

Vidya Vikas Mandal's
Shree Damodar College of Commerce & Economics, Margao-Goa
SY.BVoc(ST) Semester-III, Semester End Examination, November 2022
Reasoning Techniques (STG-303)

Duration: 2 Hours

Max Marks: 80

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

Q.1. Answer ANY FOUR of the following .

(4x4= 16 marks)

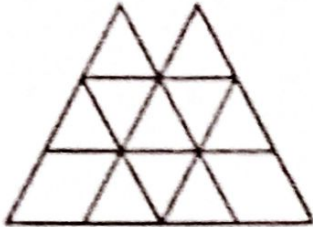
- a) Check if the following are statements or not. Justify your answer.
 - i) Why are you late?.
 - ii) $7 + 8 = 15$.
- b) My mother is Irish. Everyone from Ireland has blond hair.
 Therefore, my mother has blond hair.
 Identify whether the above argument is inductive or deductive.
 Justify your answer.
- c) Take the given two statements to be true and decide which of the given conclusions logically follows and which doesn't.
 justify your answer.
Statement 1: some poets are goats.
Statement 2: some goats are trees.
Conclusion 1: some poets are trees.
Conclusion 2: some trees are goats.
- d) Draw the possible logical venn diagrams for the following.
 Statement: Some girls are flowers.
 Some flowers are books.
- e) An accurate clock shows 2 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows
 - i) 9 o'clock in the evening
 - ii) 9 o'clock in the morning
- f) You find that the person whom you call your friend has been cheating you.
 what would you do ?
 - A) Break relations with him.
 - B) Give him tit for tat
 - C) Make him realize his mistake
 - D) Tell other friends about him.

Justify your answer.

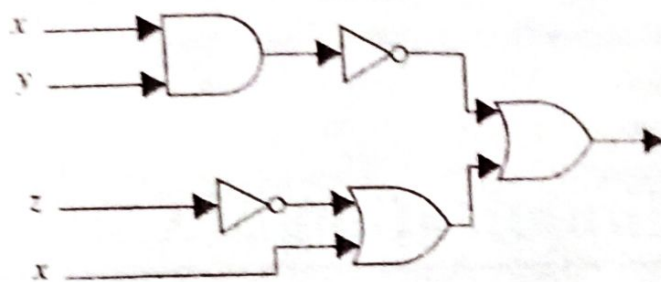
Q.2. Answer ANY FOUR of the following .

(4x4= 16 marks)

- a) Find the number of triangles in the figure.



- b) Let p and q be the propositions
 p : Swimming at the new jersey shore is allowed.
 q : Sharks have been spotted near the shore.
 write the following propositions as an English sentence
 i) $p \rightarrow \sim q$. ii) $p \wedge q$
- c) Draw the K-map for the sum of products expansion
 $x \bar{y} z + x \bar{y} \bar{z} + \bar{x} y z + \bar{x} \bar{y} z + \bar{x} \bar{y} \bar{z}$
 And hence use it to minimize this sum of products expansion.
- d) All the trees in the park are flowering trees.
 Some of the trees in the park are dogwoods.
 All dogwoods in the park are flowering trees.
 If the first two statements are true, the third statement is
 A.true B.false C.uncertain Justify your answer.
- e) Write the inverse and contrapositive of the statement
 "If it rains, then I will stay at home."
- f) Find $f(x, y, z)$ in the given circuit.



Also find the output of $f(x, y, z)$ if the input values are as follows:
 $x = 0$, $y = 1$, $z = 1$

Q.3. Answer the following questions.

A. In the following questions, the symbols $\%$, Δ , $\#$, $\&$, \notin are used. All the symbols define the following meanings

A $\%$ B means that 'A is smaller than B'

A Δ B means that 'A is less than or equal to B'

A $\#$ B means that 'A is equal to B'.

A $\&$ B means that 'A is greater than B'

A \notin B means that 'A is either greater than or equal to B'.

Now in each of the following questions, assuming the given statements to be true, find which of the conclusions, I, II given below is/are definitely true. Justify your answer.

1. **Statement:** A $\%$ B, C \notin D, B $\#$ D.

Conclusion: I) B $\%$ C II) B $\#$ C.

