13. SERVICE COSTING

NO. OF PROBLEMS IN 41E OF CA INTER: CLASSROOM - 19, ASSIGNMENT - 21

NO. OF PROBLEMS IN 42E OF CA INTER: CLASSROOM - 17, ASSIGNMENT - 17

NO. OF PROBLEMS IN 43E OF CA INTER: CLASSROOM - 17, ASSIGNMENT - 17

MODEL WISE ANALYSIS OF PAST EXAM PAPERS OF IPCC & CA INTER

No.	MODEL NAME	M-10	N-10 TO M-13	N-13	N-14	M-15	N-15	M-16	N-16	M-17	N-17	M-18 (O)	M-18 (N)	N-18 (O)	N-18 (N)	M-19 (N)	M-19 (O)	N-19 (N)	N-19 (O)
1.	Transport Costing	8	-	8	-	8	-	-	8	-	-	-	-	-	10	10	-	-	8
2.	Costing for Educational Institutions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.	Air Travel Costing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.	Hotel Costing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	10	-
5.	Canteen Costing	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-
6.	Costing for Hospitals	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-
7.	Electricity Costing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.	Costing for IT & ITES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.	Costing for Toll Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.	Costing for Financial Institutions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.	Decision Making	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SIGNIFICANCE OF EACH PROBLEM COVERED IN THIS MATERIAL

Problem No. in this material	Problem No. in NEW SM	Problem No. in OLD SM	Problem No. in OLD PM	RTP	MTP	Previous Exams	Remarks
CR 1	ILL 1	ILL 1	-	-	-	-	
CR 2	-	-		N 19(N)	-	-	
CR 3	ILL 5	ILL 4	-	-	-		
CR 4	-	-	-	-	-	M 19 (N)	
CR 5(a)	-	-	-	-	-	N 16	
CR 5(b)	-	-	-	-	-	N 18 (N)	
CR 6	ILL 4	ILL 3	-	-	-	-	
CR 7	-	-	-	M18(N&O), M20 (N&O)	-	-	
CR 8	-	-	Q 12	-	-	-	
CR 9	-	-	-	-	M 20 (N)	-	
CR 10	-	-	-	-	-	N 19 (N)	
CR 11	-	-	-	-	-	M 18 (O)	
CR 12	ILL 8	-	-	-	-	-	
CR 13	ILL12	ILL 7	-	-	-	-	
CR 14	ILL 9	-	-	-	-	-	
CR 15	ILL10	-	-	-	-	-	
CR 16	ILL 11	-	-	-	-	-	
CR 17	-	-	-	N 18(N)	-	-	
ASG 1	-	-	Q 2	-	-	-	
ASG 2	-	-	Q 5	-	M16, M19(N,O)	-	
ASG 3	-	-	-	M -17	M17, M18(N,O)	-	
ASG 4	-	-	Q 1	-	-	-	
ASG 5	-	-	-	N 18	-	-	
ASG 6	-	-	-	-	M 15	-	

ASG 7	ILL 3	-	-	-	-	-	
ASG 8	-	-	Q 11	-	-	-	
ASG 9	ILL 2	-	-	-	-	-	
ASG 10	ILL 1	ILL 5	-	-	-	-	
ASG 11	-	-	Q 4	-	-	-	
ASG 12	-	-	-	-	N 18(N,O)	-	
ASG 13	ILL 6	-	Q 14	M 19(N,O)	-	-	
ASG 14	-	-	-	-	-	-	
ASG 15	-	-	-	-	-	-	
ASG 16	-	-	-	-	-	M 18 (N)	
ASG 17	-	-	-	-	-	-	

MEANING: Operating Costing is the method of ascertaining the costs of providing / operating / rendering a service.

APPLICABILITY: It is applicable to undertakings that provide service. This method is usually adopted in case of (i) Transport (ii) Hotels &Lodges (iii) Hospitals (iv) Information Technology (IT) & Information Technology Enabled Services (ITES) (v) Toll Roads (vi) Educational Institutes (vii) Insurance (viii) Electricity generation (ix) Financial Institutes (x) Others are engaged in the provision of services.

