1) = (1)^3 + (1)^2 - 3(1) + 8 = 1 + 1 - 3 + 8 = 7 **OR -3x + 8**

Therefore, the remainder when p(x) is divided by (x-1) is **7. OR -3x + 8**

**Q.8) 8 friends P, Q, R, S, T, U, V and W are sitting on a circular table facing towards center. Q is between V and S. W is sitting third left to the Q and second right to the P. R is sitting between P and V. Q and T are not setting Infront of each other.**

**1) Who is third to the left of S..**

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| **P**  **W V**  **Q R**  **T U**  **S** |

* Let's first draw a diagram of the seating arrangement described in the problem. We can represent the circular table as a circle and label the positions with the letters of the friends' names:.
* **From the given information, we can deduce the following:**
* Q is between V and S. Therefore, Q must be seated either between V and S going clockwise or between V and S going counterclockwise.
* W is sitting third left to the Q and second right to the P. Therefore, W must be seated three positions to the left of Q and two positions to the right of P going clockwise or counterclockwise.

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| **P**  **U V**  **W R**  **Q T**  **S** |

* R is sitting between P and V. Therefore, R must be seated between P and V going clockwise or counterclockwise.
* Q and T are not sitting in front of each other. Therefore, T cannot be seated in the positions immediately to the left or right of Q.
* **Using these deductions, we can fill in the seating arrangement as follows:**
* Now we can see that the friend third to the left of S is U. Therefore, the answer is **U.**

**2) Who is second the right of T**

* To determine who is second to the right of T, we can use the seating arrangement we drew in the previous answer: We can see that the friend to the immediate right of T is Q. Therefore, the friend second to the right of T is either S or P, depending on which direction we move from T. Going clockwise, the friend second to the right of T is S, and going counterclockwise, the friend second to the right of T is **P.**

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