A. Only I is true.

B. Only II is true

C. I and II are true

D. I and II are false

2. **Statement:** A $\%$ B, B $\#$ C, C \notin D.

Conclusion: I) A $\&$ D II) B Δ D

A. Only I is true.

B. Only II is true

C. I and II are true

D. I and II are false **(6 marks)**

OR

B. Read the given situation and then decide which of the given courses of action follows.

Statement: In a recent survey by the National Health mission it was showed that fruits and vegetables which contain certain vitamins have a higher effect on human health than capsules marketed by private companies that contain the same vitamins.

Actions:

1. Such vitamin capsules marketed by private companies should be banned with immediate effect.

2. People should prefer fruits and vegetables to capsules marketed by private companies. Justify your answer also state why the particular action follows and why not. **(6 marks)**

C. Five males –B,C,D,E,F and four females J,K,L,M are to be divided into three teams of three persons each. The teams are designated as the Blue team , Red team and Green team.

D,E,F must be the captains of their respective teams.

B and C cannot be on the same team.

J and F cannot be on the same team

L must be on a team with either B or E or both

L must be on the blue team.

1. Which of the pairs of students can be on the same team as John?
E, F or B, E or E, M
2. Any of the following pair of students can be on the blue team except
a. B and F b. D and E c. E and J d. E and M e. M and F

(6 marks)

Q.4. Answer the following questions.

A. Read the information carefully and answer the question that follows.

i) Introducing a boy, Ralf said, "His mother is the only daughter of my mother in law".
how is Ralf related to the boy?

- a. Uncle b. Father c. Brother d. Husband

ii) Pointing to a man in the photograph, a woman said, "his brother's father is the only son (and child) of my grandfather". How is the woman related to the man in the photograph?

- a. Mother b. Sister c. Aunt d. Daughter

iii) Amit said "this girl is the wife of the grandson of my mother."
What is Amit to the girl?

- a. Father b. Grandfather c. Husband d. Father in law

iv) If B says that his mother is the only daughter of A's mother, how is A related to B?

- a. Son b. Father c. Brother d. Uncle

(6 marks)

OR

B. Read the following information and answer the question that follows.
Justify your answer using a diagram

i) Hema starting from her house walked 5 km to reach the crossing of Palace. In which direction she was going, a road opposite to this direction goes to Hospital. The road to the right goes to station. If the road which goes to station is just opposite to the road which goes to IT-Park, then in which direction to Hema is the road which goes to IT-Park?

- A. Right B. Left C. Front D. Back

ii) boy rode his bicycle Northward, then turned left and rode 1 km and again turned left and rode 2 km. He found himself 1 km west of his starting point. How far did he ride northward initially?

- A. 1km B. 2km C. 3km D. 5km

(6 marks)

C. Read the information carefully and answer the question that follows

i. A tired worker slept at 7.45 p.m. If he woke at 12 noon, for how many hours did he sleep?

- a) 5 hours 15 mins b) 16 hours 15 mins c) 12 hours d) 6 hours 45 mins

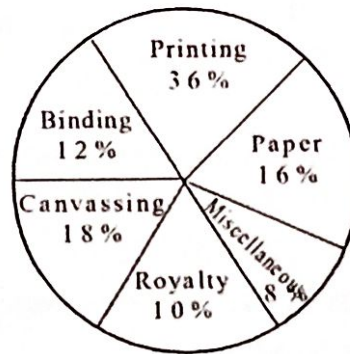
- ii. A bus for Delhi leaves every thirty minutes from a bus stand. An enquiry clerk told a passenger that the bus had already left ten minutes ago and the next bus will leave at 9.35 a.m. At what time did the enquiry clerk gave this information to the passenger?
 a) 9.10 a.m. b) 9.15 a.m. c) 8.55 a.m. d) 9.05 a.m.
- iii. If the day before yesterday was Saturday, what day will fall on the day after tomorrow?
 a) Friday b) Thursday c) Wednesday d) Tuesday

(6 marks)

Q.5. Answer the following questions.

A. Analyze the following piechart carefully and answer the questions given below

The pie chart given below shows the expenditure incurred in bringing out a book, by a publisher.