HOW ARE COST UNITS DETERMINED IN THE RENDERING OF SERVICES: The principle of Operating Costing is to accumulate cost under suitable heading and to express them in terms of number of units of service rendered. Some illustrations of cost units are as below:

Service industry	Unit of cost (examples)
Transport Services	Passenger- km., (In public transportation) Quintal- km., or Ton- km. (In goods carriage)
Electricity Supply service	Kilowatt- hour (Kwh)
Hospital	Patient per day, room per day or per bed, per operation etc.
Canteen	Per item, per meal etc.
Cinema	Per ticket
Hotels	Guest Days or Room Days
Bank or Financial Institutions	Per transaction, per services (e.g. per letter of credit, per application, per project etc.)
Educational Institutes	Per course, per student, per batch, per lecture etc.
IT & ITES	Cost per project, per module etc.
Insurance	Per policy, Per claim, Per TPA etc.

SERVICE COSTING VS. PRODUCT COSTING: Service costing differs from product costing (such as job or process costing) in the following ways due to some basic and peculiar nature.

i) Unlike products, services are intangible and cannot be stored, hence, there is no inventory for the services.

ii) Use of Composite cost units for cost measurement and to express the volume of outputs.

iii) Unlike a product manufacturing, employee (labour) cost constitutes a major cost element than material cost.

iv) Indirect costs like administration overheads are generally have a significant proportion in total cost of a service as unlike manufacturing sector, service sector heavily depends on support services and traceability of costs to a service may not economically feasible.

HOW THE OPERATING COST SHEET GETS PREPARED: An Operating Cost Sheet is prepared in the following manner:

Cost Collection: Costs are accumulated for a specified period viz, a month, a quarter, a year etc.

Cost of Classification: The costs so accumulated are classified under the following three heads:

1. Fixed costs or Standing charges
2. Variable costs or Operating expenses
3. Semi-variable costs or Maintenance expenses

Absolute (Weight Average) Tonne Kilometers: This is the sum total of tonne - Kilometers, arrived at by multiplying various distances by respective load quantities carried.

Commercial (Simple Average) Tonne Kilometers: It is derived by multiplying total distance (i.e. Kilometers), by average load quantity (Tone)

DISTINGUISH BETWEEN OPERATION COST AND OPERATING COST?

Particulars	Operation Cost	Operating Cost
Meaning	Operation refers to a stage in manufacturing activity where output is converted from one form into another. Cost of each operation is called Operation Cost	Operating Cost refers to the total cost of providing a utility or service or intangible product e.g. transport undertakings, colleges etc.
Nature of Output	Output of each operation is tangible, measurable and homogeneous. It becomes the input of the subsequent operation.	Only services provided. There is no tangible output.
Cost Classification	Costs are classified into Direct Materials, Direct Labour, Direct Expenses and Production Overheads.	Cost are classified into fixed or Standing Charges, Variable or Running Charges and Semi - variable or Maintenance Charges.
Cost Expression	At the end of each operation, the unit operation cost may be computed by dividing the total operation cost by total output	Emphasis is on the ascertainment of cost of rendering service rather on the cost of manufacturing a product.

PROBLEMS FOR CLASSROOM DISCUSSION

MODEL 1: TRANSPORT COSTING

PROBLEM 1: A lorry starts with a load of 20 tonnes of goods from station A. It unloads 8 tonnes at station B and rest of goods at station C. It reaches back directly to station A after getting reloaded with 16 tonnes of goods at station C. The distance between A to B, B to C and then from C to A are 80 km., 120 km., and 160 km., respectively. Compute Absolute tonne-km. and Commercial tonnes-km.

(B) (NEW SM, OLD SM) (ANS.: ABSOLUTE TONNE KM-5,600 TONNE KM; COMMERCIAL TONNE KM- 5,760 TONNE KM)

(SOLVE PROBLEM NO 1 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If distance between the A to B is 100km and C to A is 200 km.

Note:_____

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PROBLEM 2: A transport company has a fleet of four trucks of 10 tonne capacity each plying in different directions for transport of customer's goods. The trucks run loaded with goods and return empty. The distance travelled, number of trips made and the load carried per day by each truck are as under:

Truck No.	One way Distance Km	No. of trips per day	Load carried per trip / day tonnes
1	48	4	6
2	120	1	9

3	90	2	8
4	60	4	8

The analysis of maintenance cost and the total distance travelled during the last two years is as under:

Year	Total distance travelled	Maintenance Cost
1	1,60,200	1,38,150
2	1,56,700	1,35,525

The following are the details of expenses for the year under review:

Diesel	Rs. 60 per litre. Each litre gives 4 km per litre of diesel on an average.
Driver's salary	Rs 22,000 per truck per month
Licence and taxes	Rs 15,000 per annum per truck
Insurance	Rs 80,000 per annum for all the four trucks
Purchase Price per truck	Rs 30,00,000, Life 10 years. Scrap value at the end of life is Rs 1,00,000.
Oil and sundries	Rs 525 per 100 km run.
General Overhead	Rs 1,10,840 per annum

The trucks operate 24 days per month on an average.

