SARASWAT VIDYALAYA'S
SRIDORA CACULO COLLEGE OF COMMERCE & MANAGEMENT STUDIES
KHORLIM, MAPUSA, GOA

B.Com – Honors / B.Com - General (w. e. f. 2017-18)

F.Y.B.COM. SEMESTER END EXAMINATION, JANUARY, 2022
SEMESTER I

Subject:- COMMERCIAL ARITHMETIC – I. (CC-4)   M.Marks:- 80
        (CBCS)   Duration:- 2 hrs.

Instructions:- 1. Attempt all the questions.
          2. Use of non-programmable calculator is allowed.
          3. Each question carries marks as shown in bracket
          4. Sub-questions of a question should be answered continuously.
          5. Log table / graph paper will be supplied on request.

Q.1. Attempt the following: (5x4 = 20)

   a) In how many ways can the letters in the word "DAUGHTER' be arrange
       so that the vowels appear in the extreme positions.

   b) Find the simple interest of Rs.7000/- for 4 years at 8% p.a . Find the
       amount at the end of 2 years

   c) Let A = Set of letter in the word " FOOL"
         B = Set of letters in the word "FULL"
         C = Set of letters in the word "FILL".
      Verify that A \(A\B) = A ∩ B. Also represent the sets by means of Venn
      diagram

   d) Solve the following determinant
      $$\begin{vmatrix} 3 & 5 & 7 \\ 1 & 9 & 31 \\ 9 & 15 & 2x+1 \end{vmatrix} = 0$$

                              .OR.

Q.I. Attempt the following: (5x4 = 20)

   w) How many words can be formed with the letters in the word 'VOWEL' ?
      How many of these begins with letter W?

   x) In how many years, the amount of money will be double the principal at
      simple rate of 5 % per annum?

y) If A = {1, 2, 3}; B ={2, 3, 4, 5} and C = {2, 4, 6, 8} .
Verify that A ∪ B = (A\B) ∪ B. Also represent the sets by means of Venn diagram

z) Solve the following equations using determinants.
3x + 3y − z =11, 2x − y + 2z = 9, 4x + 3y + 2z = 25

Q.2. Attempt the following: (5x4 = 20)
a) In a group of 13 students, 7 play cricket, 8 play hockey and 6 play football, 3 play hockey and football, 2 play cricket and football and 4 play cricket and hockey. Each student plays at least one of the three games. How many play all the three games?

b) If A = $\begin{bmatrix} 2 & 3 & 4 \\ 5 & 2 & 1 \\ 4 & 6 & -5 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & 4 & 7 \\ -2 & 3 & 8 \\ 6 & -3 & 4 \end{bmatrix}$. Show that $(A+B)' = A' + B'$

c) Translate the following verbal statements into symbolic form.
i) The sky is blue and grass is green.
ii) Ram like to eat salads and vegetables.
iii) Shyam will be successful if and only if he works hard

d) Find T_n and S_n for the for the sequence: 2, - 5, -12, -19, ...

.OR.

Q.II. Attempt the following: (5x4 = 20)
w) From amongst 2000 literate individuals of a town, 60 % read magazine "Goa Today", 55 % read magazine "India Today" and 20 % read neither of the two. How many individuals read both the magazines?

x) Find the value of x, y and z from the following matrix equation:
$\begin{bmatrix} 1 & x & 0 \\ y & 2 & 4 \end{bmatrix} + \begin{bmatrix} 3 & 1 & 2 \\ 4 & 3 & -2z + x \end{bmatrix} = \begin{bmatrix} 4 & 2 & 2 \\ 6 & 5 & 2 \end{bmatrix}$

y) Let p = The temperature is 0^0 C and q = It is snowing. Translate the following symbolic to simple verbal form.
i) (~p) ∧ q   ii) ~p ∨ ~q   iii) ~ (p ∧ q)   iv) ~q → p

z) If for an A.P., d = 10 and S_{30} = 4500, find a and T_{30}.

Q.3. Attempt the following: (5x4 = 20)
a) Are the two statements (p → (q → p) and ~ p →(p → q) logically equivalent.

b) How many words are possible with the letters in the word "PROTOZOOLOGY"

c) Find three numbers in an AP such that their sum is 15 and their product is 80.

d) A company borrows a loan of Rs. 400,950 /- on the condition to repay it with compound interest at 6% per month. Further it is also agreed upon to repay the entire loan amount in three equal instalments of Rs. 150000.00/-. Prepare an amortization chart showing the interest component and the principal repayment component of the EMI for each month.

.OR.

Q.III. Attempt the following: (5x4 = 20)
w) Verify the following statement is a tautology by constructing truth table:
$$[p \wedge (p \rightarrow q)] \rightarrow q$$

x) In a class of 6 boys and 7 girls a committee of 5 students is to be formed. Find the number of committees with majority of girls.

y) Find the sum of all natural numbers between 200 and 300 divisible by even prime numbers.

z) Find the amount of an annuity if payment of Rs. 500/- is made annually for seven years at 7% p.a.

Q.4. Attempt the following: (5x4 = 20)
a) Find the compound interest and the amount for Rs. 5000/- for 3 years at 8% per annum when the interest is payable quarterly.

b) A manufacturer produces three products: P , Q and R which he sells in two markets. Annual Sales volume are indicated as follows:

Products

	A	B	C
Market I	10,000	2,000	18,000
Market II	6,000	20,000	8,000

If the unit sale of P, Q and R are Rs. 2.5, 2 and 1 respectively, find the total revenue in each market with the help of matrices.

c) If $^{10}C_x - {}^9C_4 = {}^9C_3$, find x

d) A person pays Rs. 975 in monthly instalment such that each instalment is less than the earlier instalment by Rs. 5. If the first instalment is Rs. 100, in what time will the entire amount be paid?

.OR.

Q.IV. Attempt the following: (5x4 = 20)

w) Find the amount and the compound interest on Rs.1500/- for 4years at 12% p.a calculated on yearly basis.

x) A factory employs 50 unskilled and 20 skilled workers. If unskilled worker is paid at the rate of Rs. 75 per day whereas skilled worker is paid at the rate of Rs. 100 per day, find the total payment made to the workers per day.

y) Find the value of n if $^{n+3}P_6 : {}^{(n+2)}P_4 = 14:1$

z) Find the sum, S_n of the series $7 + 77 + 777 + 7777 + \ldots$