

32.

$$\text{Time Allowed (T.A)} = (20 \times 3) = 60 \text{ hrs.}$$

$$\text{Time Taken (T.T)} = 48 \text{ hrs.}$$

$$\text{Time Saved (T.S)} = (60 - 48) = 12 \text{ hrs.}$$

$$\text{Rate Per hour (R.H)} = ₹ 0.50$$

$$\begin{aligned} \text{(i) Halsey Plan} &= \text{Normal wages} + \text{Bonus} \\ &= (\text{Time Taken} \times \text{Rate Per hour}) + 50\% \times \\ &\quad (\text{Time Saved} \times \text{Rate Per hour}) \\ &= (48 \times 0.50) + 50\% (12 \times 0.50) \\ &= 24 + 50\% \times 6 \\ &= ₹ 27 \end{aligned}$$

$$\text{Total earnings} = \frac{27}{48} = ₹ 0.5625$$

$$\begin{aligned} \text{(ii) Rowan Plan} &= \text{Normal wages} + \text{Bonus} \\ &= (\text{Time Taken} \times \text{Rate Per hour}) + \frac{\text{Time Saved}}{\text{Time allowed}} \\ &\quad (\text{Time Taken} \times \text{Rate Per hour}) \\ &= (48 \times 0.50) + \frac{12}{60} (48 \times 0.50) \\ &= 24 + \frac{12}{60} \times 24 \\ &= ₹ 28.80 \end{aligned}$$

$$\text{Total earnings} = \frac{28.8}{48} = ₹ 0.60$$

33.

$$\text{Time Allowed (T.A)} = 20 \text{ hrs.}$$

$$\text{Time Taken (T.T)} = 15 \text{ hrs.}$$

$$\text{Time Saved (T.S)} = (20 - 15) = 5 \text{ hrs.}$$

$$\text{Rate per hour (R.H)} = ₹ 1$$

$$\begin{aligned} \text{(a) Time-wage system} &= \text{Time Taken} \times \text{Rate Per hour} \\ &= 15 \times 1 \\ &= ₹ 15 \end{aligned}$$

$$\begin{aligned} \text{(b) Piece-wage system} &= \text{Time Allowed} \times \text{Rate Per hour} \\ &= 20 \times 1 \\ &= ₹ 20 \end{aligned}$$

$$\begin{aligned} \text{(c) Halsey Plan} &= \text{Normal wages} + \text{Bonus} \\ &= (\text{Time Taken} \times \text{Rate Per hour}) + 50\% \times \\ &\quad (\text{Time Saved} \times \text{Rate Per hour}) \\ &= (15 \times 1) + 50\% (5 \times 1) \\ &= 15 + 50\% \times 5 \\ &= ₹ 17.5 \end{aligned}$$

(d) Rowan Plan = Normal wages + Bonus

$$= (\text{Time Taken} \times \text{Rate per hour}) + \frac{\text{Time saved}}{\text{Time allowed}} (\text{Time Taken} \times \text{Rate per hour})$$

$$= (15 \times 1) + \frac{5}{20} \times (15 \times 1)$$

$$= 15 + \frac{5}{20} \times 15$$

$$= ₹ 18.75$$

Statement showings of Total earnings

Part	Time wage		Piece wage		Halsey Plan		Rowan plan	
	Total	Earnings	Total		Total		Total	
Normal wages	15		20		15		15	
Add-Bonus	-		-		2.50		3.75	
	15		20		17.50		18.75	
Add :- Sickness allowance	0.30		0.30		0.30		0.30	
	15.30		20.30		17.80		19.05	

34.

Time Allowed (T.A) = 100 hrs.
 Time Taken (T.T) = 80 hrs.
 Time saved (T.S) = (100 - 80) = 20 hrs.
 Rate Per hour (R.H) = ₹ 6.00

(i) Time Rate = Time Taken x Rate Per hour
 $= (80 \times 6.00)$
 $= ₹ 480$

(ii) Piece Rate = Time Allowed x Rate Per hour
 $= (100 \times 6.00)$
 $= ₹ 600$

Statement showing calculation of work cost

Particulars	Time	Piece	Halsey	Rowan
Materials cost	800	800	800	800
Add :- Labour	480	600	540	576
<u>PRIME COST</u>	1280	1400	1340	1376
Add :- Factory overhead (125% of wages)	600	750	675	720
	1880	2150	2015	2096

(35)

Time Allowed (T.A) = 9 hrs.