Required:

i) Prepare an Annual Cost Statement covering the fleet of four trucks.

ii) Calculate the cost per km. run.

iii) Determine the freight rate per tonne km. to yield a profit of 30% on freight.

(RTP N19 (N&O)) (ANS.: I) 1,13,39,112; II) 26.89 III) 10.06) (SOLVE PROBLEM NO 2 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If on return journey it take 5 tonnes.

Note:_____

_____

PROBLEM 3: Global Transport Ltd. charges Rs. 90 per ton for its 6-tons truck lorry load from city 'A' to city 'B'. The charges for the return journey are Rs. 84 per ton. No concession or reduction in these rates is made for any delivery of goods at intermediate station 'C'. In January 2012, the truck made 12 outward journeys for city 'B' with full load out of which 2 tons were unloaded twice in the way at city 'C'. The truck carried a load of 8 tons in its return journey for 5 times but was once caught by police and Rs. 1,200 was paid as fine. For the remaining trips the truck carried full load out of which all the goods on load were unloaded once at city 'C', but it returned without any load once only from 'C' station to 'A' station. The distance from city 'A' to city 'C' and city 'B' are 140 kms. and 300 kms. respectively.

Annual fixed costs and maintenance charges are Rs. 60,000 and Rs. 12,000 respectively.

Running charges spent during January 2012 are Rs. 2,944.

You are required to find out the cost per absolute ton-kilometer and the profit for January, 2012.

(B) (NEW SM, OLD SM) (ANS.: COST PER ABSOLUTE TON-KILOMETER: 0.20, PROFIT: 3,224)

(SOLVE PROBLEM NO 3 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If rate for the intermediate station c is Rs.50 per tonne.

Note:_____

_____

PROBLEM 4 (PRINTED SOLUTION AVAILABLE) X Ltd distributes its goods to a regional dealer using a single lorry the dealer premises are 40 kms. away by the road the capacity of lorry is 10 tonnes. The lorry makes the journey twice a day fully loaded on the outward journey and empty on return journey. The following information is available.

Diesel consumption	8Kms per litre
Diesel cost	Rs 60per litre
Engine Oil	Rs200per week
Drivers Wages (fixed)	Rs2,500
Repairs	Rs600per week
Garage Tank	800per week
Cost of lorry (excluding cost of types)	Rs.9,50,000
Life of lorry	1,60,000 Kms
Insurance	18,200 per annum
Cost of tyres	52,500
Life of tyres	25,000Kms
Estimated sale value of lorry at end of its life	1,50,000
Vehicle license cost	7,800 per annum
Other overhead cost	Rs41,600 per annum

The Lorry operates 5 days a week

Required:

i) A statement to show the total cost of operating the vehicles for the four week period analysed into Running cost and fixed cost

ii) Calculate the vehicle operating cost per km and per ton km (Assume 52 weeks in a year)

(M19 (N) - 10M) (ANS. RUNNING COST = RS.49,920; FIXED COST = RS.18,400; II) 21.35, 4.27)

(SOLVE PROBLEM NO 4, 5 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If lorry makes journey for 6 days in week and make 4 trips per day for first two weeks and two trips per day for the last two week in the month and empty on return journey.

