**Self –Test Problem 9.1**

**Individual costs and WACC** Humble Manufacturing is interested in measuring its overall cost of capital. The firm is in the 40% tax bracket. Current investigation has gathered the following data:

**Debt** The firm can raise debt by selling $1,000-par-value, 10% coupon interest rate, 10-year bonds on which annual interest payments will be made. To sell the issue, an average discount of $30 per bond must be given. The firm must also pay flotation costs of $20 per bond.

**Preferred stock** The firm can sell 11% (annual dividend) preferred stock at its $100-per-share par value. The cost of issuing and selling the preferred stock is expected to be $4 per share.

**Common stock** The firm’s common stock is currently selling for $80 per share. The firm expects to pay cash dividends of $6 per share next year. The firm’s dividends have been growing at an annual rate of 6%, and this rate is expected to continue in the future. The stock will have to be underpriced by $4 per share, and flotation costs are expected to amount to $4 per share.

**Retained earnings** The firm expects to have $225,000 of retained earnings available in the coming year. Once these retained earnings are exhausted, the firm will use new common stock as the form of common stock equity financing.

**a. Calculate the individual cost of each source of financing. (Round to the nearest 0.1%.)**

**b. Calculate the firm’s weighted average cost of capital using the weights shown in the following table, which are based on the firm’s target capital structure proportions. (Round to the nearest 0.1%.)**

|  |  |
| --- | --- |
| **Source of capita** | **Weight** |
| Long-term debt | 40% |
| Preferred stock | 15% |
| Common stock equity | 45% |
| **Total** | **100%** |

**c. In which, if any, of the investments shown in the following table do you recommend that the firm invest? Explain your answer. How much new financing is required?**

|  |  |  |
| --- | --- | --- |
| **Investment opportunity** | **Expected rate of return** | **Initial investment** |
| A | 11.2% | $100,000 |
| B | 9.7 | 500,000 |
| C | 12.9 | 150,000 |
| D | 16.5 | 200,000 |
| E | 11.8 | 450,000 |
| F | 10.1 | 600,000 |
| G | 10.5 | 300,000 |

**Solution of Self -Test Problem**

1. **Cost of debt, ri (using approximation formula)**

**I** = 0.10 \* $1,000 = $100

Nd = $1,000 - $30 discount - $20 flotation cost = $950

n = 10 years

(Calculator solution 10.8%)

Ri = rd\* (1 - T)

T = 0.40

Ri= 10.8% \* (1 - 0.40) = 6.5%

Cost of preferred stock, rp

Dp = 0.11 \* $100 = $11

Np = $100 - $4 flotation cost = $96

Cost of retained earnings, rr

Cost of new common stock, rn

D1 = $6

Nn = $80 - $4 underpricing - $4 flotation cost = $72g = 6.0%

**b. WACC for total new financing $500,000. This level of new financing is obtained by using retained earning so the cost of common equity is equal to the cost of retained earnings.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Source of capital** | **Weight** | **Cost** | **Weighted**  **cost** |
| **Long-term debt** | **.40** | **6.5%** | **2.6%** |
| **Preferred stock** | **.15** | **11.5** | **1.7** |
| **Common stock equity** | **.45** | **13.5** | 6.1 |
| **Totals** | **1.00** |  | **10.4%** |

**Weighted average cost of capital 10.4%**

**WACC for total new financing $500,000. This level of new financing requires the use of new common stock so the cost of common equity is equal to the cost of new common stock.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Source of capital** | **Weight** | **Cost** | **Weighted**  **cost** |
| **Long-term debt** | **.40** | **6.5%** | **2.6%** |
| **Preferred stock** | **.15** | **11.5** | **1.7** |
| **Common stock equity** | **.45** | **14.3** | 6.4 |
| **Totals** | **1.00** |  | **10.7%** |

**Weighted average cost of capital 10.7%**

|  |  |  |  |
| --- | --- | --- | --- |
| **Investment** | **Internal rate of return** | **Initial** | **Cumulative investment** |
| D | 16.5% | $200,000 | $ 200,000 |
| C | 12.9 | 150,000 | 350,000 |
| E | 11.8 | 450,000 | 800,000 |
| A | 11.2 | 100,000 | 900,000 |
| G | 10.5 | 300,000 | 1,200,000 |
| F | 10.1 | 600,000 | 1,800,000 |
| B | 9.7 | 500,000 | 2,300,000 |

**c.**

Projects D, C, E, and A should be accepted because their respective IRRs exceed the WMCC. They will require $900,000 of total new financing.