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BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SPECIALIZATION IN CYBER SECURITY(CS)
EXAMINATION : DECEMBER - 2023
SEMESTER – I

Sub: Mathematics (BCA –23-102/BCAC 23-102)

Date : 28/12/2023

Total Marks : 60

Time: 10.00 am To 12.30 pm

Instructions:

1. All questions are compulsory unless and otherwise stated.
2. Bold figures to the right of every question are the maximum marks for that question.
3. Candidates are advised to attempt questions in order.
4. Answers written illegibly are likely to be marked zero.
5. Use of Basic calculators, Log tables, Mollier Charts is allowed.
6. Draw neat and labeled diagrams wherever necessary.

Q.1. Solve (Any 4) (8)

1. Let $A = \{x: x \text{ is a natural number and a factor of } 18\}$ and $B = \{x: x \text{ is a natural number and less than } 6\}$. Find $A \cup B$
2. Draw the graph for $f(x) = 3x$
3. If A and B are two events such that $P(A) = 0.8$, $P(B) = 0.6$ and $P(A \cap B) = 0.5$. Find $P(A \cup B)$
4. Evaluate: $2! + 6!$
5. Find T_n for following A.P: 1,5,9,13,17
6. Find the number of arrangements that can be made using all the letters of the word ABSURD

Q.2. Solve (Any 3) (9)

1. Find the modulus of $7+i/1-i$
2. For a G.P, $a=5$, $r=2$, $S_n=635$, Find n
3. Solve: $6x^2-13x-6=0$
4. Draw Truth Table for $p \vee \sim p$

Q.3. Solve (Any 2) (8)

1. Draw Venn Diagrams for: a) $A \cup B$ b) $A \cap B$ c) A' d) $A-B$
2. Find $A \times B$ if $A = \begin{bmatrix} 4 & -2 \\ 7 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 5 \\ 2 & -3 \end{bmatrix}$
3. Six boys and seven girls are to be seated for a photograph in a row. Find the number of ways in which they can be seated, if no two girls sit together

Q.4. Solve (Any 3) (15)

1. Draw graph of the following function
 $F(X) = -1$ when $x < 0$
 $= 0$ when $x = 0$
 $= 1$ when $x > 0$

2. Given Statements:
 P: John is a good boy
 Q: John is an intelligent boy
 Write the following: 1) $\sim p$ 2) $\sim q$ 3) $p \vee q$ 4) $p \wedge q$
3. In a class, there are 15 boys and 10 girls. Three students are selected at random. The probability that 1 girl and 2 boys are selected, is?
4. Find the quadratic equation whose roots are $2\alpha+5$, $2\beta+5$, given that α , β are the roots of the equation $2x^2-3x+5$

Q.5. Solve. (Solve any 2) (20)

1. A husband and a wife appeared in an interview for two vacancies in the office. The probability of the selection of the husband is $1/7$ and that of wife's is $1/5$. Find the probability that:
 i) Both are selected ii) one of them is selected
2. Solve by Matrix method
 $x-y+2z = -1$
 $2x+y+z = 1$
 $3x+3z = 0$
3. Let $f = \{(3, 1), (9, 3), (12, 4)\}$ and $g = \{(1, 3), (3, 3), (4, 9), (5, 9)\}$. Show that $g \circ f$ and $f \circ g$ are defined. Also find $f \circ g$ and $g \circ f$
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