Share exchange ratio (9,09,009/50 lakh) = 0.1818: 1 or	1: 5.5

For every 5.5 shares of Firm T, 1 share in Firm A will be issued. This is the lowest exchange ratio acceptable to shareholders of Firm T. Any ratio lower than this will decrease their existing wealth of Rs 10 crore.

(ii) Upper limit (based on total gains accruing to shareholders of Firm T)

Total market value of the merged firm	Rs 120.01
Less: Pre-merger (or minimum post-merger) value acceptable to the shareholders of Firm A	100.00
Maximum acceptable post-merger market value of Firm T	20.01
Since post-merger market value of Firm A remains unchanged at Rs 100 crore (and so the number of its shares (100 lakh) and MPS of Rs 100), number of equity shares required to be issued in Firm A to have a MPS of Rs 100 and to have a post-merger value of Rs 20.01 crore of Firm T (Rs 20.01 crore/ Rs 100 MPS)	20,01,000 shares
Existing number of equity shares outstanding in Firm T	50 lakh
Share exchange ratio (20,01,000/50 lakh) = 0.4002:1 or	1: 2.5

For every 2.5 shares of Firm T, 1 share in Firm A will be issued. This is the upper most exchange ratio acceptable to shareholders of Firm A as any ratio higher than this will dilute their existing wealth of Rs 100 crore.

Question :- Exchange Ratio :- HIMP GTU Question

ABC ltd. is intending to acquire XYZ ltd. by merger and the following information is available in respect of the Companies :-

	ABC	XYZ.
No. of eq. shares	10,00,000	6,00,000
Earnings after tax	50,00,000 ₹	18,00,000 ₹.
NPS (₹)	~~48~~ 42	28.

(i) What is the present EPS of both the Companies?

(ii) If the proposed merger takes place, what would be the new earning per share for ABC Ltd? Assume that Merger takes place by exchange of equity shares and the exchange Ratio based on current NPS?

(iii) What should be the exchange Ratio, if XYZ ltd. wants to ensure the earnings to members are as before the merger takes place?

Solution :-

(i) EPS = EAT / No. of eq. sh.

ABC ltd. → 50,00,000 / 10,00,000 → 5 ₹.

XYZ " → 18,00,000 / 6,00,000 → 3 ₹

(ii) Exchange Ratio based on Market Price = $\frac{\text{Issue NPS}}{\text{Buyer NPS}}$

$= 28/42$

$= 0.6667$:1

So, shares XYZ would get in ABC

6,00,000 × 0.6667 $\boxed{28/42 \times 6,00,000}$

→ 4,00,000 shares

Total No. of equity share after Merger.

ABC → 10,00,000

XYZ → 4,00,000

Total No. of eq. shares 14,00,000

Earning per share after Merger

→ $\frac{\text{Combined PAT}}{\text{No. of shares post Merger}}$

→ $\frac{50,00,000 + 18,00,000}{14,00,000}$

→ 4.86 ₹ EPS post Merger

(iii). Calcu^n of Exchange Ratio to ensure shareholders of XYZ ltd. to earn the same as was before merger

Shares to be exchanged based on EPS $= 3/5 \times 6,00,000$

$= 3,60,000$ shares

$$\text{EPS after Merger} = \frac{\text{Combined PAT}}{\text{Total No. of eq. shares}}$$

$$= \frac{50,00,000 + 18,00,000}{10,00,000 + 3,60,000}$$

$$= ₹\ 5.$$

Total earnings in ABC ltd. available to shareholders of XYZ ltd. $= 3,60,000 \times 5$ ₹ $= 18,00,000$

Thus, to ensure that earnings to members are same as before, the ratio of exchange should be

0.6 share for 1 share $\left[3/5 = 0.6 \right]$

GTU Questions:-

X Ltd. is intending to acquire B Ltd. (by merger) and the following infor is available in respect of the companies:-

Particulars	A ltd.	B ltd.
No. of equity shares	5,00,000	3,00,000
Earnings after tax (Rs.)	2,00,0000.	6,00,000.
Market value per share (Rs.)	18	12.

(i) What is the present EPS of both the companies?