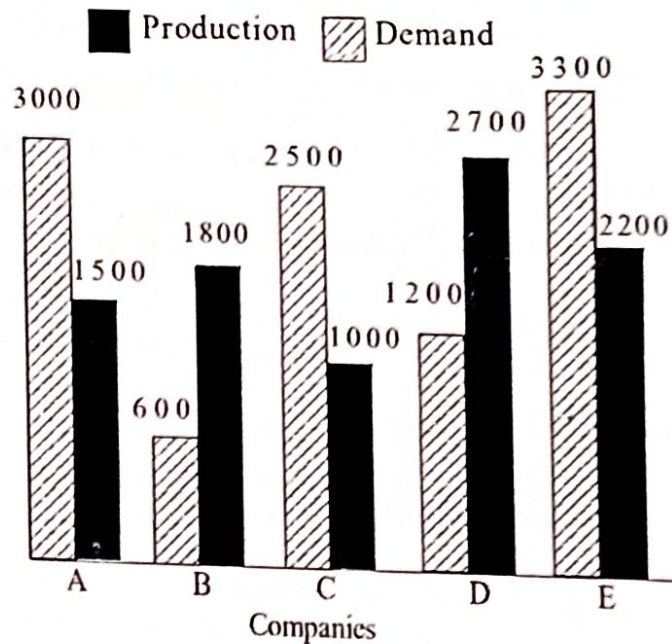
- If the cost of printing is Rs. 23400, the royalty is
 a) Rs. 6500 b) Rs. 2340 c) Rs. 4680 d) Rs. 7840
- If miscellaneous expenditures amount to Rs. 18000, the expenditure on canvassing will be
 a) Rs. 8000 b) Rs. 14400 c) Rs. 46800 d) Rs. 40500
- If 5500 copies are published and miscellaneous expenditures amount to Rs. 36960 and the marked price is 40% above cost price, then the marked price of each copy is
 a) Rs. 122.50 b) Rs. 117.60 c) Rs. 126.40 d) Rs. 92.40

(6 marks)

OR

B. Analyze the following graph carefully and answer the questions given below

Demand and Production of Colour T.V.s of Five Companies for October 1988



- What is the ratio of companies having more demand than production to those having more production than demand?
a) 2:3 b) 4:1 c) 2:2 d) 3:2
- What is the difference between average demand and average production of the five companies taken together?
a) 1400 b) 400 c) 280 d) 13
- The demand for company 'B' is approximately what percent of the demand for company 'C'?
a) 4 b) 24 c) 20 d) 60
- The production of company D is approximately how many times that of the production of the company A?
a) 1.8 b) 1.5 c) 2.5 d) 1.11

(6 marks)

C. a. Verify that the program segment

$x := 2 \quad z := x + y$

if $y > 0$ then

$z := z + 1$

else

$z := 0$

is correct w.r.t initial assertion $y = 3$ and final assertion $z = 6$

b. Verify that the program segment

if $x < 0$ then $x := 0$

is correct w.r.t the initial assertion T and final assertion $x \geq 0$

(6 marks)

Q.6. Answer the following questions.

A. Find the missing number in the following number sequences.

Justify your answer.

i) 36, 34, 30, 28, 24, ?

ii) 80, 10, 70, 15, 60, ?

iii) 8, 6, 9, 23, 87, ?

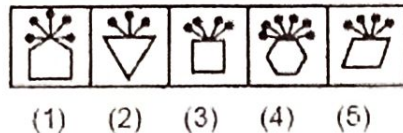
(6 marks)

OR

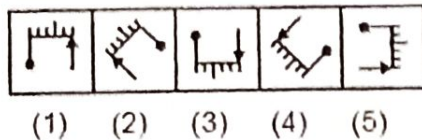
B. Choose the figure that is different from the rest of the figures.

Justify your answer in each case.

1.



2.



(6 marks)

C. a. Find whether the two statements $(p \rightarrow r) \vee (q \rightarrow r)$ and $(p \wedge q) \rightarrow r$ are logically equivalent.

b. Let $Q(x,y): x=y+3$. what are the truth values of the propositions $Q(1,2)$ and $Q(3,0)$?

(6 marks)