Questions	DIVIDEND DECISIONS	Questions	DIVIDEND DECISIONS
1	CW	30	HW Typed
2	HW Typed	31	HW Typed
3	CW	32	CW
4	CW	33	HW Typed
5	HW Typed	34	HW Typed
6	HW Typed	35	HW Typed
7	HW Typed	36	HW Typed
8	CW	37	HW Typed
9	CW		
10	CW		
11	CW		
12	HW Typed		
13	CW		
14	HW Typed		
15	CW		
16	CW		
17	HW Typed		
18	HW Typed - Disccussed in class		
19	HW Typed		
20	CW		
21	CW		
22	CW		
23	CW		
24	HW Typed		
25	CW		
26	HW Typed		
27	HW Typed		
28	HW Typed		
29	HW Typed		

Number of shares = n = original shares = 10,000
P_0 = Price of share today = ₹100

Sol①

Capitalisation rate = K_e = 10%

Investment Expenditure = ₹2,00,000.
Earnings of year = ₹1,00,000.

(i) If Dividend not Paid, So $\boxed{D_1 = 0}$

Step①
$$P_0 = \frac{P_1 + D_1}{(1+K_e)}$$
$$₹100 = \frac{P_1 + 0}{(1+10\%)}$$
$$₹100(1.10) = P_1$$
So, $\boxed{P_1 = ₹110}$

Step②
Investment expenditure = ₹2,00,000
+ Dividend Paid (10,000 × 0) = ₹ 0
− Earnings in year = −₹1,00,000

Deficit = ₹1,00,000
÷ Price of share at end ÷ 110

New Shares issued = Δn = 909 shares.

Step③ To verify
Value of firm today = PV of Value of firm at end of year 1.
$$n \times P_0 = \frac{(n+\Delta n)P_1 + \text{Earnings} - \text{Investment Exp}}{(1+K_e)}$$
$$10{,}000 \times 100 = \frac{\left(10{,}000 + \frac{1{,}00{,}000}{110}\right) \times 110 + 1{,}00{,}000 - 2{,}00{,}000}{(1+10\%)}$$
$$₹10{,}00{,}000 = \frac{₹11{,}00{,}000}{(1+10\%)}$$
₹10,00,000 ⇒ ₹10,00,000

Sol ① (ii) If Dividend is paid $\boxed{D_1 = ₹5}$

original shares = $n = 10,000$

Price today = $P_0 = ₹100$

__Step ①__

$$P_0 = \frac{P_1 + D_1}{(1+ke)}$$

$$₹100 = \frac{P_1 + ₹5}{(1+10\%)}$$

$$₹100 = \frac{P_1 + ₹5}{1.10} \Rightarrow \boxed{P_1 = ₹105}$$

__Step ②__

Investment Expenditure	=	₹2,00,000
Dividend distributed (10,000 x ₹5)	=	₹50,000
− Earning	=	− ₹1,00,000
Deficit	=	₹1,50,000
÷ Price at end of year		÷ 105
Δn = New shares issued	=	1428.57 ~ $\boxed{1429}$ shares

Step ③ To verify

Value of firm originally = PV of value of firm at end.

$$n \times P_0 = \frac{((n+\Delta n) P_1 + \text{Earning} - \text{Investment})}{(1+ke)}$$

$$10,000 \times ₹100 = \frac{\left(10,000 + \frac{150000}{105}\right) \times 105 + 1,00,000 - 2,00,000}{(1+10\%)}$$

$$₹10,00,000 = \frac{₹11,00,000}{(1.10)}$$

$$₹10,00,000 \Rightarrow \boxed{₹10,00,000}$$

Sol ③ **Income Statement**

Particulars	Amt (₹)
Profit after Tax	30,00,000
− Pref Dividend (100L × 12%)	−12,00,000
Earning available for ESC	18,00,000
÷ No of equity shares	÷ 3,00,000
EPS	₹6/share

$Ke < r$

$16\% < 20\%$

ⓐ As $Ke < r$, So optimum dividend Policy is 0%.
The company should retain 100% and declare dividend 0%.

So, optimum dividend = ₹0.

By walter model,

$$P = \frac{D + \frac{(E-D)\times r}{Ke}}{Ke}$$

$$P = \frac{0 + \frac{(6-0)\times 20\%}{16\%}}{16\%} = \frac{0 + \frac{1.2}{0.16}}{0.16} = \frac{7.5}{0.16}$$

So, $\boxed{P = ₹\ 46.875}$

Thus at optimum dividend Policy share Price will be ₹46.875

(4) If we want price at ₹42.

Walter model

$$P = \frac{D + \frac{(E-D)\times r}{Ke}}{Ke}$$

$$42 = \frac{D + \frac{(6-D)\times 0.20}{0.16}}{0.16}$$

$$42 \times 0.16 = D + (6-D) \times \frac{20}{16}$$

$$6.72 = D + (6-D)(1.25)$$

$$6.72 = D + 7.5 - 1.25D$$

$$6.72 = 7.5 - 0.25D$$

$$0.25D = 7.5 - 6.72$$

$$D = \frac{0.78}{0.25} = \boxed{3.12}$$

So, If dividend = ₹3.12, then share price = ₹42.

So, dividend payout rate $= \frac{DPS}{EPS} = \frac{₹3.12}{26} \times 100 = 12\%$

Sol(4)

Profit after TAX (NP)	=	₹30,00,000
− Pref Dividend (100L × 12%)	=	−₹12,00,000
EAES	=	₹18,00,000
÷ No. of equity shares		÷ 3,00,000
EPS	=	₹6/share

Ke < r

16% < 20%

optimum dividend is 0% (but it's not asked in question)

Gordon Model ⇒ $P = \frac{D_1}{Ke - g} = \frac{D_1}{Ke - b \times r}$

(i) If Dividend Payout rate is 25%.

So, retention rate = b = 100% − Dividend Payout rate

b = 100% − 25% = 75% = 0.75

Growth rate = $b \times r$ = 0.75 × 20% = 15% = g

D_1 = EPS × Dividend Payout rate = ₹6 × 25% = ₹1.5

$P = \frac{D_1}{Ke - g} = \frac{1.5}{16\% - 15\%} = \frac{1.5}{1\%} = \frac{1.5}{0.01} = \boxed{₹150}$

(ii) If Dividend Payout is 50%

So, retention rate = 100 − 50 = 50% = 0.5

Growth rate = $b \times r$ = 0.5 × 20% = 10%.

D_1 = ₹6 × 50% = $\boxed{₹3}$

$\boxed{P} = \frac{3}{16\% - 10\%} = \frac{3}{6\%} = \frac{3}{0.06} = \boxed{₹50}$

(iii) If Dividend Payout is 100%

Retention ratio = 0%

Growth rate = $b \times r$ = 0% × 20% = 0%

D_1 = ₹6 × 100% = $\boxed{₹6}$

$$P = \frac{6}{16\% - 0\%} = \frac{6}{0.16} = \boxed{₹37.5}$$

Sol ⑧ As per Graham-Dodd Model.

$$P = m\left(D + \frac{E}{3}\right)$$

$$P = 2\left(30 \times 60\% + \frac{30}{3}\right)$$

$$P = 2(18+10) = \boxed{₹56}$$

Sol ⑨

$$P = m\left(D + \frac{E}{3}\right)$$

$$58.33 = 7\left(5 + \frac{E}{3}\right)$$

$$\frac{58.33}{7} = 5 + \frac{E}{3}$$

$$(8.3328 - 5) \times 3 = E$$

$$E = ₹10 \text{ (approx)}$$

Sol ⑩ Lintner Model $\Rightarrow$ $D_1 = D_0 + \left(\text{EPS} \times \text{Target Payout ratio} - D_0\right) \times Af$

$$D_1 = 9.8 + \left(20 \times 60\% - 9.8\right) \times 45\%$$

$$D_1 = ₹10.79$$

Sol 11 Share Capital = 10,000 shares × ₹100 = ₹10,00,000.