(ii) If the proposed merger takes place, what would be the new earnings per share for X ltd. (assuming that the merger takes place by exchange of equity shares and the exchange Ratio is based on the current market prices)

(iii) What should be the exchange Ratio, if B ltd. wants to ensure the same earnings to members as before the merger takes place?

Solution:-> (i) $EPS = \frac{EAT}{No. of eq. sh.}$ $A = \frac{20,00,000}{5,00,000} = 4₹$ $B = \frac{6,00,000}{3,00,000} = 2₹$

(ii) Cal^n of new EPS of X ltd. after merger (Exchange Ratio based on market prices.

Particulars	A ltd.	B ltd
EAT (₹)	20,00,000	6,00,000.
No. of equity shares	5,00,000	3,00,000
MPS	18	12.

Exchange Ratio B used on MPS = $\frac{\text{Target MPS}}{\text{Buyer "}} = 12/18 = 0.67:1$

No. of shares B ltd. shareholder will get in A ltd. based on MPS will be:- $12/18 \times 3,00000 = 2,00,000$ shares.

Total No. of equity shares of X ltd. after Merger

↳ $5,00,000 + 2,00,000 = 7,00,000$

Total earnings of A ltd. after Merger = $20,00,000 + 6,00,000$
$= ₹ 26,00,000$

New EPS of A ltd. after Merger = $\frac{26,00,000}{7,00,000 \text{ shares}} = 3.71₹$.

(iii) Calcu^n of exchange Ratio ~~based~~ to ensure B ltd. to earn the same before the Merger takes place:-

Original EPS : A ltd → ₹4 B ltd = ₹2.

The no. of shares to be exchanged by A ltd. with B ltd. based on the EPS of the respective companies is as follows:-

$₹ 2/4 \times 3,00,000 \rightarrow 1,50,000$ shares.

Total no. of shares of A Ltd. after Merger
= 5,00,000 + 1,50,000 ⇒ 6,50,000 shares

The total Earnings available to new shareholders of B Ltd :-
1,50,000 shares × 4 ₹ EPS → $\boxed{6,00,000}$ Total Earning.

EPS after merger = $\frac{20,00,000 + 6,00,000}{6,50,000}$ = 4 ₹

Recommendation:- The Exchange Ratio based on market share is beneficial to the shareholders of B Ltd.

[7] The firm has 12 different items in its inventories. Classify the items in to ABC category as per their importance.

Item number	Annual quantity used	Unit value
1	6,000	4.00
2	61,200	0.05
3	16,800	2.10
4	3,000	6.00
5	55,800	0.20
6	22,680	0.50
7	26,640	0.65
8	14,760	0.40
9	20,520	0.40
10	90,000	0.10
11	29,940	0.30
12	24,660	0.50

(5) calculate Gain / loss for Shareholder of the two, Independent Companies after acquisition.

GTU Question :- Share exchange Ratio :-

Following infon is available in relation to acquiring firm Mark ltd. and the target firm Mask Limited :-

	Mark ltd.	Mask ltd.
Earning after Tax	2000 lac	400 lac
No. of O/S shares	200 lac	100 lac
P/E Ratio	10	5

Required :- (1). what is the swap ratio in terms of current Mkt. price ?

(2). what is the EPS of Marks limited after the acquisition ?

(3). what is the expected market price per share of Marks limited after acquisitions, assuming that P/E ratio of Marks limited remains unchanged ?

(4) Determine the market value of merged firm.

① Exchange Ratio in terms of current Mkt. price

↳ Exchange Ratio = $\frac{\text{Target's MPS}}{\text{Buyer's MPS}} = \frac{20}{100} = \boxed{0.2:1}$

P/E Ratio = MPS/EPS.

Mark: P/E = MPS/EPS = 10 = $\frac{MPS}{10}$ = $\boxed{100 = MPS \text{ Buyer}}$

Mask: P/E = MPS/EPS = 5 = $\frac{MPS}{4}$ = $\boxed{20 = MPS \text{ Target}}$

Exchange Ratio 0.2:1 → ie// 1 share of Mark (Buyer) for every 5 shares held in Mask Ltd.

