7. OPERATING COSTING

PROBLEM NO: 1

Absolute tonne km =

A to B = (20 tonnes x 80km) = 1,600 tonne-km

B to C = (12 tonnes x 120km) = 1,440 tonne-km

C to A = (16 tonnes x 160km) = 2,560 tonne-km

Total = 5,600 tonne-km

Absolute tonne-kms = 5,600 tonne kms.

Commercial tonne km = Average load carried x total kilometers travelled

$$= \left[\frac{20t+12t+16t}{3}\right] x [80km+120km160km]$$

=16 tone x 360 km =5,760 tonne-km

PROBLEM NO: 2

Total Distance Travelled = No. of Buses x Distance traveled in one way x no. of one way trips x No. of days in a month

= 6 Buses x 20 Km. x 2 x 8 trips x 25

= 48,000 kms.

Total Passenger Km. = Total Distance traveled x seating capacity x % of occupancy

= 48,000 kms x 40 passengers x 80%

= 15,36,000 passenger kms

PROBLEM NO: 3

Working notes:

W.N.1: Calculation of total kms. Traveled in a month

= 4 round trips x 2 sides x 20kms x 25 days

4000kms per month

Statement showing monthly cost sheet

Particulars	Amount (in Rs.)
Standing charges	
Insurance $\left[Rs.7,500 x \frac{1}{12m}\right]$	625
Taxes $\left[Rs.1,800 x \frac{1}{12m}\right]$	150
Garage rent	2,500
Depreciation $\left[\frac{Rs.4,50,000 - Rs50,000}{10Years} x \frac{1}{12m}\right]$	3,333.33
Drivers Salary	3,000
Repairs and Maintenance charges	
Repairs cost $\left[Rs.120,00 x \frac{1}{12m}\right]$	1,000

Running Charges	
Incidental Expenses	2,000
Petrol and Oil Cost $\left[\frac{Rs.4,000kms\,(W.N.1)}{100kms} x Rs.220\right]$	8,800
(+) 10% on takings	2854.444
Total Cost	24262.774
(+) profit (15% on takings) [28,544.44 x 15%]	4281.666
Total Takings per month	28,544.44

Charge per round trip = $\frac{Rs.28,544.44}{100} = Rs.285.44$

Number of round trips in a month = 4 round trips per day x 25 days
= 100

PROBLEM NO: 4

Statement showing total cost and bus fare to be charged from each passenger per km (Per month)

Particulars	**Amount (in Rs.)**
Standing charges	
Insurance $\left[Rs.9,00,000 \times 3\% \times \frac{1}{12m}\right]$	2250
Taxes $\left[Rs.10,000 \times \frac{1}{12m}\right]$	833.33
Garage rent	10,000
Manager-cum-accountant salary	3,500
Depreciation $\left[\frac{9,00,000 - 60,000}{5yrs} \times \frac{1}{12m}\right]$	14,000
Repairs and Maintenance charges	
Repairs $\left[Rs.10,000 \times \frac{1}{12m}\right]$	833.33
Running Charges	
Drivers salary	1500
Conductors	1000
Diesel and oil $\left[\frac{3000\,kms\,(w.n.l)}{100} x Rs.450\,perhundredkms\right]$	13,500
Drivers Commission $\left[63,888.88 x 10\% \times \frac{1}{2}\right]$	3194.444
Conductors Commission $\left[63,888.88 \times 10\% \times \frac{1}{2}\right]$	3194.444
Stationery cost	500
Total Cost [85%]	54305.548
(+) 15% Profit [63,888.88x15%]	9583.332
Taking value [100%]	63,888.88

∴ Bus fare to be charged from each passenger per km

$= \frac{Total\,Takings\,value}{Total\,passenger\,km} = \frac{Rs\,63,888.88}{1,20,000\,passengeskm\,[W.N.2]}$ =Rs0.5324 Per passenger Per km.