Number of Shares = $n = \frac{10,00,000}{100} = 10,000$

P_0 = Current Price = ₹100

Capitalization rate = K_e = 12%

(i) If Dividend not declared

$$P_0 = \frac{P_1 + D_1}{(1+K_e)}$$

$$100 = \frac{P_1 + 0}{(1+12\%)}$$

$$\boxed{P_1 = ₹112}$$

(ii) If Dividend declared (D_1 = ₹10)

$$P_0 = \frac{P_1 + D_1}{(1+K_e)}$$

$$100 = \frac{P_1 + 10}{(1+12\%)}$$

$$\boxed{P_1 = ₹102}$$

(iii) If Dividend is declared, D_1 = ₹10.

Step 1 P_1 = ₹102

Step 2 Investment Exp = ₹10,00,000

+ Dividend Dist = ₹1,00,000

(10,000 × ₹10)

− Earnings − ₹5,00,000

Deficit = ₹6,00,000

÷ P_1 ÷ 102

New share issued = 5883 (approx)

(Δn)

Step 3 To verify

Value of firm originally = Present value of (value of firm at end of year 1)

$$n \times P_0 = \frac{(n+\Delta n)P_1 - \text{Investment} + \text{Earnings}}{(1+K_e)}$$

$$10{,}000 \times ₹100 = \frac{\left(10{,}000 + \frac{₹6{,}00{,}000}{102}\right) \times 102 - 10{,}00{,}000 + 5{,}00{,}000}{(1+12\%)}$$

$$₹10{,}00{,}000 = ₹10{,}00{,}000$$

Hence verified.

Sol 13 (i) Growth $r = 15\%$, $Ke = 10\%$, $EPS = ₹10$, $b = 0.6\ (60\%)$

$g = b \times r = 0.6 \times 15\% = \boxed{9\%}$

$D_1 = ₹10 \times (1-b) = ₹10 \times 40\% = ₹4$

Gordon model = $P = \frac{D_1}{Ke - g} = \frac{₹4}{10\% - 9\%} = \frac{4}{0.01} = \boxed{₹400}$

(ii) Normal firm

$r = 10\%$, $Ke = 10\%$, $EPS = ₹10$, $b = 0.6\ (60\%)$

$g = b \times r = 0.6 \times 10\% = \boxed{6\%}$

$D_1 = ₹10 \times 40\% = ₹4$

$P = \frac{D_1}{Ke - g} = \frac{₹4}{(10\% - 6\%)} = \frac{₹4}{4\%} = \boxed{₹100}$

(iii) Declining firm

$g = b \times r = 0.6 \times 8\% = \boxed{4.8\%}$

$D_1 = ₹10 \times 0.4 = ₹4$

$P = \frac{₹4}{10\% - 4.8\%} = \boxed{₹76.92}$

Sol 15) (i) $EPS = E = \frac{₹290000}{29000} = ₹10.$

$DPS = D = \frac{₹15000}{29000} = ₹7.5.$

$P/E \text{ ratio} = 12.5$, $Ke = \frac{1}{P/E \text{ ratio}} = \frac{1}{12.5} \times 100 = \boxed{8\%}$

$r = \text{rate of return} = \frac{\text{Earnings}}{\text{Equity value}} = \frac{₹290000}{29000 \times ₹100} \times 100 = 10\%$

If $r > Ke$, so optimal Dividend policy should be 0 Dividend.
$10\% > 8\%$

Firm is not following optimal Dividend Policy. (as firm has paid ₹7.5 dividend per share whereas optimal dividend was '0'.)

(ii) If $Ke = r$, Dividend policy will be irrelevant. (Company can pay any amount as dividend).

$Ke = r$

$\frac{1}{P/E} = r$

$\frac{1}{P/E} \times 100 = 10\%$

If $\boxed{P/E = 10 \text{ Times}}$, dividend policy will have no impact on value of shares.

(iii) If $P/E = 8$,

$$Ke = \frac{1}{P/E} \times 100 = \frac{1}{8} \times 100 = 12.5\%$$

Then $Ke > r$

$12.5\% > 10\%$, optimal dividend policy will be 100% dividend payout.

As $Ke > r$, thus all the earnings should be distributed as dividend.

Thus our Advice has changed if $P/E = 8$ Times.

$D = 100\% \times 10 = ₹10$

$$P = \frac{D + \frac{(E-D) \times r}{Ke}}{Ke} = \frac{10 + \frac{(10-10) \times 10\%}{12.5\%}}{12.5\%} = \boxed{₹80}$$

Sol (16) EPS = ₹10, DPS = ₹6, Ke = 20%, r = 25%

Dividend Payout $= \frac{6}{10} \times 100 = 60\%$, $D = ₹10 \times 60\% = \boxed{₹6}$

b = Retention rate = $100\% - 60\% = 40\% = 0.4$

(i) Walters Model ⇒ $P = \dfrac{D + \frac{(E-D) \times r}{Ke}}{Ke} = \dfrac{6 + \frac{(10-6) \times 25\%}{20\%}}{20\%}$

$$P = \frac{6 + \frac{4 \times 0.25}{0.20}}{0.20} = \frac{6+5}{0.20} = \boxed{₹55}$$

(ii) Gordon's Model ⇒

$$P = \frac{D}{Ke - g} = \frac{₹6}{20\% - b \times r} = \frac{6}{20\% - 0.4 \times 25\%}$$

$$P = \frac{6}{20\% - 10\%} = \frac{6}{0.10} = \boxed{₹60}$$

$g = b \times r = 0.4 \times 25\% = 10\%$

$EPS = E = ₹10$

$Ke = 10\%$

Sol 18

Dividend = (i) 50% $= \boxed{₹5}$, (ii) 75% $\boxed{₹7.5}$ & (iii) 100% $\boxed{₹10}$

rate of return: (a) 15%, (b) 10%, (c) 5%

	(i) $D = ₹5$	(ii) $\boxed{D = 7.5}$	(iii) $\boxed{D = ₹10}$
(a) $r = 15\%$	$\frac{5 + \frac{(10-5) \times 15\%}{10\%}}{10\%}$ $= \boxed{₹125.}$		
(b) $r = 10\%$ =	$\frac{5 + \frac{(10-5) \times 10\%}{10\%}}{10\%}$ $= \boxed{₹100}$		
(c) $r = 5\% \Rightarrow$	$\frac{5 + \frac{(10-5) \times 5\%}{10\%}}{10\%}$ $= \boxed{₹75}$		

Sol 20

$$EPS = \frac{₹10{,}00{,}000}{2{,}00{,}000} = ₹5/\text{share}$$

$$DPS = \frac{₹6{,}00{,}000}{2{,}00{,}000} = ₹3/\text{share}$$

P/E ratio = 10, $Ke = \frac{1}{P/E} = \frac{1}{10} \times 100 = 10\%$.

Rate of Return = R = 20%.