Note:_____

_____

PROBLEM 5:

a) Royal transport company has been given a 50 kilometers long route to run 6 buses. The cost of each bus is Rs. 7,50,000. The buses will make 3 round trips per day carrying on an average 75 percent passengers of their seating capacity. The seating capacity of each bus is 48 passengers. The buses will run on an average 25 days in a month. The other information for the year 2016-17 is given below:

Garage Rent	Rs. 6,000 per month
Annual Repairs & Maintenance	Rs. 24,000 each bus
Salaries of 6 drivers	Rs. 4,000 each per month
Wages of 6 conductors	Rs. 1,600 each per month
Wages of 6 cleaners	Rs. 1,000 each per month
Manager's salary	Rs. 10,000 per month
Road Tax, Permit fee, etc.	Rs. 6,000 for a quarter
Office expenses	Rs. 2,500 per month
Cost of diesel per liter	Rs. 66
Kilometer run per liter for each bus	6 kilometers

Annual Depreciation	20% of cost
Annual Insurance	4% of cost
Engine oils & lubricants (for 1,000 kilometers)	Rs. 2,000

You are required to calculate the bus fare to be charged from each passenger per kilometer (up to four decimal points), if the company wants to earn profit of 33.33 % on takings (total receipts from passengers).

(A) (N16 - 8M) (ANS.: RATE PER PASSENGER KM.: RS. 0.6918)

(SOLVE PROBLEM NO 6, 7 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If profit is ½ on takings.

b) M/s XY Travels has been given a 25 km. long route to run an air- conditioned Mini Bus. The cost of bus is Rs. 20,00,000. It has been insured @3% premium per annum while annual road tax amounts to Rs. 36,000. Annual repairs will be Rs. 50,000 and the bus is likely to last for 5 years. The driver's salary will be Rs.2,40,000 per annum and the conductor's salary will be Rs. 1,80,000 per annum in addition to 10% of the takings as commission (to be shared by the driver and the conductor equally). Office and administration overheads will be Rs. 3,18,000 per annum. Diesel and oil will be Rs. 1,500 per 100 km. The bus will make 4 round trips carrying on an average 40 passengers on each trip.

Assuming 25% profit on takings and considering that the bus will run on an average 25 days in a month, you are required to:

i) Prepare operating cost sheet (for the month).

ii) Calculate fare to be charged per passenger km.

(A) (N18 (N) - 10M) (ANS.: I) PROFIT (P.A): RS. 8,40,000; II) FARE PER PASSENGER K.M.: RS.1.40)

(SOLVE PROBLEM NO 8, 9, 10 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If commission is shared between the driver and conductor is the ratio of 25% and 75%.

Note:_____

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PROBLEM 6: (PRINTED SOLUTION AVAILABLE) SMC is a public school having five buses each plying in different directions for the transport of its school students. In view of a larger number of students availing of the bus service the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The work-load of the students has been so arranged that in the morning the first trip picks up senior students and the second trip plying an hour later picks up the junior students. Similarly, in the afternoon the first trip takes the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus one way is 8 km. The school works 25 days in a month and remains closed for vacation in May, June and December. Bus fee, however, is payable by the students for all 12 months in a year.

The details of expenses for a year are as under:

Driver's salary	Rs.4,500 per month per driver
Cleaner's salary (Salary payable for all 12 months) (one cleaner employed for all the five buses)	Rs.3,500 per month
License fee, taxes, etc.	Rs.8,600 per bus per annum
Insurance	Rs.10,000 per bus per annum
Repairs & maintenance	Rs.35,000 per bus per annum
Purchase price of the bus	Rs.15,00,000 each
Life	12 years
Scrap value	Rs.3,00,000
Diesel cost	Rs.45.00 per litre

Each bus gives an average mileage of 4 km. per litre of diesel.

Seating capacity of each bus is 50 students.

The seating capacity is fully occupied during the whole year.

Students picked up and dropped within a range up to 4 km. of distance from the school are charged half fare and fifty per cent of the students travelling in each trip are in this category. Ignore interest. Since the charges are to be based on average cost you are required to:

a) Prepare a statement showing the expenses of operating a single bus and the fleet of five buses for a year.

b) Work out the average cost per student per month in respect of -

i) Students coming from a distance of up to 4 km. from the school and

ii) Students coming from a distance beyond 4 km. from the school. *(B) (NEW SM, OLD SM)*

(ANS.: A) 3,78,000, 18,90,000; B) (I) 210, (II) 420) (SOLVE PROBLEM NO 11 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If the vacation are in april and may only.

