QUIZ 3 SPK 2024/2025
MABAC-GDSS-FUZZY

Case:
A university wants to choose **the best city** to open **a new campus**. There are **4 alternative cities**:

1. **A1: Alpha City**
2. **A2: Beta City**
3. **A3: Gamma City**
4. **A4: Delta City**

The main criteria considered:

1. **C1: Operating Costs**
2. **C2: Accessibility**
3. **C3: Student Potential**
4. **C4: Local Government Support**

The weight of each criterion is the same for all DMs, which is 0.25

There are **3 Decision Makers (DMs):** DM1, DM2, DM3. Assessment of DM1, DM2, DM3 against each alternative (in linguistic value):

DM1					**DM2**				
Criterion	C1	C2	C3	C4	**Criterion**	C1	C2	C3	C4
A1	Keep	Tall	low	Keep	**A1**	Tall	low	low	Keep
A2	Tall	Tall	keep	Tall	**A2**	Tall	Low	Tall	Keep
A3	Low	Keep	Tall	Tall	**A3**	Low	Low	Keep	Tall
A4	Keep	Keep	Keep	low	**A4**	Low	Keep	Tall	Keep

DM3				
Criterion	C1	C2	C3	C4
A1	Low	low	low	low
A2	Keep	tall	Keep	Tall
A3	Low	Keep	Tall	Keep
A4	Keep	Keep	Keep	Keep

Fuzzy Ratings for criteria are given as **linguistic values**:

Linguistic Value	**Fuzzy Representation**
Low (R)	(0, 25, 50)
Medium (S)	(25, 50, 75)
Height (T)	(50, 75, 100)

QUESTION:

1. Draw the curve of the membership function (membership function: Low, Medium and High) according to the given Fuzzy Representation. **(10)**
2. Determine the Crisp value of each linguistic value using the **Centroid of Grafity formula (5)**
3. Determine Criteria Type **(5)**
4. Show the calculation to get the ranking of each DM based on the MABAC method **(60)**
5. Determine the Ranking Results of all DMs processed using **Borda** or **Copeland** to determine the final result **(20)**