Current Dividend Policy

D = ₹3/share

$$P = \frac{D + \frac{(E-D)r}{Ke}}{Ke}$$

$$P = \frac{3 + \frac{(5-3)20\%}{10\%}}{10\%}$$

$$\boxed{P = ₹70}$$

Optimum Dividend Policy

10% < 20%

Ke < R

So, optimum Dividend = '0'

$$P = \frac{0 + \frac{(5-0)20\%}{10\%}}{10\%}$$

$$\boxed{P = ₹100}$$

(i) The company was not following optimum Dividend Policy, As Ke < r, optimum dividend Policy is 0%.

(ii) The change in Price if company follows optimum dividend Policy is increase of ₹30.
(₹100 − ₹70)

Sol 21 $E = ₹6$, $Ke = 10\%$, $r = 20\%$

(a) If Dividend Payout rate is 30%

$D = ₹6 \times 30\% = ₹1.8$

Walter Model

$$P = \frac{D + \frac{(E-D) \times r}{Ke}}{Ke} = \frac{1.8 + \frac{(6-1.8) \times 20\%}{10\%}}{10\%}$$

$$= \frac{1.8 + \frac{4.2 \times 0.2}{0.1}}{10\%}$$

$$P = \boxed{₹102}$$

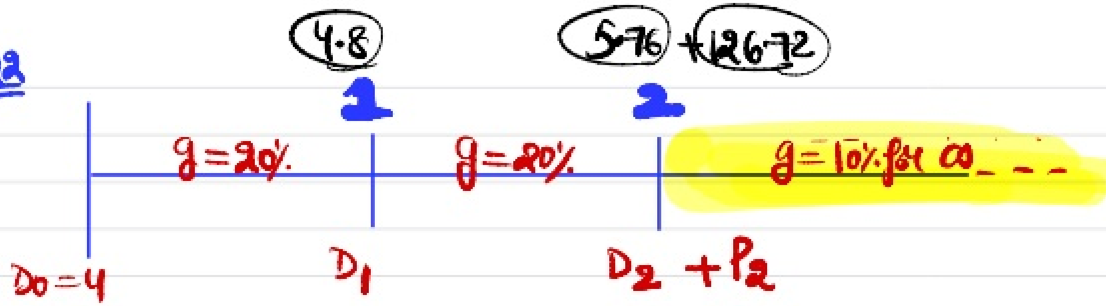
(b) As $10\% < 20\%$

$Ke < r$ so, optimum Dividend Policy should be 0%.

Thus company currently does not follow optimum dividend Policy.

Price at optimum Dividend Policy $\Rightarrow \frac{0 + \frac{(6-0) \times 20\%}{10\%}}{10\%}$ ₹120

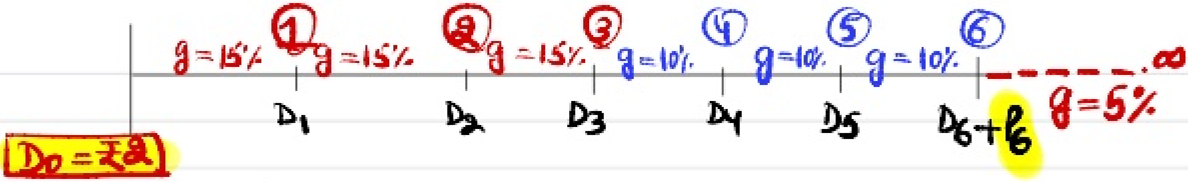
Sol 22



Year	Amount of Dividend / Price	PV factor	PV
1	$D_1 = 4(1+20\%) = 4.8$	$\frac{1}{(1.15)^1} = 0.8696$	4.17
2	$D_2 = 4.8(1+20\%) = 5.76$	$\frac{1}{(1.15)^2} = 0.7561$	4.36
2	$P_2 = \frac{D_3}{Ke-g} = \frac{D_2(1+g)}{Ke-g}$		
	$P_2 = \frac{5.76(1+10\%)}{15\%-10\%} = 126.72$	$\frac{1}{(1.15)^2} = 0.7561$	95.81
		PV today =	104.34

So, Intrinsic value of share today = ₹104.34

Sol 23



yr	Amount Dividend / Price		PV factor @ 9%	P.V.
1	$D_1 = 2(1+15\%)$	$= 2.3$	$\frac{1}{(1.09)^1} = 0.917$	2.109
2	$D_2 = 2.3(1+15\%)$	$= 2.645$	$= 0.842$	2.227
3	$D_3 = 2.645(1+15\%)$	$= 3.04175$	$= 0.772$	2.348
4	$D_4 = 3.04175(1+10\%)$	$= 3.3459$	$= 0.708$	2.369
5	$D_5 = 3.3459(1+10\%)$	$= 3.68049$	$= 0.650$	2.392
6	$D_6 = 3.68049(1+10\%)$	$= 4.0485$	$= 0.596$	2.413
6	$P_6 = \frac{D_7}{Ke-g} = \frac{D_6(1+5\%)}{9\%-5\%}$	$= 106.27$	$= 0.596$	63.337

$$\left(\frac{4.0485(1+5\%)}{9\%-5\%}\right) = \frac{4.25097}{4\%}$$

$$P_0 = 77.196$$

∴ Present value of share $= P_0 = ₹77.196$

Sol(25)

Price = P_0 = ₹120
EPS = E = ₹12
DPS = D = ₹6

(i) P/E ratio = Price Earning = $\frac{MPS}{EPS} = \frac{120}{12}$ = 10 Times

(ii) Traditional Approach
Grahm Dodd

$$P = m\left(D + \frac{E}{3}\right)$$

$$120 = m\left(6 + \frac{12}{3}\right)$$

$$120 = m(6+4)$$

$$\boxed{12 = m}$$

Sol 32 $D_0 = ₹2.5 \times 4 = ₹10.$

By Gordon Model

$$P_0 = \frac{D_1}{K_e - g} = \frac{D_0(1+g)}{K_e - g} = \frac{₹10(1+5.4\%)}{8.85\% - 5.4\%} = ₹305.51$$

WN ① For calculating 'g' = b × r.

Situation	b	Prob	b × prob.
A	5%	30%	0.15
B	60%	40%	0.24
C	50%	30%	0.15
			0.54 = 'expected b'

WN ② Growth rate = b × r

g = 0.54 × 10% = 5.4%

WN ③ $K_e = R_f + \beta(ER_m - R_f)$

$= 3.75\% + 1.2 \times 4.25\% = 8.85\%$

Q.A

Mr H is currently holding 1,00,000 shares of HM ltd, and currently the share of HM ltd is trading on Bombay Stock Exchange at ₹ 50 per share. Mr H have a policy to re-invest the amount of any dividend received into the shared back again of HM ltd. If HM ltd has declared a dividend of ₹ 10 per share, please determine the no of shares that Mr H would hold after he re-invests dividend in shares of HM ltd.

QB Following information is given pertaining to DG ltd,

No of shares outstanding	1 lakh shares
Earnings Per share	25 per share
P/E Ratio	20
Book Value per share	400 per share

If company decides to repurchase 25,000 shares, at the prevailing market price, what is the resulting book value per share after repurchasing.

QC

outstanding No of shares	2,00,000 shares.
EPS	₹20 per share
P/E ratio	8 Times.
Book value per share	₹120/share.

If company decides to repurchase 50,000 shares at prevailing market price, what is the resulting book value per share after repurchasing.

(Q8 of Study Material ICAI)

Sol (A)

Number of Shares originally held by Mr X = 1,00,000 Shares

Dividend amount received = 1,00,000 Shares × ₹10 = ₹10,00,000

(Amount available to reinvest)

Share Price after dividend distribution = ₹50 − ₹10 = $\boxed{₹40}$

Thus Number of additional Shares purchased with dividend amount = $\frac{₹10,00,000}{₹40}$ = 25000 Shares

Total Number of Shares at end = 1,00,000 (original) + 25000 (New) = $\boxed{125000}$

Sol (B) (Q9 of ICAI Study Material)

→ P/E ratio = $\frac{MPS}{EPS}$

$20 = \frac{MPS}{25}$, So Current MPS = ₹500.