Time Taken (T.T) = 6 hrs.

Time saved (T.S) = (9-6) = 3 hrs.

Rate per hour (R.H) = $\frac{75}{100} = ₹ 0.75$

(i) Piece works plan = Time Allowed x Rate per hour
 $= (9 \times 0.75)$
 $= ₹ 6.75$

(ii) Rowan Plan = Normal wages + Bonus
 $= (\text{Time Taken} \times \text{Rate per hour}) + \frac{\text{Time saved}}{\text{Time Allowed}} (\text{Time Taken} \times \text{Rate per hour})$
 $= (6 \times 0.75) + \frac{3}{9} (6 \times 0.75)$
 $= 4.5 + \frac{3}{9} \times 4.5$
 $= ₹ 6.00$

(iii) Halsey Plan = Normal wages + Bonus
 $= (\text{Time Taken} \times \text{Rate per hour}) + 50\% \text{ of } (\text{Time saved} \times \text{Rate per hour})$
 $= (6 \times 0.75) + 50\% (3 \times 0.75)$
 $= 4.5 + 50\% \times 2.25$
 $= ₹ 5.625$

Calculation of work cost:

Particulars	Piece	Rowan	Halsey
Materials cost	4	4	4
Add :- Labour	6.75	6.00	5.625
<u>PRIME COST</u>	10.75	10.00	9.625
Add :- Overhead (150% of direct wages)	10.125	9.00	8.44
<u>WORKS COST</u>	20.88	19.00	18.07

36

Time Allowed (T.A) = 40 hrs.

Time Taken (T.T) = 26 hrs.

Time Saved (T.S) = (40 - 26) = 14 hrs.

Rate Per hour (R.H) = ₹ 10

Halsey Scheme = Normal wages + Bonus

= (Time Taken x Rate Per hour) + 50% of (Time Saved x Rate Per hour)

= (26 x 10) + 50% (14 x 10)

= 260 + 50% x 140

= ₹ 330

(a) Effective hourly rate of wages of sudhir

= Total earnings / Time Taken

= ₹ 330 / 26

= ₹ 12.69

37

Time Allowed (T.A) = ^{Ajay} 150 x 40 / 100 = 60 hrs.

Time Taken (T.T) = 48 hrs.

Time Saved (T.S) = (60 - 48) = 12 hrs.

Rate Per hour (R.H) = ₹ 8

^{Saurav} 200 x 42 / 100 = 84 hrs.
70 hrs.

(84 - 70) = 14 hrs.

₹ 12

Ajay

Halsey plan = Normal wages + Bonus

= (Time Taken x Rate Per hour) + 50% (Time Saved x Rate Per hour)

= (48 x 8) + 50% (12 x 8)

= ₹ 432

Saurav

Rowan plan = Normal wages + Bonus

= (Time Taken x Rate Per hour) + Time Saved / Time allowed (Time Taken x Rate Per hour)

= (70 x 12) + 14 / 84 x (70 x 12)

= ₹ 980

Calculation of work cost:

Particulars	Halsey (₹)	Rowan (₹)
Material cost for job	668	100
<u>Add:- Labour</u>	432	98
<u>PRIME COST</u>	1,100	198
<u>Add:- factory overhead</u>	648	98
<u>WORKS COST</u>	1748	296

(38)

Time Allowed (T.A) = $(50 \times 6) = 300$ hrs.

Time Taken (T.T) = 160 hrs.

Time Saved (T.S) = $(300 - 160) = 140$ hrs.