So, No. of shares to be issue to target company → 100 lac × 0.2
→ 20 lac shares

②. EPS of Mark limited after acquisition.

= $\frac{\text{Combined PAT}}{\text{No. of outstanding shares}} = \frac{2000 \text{ lac} + 400 \text{ lac}}{200 \text{ lac} + 20 \text{ lac}}$ = ₹ 10.91

↓ [post Merger EPS.]

③ Expected Market price per share of Mark limited after an acquisition assuming P/E ratio of Mark Ltd. remains unchanged

P/E = MPS/EPS ∴ P/E × EPS = MPS ∴ 10 × 10.91 = 109.10 ₹.

④ Market value of the Merged Firm.

~~P/E = MPS/EPS ∴ P/E × EPS = MPS ∴ 10 ×~~

Market value of Merged Firm = No. of shares × Market price
= 220 lac × 109.10
= 240.02 Cr.

⑤. Gain from the Merger.

Post Merger Market value — 240.02 Cr.

Less: Pre-merger value (MPS)

Mark 200 lac × 100 ₹ = 20000 = 200 Cr

Mask. 100 lac × 20 ₹ 20.00 = 20 Cr — 220 Cr.

Gain from Merger. — 20.20 Cr.

⑥. Gain to Shareholders of Mark & Mask Ltd.

Particulars	Mark (No. of shares)	Mask
Post Merger value (109.1 MPS × 200 shares)	(109.1 × 200 lac) Cr. 218.20	(109.1 × 20 lac) Cr. 21.82
Less:- ~~Post~~ Pre-Merger value	Cr. 200	Cr. 20
Gain to Shareholders	Cr. 18.20	1.82

⑥ Maximum exchange Ratio

= $\frac{\text{Gain from merger}}{\text{Market price of Buyer}} = \frac{20.20}{100} = \frac{0.202:1}{}$ ~~20202000~~ No. of shares / 20,00,000 No. of shares

Comparative Company Analysis Winter 2014.

Calculate the value of Zee ltd. Based on Comparable Companies approach. The following data is available with respect to Zee ltd.

Sales Rs. 100 cr.
Profit. 15 cr.
Book value 60 cr.

The valuer feels that 50% weightage should be given to earnings in the valuation process, sales & Book value may be given equal weightages. The valuer has identified 3 firms which are comparable to the operations of Zee ltd.

Particulars.	Alpha ltd.	Beta ltd.	Gamma ltd
Price / Sales Ratio.	1.5	1.25	1.60.
Price / Earnings Ratio.	10.	8.33	9.60.
Price / Book value Ratio.	3	1.66.	2.40

Solution :- Assume that Mean of all the Comparable factors used to evaluate the target company.

Multiplier Based on :-

Sales ⇒ 1.45. avg. of sales $\bar{x} = \frac{\Sigma x}{n}$.
Earnings → 9.31
Price. → 2.35.

Value of Zee limited Based on multipliers Obtained :- Mean

$$100 \times 1.45 + \frac{0.50(9.31 \times 15)}{3} + 60 \times 2.35 = 118.61$$

$$\text{Price to Sales Ratio} = \frac{\text{Price}}{\text{Sales}}.$$

$$1.45 = \frac{\text{Price}}{100}.$$

Analysis :- GTU Winter 2019.

(b) Based on the comparable companies approach, find out the value H Ltd. which is a prospective target, from the following information

	P Ltd.	Q Ltd.	R Ltd.
Enterprise value / EBITDA	7.1	9.7.	8.7.
Enterprise value / Book value.	2.5.	3.5	3
Enterprise value / Sales.	1.25	1.75.	1.32.

The current sales of H Ltd. amounted to Rs. 250 cr., Book value of assets Rs. 100 cr, Earnings before Interest, Taxes, Depreciation and Amortisation (EBITDA) Rs. 40 cr.

Solution:- Note:- Meaning of Enterprise value:- EV is a measure of company's total value.

EV = Market value of equity + Market value of debt − Cash & Investment.

Cash & Investment of the target firm is going to be combined with Buyer Company so, we deduct it from EV calculation.