⇒ Company has purchased 25000 shares at ₹500 (MPS) = $\boxed{₹125 L}$

Book Value of Shares before Repurchase (100000 × ₹400)	= ₹400 L
− Share Repurchase Value (25000 × ₹500)	= (₹125 L)
Remaining book value	= 275 L
÷ Remaining shares	÷ 75000
Book Value per share after Repurchase	= ₹367.

Sol © $P/E \text{ ratio} = \frac{MPS}{EPS}$

$8 = \frac{MPS}{20}$, $MPS = ₹160$.

Original book value before Repurchase (2,00,000 x 120)	=	2,40,00,000
− Repurchased Shares (50,000 x 160)	=	− 80,00,000
Remaining book value after repurchase	=	1,60,00,000.
÷ No of Remaining Shares		÷ 1,50,000 Shares

Book value per share after repurchase = ₹106.67

Chapter 5 - DIVIDEND DECISIONS SOLUTIONS

Solution 2:

Since r > Ke , the optimum dividend pay-out ratio would 'Zero' (i.e. D = 0),
Accordingly, value of a share:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$P = \frac{0 + \frac{0.12}{0.10}(10 - 0)}{0.10} = ₹\ 120$$

The optimality of the above payout ratio can be proved by using 25%, 50%, 75% and 100% as pay- out ratio:

At 25% pay-out ratio

$$P = \frac{2.5 + \frac{0.12}{0.10}(10 - 2.5)}{0.10} = ₹\ 115$$

At 50% pay-out ratio

$$P = \frac{5 + \frac{0.12}{0.10}(10 - 5)}{0.10} = ₹\ 110$$

At 75% pay-out ratio

$$P = \frac{7.5 + \frac{0.12}{0.10}(10 - 7.5)}{0.10} = ₹\ 105$$

At 100% pay-out ratio

$$P = \frac{10 + \frac{0.12}{0.10}(10 - 10)}{0.10} = ₹\ 100$$

Solution 3:

	₹ in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Therefore earning per share	18/3 = ₹ 6

Let, the dividend per share be D to get share price of ₹42

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$₹\ 42 = \frac{D + \frac{0.20}{0.16}(6 - D)}{0.16}$$

$$6.72 = \frac{0.16D + 1.2 - 0.20D}{0.16}$$

0.04D = 1.2 – 1.0752
D = 3.12

$$\text{D/P ratio} = \frac{DPS}{EPS} \times 100 = \frac{3.12}{6} \times 100 = 52\%$$

So, the required dividend payout ratio will be = 52%

Solution 4:

	₹ in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Therefore earning per share	18/3 = ₹ 6.00

Price per share according to Gordon's Model is calculated as follows:

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

Here, E1 = 6, Ke =

(i) When dividend pay-out is 25%

$$P_0 = \frac{6\times0.25}{0.16-(0.75\times0.2)} = \frac{1.5}{0.16-0.15} = 150$$

(ii) When dividend pay-out is 50%

$$P_0 = \frac{6\times0.5}{0.16-(0.5\times0.2)} = \frac{3}{0.16-0.10} = 50$$

(iii) When dividend pay-out is 100%

$$P_0 = \frac{6\times1}{0.16-(0\times0.2)} = \frac{6}{0.16} = 37.50$$

Solution 5:

$$P_0 = \frac{D}{K_e} = \frac{5}{0.10} = ₹\ 50$$

Solution 6:

$$P_0 = \frac{D_0(1+g)}{K_e - g}$$

D_0 = 10 × 20% = ₹2

g = 2% or 0.02

K_e = 15% or 0.15

$$P = \frac{2(1+0.02)}{0.15-0.02} = ₹\ 15.69$$

Solution 7:

In the present situation, the current MPS is as follows:

$$P_0 = \frac{D_0(1+g)}{K_e - g}$$

$$P = \frac{2(1+0.05)}{0.15-0.05} = ₹\ 21$$

(i) The impact of changes in growth rate to 8% on MPS will be as follows:

$$P = \frac{2(1+0.08)}{0.15-0.08} = ₹\ 30.86$$

(ii) The impact of changes in growth rate to 3% on MPS will be as follows:

$$P = \frac{2(1+0.03)}{0.15-0.03} = ₹\ 17.17$$

So, the market price of the share is expected to vary in response to change in expected growth rate is dividends.

Solution 8:

Price per share (P) = m (D + $\frac{E}{3}$)

P = 2 (30 x 0.6 + $\frac{30}{3}$)

P = 2(18 + 10) = ₹ 56

Solution 9:

Price per share (P) = m (D + $\frac{E}{3}$)

₹ 58.33 = 7 (5 + $\frac{E}{3}$)

105 + 7E = 175

Or, 7E = 175 -105 = ₹10

Therefore, EPS = ₹10

Solution 10:

$D_1 = D_o$ + [(EPS ×Target payout) - D_o] × Af

D_1 = 9.80 + [(20 × 60%) − 9.80] × 0.45

D_1 = 9.80 + 0.99 = ₹10.79

Solution 11:

Given,

Cost of Equity (K_e)	12%
Number of shares in the beginning (n)	10,000
Current Market Price (P_0)	₹ 100
Net Profit (E)	₹ 5,00,000
Expected Dividend	₹ 10 per share
Investment (I)	₹ 10,00,000

Computation of market price per share, when:

(i) **No dividend is declared:**

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

$$100 = \frac{P_1 + 0}{1 + 0.12}$$

P_1 = 112 − 0 = ₹112

(ii) **Dividend is declared:**

$$100 = \frac{P_1 + 10}{1 + 0.12}$$

P_1 = 112 − 10 = ₹102

(iii) **Calculation of funds required for investment**

Earning	5,00,000
Dividend distributed	1,00,000
Fund available for investment	4,00,000
Total Investment	10,00,000
Balance Funds required	10,00,000 - 4,00,000 = ₹ 6,00,000

No. of shares = $\frac{Funds\ required}{Price\ at\ end(P_1)}$

$$\Delta n = \frac{6,00,000}{102} = 5882.35 \text{ or } 5883 \text{ shares}$$

Solution 12:

(i) Walter's model is given by

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where

P = Market price per share.

E = Earnings per share = ₹ 5

D = Dividend per share = ₹ 3

R = Return earned on investment = 15%

Ke = Cost of equity capital = 12%

$$P = \frac{3 + \frac{0.15}{0.12}(5 - 3)}{0.12} = ₹\ 45.83$$

(ii) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is nil. So, at a pay-out ratio of zero, the market value of the company's share will be:

$$P = \frac{0 + \frac{0.15}{0.12}(5 - 0)}{0.12} = ₹\ 52.08$$

Solution 13:

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

(i) Situation-1: Growth Firm r > K_e

$$P_0 = \frac{10(1-0.06)}{0.10-0.15 \times 0.6} = \frac{4}{0.10-0.09} = ₹\ 400$$

(ii) Situation-2: Normal Firm r = K_e

$$P_0 = \frac{10(1-0.06)}{0.10-0.10 \times 0.6} = \frac{4}{0.10-0.06} = ₹\ 100$$

(iii) Situation-3: Normal Firm r < K_e

$$P_0 = \frac{10(1-0.06)}{0.10-0.08 \times 0.6} = \frac{4}{0.10-0.048} = ₹\ 76.92$$

If the retention ratio (b) is changed from 0.6 to 0.4, the new share price will be as follows:

Growth Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.15 \times 0.4} = \frac{6}{0.10-0.06} = ₹\ 150$$

Normal Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.10 \times 0.4} = \frac{6}{0.10-0.04} = ₹\ 100$$

Declining Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.08 \times 0.4} = \frac{6}{0.10-0.032} = ₹\ 88.24$$

From the above analysis it can be concluded that.