Note:_____

MODEL 2: COSTING FOR EDUCATIONAL INSTITUTIONS

PROBLEM 7: (PRINTED SOLUTION AVAILABLE) AD Higher Secondary School (AHSS) offers courses for 11th & 12th standard in three streams i.e. Arts, Commerce and Science. AHSS runs higher secondary classes along with primary and secondary classes but for accounting purpose it treats higher secondary as a separate responsibility centre. The Managing committee of the school wants to revise its fee structure for higher secondary students. The accountant of the school has provided the following details for a year:

Particulars	Amount (Rs.)
Teachers' salary (15 teachers × Rs.35,000 × 12 months)	63,00,000
Principal's salary	14,40,000
Lab attendants' salary (2 attendants × Rs.15,000 × 12 months)	3,60,000
Salary to library staff	1,44,000
Salary to peons (4 peons × Rs.10,000 × 12 months)	4,80,000
Salary to other staffs	4,80,000
Examinations expenditure	10,80,000
Office & Administration cost	15,20,000
Annual day expenses	4,50,000
Sports expenses	1,20,000

i) Other information:

Particulars	Standard 11 & 12			Primary & Secondary
	Arts	Commerce	Science	
No. of students	120	360	180	840
Lab classes in a year	0	0	144	156
No. of examinations in a year	2	2	2	2
Time spent at library per student per year	180 hours	120 hours	240 hours	60 hours
Time spent by principal for administration	208 hours	312 hours	480 hours	1,400 hours
Teachers for 11 & 12 standard	4	5	6	-

ii) One teacher who teaches economics for Arts stream students also teaches commerce stream students. The teacher takes 1,040 classes in a year, it includes 208 classes for commerce students.

iii) There is another teacher who teaches mathematics for Science stream students also teaches business mathematics to commerce stream students. She takes 1,100 classes a year, it includes 160 classes for commerce students.

iv) One peon is fully dedicated for higher secondary section. Other peons dedicate their 15% time for higher secondary section.

v) All school students irrespective of section and age participates in annual functions and sports activities.

Required:

i) Calculate cost per student per annum for all three streams.

ii) If the management decides to take uniform fee of Rs. 1,000 per month from all higher secondary students, calculate stream wise profitability.

iii) If management decides to take 10% profit on cost, compute fee to be charged from the students of all three streams respectively. ***(C) (RTP M18 (N&O), RTP M20 (N&O))***

(ANS.: I) 17,397, 9,533, 19,238; II) (6,47,640), 8,88,120, (13,02,840); III) 1,595, 874, 1,764)

Concept question: What is the impact on the question If the principal is administrating on 11th and 12th standard only.

Note:_____

MODEL 3: AIR TRAVEL COSTING

PROBLEM 8: In order to develop tourism, ABCL airline has been given permit to operate three flights in a week between X and Y cities (both side). The airline operates a single aircraft of 160 seats capacity. The normal occupancy is estimated at 60% throughout the year of 52 weeks. The one-way fare is Rs. 7,200. The costs of operation of flights are:

Fuel cost (variable) Rs. 96,000 per flight

Food served on board on non-chargeable basis Rs. 125 per passenger

Commission 5% of fare applicable for all booking

Fixed cost:

Aircraft lease Rs. 3,50,000 per flight

Landing Charges Rs. 72,000 per flight

Required:

a) Calculate the net operating income per flight.

b) The airline expects that its occupancy will increase to 108 passengers per flight if the fare is reduced to Rs. 6,720. Advise whether this proposal should be implemented or not. ***(B) (OLD PM)***

(ANS.: NET OPERATING INCOME: PRESENT RS.1,26,640, ADVISABLE TO IMPLEMENT THE PROPOSAL)

(SOLVE PROBLEM NO 12 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If 60 passengers are paid at Rs.7,200 each and 36 passengers are paid at Rs.9,500 each.

Note:_____

MODEL 4: HOTEL COSTING

PROBLEM 9: (PRINTED SOLUTION AVAILABLE) KR Resorts (P) Ltd. offers three types of rooms to its guests, viz deluxe room, super deluxe room and luxury suite. You are required to DETERMINE the tariff to be charged to the customers for different types of rooms on the basis of following information:

Types of Room	Number of Rooms	Occupancy
Deluxe Room	100	90%
Super Deluxe Room	60	75%
Luxury Suite	40	60%

Rent of 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and that of 'luxury suite' is 3 times of 'deluxe room'. Annual expenses are as follows:

Particulars	Amount (Rs. lakhs)
Staff salaries	780.00
Lighting, Heating and Power	350.00
Repairs, Maintenance and Renovation	220.00
Linen	60.00
Laundry charges	34.00
Interior decoration	85.00
Sundries	36.28

An attendant for each room was provided when the room was occupied and he was paid Rs. 500 per day towards wages. Further, depreciation is to be provided on building @ 5% on Rs. 900 lakhs, furniture and fixtures @ 10% on Rs. 90 lakhs and air conditioners @ 10% on Rs. 75 lakhs.

