Group - A (ALGEBRA-II)

A. Ans Any two $2 \times 5 = 10$

A.1. a) For three set $A = \{1,2,3,4,5,6,7,8,9,10\}$, $B = \{2,4,6,8,10\}$
$C = \{1,3,5,7,9\}$. Verify that $A - (B \cup C) = (A-B) \cap (A-C)$

b) $A = \{p, q, r\}$, $B = \{s, t, u\}$, $C = \{s, u\}$. Verify that
$A \times (B-C) = (A \times B) - (A \times C)$.

A.2. a) Let (G, o) be a group. Then prove that
$(a o b)^{-1} = b^{-1} o a^{-1}$ $\forall$ $a, b \in G$.

b) Show that the set of all root of the equation
$x^4 = 1$ form a group under multiplication.

A.3. a) In the real vector space R^3, $\alpha = (0,1,3)$, $\beta = (2,1,1)$, $\gamma = (4,2,2)$.
Are the Linearly Independent. Justify.

b) Prove that the set $S = \{(2,1,1), (1,2,1), (1,1,2)\}$ form
a basis of R^3.

Group - B (Computer)

B. Ans any three :— $3 \times 6 = 18$

B.1. a) Write down the full form of the following.
   a) CPU   b) ALU c) MICR. d) OMR , e) OCR.
   f) CU.

B.2. Write down the difference between Hardware
   and software.

B.3. a) obtain the binary equivalant of the number
   $(13.535)_{10}$.

b) Find the subtraction $1101010 - 0101010$. (2's complement)

B.4. Write down the flow chart to calculate maximum of three real numbers follows.

B.5. Write a C program to determine whether a year is a leep year or ⊘ not.

Group-C (Probability)

C.

1. Answer any two:- $6 \times 2 = 12$

1.a) The probability density function of a continuous distribution is given by $f(x) = \frac{3}{4} x(2-x)$, $0 < x < 2$
compute the mean and variance.

1.b) The joint probability density function of two random variable X and Y is given by
$f(x) = 8xy$ $0 \le x \le y$, $0 \le y \le 1$
$= 0$, else where.
Determine marginal density function X & Y; check whether X and Y are independent. Also compute $Var(x)$ and $Var(Y)$.

1.c) Find the Mean and variance of Binomial Distribution.

2. Answer Any one.
                                             $5 \times 1 = 5$

2.a) State and ~~proved~~ proof the Bayes theorem.

2.b) Foure dice are thrown. Find the probability that the sum of the number will be 15.