When r > k, the market value increases with retention ratio.

When r < k, the market value of share stands to decrease.

When r = k, the market value is not affected by dividend policy.

The conclusion of the Gordon's model is similar to that of Walter's model.

Solution 14:

Given,

Cost of Equity (K_e)	10%
Number of shares in the beginning (n)	25,000
Current Market Price (P_0)	₹ 100
Net Profit (E)	₹ 2,50,000
Expected Dividend	₹ 5 per share
Investment (I)	₹ 5,00,000

Case 1 - When dividends are paid	Case 2 - When dividends are not paid
Step 1 $P_0 = \frac{P_1 + D_1}{1 + K_e}$ $100 = \frac{P_1 + 5}{1 + 0.10}$ $P_1 = 110 - 5 = 105$	Step 1 $P_0 = \frac{P_1 + D_1}{1 + K_e}$ $100 = \frac{P_1 + 0}{1 + 0.10}$ $P_1 = 110 - 0 = 110$
Step 2 No. of shares required to be issued for balance fund No. of shares $= \frac{\textit{Funds required}}{\textit{Price at end}(P_1)}$ $\Delta n = \frac{3{,}75{,}000}{105} = 3{,}571.4285$	Step 2 No. of shares required to be issued for balance fund No. of shares $= \frac{\textit{Funds required}}{\textit{Price at end}(P_1)}$ $\Delta n = \frac{2{,}50{,}000}{110} = 2{,}272.73$
Step 3: Calculation of value of firm $Vf = \frac{(n + \Delta n)P_1 - I + E}{(1 + K_e)}$ $Vf = \frac{\left(25{,}000 + \frac{3{,}75{,}000}{105}\right)105 - 5{,}00{,}000 + 2{,}50{,}000}{(1 + 0.10)}$ = ₹ 25,00,000	Step 3: Calculation of value of firm $Vf = \frac{(n + \Delta n)P_1 - I + E}{(1 + K_e)}$ $Vf = \frac{\left(25{,}000 + \frac{2{,}50{,}000}{110}\right)110 - 5{,}00{,}000 + 2{,}50{,}000}{(1 + 0.10)}$ = ₹ 25,00,000

Solution 15:

(i) The EPS of the firm is ₹ 10 (i.e., ₹ 2,00,000/ 20,000). r = 2,00,000/ (20,000 shares × ₹100) = 10%. The P/E Ratio is given at 12.5 and the cost of capital, K_e, may be taken at the inverse of P/E ratio. Therefore, K_e is 8 (i.e., 1/12.5). The firm is distributing total dividends of ₹ 1,50,000 among 20,000 shares, giving a dividend per share of ₹ 7.50. the value of the share as per Walter's model may be found as follows:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{7.5 + \frac{0.1}{0.08}(10 - 7.5)}{0.08} = ₹\ 132.81$$

The firm has a dividend payout of 75% (i.e., ₹ 1,50,000) out of total earnings of ₹ 2,00,000. since, the rate of return of the firm, r, is 10% and it is more than the K_e of 8%, therefore, by distributing 75% of earnings, the firm is not following an optimal dividend policy. The optimal dividend policy for the firm would be to pay zero dividend and in such a situation, the market price would be:

$$\frac{0 + \frac{0.1}{0.08}(10 - 0)}{0.08} = ₹\ 156.25$$

So, theoretically the market price of the share can be increased by adopting a zero payout.

(ii) The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the K_e would be equal to the rate of return, r, of the firm. The K_e would be 10% (= r) at the P/E ratio of 10. Therefore, at the P/E ratio of 10, the dividend policy would have no effect on the value of the share.

(iii) If the P/E is 8 instead of 12.5, then the K_e which is the inverse of P/E ratio, would be 12.5 and in such a situation k_e > r and the market price, as per Walter's model would be:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{7.5 + \frac{0.1}{0.125}(10 - 7.5)}{0.125} = ₹\ 76$$

Solution 16:

Market price per share by

(i) Walter's model:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{6 + \frac{0.25}{0.20}(10 - 6)}{0.20} = ₹\ 55$$

(ii) Gordon's model (Dividend Growth model): When the growth is incorporated in earnings and dividend, the present value of market price per share (Po) is determined as follows:

Gordon's theory:

Present market price per share (Po) = $P_0 = \frac{E\,(1-b)}{K - br}$

Where,

Po = Present market price per share.

E = Earnings per share

b = Retention ratio (i.e. % of earnings retained)

r = Internal rate of return (IRR)

Growth rate (g) = br

$$P_0 = \frac{10(1-0.4)}{0.20-(0.4\ x\ 0.25)} = ₹\ \frac{6}{0.1} = ₹\ 60$$

Solution 17:

The P/E ratio i.e. price earnings ratio can be computed with the help of the following formula:

P/E ratio = $\frac{MPS}{EPS}$

Since the D/P ratio is 40%,

D = 40% of E i.e. 0.4E

Hence,

Market price per share (P) using Graham & Dodd's model =

$$P_0 = m\left(D + \frac{E}{3}\right)$$

Where,

P0 = Market price per share

D = Dividend per share

E = Earnings per share

m = a multiplier

$$P_0 = 9\left(0.4E + \frac{E}{3}\right)$$

$$P_0 = 9\left(\frac{1.2\,E + E}{3}\right) = 3(2.2E)$$

P_0 = 6.6E

$\frac{P}{E}$ = 6.6 i.e. P/E ratio is 6.6 times

Solution 18:

Market Price (P) per share as per Walter's Model is:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where,

P = Price of Share

r = Return on investment or rate of earning

Ke = Rate of Capitalization or Cost of Equity

Calculation of Market Price (P) under the following dividend payout ratio and earning rates:

		(i)	(ii)	(iii)
	Rate of Earning (r)	**DP ratio 50%**	**DP ratio 75%**	**DP ratio 100%**
(a)	15%	$\frac{5 + \frac{0.15}{0.10}(10 - 5)}{0.10}$ $= \frac{12.5}{0.10}$ = ₹ 125	$\frac{7.5 + \frac{0.15}{0.10}(10 - 7.5)}{0.10}$ $= \frac{11.25}{0.10}$ = ₹ 112.5	$\frac{10 + \frac{0.15}{0.10}(10 - 10)}{0.10}$ $= \frac{10}{0.10}$ = ₹ 100
(b)	10%	$\frac{5 + \frac{0.10}{0.10}(10 - 5)}{0.10}$ $= \frac{10}{0.10}$ = ₹ 100	$\frac{7.5 + \frac{0.10}{0.10}(10 - 7.5)}{0.10}$ $= \frac{10}{0.10}$ = ₹ 100	$\frac{10 + \frac{0.10}{0.10}(10 - 10)}{0.10}$ $= \frac{10}{0.10}$ = ₹ 100
(c)	5%	$\frac{5 + \frac{0.05}{0.10}(10 - 5)}{0.10}$ $= \frac{7.5}{0.10}$ = ₹ 75	$\frac{7.5 + \frac{0.05}{0.10}(10 - 7.5)}{0.10}$ $= \frac{8.75}{0.10}$ = ₹ 87.5	$\frac{10 + \frac{0.05}{0.10}(10 - 10)}{0.10}$ $= \frac{10}{0.10}$ = ₹ 100

Solution 19:

Earnings Per share(E) = $\frac{₹\ 40\ lakhs}{4,00,000}$ = ₹ 10

Calculation of Market price per share by

(i) **Walter's formula: Market Price (P) =** $\frac{D + \frac{r}{K_e}(E - D)}{K_e}$

Where,

P = Market Price of the share.