Value of H Based on Comparable Company approach

If H Ltd. is valued as per the mean of the comparatives available, then the multiple for all the factors will be as follows:-

EV / EBITDA → 25.5/3 → 8.5

EV / Book value → 9/3 → 3.

EV / Sales → 4.32/3 → 1.44.

Based on Book value.

$3 = \frac{EV}{\text{Book value}}$ ∴ $3 = \frac{EV}{100}$.

EV = 300 cr.

Valuation of H Ltd.

Based on EBITDA

$8.5 = \frac{EV}{EBITDA}$

$8.5 = \frac{EV}{40}$ = 340 cr.

Based on Sales.

$1.44 = \frac{EV}{\text{Sales}}$ ∴ $1.44 = \frac{EV}{250}$

$\boxed{EV = 360 \text{ cr}}$

Buyer

37U Question:- Value of firm based on Cash Flow:- (Summer 2013)

Que:- V Company & W Company are two identical firms that agree to merge. Both have revenues of ₹ 1500. Operating margin of 15%, a tax rate of 40%, investment rate of 10%, growth rate of 11%, 5 years supernormal growth followed by zero growth thereafter, and a 9% cost of capital.
If the combined firm increases its operating margin by 2%, revenues are combined, and the other value drivers remains unchanged, what is the value of combined firm?

Solution:-
If operating margin in value is increased by 2%, it means operating margin of 17%.
Operating margin is a measurement of what proportion of a company's revenue is left over after paying for variable costs of prod^n.

		Operating Margin (Cash flows)	PV of CF @ 9%
1st year	1500 × 17%	255	
2nd "		255 (1+0.11) = 283.05	283.05 × 0.917 = 259.56
3rd "		283.05 (1+0.11) = 314.19	314.19 × 0.842 = 264.55
4th "		314.19 (1+0.11) = 348.75	348.75 × 0.772 = 269.24
5th "		348.75 (1+0.11) = 387.11	387.11 × 0.708 = 274.07
		387.11 (1+0.11) = 429.70	429.70 × 0.650 = 279.31
			1346.73

1 to 5 yr → growth 11%
5th to ... → 0% growth.

Terminal value $= \frac{429.70(1+g)}{K_0 - g} = \frac{429.70(1+0)}{0.09-0.00} = 4774.44$

× PVF @ 0.650

3103.39

Value of combined firm

= value from 1 to 5 yr	1346.73
Terminal value	3103.39
	4450.12

GTU May 2012. The free cash flow of a firm is projected grow at a compound annual average rate of 25% for the next years. Growth is then expected to slow down to a normal 10% annual growth rate. The current year's cash flow to the firm is Rs. 4 lakh. The firm's cost of capital during high growth period is 18% & 12%, beyond the 5th year, as growth stabilizes. Compute the value of the firm.

Solution:-

Year	FCF (lacs)		PVF @18%	PV of FCF
1	4 × (1+0.25)	5.	0.847	4.235
2	5 × (1+0.25)	6.25.	0.718.	4.488
3	6.25 × (1+0.25)	7.81	0.609	4.756
4	7.81 × (1+0.25)	9.77.	0.516.	5.041
5.	9.77 × (1+0.25)	12.21.	0.437.	5.336.
				23.856.

PV of cash flow after the period of 5 years.

$$TV_5 = \frac{CF_5(1+g)}{Ke-g} = \frac{\cancel{9.77}\ 12.21(1+0.10)}{0.12-0.10} = \frac{\cancel{10.747}\ 13.431}{0.02} = \cancel{537.35}\ 671.55.$$

@ the end of 5 years.

Ko − g

PV of TV_5 671.55 × PVF @ ~~0.12~~ 0.18 (0.437).

671.55 × 0.437 → 293.47. PV of CF after the period of 5 years

Value of firm = Cash flow during 5 yrs + Cash flow after 5 yrs

23.856
+ 293.47
317.326.

→ cost of capital includes cost of equity + debt to the firm.

