

Vidya Vikas Mandal's
Shree Damodar College of Commerce & Economics, Margao-Goa
SY BVoc(ST), Semester-III, Semester End Examination, November 2023
Subject : STG303 Reasoning Techniques

Duration: 2 Hours

Max Marks:80

*Instructions: 1) Start each question on a fresh page.
2) Figures to the right indicate Full Marks.
3) All Questions are compulsory.*

Q1 Answer any four of the following.

4x4=16marks

a. Draw the possible logical Venn diagrams for the following statements.
statements:

- 1) No birds are mammals.
- 2) Some lions are tigers.

- b. i) How many leap years are there in first 100 years?
ii) What is the angle made by hour hand and minute hand of a clock at 12.20 p.m.?
- c. Consider the statements given below to be true and decide which of the conclusions logically follows. Justify your answer.

Statement 1: All politicians are honest.

Statement 2: Kamala Devi is an honest lady.

Conclusion I: She is a politician

Conclusion II: she is not interested in politics.

d. Check whether the following are statements or not.

- 1) The equation $x+4=5$ has exactly one root.
- 2) How old are you?

e. State which conclusions logically follow from the given statement. Justify your answer.

Statement: $U \leq V < W = X < Y$

Conclusion 1 : $Y > V$

Conclusion 2: $W \geq U$

f. An accurate clock shows 8 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows

- a) 2 o'clock in the afternoon b) 5 o'clock in the evening

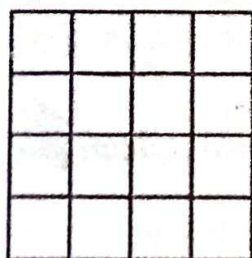
Q2 Answer any four of the following.

4x4=16marks

a. Write the contrapositive and converse of the following statement.

p: If Virat Kohli plays well then India wins.

b. Find the number of squares in the figure given below.



- c. Draw logic gates for the following operations.
- NOR
 - AND
- d. Construct the truth table for the following statement.
 $(\sim p \vee q) \rightarrow \sim q$
- e. Prove that "For all integers n, if n^2 is odd then n is odd" by the method of contradiction.
- f. Simplify $F = \bar{A}\bar{B} + AB + A\bar{B}$ using K map.

Q3 Answer the following questions.

- A
- If Ram is in the west of Shyam and Kareem is in the north of Shyam then in which direction is Kareem with respect to Ram? 6 marks
 - A man started walking towards north, he walks 10 mts and then turns to his right, walks 5 mts and turns to his right again and walks 10 mts and turns to his left, walks 7 mts and then turns to his right. At this point in which direction is he facing?

OR

- B Choose the correct options based on the information provided below. 6 marks
- Sumit told Rekha, "Yesterday I met the son of my wife's father -in-law." How is Sumit related to that man?
 a) Brother b) Father c) Son-in-law d) niece
 - A family consists of a husband and wife, their three sons and two daughters, three wives of three sons. How many females are there in the family?
 a) 5 b) 6 c) 7 d) none of these
- C A statement is given below followed by two assumptions. Consider the statement and decide which of the following assumptions is implicit. Justify your answer. 6 marks
- Statement:** If you want to specialise in Human Resource Management in India, join XLRI
- Assumption I:** XLRI provides specialisation in HRM
- Assumption II:** XLRI has the best HRM course in India.

Q4 Answer the following questions.

- A Study the following information and answer the questions given below. Justify your answers. 6 marks
- In a certain code language "lu ja ka hu" means "we provide study material", "fa ka la ju" means "we score maximum selection", "la fu ja ju" means "study score the selection" and "ju lu na fu" means "selection of the material".
- What is the code of score in this code language?
 - What is the code of provide in this code language?
 - What is the code of material in this language.

OR

- B
- If 15th July 2005 was tuesday then what was the day on 15th August 2012? 6 marks
 - check whether the following years are leap years
 a) 2016 b) 2025

- C Choose the correct most appropriate alternative based on the information given below. Justify your answer. 6 marks

You are a pure vegetarian and have been invited to a party where non vegetarian items are also being served. You must

- Sermonize those who eat non vegetarian items.
- Ask the host not to serve non vegetarian items.
- Attend the party and follow your principles.
- Not attend such a party.

Q5 Answer the following questions.

- A Check if the following statements are logically equivalent or not 6 marks
- $\sim(p \leftrightarrow q)$ and $(p \wedge \sim q) \vee (\sim p \wedge q)$

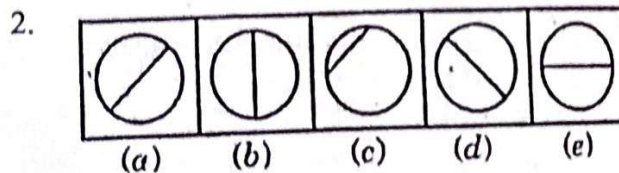
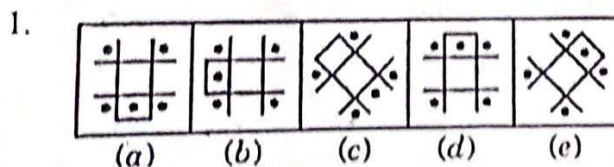
OR

- B Prove that $1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$ by the method of induction. 6 marks

- C Construct the truth table for disjunction, conditional and bi-conditional statements. 6 marks

Q6 Answer the following questions.