E = Earnings per share.

D = Dividend per share.

K_e = Cost of equity/ rate of capitalization/ discount rate.

R = Internal rate of return/ return on investment

$$P = \frac{4 + \frac{0.20}{0.16}(10 - 4)}{0.16}$$

$= \frac{4 + 7.5}{0.16}$ = ₹ 71.88

(ii) **Gordon's formula:** When the growth is incorporated in earnings and dividend, the present value of market price per share (Po) is determined as follows

Gordon's theory = P_0 = $\frac{E\,(1-b)}{k - br}$

Where,

P_0 = Present market price per share.

E = Earnings per share

b = Retention ratio (i.e. % of earnings retained)

r = Internal rate of return (IRR)

Growth rate (g) = br

Now, $P_0 = \frac{10\,(1-0.60)}{16-(0.60 \times 0.20)} = ₹\ \frac{4}{0.04} = ₹\ 100$

Solution 22:

$D_0 = ₹\ 4$

$D_1 = ₹4\ (1.20)^1 = ₹\ 4.80$

$D_2 = ₹4\ (1.20)^2 = ₹\ 5.76$

$D_3 = ₹4\ (1.20)^2 (1.10)^1 = ₹\ 6.336$

$$P_0 = \frac{D_1}{(1+Ke)^1} + \frac{D_2}{(1+Ke)^2} + \frac{P_2}{(1+Ke)^2}$$

$$P_2 = \frac{D_3}{Ke-g} = \frac{₹\ 6.336}{0.15-0.10} = ₹\ 126.72$$

$$P_0 = \frac{₹\ 4.80}{(1+0.15)^1} + \frac{₹\ 5.76}{(1+0.15)^2} + \frac{₹\ 126.72}{(1+0.15)^2}$$

= (₹ 4.80 x 0.8696) + (₹ 5.76 x 0.7561) + (₹ 126.72 x 0.7561) = ₹ 104.34

Solution 23:

Computation of Present value of Equity Shares

Particulars	Time	PVF	Amount in ₹	PV in ₹
Amount of dividends receivable during abnormal growth period	1	0.917	2.30	2.11
	2	0.842	2.65	2.23
	3	0.772	3.04	2.35
	4	0.708	3.35	2.37
	5	0.650	3.68	2.39
	6	0.596	4.05	2.41
Amount of Market Price at the end of abnormal growth period = ₹ 4.04 (1.05) / 0.09 – 0.05 = ₹ 106.25	6	0.596	106.25	63.33
Present Value of Share				77.19

Solution 24:

Stage 1:

Explicit Forecast Period (first 4 years)

Time	PVF @ 16%	Dividend	PV
1	0.862	1.68	1.45
2	0.743	1.88	1.40
3	0.641	2.07	1.33
4	0.552	2.28	1.26
			5.44

Stage 2:

Horizon Period (Beyond 4 years)

Expected dividend for the fifth year

D_5 = 2.28 x 1.08 = 2.46

Horizon Price i.e.

$P_4 = D_5$ / (Re – g) = 2.46 / (0.16 – 0.08) = 30.75

PV of P_4 = 30.75 x 0.552 = 16.97

Intrinsic Value of share today = Stage I + Stage II

= 5.44 + 16.97
= ₹ 22.41

Solution 25.
P_o = Rs 120
E = Rs 12
D = Rs 6
Compute P/E Ratio. Also compute multiplier as per traditional theory.
P = M (D + E/3)
120 = M (6 + 12/3)
120 = M (30/3)
12 = M

Solution 26:
P/E Ratio = 10
Ke = 1 / P/E Ratio = 1/10 = 10%
Equity Shares = 50,000
Dividend = ₹ 8

(i) Value of shares:

a) If Dividend is not declared:
P_1 = P_0 (1 + Ke) − D = ₹ 100 (1 + 0.10) − 0 = ₹ 100 (1.10) = ₹ 110

b) If Dividend is declared:
P_1 = P_0 (1 + Ke) − D = ₹ 100 (1 + 0.10) − ₹8 = ₹ 110 − ₹8 = ₹ 102

(ii) Computation of No. of Shares:

Particulars	Amount (₹)
Net Income	5,00,000
Less: Dividend (50,000 x 8)	(4,00,000)
	1,00,000
Add: issue of Share	9,00,000
Fresh Investment	10,00,000

No. of shares = ₹ 9,00,000 / ₹ 102 = 8,823.5294

Solution 27:

(a)

	₹ in lakhs
Net Profit	75
Less: Preference dividend	30
Earning for equity shareholders	45
Earning per share	= 45/7.5 = ₹ 6.00

Let, the dividend per share be D to get share price of ₹ 42

$$P = \frac{D + \frac{r}{Ke}(E-D)}{Ke}$$

$$₹42 = \frac{D + \frac{0.20}{0.16}(6-D)}{0.16}$$

$$6.72 = \frac{0.16\,D + 1.2 - 0.20D}{0.16}$$

0.04D = 1.2 − 1.0752

D = 3.12

D/P ratio $= \frac{DPS}{EPS} \times 100 = \frac{3.12}{6} \times 100 = 52\%$

So, the required dividend payout ratio will be = 52%

(b) Since r > K_e, the optimum dividend pay-out ratio would 'Zero' (i.e. D = 0),

Accordingly, value of a share:

$$P = \frac{D+\frac{r}{Ke}(E-D)}{Ke}$$

$$P = \frac{0+\frac{0.20}{0.16}(6-0)}{0.16} = ₹\ 46.875$$

(c) The optimality of the above pay-out ratio can be proved by using 25%, 50%, 75% and 100% as pay- out ratio:

At 25% pay-out ratio

$$P= \frac{1.5+\frac{0.20}{0.16}(6-1.5)}{0.16} = ₹44.531$$

At 50% pay-out ratio

$$P= \frac{3+\frac{0.20}{0.16}(6-3)}{0.16} = ₹42.188$$

At 75% pay-out ratio

$$P= \frac{4.5+\frac{0.20}{0.16}(6-4.5)}{0.16} = ₹39.844$$

At 100% pay-out ratio

$$P= \frac{6+\frac{0.20}{0.16}(6-6)}{0.16} = ₹\ 37.50$$

From the above it can be seen that price of share is maximum when dividend pay-out ratio is 'zero' as determined in (b) above.

