

UDHNA COLLEGE

SYBCOM SEM-3

LABOUR COSTING

PRACTICE QUESTIONS & SOLUTIONS-2

QUESTION 1

In a factory there are three employees X, Y and Z. Standard time for one job was 120 hours. Rate per hour was Rs 50. X, Y and Z completed the work in 60, 90 and 108 hours respectively. Calculate their wages under:

- (i) Time wages
- (ii) Piece wages
- (iii) Halsey bonus plan.

SOLUTION:

Time Allowed for all workers (TA): 120 hours

Workers	Time Taken (T) hours	Time Saved (TS) hours
X	60	60
Y	90	30
Z	108	12

FORMULA / WORKING RULE: Wage Computation Formulas

- 1) Time Wages = $T \times \text{Rate per hour}$
- 2) Piece Wages = $TA \times \text{Rate per hour}$
- 3) Halsey Plan = $(T \times R) + [50\% \times (TS \times R)]$

1) Time Wages Calculation:

- Worker X = 60 hrs $\times$ Rs 50 = Rs 3,000
- Worker Y = 90 hrs $\times$ Rs 50 = Rs 4,500
- Worker Z = 108 hrs $\times$ Rs 50 = Rs 5,400

2) Piece Wages Calculation:

- Worker X = 120 hrs × Rs 50 = Rs 6,000
- Worker Y = 120 hrs × Rs 50 = Rs 6,000
- Worker Z = 120 hrs × Rs 50 = Rs 6,000

3) Halsey Bonus Plan Calculation:

- Worker X = $(60 \times 50) + 1/2 (60 \times 50) = 3,000 + 1,500 = \text{Rs } 4,500$
- Worker Y = $(90 \times 50) + 1/2 (30 \times 50) = 4,500 + 750 = \text{Rs } 5,250$
- Worker Z = $(108 \times 50) + 1/2 (12 \times 50) = 5,400 + 300 = \text{Rs } 5,700$

QUESTION 2

The standard time for job is 15 hours and the hourly rate is Rs 2. A workman completes the job in 12 hours. Calculate the wages as per Rowan Plan.

SOLUTION:

Given Data: TA = 15 hours, T = 12 hours, Hourly Rate (R) = Rs 2

Time Saved (TS): $TA - T = 15 - 12 = 3$ hours

FORMULA / WORKING RULE: Rowan Premium Plan Formula

$$\text{Total Earnings (E)} = (T \times R) + [(T \times R) \times (TS / TA)]$$

$$\begin{aligned} \text{Calculation: } E &= (12 \times 2) + [(12 \times 2) \times (3 / 15)] \\ &= 24 + [24 \times 0.20] = 24 + 4.80 \end{aligned}$$

Total Wages (Rowan Plan) = Rs 28.80

QUESTION 3

Ramesh has taken 48 hours to complete a job. The wage rate per hour is Rs 15. If he has received Rs 864 as total wages according to Rowan Plan, what would be the amount of wages earned by him according to Halsey Plan?

SOLUTION:

Given Data: Time taken (T) = 48 hrs, Rate (R) = Rs 15, Rowan Earnings = Rs 864

FORMULA / WORKING RULE: Step 1: Determine Time Allowed (TA) via Rowan Formula

$$\begin{aligned} \text{Rowan Earnings} &= (T \times R) + [(T \times R) \times (TS / TA)] \\ 864 &= (48 \times 15) + [720 \times (TS / TA)] \\ 864 &= 720 + 720 \times (TS / TA) \Rightarrow 144 = 720 \times (TS / TA) \\ TS / TA &= 144 / 720 = 1 / 5 \end{aligned}$$

Ratio Analysis: If TA = 5, then TS = 1, so T = TA - TS = 5 - 1 = 4

Standard Unit (T)

Time Allowed (TA)

4	5
48 hours	$(?) = (48 \times 5) / 4 = 60 \text{ hours}$

Time Saved (TS) = TA – T = 60 – 48 = 12 hours

FORMULA / WORKING RULE: Step 2: Calculate Wages under Halsey Plan

$$\begin{aligned} \text{Halsey Wages} &= (T \times R) + 50\% \times (TS \times R) \\ &= (48 \times 15) + 1/2 \times (12 \times 15) = 720 + 90 = \text{Rs } 810 \end{aligned}$$

Total Wages (Halsey Plan) = Rs 810

QUESTION 4

Mr. Suresh produced 600 units in 150 hours. Rate per hour was Rs 8. The standard time for producing one unit was 15 minutes, but under incentive wage system this time was increased by 20%. Find out total wages under Rowan Plan.