Rate Per hour (R.H) = ₹ 1.00

(a) Halsey Method = Normal wages + Bonus
 $= (\text{Time Taken} \times \text{Rate per hour}) + \frac{1}{2} (\text{Time Saved} \times \text{Rate per hour})$
 $= (160 \times 1) + 50\% (140 \times 1)$
 $= ₹ 230$

Effective hourly rate = $\frac{\text{Total Earnings } ₹ 230}{\text{Time Taken } 160} = ₹ 1.4375$

(b) Rowan Method = Normal wages + Bonus
 $= (\text{Time Taken} \times \text{Rate per hour}) + \frac{\text{Time saved}}{\text{Time allowed}} (\text{Time Taken} \times \text{Rate per hour})$
 $= (160 \times 1) + \frac{140}{300} (160 \times 1)$
 $= ₹ 234.67$

Effective hourly rate = $\frac{\text{Total Earnings } ₹ 234.67}{\text{Time Taken } 160} = ₹ 1.4667$

Calculation of work cost :

Particulars	Halsey (₹)	Rowan (₹)
Materials cost (50x36)	1,800	1,800
Add :- Labour	230	234.67
<u>PRIME COST</u>	2030	2,034.67
Add :- Factory overhead	460	469.34
	2,490	2,504.01

(39.)

Time Allowed (T.A) = 10 hrs.

Time Taken (T.T) = 6 hrs.

Time saved (T.S) = (10-6) = 4 hrs.

Rate Per hour (R.H) = $\frac{6}{8} = ₹ 0.75$

∴ Piece rate system = ₹ 9.00

Effective hourly Rate = $\frac{\text{Total earnings}}{\text{Time taken}} = \frac{₹ 9}{6} = ₹ 1.50$

Halsey system = Normal wages + Bonus
 = (Time taken x Rate per hour) + 50% of (Time saved x Rate per hour)
 = (6 x 0.75) + 50% (4 x 0.75)
 = ₹ 6.00

Effective hourly rate = $\frac{\text{Total Earnings}}{\text{Time Taken}} = \frac{₹ 6}{6} = ₹ 1.00$

Calculation of work cost :

Particulars	Piece Rate (₹)	Halsey (₹)
Material cost	5	5
Add :- Labour	9	6
<u>PRIME COST</u>	14	11
Add :- Factory overhead (0.40x6)	2.40	2.40
<u>WORKS COST</u>	16.40	13.40

41

	Job A	Job B
Time Allowed (T.A)	30 hrs.	36 hrs.
Time Taken (T.T)	20 hrs.	20 hrs.
Time saved (T.S)	$(30-20)$ = 10 hrs.	$(36-20)$ = 16 hrs.
Rate Per hour (R.H)	₹ 0.50	₹ 0.50

Rowan System = Normal wages + Bonus

$$= (\text{Time Taken} \times \text{Rate Per hour}) + \frac{\text{Time saved}}{\text{Time Allowed}} (\text{Time Taken} \times \text{Rate Per hour})$$

Job A = $(20 \times 0.50) + \frac{10}{30} (20 \times 0.50)$
 $= ₹ 13.33$

Job B = $(20 \times 0.50) + \frac{16}{36} (20 \times 0.50)$
 $= ₹ 14.44$

Calculate of total earnings :-

Particulars	Details (₹)	Amount (₹)
Normal wages - Job A	10	
Job B	10	
Add :- Bonus - Job A		2.00
Job B	3.33	
Add :- waiting time (4 x 0.50)	4.44	7.77
		27.77
<u>TOTAL EARNINGS</u>		29.50

42

	a	b	c	d
Time Allowed (T.A)	8 hrs.	8 hrs.	6 hrs.	4 hrs.
Time Taken (T.T)	8 hrs.	6 hrs.	4 hrs.	2 hrs.
Time saved (T.S)	$(8-8) = 0$	$(8-6) = 2$	$(8-6) = 2$	$(8-4) = 4$
Rate Per hour (R.H)	₹ 4.00	₹ 4.00	₹ 4.00	₹ 4.00

