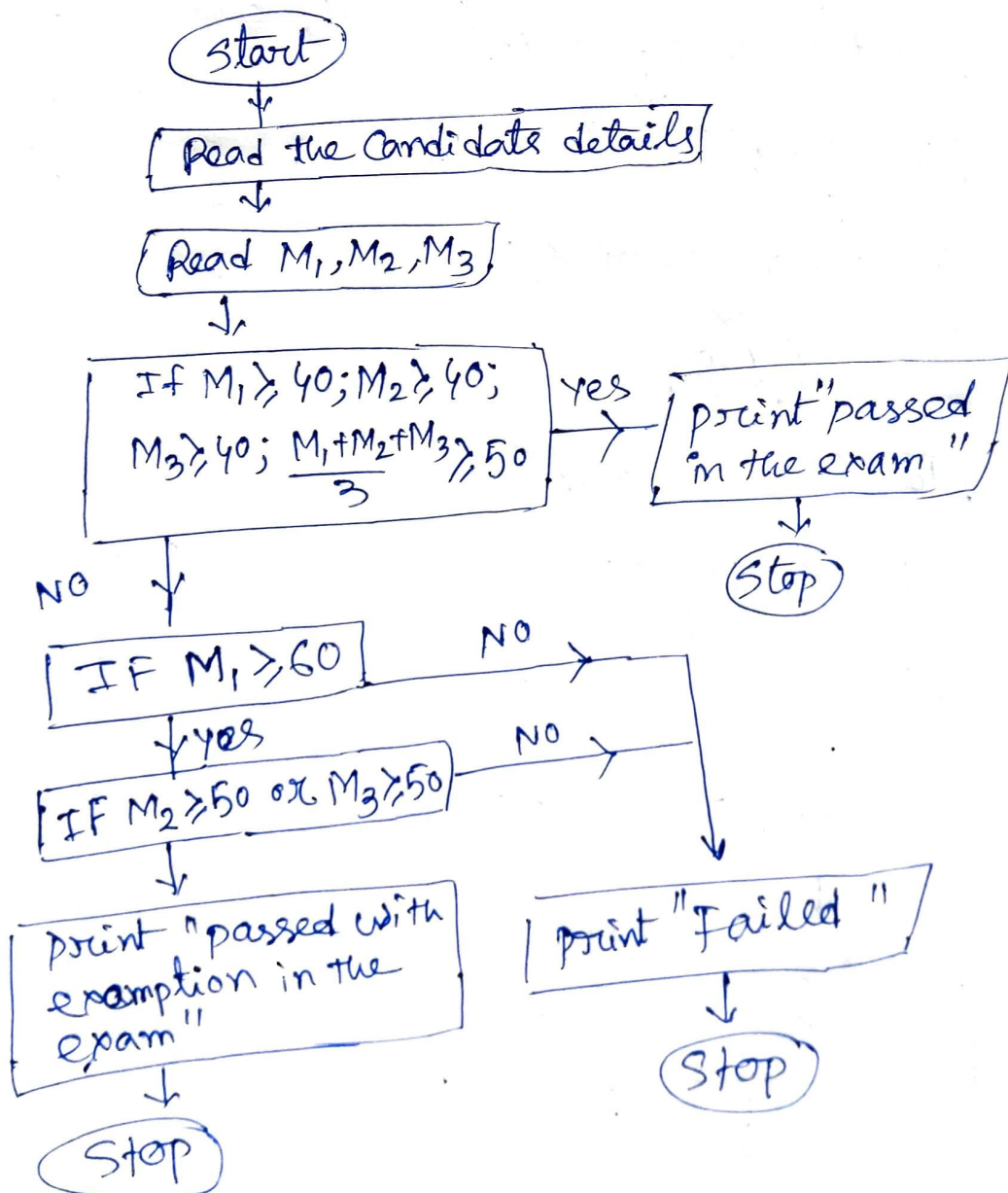# IFoS – 2011 – Paper II

6) (b) Draw a flow chart to declare the results for the following examination system: 60 candidates Take the exam. Each candidate writes one major and two minor papers. A candidate is decleared to have passed in the examination if he/she gets a minimum of 40 in all the three papers separately and an average of 50 in all the three papers put togethers. Remaining Candidates fail in the examination with an examption in major if they obtain 60 and above and examption in each minor if they obtain 50 and more in the minor.

→ Let M_1 be the major subject & M_2, M_3 are the minor subjects,

$$\boxed{\text{Start}}$$
↓
$$\boxed{\text{Read the Candidate details}}$$
↓
$$\boxed{\text{Read } M_1, M_2, M_3}$$
↓

If $M_1 \geqslant 40$; $M_2 \geqslant 40$; $M_3 \geqslant 40$; $\dfrac{M_1 + M_2 + M_3}{3} \geqslant 50$ — yes → print "passed in the exam" → Stop

NO ↓

IF $M_1 \geqslant 60$ — NO →

↓ yes

IF $M_2 \geqslant 50$ or $M_3 \geqslant 50$ — NO →

↓

print "passed with examption in the exam" → Stop

print "Failed" → Stop

8)(b) Draw a flow chart to solve a quadratic equation with non zero co-efficients. The roots be classified as real distinct, real repeated and Complex.

⇒ let $ax^2 + bx + c = 0$ be the quadratic equation

Flow chart ⇒

```
                    ( Start )
                        ↓
                ( Input a,b,c )
                        ↓
                              yes
                ( Is A=0 ) ──────→  [ print "The equation is
                        │              not Quadratic." ]
                        ↓
                [ Compute
                  Disc = b²-4ac ]
                        ↓
                              yes
                | Is Disc<0 | ──────→  [ print " The roots are      ]──→ ( Stop )
                        │                Complex root "
                       ↓ NO
                | Is Disc =0 |  yes
                        │    ─────→  [ Compute x₁ = -b/2a ]
                       ↓ NO                    ↓
                        ↓              [ print x₁, x₁ ] ──→ ( stop )
                [ Is Disc >0 ]
                        ↓ yes
                [ Compute
                    x₁ = (-b + √Disc) / 2a
                    x₂ = (-b - √Disc) / 2a ]
                        ↓
                [ Print x₁, x₂ ]
                        ↓
                    ( Stop )
```

Compute Disc $= b^2 - 4ac$

Is Disc < 0 → print "The roots are Complex root"

Is Disc $= 0$ → Compute $x_1 = -b/2a$ → print x_1, x_1

Is Disc > 0 → Compute $x_1 = \dfrac{-b + \sqrt{Disc}}{2a}$, $x_2 = \dfrac{-b - \sqrt{Disc}}{2a}$ → Print x_1, x_2