SOLUTION:

Standard Time per unit = 15 mins + (20% of 15) = 15 + 3 = 18 minutes

Total Time Allowed (TA) = 600 units × 18 minutes = 10,800 minutes

Time Allowed in hours = 10,800 / 60 = 180 hours

Given Parameters: TA = 180 hrs, T = 150 hrs, Rate (R) = Rs 8

Time Saved (TS) = 180 – 150 = 30 hours

FORMULA / WORKING RULE: Rowan Plan Calculation

$$\begin{aligned} E &= (T \times R) + [(T \times R) \times (TS / TA)] \\ &= (150 \times 8) + [(150 \times 8) \times (30 / 180)] \\ &= 1,200 + [1,200 \times (1 / 6)] = 1,200 + 200 = \text{Rs } 1,400 \end{aligned}$$

Total Wages (Rowan Plan) = Rs 1,400

QUESTION 5

Calculate the earnings under Halsey Premium Plan and Rowan Premium Plan:

[1] Time saved: 25% of time allowed

[2] Time taken: 18 hours

[3] Rate per hour: Rs 20

SOLUTION:

Assumed Proportion: If TA = 100%, TS = 25%, then Time Taken (T) = 75%

Time Taken (T)	Time Allowed (TA)
75%	100%
18 hours	$(?) = (18 \times 100) / 75 = 24 \text{ hours}$

Calculated Values: TA = 24 hours, TS = 24 – 18 = 6 hours

FORMULA / WORKING RULE: Earnings Computation

$$\begin{aligned} \text{1) Halsey Plan} &= (T \times R) + [50\% \times (TS \times R)] \\ &= (18 \times 20) + 1/2 \times (6 \times 20) = 360 + 60 = \text{Rs } 420 \end{aligned}$$

$$\begin{aligned} \text{2) Rowan Plan} &= (T \times R) + [(T \times R) \times (TS / TA)] \\ &= (18 \times 20) + [360 \times (6 / 24)] = 360 + 90 = \text{Rs } 450 \end{aligned}$$

QUESTION 6

The following information have been received from the production department of Zenith Ltd:

- No. of workers: 10
- Monthly working days: 24
- Working hours per day for each worker: 8
- Minimum wages per hour: Rs 25
- Production units in the month: 1,200
- Production time per unit: 2 hours

Calculate wages of each worker by: (1) Halsey Plan (2) Rowan Plan (3) Time Wages (4) Piece Wages

SOLUTION:

Total Production Time Allowed = 1,200 units × 2 hrs = 2,400 hours

Time Allowed per Worker (TA) = 2,400 hrs / 10 workers = 240 hours

Time Taken per Worker (T) = 24 days × 8 hrs/day = 192 hours

Time Saved per Worker (TS) = 240 – 192 = 48 hours

FORMULA / WORKING RULE: Comparative Wage Schemes (Per Worker)

$$\text{1) Halsey Plan} = (192 \times 25) + 1/2 \times (48 \times 25) = 4,800 + 600 = \text{Rs } 5,400$$

$$\text{2) Rowan Plan} = (192 \times 25) + [4,800 \times (48 / 240)] = 4,800 + 960 = \text{Rs } 5,760$$

$$\text{3) Time Wages} = 192 \text{ hrs} \times \text{Rs } 25 = \text{Rs } 4,800$$

$$\text{4) Piece Wages} = 240 \text{ hrs} \times \text{Rs } 25 = \text{Rs } 6,000$$

QUESTION 7

Mr. Anil takes 75% of standard time to complete a job. For it he gets Rs 30 more under Halsey Plan than the time wage system. Rate per hour is Rs 20. Find out total wages and per hour effective rate of wages as per Rowan Plan.

SOLUTION:

FORMULA / WORKING RULE: Step 1: Calculate Time Saved (TS)

$$\text{Halsey Bonus Amount} = 50\% \times (\text{TS} \times \text{R})$$

$$30 = 0.50 \times (\text{TS} \times 20) \Rightarrow 30 = 10 \times \text{TS} \Rightarrow \text{TS} = 3 \text{ hours}$$

Proportion Calculation: Since T = 75% of TA, TS = 25% of TA (100% – 75%)

Time Saved % (TS)	Time Allowed % (TA)
25%	100%
3 hours	(?) = $(3 \times 100) / 25 = 12 \text{ hours}$

Calculated Hours: TA = 12 hours, T = 12 – 3 = 9 hours

FORMULA / WORKING RULE: Step 2: Rowan Plan Wages & Effective Rate

$$\begin{aligned} \text{Rowan Wages} &= (\text{T} \times \text{R}) + [(\text{T} \times \text{R}) \times (\text{TS} / \text{TA})] \\ &= (9 \times 20) + [180 \times (3 / 12)] = 180 + 45 = \text{Rs } 225 \end{aligned}$$

$$\text{Effective Rate per hour} = \text{Total Wages} / \text{Time Taken} = 225 / 9 = \text{Rs } 25 / \text{hr}$$

QUESTION 8

A worker is allowed 16 hours to complete a job, but completes it in 12 hours. Labour rate per hour is Rs 5. Cost of material is Rs 20 and factory overheads are 120% of direct labour. Find factory cost under: (1) Halsey Plan (2) Rowan Plan (3) Piece Rate system.