Here we assume while calculating sum of terminal value/ continuing value that the firm earns a constant return on the existing invested capital. (ROR → discounting factor)

Que. (1)

P.33.14 The following information is provided related to the acquiring firm A Ltd. and the target firm T Ltd:

Particulars	*Firm A*	*Firm T*
EAT (Rs lakh)	1,000	200
Number of shares outstanding (in lakh)	100	50
EPS (Rs)	10	4
P/E ratio (times)	10	5
MPS (Rs)	100	20

(a) What is the swap ratio based on current market prices?
(b) What is the EPS of A Ltd after acquisition?
(c) What is the expected market price per share (MPS) of A Ltd after acquisition, assuming P/E ratio of Firm A remains unchanged.
(d) Determine the market value of the merged firm.
(e) Calculate gain/loss for shareholders of the two independent companies, after acquisition.
(f) Determine the upper and lower limits for swap ratio beyond which the two firms would not go for the acquisition/merger.

Solution

(a) Exchange ratio based on market prices = Rs 20/Rs 100 = 0.2:1. For every one share of Firm T, 0.2 share will be issued in Firm A. Based on this ratio, the number of new shares issued by Firm T will be = 50 lakh × 0.2 = 10 lakh.
(b) EPS after the merger (EPSc) = = Rs 10.91
(c) Expected MPS after merger = Rs 10.91 × 10 = Rs 109.10
(d) Market value of merged firm = Rs 109.10 MPS × 110 lakh shares = Rs 120.01 crore.

(e) Gains from the merger *(Rs crore)*

Post-merger market value of the firm		Rs 120.01
Less: Pre-merger market value:		
Firm A (100 lakh shares × Rs 100 MPS)	Rs 100	
Firm T (50 lakh shares × Rs 20 MPS)	10	110.00
Gains from merger		10.01

Apportionment of gains from merger among shareholders *(Rs crore)*

Firm A:	
Post-merger market value (100 lakh shares × Rs 109.10 MPS)	109.10
Less: Pre-merger market value	100.00
Gains to the shareholders of Firm A	9.10
Firm B:	
Post-merger market value (10 lakh shares × Rs 109.10)	10.91
Less: Pre-merger market value	10.00
Gain to the shareholders of Firm T	0.91

(f) Determination of upper limit and lower limit of share exchange ratio *(Rs crore)*

(i) Lower limit (based on total gains accruing to shareholders of Firm A)	
Total market value of the merger firm	Rs 120.01
Less: Pre-merger (or minimum post-merger) value acceptable to shareholders of Firm T	10.00
Maximum acceptable post-merger market value of Firm A	110.01
Divided by the number of equity shares outstanding in Firm A	100
Post-merger MPS (Rs 110.01 crore/100 lakh)	110.01
Number of equity shares required to be issued in Firm A to have the desired MPS of Rs 110.01 and to have a post-merger value of Rs 10 crore of Firm T, that is, (Rs 10 crore/Rs 110.01) = 9,09,008.27	9,09,009 shares
Existing number of equity shares of Firm T	50

MPS = Market value total / No. of shares.

Share exchange ratio (9,09,009/50 lakh) = 0.1818: 1 or	1: 5.5

For every 5.5 shares of Firm T, 1 share in Firm A will be issued. This is the lowest exchange ratio acceptable to shareholders of Firm T. Any ratio lower than this will decrease their existing wealth of Rs 10 crore.

(ii) Upper limit (based on total gains accruing to shareholders of Firm T)

Total market value of the merged firm	Rs 120.01
Less: Pre-merger (or minimum post-merger) value acceptable to the shareholders of Firm A	100.00
Maximum acceptable post-merger market value of Firm T	20.01
Since post-merger market value of Firm A remains unchanged at Rs 100 crore (and so the number of its shares (100 lakh) and MPS of Rs 100), number of equity shares required to be issued in Firm A to have a MPS of Rs 100 and to have a post-merger value of Rs 20.01 crore of Firm T (Rs 20.01 crore/ Rs 100 MPS)	20,01,000 shares
Existing number of equity shares outstanding in Firm T	50 lakh
Share exchange ratio (20,01,000/50 lakh) = 0.4002:1 or	1: 2.5

For every 2.5 shares of Firm T, 1 share in Firm A will be issued. This is the upper most exchange ratio acceptable to shareholders of Firm A as any ratio higher than this will dilute their existing wealth of Rs 100 crore.