W.N.1: Calculation of Total kms traveled per month

= 3round trips x 2 times x 20km x 40 passengers x 25 days

= 3,000 kilometers

W.N.2: Calculation of Total passenger kms per month

= No. of kms travelled x average passengers per trip

= 3,000 kms x 40 passengers

= 1,20,000 passenger kilometers

PROBLEM NO: 5

Repeated same as PROBLEM NO: 4

PROBLEM NO: 6

a) Statement showing operating cost for operating single bus and fleet of 5 buses per annum

Particulars	**(1) Single bus**	**(2) = (1) x 5 Fleet of fie buses**
Driver's salary [4,500x12]	Rs. 54,000	Rs. 2,70,000
Cleaner's salary $\left[\frac{3500 \times 12}{5}\right]$	Rs. 8400	Rs. 42,000
License Fee, taxes etc;	Rs. 8,600	Rs.43,000
Insurance	Rs. 10,000	Rs. 50,000
Repairs & maintenance	Rs. 35,000	Rs.1,75,000
Depreciation $\left[\frac{Rs.15,00,000 - Rs.3,00,000}{12 Years}\right]$	Rs. 1,00,000	Rs. 5,00,000
Diesel Cost $\left[\frac{Rs.14,400\,[W.N.1]}{4\,kms} \times Rs.45\right]$	Rs. 1,62,000	Rs. 8,10,000
Total Cost	Rs. 3,78,000	Rs. 18,90,000

b) Let 'x' be the full fair Per Student per annum and therefore half fair will be '0.5x' No of students droped with in range of 4 km will be pay half fair

No. of students availed this group = 100 students x 50%

= 50 students.

And who pay full fair be 'x'

No of students adopting this group = 50 students

$\therefore$ 0.5x x 50 students + x x 50students = Rs. 3,78,000

$\Rightarrow$ 75x students = Rs.3,78,000

$\Rightarrow$ x = Rs. 5040, per annum

i) Student coming from a distance up to 4km

= Rs. 5040 x $\frac{1}{12m}$ x 50% = Rs. 210 per student per month

ii) Student coming form a distance beyond 4km

= Rs. 5040 x $\frac{1}{12m}$ = Rs. 420 per students per month.

PROBLEM NO: 7

Working Notes :

Total distance (in km) covered per month.

Bus Route	Km. per trip	Trips per day	Days Per month	Km per month
Delhi to chandigarh	250	2	8	4,000
Delhi to Agra	210	2	10	4,200
Delhi to Jaipur	270	2	6	3240
				11,440

PASSENGER KM PER MONTH:-

Bus Route	Km. Per Month	Seating Capacity	Passenger km per month
Delhi to chandigarh	4,000	45 (50 x 90%)	180,000
Delhi to Agra	4,200	42.5 (50 x 85%)	178500
Delhi to Jaipur	3240	50 (50 x 100%)	162,000
			520500

MONTHLY OPERATING COST STATEMENT

Particulars	Amount (Rs.)	Amount (Rs.)
Standing Charges		
Depreciation $\left(\frac{12,00,000 \times 20\%}{12 \text{ months}}\right)$	20,000	
Salary of the driver	24,000	
Salary of the conductor	21,000	
Salary of the part-time Accountant	5000	
Insurance of the bus $\left(\text{Rs.}\frac{4800 \text{ Rs.}}{12 \text{ months}}\right)$	400	
Road tax $\left(\text{Rs.}\frac{15,915}{12 \text{ months}}\right)$	1326.25	
Permit fee	315	72041.25
Repairs & Maintenance Charges		
Repairs and maintenance		1000
Running Charges		
Diesel consumption $\left(\text{Rs.}56 \times \frac{11400 \text{ kms}}{4 \text{ kms}}\right)$	160160	
Lubricant oil $\left(\text{Rs.}10 \times \frac{11,440 \text{ kms}}{100 \text{ kms}}\right)$	1144	161304
Add:- passenger Tax $\left(\text{Rs.}234345.25 \times \frac{20}{50}\right)$		93738.1 (20%)
TOTAL COST		**3,28,083.35**
Add:- Profit @ 30% on Takings $\left(\text{Rs.}328083.35 \times \frac{30}{70}\right)$		140607.15 (30%)
Total takings per Month		**468690.5 (100%)**

a) CALCULATIONOF FARE PER PASSENGER KM

$$\text{Rate per passenger km} = \frac{\text{Total takings per month}}{\text{Total passenger kms per month}}$$

$$= \frac{\text{Rs.}4,68,690.50}{520500 \text{ passenger kms}} = \text{Rs.}0.90 \text{ per (passenger km.)}$$