SOLUTION:

Given Parameters: TA = 16 hrs, T = 12 hrs, TS = 4 hrs, Rate = Rs 5

Direct Labour Cost (Halsey) = $(12 \times 5) + 1/2 (4 \times 5) = 60 + 10 = \text{Rs } 70$

Direct Labour Cost (Rowan) = $(12 \times 5) + [60 \times (4 / 16)] = 60 + 15 = \text{Rs } 75$

Direct Labour Cost (Piece Rate) = $16 \text{ hrs} \times \text{Rs } 5 = \text{Rs } 80$

Statement of Factory Cost:

Particulars	Halsey Plan (Rs)	Rowan Plan (Rs)	Piece Rate (Rs)
Direct Materials	20.00	20.00	20.00
Direct Labour	70.00	75.00	80.00
Prime Cost	90.00	95.00	100.00
Factory Overheads (120% of Labour)	84.00	90.00	96.00
FACTORY COST	174.00	185.00	196.00

QUESTION 9

From the following particulars, calculate the monthly wages of workers A, B and C:

- (1) Standard output: 1000 units
- (2) Actual output: A - 850 units, B - 700 units, C - 950 units
- (3) Rate per unit: Rs 5
- (4) Fixed Allowances: DA = Rs 600, HRA = Rs 300, TA = Rs 100
- (5) Additional Output Bonus: Output exceeds 80% of standard, for every 1% additional output Rs 50.

SOLUTION:

FORMULA / WORKING RULE: Efficiency & Bonus Calculation Rule

Efficiency % = (Actual Output / Standard Output) × 100

Bonus = (Efficiency % - 80%) × Rs 50 [If Efficiency > 80%]

Worker A Efficiency = $(850 / 1000) \times 100 = 85\% \Rightarrow \text{Bonus} = (85 - 80) \times 50 = \text{Rs } 250$

Worker B Efficiency = $(700 / 1000) \times 100 = 70\% \Rightarrow \text{Bonus} = \text{NIL (Below 80\%)}$

Worker C Efficiency = $(950 / 1000) \times 100 = 95\% \Rightarrow \text{Bonus} = (95 - 80) \times 50 = \text{Rs } 750$

Statement of Monthly Remuneration:

Particulars	Worker A (850 u)	Worker B (700 u)	Worker C (950 u)
Output Wages @ Rs 5/unit	4,250	3,500	4,750
Output Bonus	250	0	750
Dearness Allowance (DA)	600	600	600

House Rent Allowance (HRA)	300	300	300
Travelling Allowance (TA)	100	100	100
TOTAL MONTHLY WAGES (Rs)	5,500	4,500	6,500

QUESTION 10

Calculate the total monthly remuneration of three workers P, Q and R based on:

(1) Standard production: 1,500 units

(2) Piece rate: Rs 1.00 per unit

(3) Production Bonus:

- Upto 80% efficiency: Nil

- 80% to 100%: Rs 50 for every 5% increase above 80%

- Above 100%: Rs 50 for every 5% increase above 80% PLUS 15% additional bonus on total incentive earned.

(4) Actual production in Jan 2026: P - 1,200 units, Q - 1,500 units, R - 1,650 units.

SOLUTION:

Worker	Output	Piece Wages	Efficiency	Incentive	Total Earnings
P	1,200 u	Rs 1,200	80%	Rs 0	Rs 1,200
Q	1,500 u	Rs 1,500	100%	Rs 200	Rs 1,700
R	1,650 u	Rs 1,650	110%	Rs 345	Rs 1,995

FORMULA / WORKING RULE: Detailed Incentive Workings

- Worker P: Efficiency = $1,200/1,500 = 80\%$ => Incentive = Nil
- Worker Q: Efficiency = $1,500/1,500 = 100\%$ (20% above 80% = 4 slabs of 5%)
Incentive = $4 \times \text{Rs } 50 = \text{Rs } 200$
- Worker R: Efficiency = $1,650/1,500 = 110\%$ (30% above 80% = 6 slabs of 5%)
Basic Incentive = $6 \times \text{Rs } 50 = \text{Rs } 300$
Additional Bonus = 15% of Rs 300 = Rs 45
Total Incentive = $300 + 45 = \text{Rs } 345$

QUESTION 11

From Apex Mills Ltd. details for March 2026:

Beginning workers = 800, End workers = 1,000, Relieved = 10, Retired = 5, Resigned = 15, Appointed on existing posts = 10, Appointed for expansion = 50. Calculate Labour Turnover Rate (LTR) by all methods.