Profit is to be provided @ 25% on total taking and assume 360 days in a year. ***(B) (MTP M20)***

(ANS.: TOTAL COST FOR THE YEAR: RS.1,912.98 LAKHS, PROFIT: RS.637.66 LAKHS)

(SOLVE PROBLEM NO 13 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question Profit is 30% on Total takings.

Note:_____

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PROBLEM 10: (PRINTED SOLUTION AVAILABLE) A hotel is being run in a Hill station with 200 single rooms. The hotel offers concessional rates during six off-season months in a year.

During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending 31st March, 2019:

i) Occupancy during the season is 80% while in the off-season it is 40%.

ii) Total investment in the hotel is Rs. 300 lakhs of which 80% relates to Buildings and the balance to Furniture and other Equipment.

iii) Room attendants are paid Rs. 15 per room per day on the basis of occupancy of rooms in a month.

iv) Expenses:

- Staff salary (excluding that of room attendants) Rs. 8,00,000
- Repairs to Buildings Rs. 3,00,000
- Laundry Charges Rs. 1,40,000
- Interior Charges Rs. 2,50,000
- Miscellaneous Expenses Rs. 2,00,200

v) Annual Depreciation is to be provided on Buildings @ 5% and 15% on Furniture and other Equipments on straight line method.

vi) Monthly lighting charges are Rs. 110, except in four months in winter when it is Rs. 30 per room and this cost is on the basis of full occupancy for a month.

You are required to work out the room rent chargeable per day both during the season and the off-season months using the foregoing information. (Assume a month to be of 30 days and winter season to be considered as part of off-season). ***(A) (N19 (N) - 10M) (TOTAL RENT T O BE CHARGED: RS.57,13,750)***

Concept question: What is the impact on the question If Occupancy during the season is 90% and in off-season is 50%.

Note:_____

MODEL 5: CANTEEN COSTING

PROBLEM 11: A company wants to outsource the operation of its canteen to a contractor. The company will provide space for cooking, free electricity and furniture in the canteen. The contractor will have to provide lunch to 300 workers of which 180 are vegetarian (Veg) and the rest are non-vegetarian (Non-Veg). In the case of non-veg meals, there will be a non-veg item in addition to the veg items. A contractor who is interested in the contract has analysed the costs likely to be incurred. His analysis is given below:

Cereals	Rs. 8 per plate
Veg items	Rs. 5 per plate
Non-veg items	Rs. 15 per plate
Spices	Rs. 1 per plate
Cooking oil	Rs. 4 per plate
One cook Salary	Rs. 13,000 per month
Three helpers Salary	Rs. 7,000 per month per head
Fuel	Two commercial cylinders per month, price Rs. 1,000 each.

On an average the canteen will remain open for 25 days in a month. The contractor wants to charge the non-veg meals at 1.50 times of the veg meals.

You are required to calculate:

i) The price per meal (veg and non-veg separately) that contractor should quote if he wants a profit of 20% on his takings.

ii) The price per meal (separately for veg and non-veg) that a worker will be required to pay if the company provides 60% subsidy for meals out of welfare fund. ***(B) (M18 (O) - 8M)***

(ANS.: I) PRICE PER VEG MEAL: RS. 30, NON-VEG MEAL: RS. 45; II) PRICE PER VEG MEAL: RS. 12; NON-VEG MEAL: RS. 18)

Concept question: What is the impact on the question Profit is ¼ on takings.

Note:_____

MODEL 6: COSTING FOR HOSPITALS

PROBLEM 12: (PRINTED SOLUTION AVAILABLE) ABC Hospital runs a Critical Care Unit (CCU) in a hired building. CCU consists of 35 beds and 5 more beds can be added, if required.

Rent per month - Rs. 75,000

Supervisors - 2 persons - Rs. 25,000 Per month - each

Nurses - 4 persons - Rs. 20,000 per month - each

Ward Boys - 4 persons - Rs. 5,000 per month - each

Doctors paid Rs.2, 50,000 per month - paid on the basis of number of patients attended and the time spent by them.

