

Carmel College of Arts, Science and Commerce for Women,

Nuvem – Goa.

January 2021

Semester – I of B.Com Course Name: Commercial Arithmetic – I

Total Marks: 40

Date: 07/01/2021

Duration: 2 hours

Total number of pages : 2

I. Answer any five of the following **(2 x 5 = 10)**

- 1) Let $X = \{1,2,3,4,\dots,16\}$ be the universal set, $A = \{1,3,5,7,8,9,11,12,15\}$ and $B = \{2,3,4,7,10,11,13,15\}$. Find $(A \cup B)'$
- 2) In how many ways can the letters of the word ONLINE be arranged so that the Ns are always together?
- 3) Find the Principal and the amount to earn Rs 200 Simple interest in 5 years at the rate of 5% p.a.
- 4) A man borrows a loan of Rs 10,000 to be repaid in three monthly installments at the rate of 10% p.a. compounded monthly. Calculate the EMI using reducing balance method.
- 5) Find the 12th term and the sum of the first 12 terms for the following AP.
1, 5, 9, 13, ...
- 6) Evaluate the following determinant
$$\begin{vmatrix} 2 & 3 & 1 \\ 5 & 4 & 1 \\ 1 & 1 & 1 \end{vmatrix}$$
- 7) Obtain the product of the following matrices
$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix} \times \begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 5 \end{bmatrix}$$
- 8) Obtain the truth table for the following statement.
 $p \Rightarrow (q \wedge \sim p)$

II. Answer any six of the following **(6 x 5 = 30)**

- 1) Check whether the following statements are equivalent
 $p \wedge \sim(q \vee r) ; p \wedge (\sim q \wedge \sim r)$
- 2) In a survey it was found that 21 people liked product A, 26 people liked product B and 29 people liked product C. If 14 people liked products A and B, 12 liked products C and A, 14 liked products B and C and 8 liked all 3 products. Find the number of people who liked product C only.
- 3) In how many ways can the letters of the word DESKTOP be arranged so that
 - i) the vowels are together
 - ii) the vowels are not together
 - iii) the consonants are together
- 4) Find the compound interest on Rs 10000, compounded at 10% annually if the interest is calculated
 - i) yearly
 - ii) half yearly
 - iii) quarterly
- 5) Solve the following system of equations using Cramer's rule
$$\begin{aligned} 5x - 2y + 3z &= 9 \\ 3x + 4y + 2z &= 10 \\ x + y + z &= 2 \end{aligned}$$
- 6) If the third term and the sixth term of a G.P. are 36 and 972 respectively, then find the G.P.

- 7) A man is offered a job where his starting salary will be Rs 10,000 and the salary will be incremented by Rs 500 every month. What will be his salary at the end of the year? How much will he have earned by then?
- 8) In a group of 20 children there are 11 girls. In how many ways can 10 children be selected so as to include
- i) exactly 5 girls
 - ii) at least 5 girls
 - iii) at most 5 girls
