Ques 6. An Insurance company issues a policy to an applicant only when the applicant satisfies at least one of the following conditions:

- The applicant is a married male of age 25 years or above.
- The applicant is a female who never had a car accident.
- The applicant is a married female and has had a car accident.
- The applicant is a male below 25 years.
- The applicant is not below 25 years and has never had a car accident.

Inputs are –
M - The applicant is married (1 indicates yes and 0 indicates no)
C - The applicant has had a car accident (1 indicates yes and 0 indicates no)
S - The applicant is a male (1 indicates yes and 0 indicates no)
Y - The applicant is below 25 years (1 indicates yes and 0 indicates no)
Output is –
I : Denotes, Issue the policy (1 indicates it is issued and 0 indicates it is not issued)

(a) Draw the truth table for the inputs and outputs given above.
Write the SOP expression for I(M, S, C, Y) 5

(b) Reduce I(M, S, C, Y) using Karnaugh's map.
Draw the logic gate diagram for the reduced SOP expression for I(M, S, C, Y) using AND & OR gates. You may use gates with two or more inputs. Assume that variables and their complements are available as inputs. 5

(a) Given the Boolean function $F(A, B, C, D) = \Sigma(5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)$. 5
Use Karnaugh's map to reduce this function F, using the given SOP. Draw the logic gate diagram for the reduced SOP form. You may use gates with more than two inputs. Assume that variables and their complements are available as inputs.

(b) Given $F(A, B, C, D) = \pi (0, 1, 3, 5, 6, 7, 10, 14, 15)$. 5
Use Karnaugh's map to reduce this function F, using the given POS form. Draw the logic gate diagram for the reduced POS form. You may use gates with more than two inputs. Assume that variables and their complements are available as inputs.

(a) Given the Boolean function $F(A, B, C, D) = \Sigma(0, 1, 6, 7, 8, 9, 10, 14, 15)$. 5
Use Karnaugh's map to reduce this function F, using the given SOP. Draw the logic gate diagram for the reduced SOP form. You may use gates with more than two inputs. Assume that variables and their complements are available as inputs.

(b) Given $F(A, B, C, D) = \pi (2, 3, 4, 5, 11, 12, 13)$. 5
Use Karnaugh's map to reduce this function F, using the given POS form. Draw the logic gate diagram for the reduced POS form. You may use gates with more than two inputs. Assume that variables and their complements are available as inputs.

A committee has three general members and a Group Head, Mr. Amazing. The three general members are Mr. Big, Ms. Creative and Ms. Dynamic. According to the rule a motion passes only when

- The Group Head and at least any one general member vote yes
  or
- All three general members vote yes

Let us assume that :

INPUTS ARE :

A :	Denotes Mr. Amazing's vote	(1 indicates yes and 0 indicates no)
B :	Denotes Mr. Big's vote	(1 indicates yes and 0 indicates no)
C :	Denotes Ms.Creative's vote	(1 indicates yes and 0 indicates no)
B :	Denotes Ms. Dynamic's vote	(1 indicates yes and 0 indicates no)

OUTPUT IS :

M : Denotes the passage of a motion (1 indicates the motion passes and 0 indicates it does not)

(a) Draw the truth table for the inputs and outputs given above and write the SOP expression for the result of the motion M (A, B, C, D).Reduce M (A, B, C, D) using Karnaugh's map. 5

(b) Draw the logic gate diagram for the reduced SOP expression for M (A, B, C, D) using AND & OR gates. You may use gates with two or more inputs. Assume that variables and their complements are available as inputs. 5