Solution 28:

P0 = ₹ 10 n = 2,00,000, E = ₹ 5,00,000 Ke = 15%, Δn = 26,089, I = ?

$$Po= \frac{P1}{1+Ke}$$

$$10=\frac{P1}{1.15}$$

P1= 11.5

$$\Delta n=\frac{I-E+nD1}{P1}$$

$$26.089= \frac{1-5,00,000}{11.5}$$

I = 8,00,024

Now,

P0 = ₹ 10, n = ₹ 2,00,000,

E = ₹ 5,00,000, I = 8,00,024,

Ke = 15%, Δn 47,619, D1 = ?

$$Po= \frac{P1+D1}{1+Ke}$$

$$10= \frac{P1+D1}{1.15}$$

P1= 11.5-D1

$$\Delta n = \frac{I-E+nD1}{P1}$$

$$47.619= \frac{8,00,024-5,00,000+2,00,000D1}{P1}$$

47,619 P1 = 2,00,000 D1+ 3,00,024

From 1,

47619 (11.5 – D_1) = 2,00,000 D_1 + 3,00,024

5,47,618.5 – 47,619D_1 = 2,00,000D_1 + 3,00,024

2,47,594.5 = 2,00,000D_1 + 47,619 D_1

2,47,594.5 = 2,47,619 D1

D1 = $\frac{2,47,594.5}{2,47,619}$ = 0.99 =1

P_1 = 11.5 – D_1

P_1 = 11.5 – 1

P_1 = 10.5

n.Po = $\frac{(2,00,000+47,619)(10.5)-8,00,024+5,00,000}{1.15}$

n.P0 = ₹19,99,979 » ₹20,00,000

Using direct calculation,

n.P0 = 2,00,000 ×10 = ₹ 20,00,000

Solution 29:

CASE 1: Value of the firm when dividends are not paid.

Step 1: Calculate price at the end of the period

Ke = 15%, P_0 = ₹100, D_1 = 0

$P_o = \frac{P1+D1}{1+Ke}$

₹100 = $\frac{P1+0}{1+0.15}$

P_1 = ₹115

Step 2: Calculation of funds required for investment

Earning	₹ 40,00,000
Dividend distributed	Nil
Fund available for investment	₹ 40,00,000
Total Investment	₹ 50,00,000
Balance Funds required	₹ 50,00,000 - ₹ 40,00,000 = ₹ 10,00,000

Step 3: Calculation of No. of shares required to be issued for balance funds

No. of shares = Funds required/P1

Δn = ₹10,00,000/₹115

Step 4: Calculation of value of firm

nP_o = [(n+Δn)P1-I+E]/(1+Ke)

nP_0 = [(100000+1000000/₹115) ₹115 - ₹5000000 + ₹4000000]/(1.15)

= ₹1,00,00,000

CASE 2: Value of the firm when dividends are paid.

Step 1: Calculate price at the end of the period

Ke= 15%, P_0= ₹100, D_1= ₹10

$P_o = \frac{P1+D1}{1+Ke}$

₹100 = $\frac{P1+10}{1+0.15}$

P_1 = ₹105

Step 2: Calculation of funds required for investment

Earning	₹ 40,00,000
Dividend distributed	10,00,000
Fund available for investment	₹ 30,00,000
Total Investment	₹ 50,00,000
Balance Funds required	₹ 50,00,000 - ₹ 30,00,000 = ₹ 20,00,000

Step 3: Calculation of No. of shares required to be issued for balance fund

No. of shares = Funds Required/P1

Δn = ₹2000000/₹105

Step 4: Calculation of value of firm

nP_o = [(n+Δn)P1 – I+E]/(1+Ke)

nP_0 = [(100000 + 2000000/₹105) ₹105 – ₹5000000 + ₹4000000]/(1.15)= ₹1,00,00,000

Thus, it can be seen from the above calculations that the value of the firm remains the same in either case.

Solution 30:

Price per share according to Gordon's Model is calculated as follows:

Particulars	Amount in ₹
Net Profit	78 lakhs
Less:Preference dividend(120 lakhs@15%)	18 lakhs
Earnings for equity shareholders	60 lakhs
Earnings Per Share	60 lakhs/6 lakhs = ₹ 10.00

Price per share according to Gordon's Model is calculated as follows:

P0 = $\frac{E1(1-b)}{Ke - br}$

Here, E1 = 10, Ke = 16%

(i) When dividend pay-out is 30%

Po = $\frac{10\times0.30}{0.16-(0.70\times0.2)}$=$\frac{3}{0.16-0.14}$ = ₹150

(ii) When dividend pay-out is 50%

P0 =$\frac{10\times0.5}{0.16-(0.5\times0.2)} = \frac{5}{0.16-0.10}$ = ₹83.33

(iii) When dividend pay-out is 100%

P0 =$\frac{10\times1}{0.16-(0\times0.2)} = \frac{10}{0.16}$=₹ 62.5

Solution 31:

(i) As per Gordon's Model, Price per share is computed using the formula:

P0 = $\frac{E1(1-b)}{Ke-br}$

Where,

P0 = Price per share

E1 = Earnings per share

b = Retention ratio; (1 - b = Pay-out ratio)

Ke = Cost of capital r = IRR

br = Growth rate (g)

Applying the above formula, price per share

P0 =$\frac{30\times0.3*}{0.15-0.70\times0.2}$= $\frac{9}{0.01}$ = ₹ 900

*Dividend pay-out ratio =$\frac{9}{₹30}$= 0.3 or 30%

(ii) As per Walter's Model, Price per share is computed using the formula:

Price (P) = $\frac{D+\frac{r}{Ke}(E-D)}{Ke}$

Where,

P = Market Price of the share

E = Earnings per share

D = Dividend per share

Ke = Cost of equity/ rate of capitalization/ discount rate

r = Internal rate of return/ return on investment

Applying the above formula, price per share

P= $\frac{g+\frac{0.20}{0.15}(30-9)}{0.15}$ = $\frac{37}{0.15}$ = ₹246.67

Solution 32:

The Present Value of the Cash Flows for all the years by discounting the cash flow at 7% is calculated as below:

Year	Cash flows ₹In lakhs	Discounting Factor@7%	Present value of Cash Flows ₹ In Lakhs
1	50	0.935	46.75
2	120	0.873	104.76
3	150	0.816	122.40
4	160	0.763	122.08
5	130	0.713	92.69
Total of present value of Cash flow			488.68
Less: Initial investment			(200.00)

Net Present Value (NPV)	288.68

Now, the risk-free rate is 7 % and the risk premium expected by the Management is 7 %. So, the risk adjusted discount rate is 7 % + 7 % =14%.

Discounting the above cash flows using the Risk Adjusted Discount Rate would be as below:

Year	Cash flows ₹ in Lakhs	Discounting Factor@14%	Present Value of Cash Flows ₹ in lakhs
1	50	0.877	43.85
2	120	0.769	92.28
3	150	0.675	101.25
4	160	0.592	94.72
5	130	0.519	67.47
Total of present value of Cash flow			399.57
Initial investment			(200.00)
Net present value (NPV)			199.79

Solution 33:

(i) Current Market price of shares (applying Walter's Model)

- The EPS of the firm is ₹ 5 (i.e., ₹ 10,00,000 / 2,00,000).
- Rate of return on Investment (r) = 20%.
- The Price Earnings (P/E) Ratio is given as 10, so capitalization rate (Ke), may be taken at the inverse of P/E Ratio. Therefore, Ke is 10% or .10 (i.e., 1/10).
- The firm is distributing total dividends of ₹ 6,00,000 among 2,00,000 shares, giving a dividend per share of ₹ 3.

The value of the share as per Walter's model may be found as follows: Walter's model is given by-

$$P = \frac{D + \frac{r}{Ke}(E - D)}{Ke}$$

Where,

P = Market price per share.

E = Earnings per share = ₹ 5

D = Dividend per share = ₹ 3

R = Return earned on investment = 20 %

Ke = Cost of equity capital = 10% or .10

$$P = \frac{3 + \frac{0.20}{0.10}(5-3)}{0.10} = ₹\ 70$$

Current Market Price of shares can also be calculated as follows:

Price Earnings (P/E) Ratio = $\frac{Market\ Price\ of\ share}{Earnings\ per\ shares}$

Or, 10 = $\frac{Market\ price\ per\ share}{₹\ 10{,}00{,}000\ /\ 2{,}00{,}000}$

Or , 10 = $\frac{Market\ price\ per\ share}{₹\ 5}$

Market Price of Share = ₹ 50

(ii) Capitalization rate (Ke) of its risk class is 10% or .10 (i.e., 1/10).

