**CHINEDUM PRUDENCE ESE**

**MATRIC NO: 17/ENG01/007**

**Material balance equations on the overall of the three columns will yield:**

0.15×70=0.07×D1+0.18×B1+0.15×D2+0.24×B2

0.25×70=0.04×D1+0.24×B1+0.10×D2+0.65×B2

0.40×70=0.54×D1+0.42×B1+0.54×D2+0.10×B2

0.20×70=0.35×D1+0.16×B1+0.21×D2+0.01×B2

The two streams B and D can be got from material balance equations around both towers number 2 and

3,

**For tower 2: D=D1+B1**

𝐷𝑥𝐷𝑋=0.07×𝐷1+0.18×𝐵1

𝐷𝑥𝐷𝑆=0.04×𝐷1+0.24×𝐵1

𝐷𝑥𝐷𝑇=0.54×𝐷1+0.42×𝐵1

𝐷𝑥𝐷𝐵=0.35×𝐷1+0.16×𝐵1

**For tower 3: B=D2+B2**

𝐵𝑥𝐵𝑋=0.15×𝐷2+0.24×𝐵2

𝐵𝑥𝐵𝑆=0.10×𝐷2+0.65×𝐵2

𝐵𝑥𝐵𝑇=0.54×𝐷2+0.21×𝐵2

𝐵𝑥𝐵𝐵=0.21×𝐷2+0.01×𝐵2