Delhi to chandigarh : Rs. 0.90 x250 kms = Rs. 225.00

Delhi to Agra : Rs. 0.90 x 210 kms = Rs. 189.00

Delhi to jaipur : Rs. 0.90 x 270kms = 243.00

PROBLEM NO: 8

a) Calculation of net operating income on each one way flight:

Particulars	Amount (Rs.)	Amount (Rs.)
Fare collected (100 passengers x Rs.10,000)		10,00,000
(-)Variable costs		
Fuel cost	1,40,000	
Food Service to passengers [Rs.400 x 100 passengers]	40,000	
Commission paid to agents (Rs. 10,00,000 x 8%)	80,000	(260,000)
Contribution earned		7,40,000
(-)Fixed Costs		
Annual lease cost	530,000	
Ground service (le) maintenance	70,000	
Salaries to flight crew	40,000	(640,000)
Net operating income		1,00,000

b) Calculation of net operating income per flight if fares are reduced to Rs. 9600.

Particulars	Amount (Rs.)	Amount (Rs.)
Fare collected (Rs. 9600 x 106 passengers)		1017600
(-)Variable costs		
Fuel cost	140,000	
Food Cost (Rs 400 x 106 passengers)	42,400	
Commission (Rs. 1017600 x 8%)	81,408	(2,63,808)
Total Contribution Earned		753792

Conclusion: Hence it is advisable to accept the offer.

c) Statement showing contribution earned by ABC if it lease the plight

Particulars	Amount (Rs.)
Lease Rentals	750,000
Fuel Cost	-
Food Cost	-
Commission	-
Contribution earned	750,000

CONCLUSION: It is advisable to reject the offer

NOTE: Fixed cost shall not be taken into account at the time of decision making

PROBLEM NO: 9

Statement showing total cost of nonresident hotel

Particulars	Amount (Rs.)
Staff salaries (Given)	22,00,000
Repairs	4,20,000
Linen	4,50,000
Interior decoration	5,00,000
Sundries	3,15,500
Deprecation (1,40,00,000 x 5% + 10,00,000 x 10% + 20,00,000 x 10%	10,00,000
Room-attendant's Wages (Working Note 2)	931500
Lighting's cost (Working Note 3)	5,54,000
Power cost (Working Note 4)	277,000

Total Cost	66,48,000
Add: profit on cost @ 25% $\left(66,48,000 \times \frac{25}{100}\right)$	166200
Amount to be collected	83,10,000

RENT TO BE CHARGED :

DELUXE : $\frac{Rs.83,10,000}{41,550\ Rooms}$ = Rs.200

SUPER DELUXE : Rs.200 x 1.5 times = Rs.300

EXECUTIVE DELUXE : Rs.200 x 2times = Rs.400

WORKING NOTES 1: Calculation of No of Room days per annum

Particulars	Deluxe	Super Deluxe	Executive Deluxe
Summer	18900 (100 x 90% 30 x7)	5040	2520
Winter	7500 (100 x 50% x 30 x 5)	900	600
	26,400	5940	3120

WORKING NOTE 2: Calculation of Room Attendant's Wages per annum

Particulars	Amounts (Rs.)
Deluxe = [18,900 x Rs.20 + 7500 x Rs.30]	6,03,000
Super Deluxe = [5040 x Rs.30 + 900 x Rs.45]	1,91,700
Executive Deluxe = [2520 x Rs.40 + 600 x Rs.60]	1,36,800
	9,31,500

WORKING NOTES 3: Calculation of Lighting cost

Particulars	Amounts (Rs.)
Deluxe = $\left(26,400 \times \frac{Rs.400}{30days}\right)$	3,52,000
Super deluxe = $\left(5940 \times \frac{Rs.600}{30days}\right)$	1,18,800
Executive deluxe = $\left(3120 \times \frac{Rs.800}{30days}\right)$	83,200
	554,000

WORKING NOTES 4: Calculation of power cost

Particulars	Amounts (Rs.)
Deluxe = $\left(26,400 \times \frac{Rs.200}{30days}\right)$	1,76,000
Super deluxe = $\left(5940 \times \frac{Rs.300}{30days}\right)$	59,400
Executive deluxe = $\left(3120 \times \frac{Rs.400}{30days}\right)$	41,600
	2,77,000

WORKING NOTES 5:

Calculation of Equivalent Rooms days	No. Of Room Days
Deluxe Rooms (26,400 x 1 time)	26,400
Super deluxe Rooms (5940 x 1.5 times)	8910
Executive deluxe Rooms(3120 x 2 times)	6240
	41,550