Halsey Plan = Normal wages + Bonus

$$= (\text{Time Taken} \times \text{Rate Per hour}) + 50\% (\text{Time saved} \times \text{Rate Per hour})$$

a = $(8 \times 4) + 50\% (0 \times 4)$ / Total earnings = $\frac{32}{8}$

b = $(6 \times 4) + 50\% (2 \times 4)$ / Total earnings = $\frac{28}{6}$

$$C = (4 \times 4) + 50\% \cdot (4 \times 4)$$

$$= ₹ 24$$

$$\text{Total earnings} = \frac{24}{4} = ₹ 6.00$$

$$d = (2 \times 4) + 50\% \cdot (6 \times 4)$$

$$= ₹ 20$$

$$\text{Total earnings} = \frac{20}{2} = ₹ 10.00$$

$$e = (1 \times 4) + 50\% \cdot (7 \times 4)$$

$$= ₹ 18$$

$$\text{Total earnings} = \frac{18}{1} = ₹ 18.00$$

Rowan plan = Normal wages + Bonus

$$= (\text{Time taken} \times \text{Rate per hour}) + \frac{\text{Time saved}}{\text{Time allowed}} (\text{Time taken} \times \text{Rate per hour})$$

$$a = (8 \times 4) + \frac{0}{8} (8 \times 4)$$

$$= ₹ 32$$

$$\text{Total earnings} = \frac{32}{8} = ₹ 4.00$$

$$b = (6 \times 4) + \frac{2}{8} (6 \times 4)$$

$$= ₹ 30$$

$$\text{Total earnings} = \frac{30}{6} = ₹ 5.00$$

$$c = (4 \times 4) + \frac{4}{8} (4 \times 4)$$

$$= ₹ 24$$

$$\text{Total earnings} = \frac{24}{4} = ₹ 6.00$$

$$d = (2 \times 4) + \frac{6}{8} (2 \times 4)$$

$$= ₹ 14$$

$$\text{Total earnings} = \frac{14}{2} = ₹ 7.00$$

$$e = (1 \times 4) + \frac{7}{8} (1 \times 4)$$

$$= ₹ 7.50$$

$$\text{Total earnings} = \frac{7.50}{1} = ₹ 7.50$$

43.

Time Allowed (T.A) = $\frac{A}{16}$ hrs.	$\frac{B}{16}$ hrs.
Time Taken (T.T) = 12 hrs.	14 hrs.
Time Saved (T.S) = $(16-12)$ = 4 hrs.	$(16-14)$ = 2 hrs.
Rate Per hour (R.H) = ₹ 0.80	₹ 0.80

Halsey system = (Normal wages + Bonus)
 = (Time Taken x Rate per hour) + 50%
 (Time saved x Rate per hour)

$$A = (12 \times 0.80) + 50\% (4 \times 0.80)$$

$$= ₹ 11.20$$

$$B = (14 \times 0.80) + 50\% (2 \times 0.80)$$

$$= ₹ 12.00$$

Effective hourly rate = $\frac{\text{Total earnings}}{\text{Time taken}}$

A = $\frac{11.20}{12}$

B = $\frac{12}{14} = ₹$

Rowan system = Normal wages + Bonus
 = (Time taken x Rate per hour) + $\frac{\text{Time saved}}{\text{Time allowed}}$
 x Rate per hour

$$A = (12 \times 0.80) + \frac{4}{16} (12 \times 0.80)$$

$$= ₹ 12.00$$

$$B = (14 \times 0.80) + \frac{2}{16} (14 \times 0.80)$$

$$= ₹ 12.60$$

Effective hourly rate = $\frac{\text{Total earnings}}{\text{Time taken}}$

A = $\frac{12.00}{12} = ₹$

B = $\frac{12.60}{14} = ₹$

calculation of work cost / Factory cost:

Particulars	Halsey		Rowan	
	A	B	A	B
Material cost	8.00	8.00	8.00	8.00
Add:- Labour	11.20	12	12	12
<u>PRIME COST</u>	19.20	20.00	20.00	20.00
Add:- factory overhead (12 x 1.20)	14.40	14.40	16.800	16.80
<u>factory cost</u>	33.60	34.40	36.80	36.80