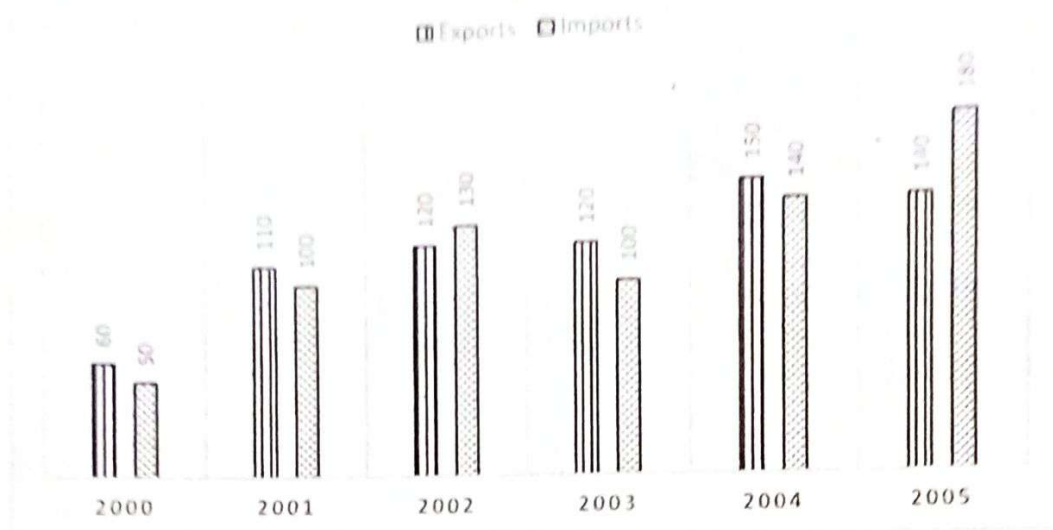
- A Choose the figure that is different from the rest of the figures. Justify your answer in each case. 6 marks



OR

- B Examine the bar graph below carefully and answer the following questions. The graph depicts the export & import of a country in tonnes. 6 marks

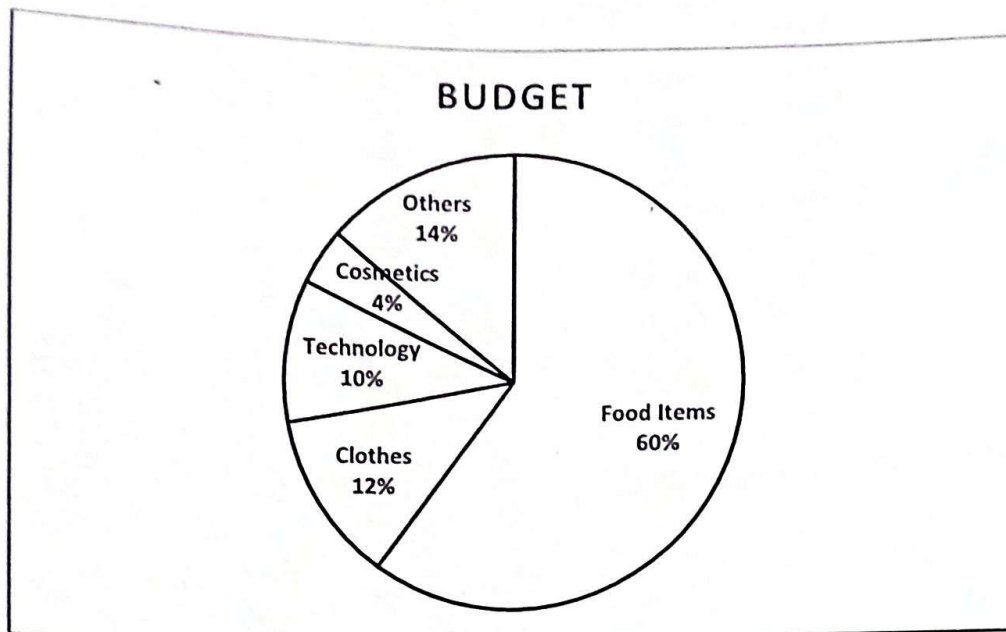
EXPORTS & IMPORTS IN A COUNTRY



1. Out of the given years, in how many did the export was more than 10% as compared to the import?
 - a. 1
 - b. 2
 - c. 3
 - d. 4
2. For all the years mentioned what is the average of the exports?
 - a. 110
 - b. 120
 - c. 125
 - d. 130
3. From 2000 to 2005 in which year was the growth in imports as compared to the previous years was the highest?
 - a. 2001
 - b. 2002
 - c. 2004
 - d. 2005

C The pie chart given below represents the monthly budget of a family in percent. Study the pie chart and answer the questions.

6 marks



1. Which of the following items are displayed in the ratio of 1:15.
 - a. Food items and cosmetics
 - b. Technology and Food items
 - c. Cosmetics and others
 - d. Cosmetics and Food items

2. If the budget of the house is Rs. 20,000, then by what percentage is the expenditure on food items more than the rest of the expenditure?
 - a. 10 %
 - b. 10 – 15 %
 - c. 15 – 20 %
 - d. More than 20 %

3. Which of the item is $\frac{1}{5}^{\text{th}}$ in percentage of Food Items.
 - a. Clothes
 - b. Technology
 - c. Cosmetics
 - d. Others