PROBLEM NO: 10

WORKING NOTES:

i) Total equivalent single room suites

Nature of Suite	Occupancy (Room-days)	Equivalent single room suites
Single room suite	36,000 (100 Rooms x 360 days x 100%)	36,000 (36,000 x 1)
Double room suites	14,400 (50 Rooms x 360 days x 80%)	36,000 (14400 x 2.5)
Triple room suites	6,480 (30 Rooms x 360 days x 60%)	32,400 (6,480 x 5)
		1,04,400

ii) Statement of total cost

Particulars	Amounts (Rs.)
Staff Salaries	14,25,000
Room Attendant's wages	4,50,000
Lighting, heating and power	215000
Repairs and renovation	123500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000
Building rent [(Rs.10,000 x 12 months) + 5% on total takings]	25,21,000 120,000 + 5% On Total Takings
Total Cost	26,41,000 + 5% On Total Takings

Profit is 20% on Total takings

∴ Total Takings = Rs.26,41,000 + 25% (5% + 20%) of total takings

Let x be rent for single room suite.

The 1,04,400x = 26,41,000 + 0.25 x 1,04,400 x

∴ x = 33.73

iii) Rent to be charged for single room suite = Rs. 33.73

Rent for double rooms suite = Rs.33.73 x 2.5 = Rs.84.325

Rent for triple room suites = Rs.33.73 x 5 = Rs.168.65

Alternative:

Let x be the total takings & Profit is 20% on total takings

Total takings = 26,41,000 + 5% on total takings + 20% on total takings

X = 26,41,000 + 5% on x + 20% on x

X = 26,41,000 + 25%x

X – 0.25x = 26,41,000

0.75x = 26,41,000

$X = \frac{26,41,000}{0.75}$

X = Rs.35,21,333.33

Total Takings = Rs.35,21,333.33

iv) Rent to be charged

Single Room suite $= \frac{35,21,333.333}{1,04,400}$ = Rs.33.73

Double Room Suite = 33.73 x 2.5 = Rs.84.325

Triple Room Suite = 33.73 x 2.5 x 2 = Rs.168.65

PROBLEM NO: 11

Statement showing monthly steam production cost:

Particulars	Amounts (Rs.)
Cost of coal (Rs.16 per quintal x 1400 Quintals)	22,400
Water $\left(150,000\,\text{liters} \times \frac{\text{Rs.1}}{1000\,\text{liters}}\right)$	150
Freight and handling of coal (Rs. 22400 x 10%)	2240
Net sales of ash (Rs.1540 – Rs.200)	(1340)
Repairs and maintenance $\left(\text{Rs.2000} \times \frac{1}{2}\right)$	1000
Stores $\left(\text{Rs.1500} \times \frac{2}{3}\right)$	1000
Supervision and administrative costs $\left(\text{Rs.2500} \times \frac{3}{5}\right)$	1500
Wages and salaries (Rs.150 x 50 men)	7500
Depreciation $\left(\frac{\text{Rs.62,000} - \text{Rs2000}}{10\,\text{yrs}} \times \frac{1}{12\,\text{months}}\right)$	500
Total Cost	34950

COST PER THERM / UNIT $= \frac{\text{Rs.34,950}}{40,000\,\text{therms(given)}} = \text{Rs}0.874$

Statement showing total cost of electricity generation:

Particulars	Amount (Rs.)
steam cost $\left(\text{Rs.34,950} \times \frac{4}{5}\right)$	27,960
Repairs and maintenance (Rs. 2000 x 0.5)	1000
Stores $\left(\text{Rs.1500} \times \frac{1}{3}\right)$	500
Supervision and administration cost (2,500 x 2/5)	1000
Dep. On G.P $\left(\frac{\text{Rs.1,00,000} - \text{Rs.4,000}}{10\text{years}} \times \frac{1}{12}\right)$	800
Wages and salaries (10men x Rs.300)	3000
	34,260

$\therefore$ Cost of generating electricity $= \frac{\text{Rs.34,260}}{3,00,000\text{units}}$ = Rs. 0.1142 per unit

WORKING NOTE:

Total Electricity generated = 3,10,000 units

Less: Normal Loss in Units = 10,000 units 3,00,000 units

THE END