SOLUTION:

FORMULA / WORKING RULE: Labour Turnover Rate (LTR) Core Formulas

- 1) Average Workers = (Workers at Beginning + Workers at End) / 2
- 2) LTR (Separation) = (Total Left Workers / Average Workers) × 100
- 3) LTR (Replacement) = (Number of Replacements / Average Workers) × 100
- 4) LTR (Flux Method) = [(Left Workers + Replacements) / Average Workers] × 100

Average Workers = $(800 + 1,000) / 2 = 900$ workers

Total Separations (Left) = Relieved (10) + Retired (5) + Resigned (15) = 30 workers

Total Replacements = 10 workers (Excludes 50 expansion appointments)

1) LTR (Separation Method) = $(30 / 900) \times 100 = 3.33\%$

2) LTR (Replacement Method) = $(10 / 900) \times 100 = 1.11\%$

3) LTR (Flux Method) = $[(30 + 10) / 900] \times 100 = (40 / 900) \times 100 = 4.44\%$

QUESTION 12

Orient Textile Ltd. April 2026 data:

Workers on 1-4-2026 = 2,000; Workers on 30-4-2026 = 1,600.

During April: Resigned = 100, Retired = 200, Dismissed = 100, Newly Appointed = 250 (100 under expansion scheme).

Calculate LTR by Separation, Replacement, and Equivalent Annual LTR.

SOLUTION:

Average Workers = $(2,000 + 1,600) / 2 = 1,800$ workers

Total Left Workers = $100 + 200 + 100 = 400$ workers

Replacements = Total Appointed (250) – Expansion (100) = 150 workers

FORMULA / WORKING RULE: Equivalent Annual LTR Formula

Equivalent Annual LTR = (Monthly LTR × 365 Days) / Number of Days in Month (30)

Separation Rate = $(400 / 1,800) \times 100 = 22.22\%$

Replacement Rate = $(150 / 1,800) \times 100 = 8.33\%$

Annual Equivalent (Separation) = $(22.22 \times 365) / 30 = 270.34\%$

Annual Equivalent (Replacement) = $(8.33 \times 365) / 30 = 101.36\%$

QUESTION 13

Calculate Labour Turnover Rate in Reliance Ltd. for June 2026:

Beginning = 5,000, End = 7,000, Resigned = 300, Retired = 200, Suspended = 100, New Recruitment = 800 (50% under expansion plan).

Compute: (1) Separation (2) Replacement (3) Flux (4) Annual Equivalent for all.

SOLUTION:

Average Workers = $(5,000 + 7,000) / 2 = 6,000$ workers

Total Separations = $300 + 200 + 100 = 600$ workers

Replacements = $800 \text{ recruitment} - 50\% \text{ expansion } (400) = 400$ workers

FORMULA / WORKING RULE: Summary of LTR Calculations (June = 30 Days)

$$1) \text{ Separation LTR} = (600 / 6,000) \times 100 = 10.00\%$$

$$\text{Annual Equivalent} = (10.00 \times 365) / 30 = 121.67\%$$

$$2) \text{ Replacement LTR} = (400 / 6,000) \times 100 = 6.67\%$$

$$\text{Annual Equivalent} = (6.67 \times 365) / 30 = 81.15\%$$

$$3) \text{ Flux LTR} = [(600 + 400) / 6,000] \times 100 = 16.67\%$$

$$\text{Annual Equivalent} = (16.67 \times 365) / 30 = 202.82\%$$

QUESTION 14

Horizon Ltd. January 2026 data:

[1] Workers on 1st Jan: 2,000

[2] Workers left: 150

[3] Replacements: 100

[4] Expansion appointments: 300

[5] LTR as per Flux Method: 10%

Find out workers as on 31st January 2026.

SOLUTION:

FORMULA / WORKING RULE: Step 1: Determine Average Workers using Flux Method

$$\text{Flux LTR} = [(\text{Left Workers} + \text{Replacements}) / \text{Average Workers}] \times 100$$

$$10 = [(150 + 100) / \text{Average Workers}] \times 100$$

$$10 = [250 / \text{Average Workers}] \times 100 \Rightarrow \text{Average Workers} = (250 \times 100) / 10 = 2,500$$

FORMULA / WORKING RULE: Step 2: Derive Ending Worker Strength

Average Workers = (Workers at Beginning + Workers at End) / 2

2,500 = (2,000 + Workers at End) / 2

5,000 = 2,000 + Workers at End

Workers at End (31st Jan 2026) = 3,000 workers

Final Answer: 3,000 workers as on 31st January 2026