

The CES College of Arts and Commerce Cuncolim Salcete Goa
FYBCOM I Semester End Examination,
Commercial Arithmetic

Marks: 80

Duration: 2hrs

Date: 24/10/19

Time: 10.00 am To 12.00 noon

Instructions: 1) Attempt all questions.

2) Figure to the right indicates full marks.

3) Use of non-programmable calculator is allowed.

4) Log tables and graph papers will be supplied on request.

Q.1. Attempt the following:

(4X5=20)

a) Verify if $(p \rightarrow \neg q) \leftrightarrow (\neg p \wedge q)$ is a tautology.

b) Find the simple interest on Rs. 50,000/- for 6 years at the rate of 10% p.a. Also find the amount after 6 years.

c) Four digit number is to be formed by using the digits 1, 2, 3, 4, 5 and 6. How many of these numbers are even?

d) Find the n^{th} term of the sequence 2, 7, 12, 17, ---

e) If $\begin{vmatrix} 2 & x-3 \\ 1 & 4 \end{vmatrix} = 0$, find x

OR

Q.I. Attempt the following:

(4X5=20)

v) Prepare the truth table for $(\neg p \wedge \neg q) \rightarrow (p \wedge q)$

w) An amount of Rs. 40,000/- is kept in a bank with a simple interest of 8% p.a. Find the amount after 5 years.

x) How many words starting and ending with a vowel can be formed by using the letters of the word 'equation'?

y) The general term of a sequence is $105 - 5n$. Is it an A.P?

z) If $\begin{vmatrix} 2x-3 & 2 \\ -4 & 1 \end{vmatrix} = 0$, find x .

Q.2. Attempt the following:

(4X5=20)

a) Find the compound interest on Rs. 1200/- at the rate of 10% p.a. for 2 years, compounded semi annually.

b) Solve $x + y = 2$ and $2x - y = 4$ by using determinants.

c) If $X = \{1, 2, 3, 4, 5, 6\}$ is a universal set. $A = \{1, 4, 5\}$; $B = \{1, 2, 3, 5\}$ verify if
(i) $(A \cup B)^c = A^c \cap B^c$ and (ii) $(A \cap B)^c = A^c \cup B^c$.

d) Find the sum of all natural numbers between 200 and 500 which are multiples of 4.

e) A 3 digit number is to be formed by using the digits 1, 2, 3, 4, 5 and 6. In how many ways can you do this if the number is to be odd?

OR

Q.II. Attempt the following:

(4X5=20)

v) Find the compound interest on Rs. 7,000/- for two years at rate of 10% p.a. compounded half yearly.

w) Verify if $x + y - 1 = 0$; $2x - y + 3 = 0$ and $x - 2y + 1 = 0$ are consistent.

x) If $A = \{x/x \text{ is a letter of word "stats"}\}$

$B = \{x/x \text{ is a letter of word "maths"}\}$

$C = \{x/x \text{ is a letter of word "accounts"}\}$

Check if $(A \cup B) - (A \cap C) = A \cup C$.

y) The general term of a sequence is $5n + 2$. Verify if it is an A.P.

Cont. -->

- z) How many words can be formed by using the letters of the word 'logarithm'. How many of these words start and end with a consonant?

(4X5=20)

Q.3. Attempt the following:

- Check if $\sim(p \wedge q) = \sim p \vee \sim q$.
- Find the point of intersection of the lines $x + 2y - 1 = 0$ and $2x - 2y = 5$.
- In a group of 400 people, 250 can speak in English and 200 can speak in Konkani. Using Venn diagram, find the number of people speaking both the languages.
- Mahesh saves Rs. 25/- in the 1st month and then continue his saving by increasing the amount Rs. 10 every month. If he continues in this manner, what will be his saving after 3 years?
- A committee is to be formed from 3 boys and 5 girls. Find the number of ways in which these can be done if the committee is to include atleast 2 boys.

OR

(4X5=20)

Q.III. Attempt the following:

- If I take tea then I do not have headache. I have headache. Therefore I do not take tea. Check the validity of the above argument.
- Solve $x - y - z = 7$; $x + 2y + z = 15$; $-x + 4y + z = -1$.
- $X = \{1, 2, 3, \dots, 10\}$ is an universal set. $A = \{1, 3, 7, 8\}$; $B = \{2, 3, 6, 7, 8, 9\}$ Find
1) $(A - B) \cap (A \cup B)$
- Find $7 + 77 + 777 + \dots$ to n terms.
- A committee of 3 is to be formed from 3 Doctors, 2 Engineers and 4 Advocates. In How many ways can you do this if the committee is to have representation from all sections?

Q.4. Attempt the following:

(4X5=20)

- Find $10 + 15 + 20 + \dots$ to 20 terms.
- A sum was borrowed at 12% interest to be compounded monthly. It was repaid in 12 equal installments of Rs. 1300/- each, paid at the end of each month. Find the sum borrowed.
- 3 books on English, 4 books on Marathi and 2 books in Konkani. In how many ways can they be arranged on a shelf, so that books of the same subject are together?
- Find the amount of ordinary annuity with periodic investments of Rs. 6,000/- at the rate of interest of 8% p.a. for 3 years. Period of Investment is yearly.
- If $A = \begin{bmatrix} 2 & 1 \\ 4 & 3 \end{bmatrix}$; $B = \begin{bmatrix} -1 & 3 \\ 2 & -1 \end{bmatrix}$ find AB and BA

OR

Q.IV. Attempt the following:

(4X5=20)

- Find 3 numbers in G.P. such that their sum is 26 and the product is 216.
- A company decides to create a sinking fund for paying the debenture issue of Rs. 5 lakh at the end 14 years. What will be some retained out of the profit at the end of each year, assuming the money accumulated earns 8% p.a. compound interest.
- In how many ways a committee of 4 can be formed from 5 Teachers and 3 Doctors, so as to include exactly 2 Doctors?
- Find the future value of Rs. 5,000/- after 2 years if compound interest rate is 8% per annum.

z) If $A = \begin{bmatrix} 2 & 1 & 4 \\ 1 & -1 & 2 \\ 3 & 1 & 1 \end{bmatrix}$ Find $A^2 - 3I$.

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