(iii) Optimum dividend pay-out ratio

According to Walter's model when the return on investment is more than the cost of equity capital (10%), the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is nil or 0 (zero).

(iv) Market price per share at optimum dividend pay-out ratio

At a pay-out ratio of zero, the market value of the company's share will be:

0 + 0.20 (5 – 0)

$$P = \frac{0 + \frac{0.20}{0.10}(5-0)}{0.10} = ₹\ 100$$

Solution 34:

(i) Calculation of market price per share

According to Miller – Modigliani (MM) Approach:

$$P_o = \frac{P1 + D1}{1 + Ke}$$

Where,

Existing market price (P_o) = ₹ 150

Expected dividend per share (D_1) = ₹ 8
Capitalization rate (ke) = 0.10
Market price at year end (P1) = to be determined

(a) If expected dividends are declared, then

₹ 150 = $\frac{P1 + ₹ 8}{1 + 0.10}$

P1 = ₹ 157

(b) If expected dividends are not declared, then

₹ 150 = $\frac{P1 + 0}{1 + 0.10}$

P1 = ₹ 165

(ii) Calculation of number of shares to be issued

	(a) Dividends are declared (₹ lakh)	(b) Dividends are not Declared (₹ lakh)
Net income	300	300
Total dividends	(80)	-
Retained earnings	220	300
Investment budget	600	600
Amount to be raised by new issues	380	300
Relevant market price (₹ per share)	157	165
No. of new shares to be issued (in lakh) (₹ 380 ÷ 157; ₹ 300 ÷ 165)	2.42	1.82

(iii) Calculation of market value of the shares

	(a) Dividends are declared	(b) Dividends are not Declared
Existing shares (in lakhs)	10.00	10.00
New shares (in lakhs)	2.42	1.82
Total shares (in lakhs)	12.42	11.82
Market price per share (₹)	157	165
Total market value of shares at the end of the year (₹ in lakh)	12.42 × 157 = 1,950 (approx.)	11.82 × 165 = 1,950 (approx.)

Hence, it is proved that the total market value of shares remains unchanged irrespective of whether dividends are declared, or not declared.

Solution 35:

Given,

Cost of Equity	12%
Number of shares in the beginning (n)	40,000
Current Market Price (Po)	₹ 200
Net profit (E)	₹ 5,00,000
Expected dividend (D1)	₹ 10 per share
Investment (I)	₹ 10,00,000

Situation 1	Situation 2
(i) Po = $\frac{P1 + D1}{1 + Ke}$ 200 = $\frac{P1 + 10}{1 + 0.12}$ P1 + 10 = 200 x 1.12 P1 = 224 – 10 = 214	(i) Po = $\frac{P1 + D1}{1 + Ke}$ 200 = $\frac{P1 + 0}{1 + 0.12}$ P1 + 0 = 200 x 1.12 P1 = 224 – 0 = 224
(ii) Calculation of funds required = Total Investment – (Net profit – Dividend) = 10,00,000 – (5,00,000 – 4,00,000) = 9,00,000	(ii) Calculation of funds required = Total Investment – (Net profit – Dividend) = 10,00,000 – (5,00,000 – 0) = 5,00,000

(iii) No. of shares required to be issued for balance fund No. of shares = $\frac{Funds\ Required}{Price\ at\ end\ (P1)}$ Δn = $\frac{9,00,000}{214}$ = 4205.61	(iii) No. of shares required to be issued for balance fund No. of shares = $\frac{Funds\ Required}{Price\ at\ end\ (P1)}$ Δn = $\frac{9,00,000}{214}$ = 2232.14
(iv) Calculation of value of firm Vf = $\frac{(n+n)P1 - I + E}{1 + Ke}$ = $\frac{\{40,000+\frac{9,00,000}{214}\}214-10,00,000+5,00,000}{1+0.12}$ = $\frac{94,60,000 - 5,00,000}{1.12}$ = 80,00,000	(iv) Calculation of value of firm Vf = $\frac{(n+n)P1 - I + E}{1 + Ke}$ = $\frac{\{40,000+\frac{5,00,000}{224}\}224-10,00,000+5,00,000}{1+0.12}$ = $\frac{94,60,000 - 5,00,000}{1.12}$ = 80,00,000

Solution 36:

(a)

	₹ In lakhs
Net Profit	75
Less: Preference Dividend	30
Earning for equity shareholders	45
Earnings per share	= 45/7.5 = ₹ 6.00

Let, the dividend per share be D to get share price of ₹ 42

P = $\frac{D+\frac{r}{Ke}(E-D)}{Ke}$

₹ 42 = $\frac{D+\frac{0.20}{016}(6-D)}{0.16}$

6.72 = $\frac{0.16D + 1.2 - 0.20D}{0.16}$

0.04D = 1.2 − 1.0752

D = 3.12

D/P ratio = $\frac{DPS}{EPS}$ x 100 = $\frac{3.12}{6}$ x 100 = 52%

So, the required dividend payout ratio will be = 52%

(b) Since r > Ke, the optimum dividend pay-out ratio would 'Zero' (i.e. D = 0),
Accordingly, Value of a share:

P = $\frac{D+\frac{r}{Ke}(E-D)}{Ke}$

P = $\frac{0+\frac{0.20}{0.16}(6-0)}{0.16}$ = ₹ 46.875

(c) The optimality of the above pay-out ratio can be proved by using 25%, 50%, 75% and 100% as pay-out ratio:

At 25% pay-out ratio

P = $\frac{1.5+\frac{0.20}{0.16}(6-1.5)}{0.16}$ = ₹ 44.531

At 50% pay-out ratio

P = $\frac{3+\frac{0.20}{0.16}(6-3)}{0.16}$ = ₹ 42.188

At 75% pay-out ratio

P = $\frac{4.5+\frac{0.20}{0.16}(6-4.5)}{0.16}$ = ₹ 39.844

At 100% pay-out ratio

P = $\frac{6+\frac{0.20}{0.16}(6-6)}{0.16}$ = ₹ 37.50

From the above it can be seen that price of share is maximum when dividend pay-out ratio is 'zero' as determined in (b) above.

Solution 37:

As per Dividend discount model, the price of share is calculated as follows:

$$P = \frac{D1}{(1+Ke)1} + \frac{D2}{(1+Ke)2} + \frac{D3}{(1+Ke)3} + \frac{D4}{(1+Ke)4} + \frac{D4\,(1+g)}{(Ke-g)} \times \frac{1}{(1+Ke)4}$$

Where,
P = Price per share
Ke = required rate of return on equity
g = Growth rate

$$P = \frac{₹\,140 \times 1.12}{(1+0.18)1} + \frac{₹\,156.80 \times 1.12}{(1+0.18)2} + \frac{₹\,175.62 \times 1.12}{(1+0.18)3} + \frac{₹\,196.69 \times 1.12}{(1+0.18)4} + \frac{₹\,220.29(1+0.05)}{(0.18-0.05)} \times \frac{1}{(1+0.18)4}$$

P= 132.81 + 126.10 + 119.59 + 113.45 + 916.34 = ₹ 1,408.29

Intrinsic value of share is ₹ 1,408.29 as compared to latest market price of ₹ 2,185. Market price of share is over-priced by ₹ 776.71.