Other expenses for the year are as follows:

Repairs (Fixed)	-	Rs. 81,000
Food to Patients (Variable)	-	Rs. 8,80,000
Other services to patients (Variable)	-	Rs. 3,00,000
Laundry charges (Variable)	-	Rs. 6,00,000
Medicines (Variable)	-	Rs. 7,50,000
Other fixed expenses	-	Rs. 10,80,000
Administration expenses allocated	-	Rs. 10,00,000

It was estimated that for 150 days in a year 35 beds are occupied and for 80 days only 25 beds are occupied.

The hospital hired 750 beds at a charge of Rs.100 per bed per day, to accommodate the flow of patients. However, this does not exceed more than 5 extra beds over and above the normal capacity of 35 beds on any day.

You are required to - (a) Calculate profit per Patient day, if the hospital recovers on an average Rs. 2,000 per day from each patient (b) Find out Breakeven point for the hospital.

(C) (NEW SM) (ANS.: PROFIT PER PATIENT DAY: RS. 691.75; BREAKEVEN POINT: 3,741 PATIENT DAYS)

(SOLVE PROBLEM NO 15, 16 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question If hospital collects Rs.2,500 per patient day.

Note:_____

MODEL 7: ELECTRICITY COSTING

PROBLEM 13: From the following data pertaining to the year 2017-18 prepare a cost statement showing the cost of electricity generated per kWh by Chambal Thermal Power Station.

Total units generated	10,00,000 kWh
Operating labour	15,00,000
Repairs & maintenance	5,00,000
Lubricants, spares and stores	4,00,000
Plant supervision	3,00,000
Administration overheads	20,00,000

5 kWh. of electricity generated per kg of coal consumed @ Rs.4.25 per kg. Depreciation charges @ 5% on capital cost of Rs. 2,00,00,000. ***(C) (NEW SM - TYK, OLD SM)***

(ANS.: TOTAL COST RS.65,50,000, COST PER KWH-6.55) (SOLVE PROBLEM NO. 17 OF ASSIGNMENT PROBLEMS AS REWORK)

Concept question: What is the impact on the question Cost of coal is Rs.5 per kg.

Note:_____

MODEL 8: COSTING FOR IT & ITES

PROBLEM 14: (PRINTED SOLUTION AVAILABLE): Following are the data pertaining to Info Tech Pvt. Ltd, for the year 20X6-X7

	Amount (Rs.)
Salary to Software Engineers (5 persons)	15,00,000
Salary to Project Leaders (2 persons)	9,00,000
Salary to Project Manager	6,00,000
Repairs & maintenance	3,00,000
Administration overheads	12,00,000

The company executes a Project XYZ, the details of the same as are as follows:

Project duration - 6 months One Project Leader and three Software Engineers were involved for the entire duration of the project, whereas Project Manager spends 2 months' efforts, during the execution of the project.

Travel expenses incurred for the project - Rs.1,87,500 Two Laptops were purchased at a cost of Rs. 50,000 each, for use in the project and the life of the same is estimated to be 2 years Prepare Project cost sheet

(A) (NEW SM) (ANS.: TOTAL COST RS.13,75,000)

Concept question: What is the impact on the question If project duration is 6 months.

Note:_____

MODEL 9: COSTING FOR TOLL ROADS

PROBLEM 15: (PRINTED SOLUTION AVAILABLE): BHG Toll Plaza Ltd built a 60 km. long highway and now operates a toll plaza to collect tolls from passing vehicles using the same. The company has invested Rs.600 crore to build the road and has estimated that a total of 60 crore vehicles will be using the highway during the 10 years toll collection tenure. Toll Operating and Maintenance cost for the month of April 20X7 are as follows:

a) Salary to:

- **i)** Collection Personnel (3 Shifts and 4 persons per shift) -Rs.150 per day per person
- **ii)** Supervisor (2 Shifts and 1 person per shift) -Rs. 250 per day per person
- **iii)** Security Personnel (3 Shifts and 2 persons per shift) -Rs.150 per day per person
- **iv)** Toll Booth Manager (2 Shifts and 1 person per shift) -Rs.400 per day per person

b) Electricity - Rs. 80,000

c) Telephone - Rs. 40,000

d) Maintenance cost - Rs. 30 Lacs

e) The company needs 25% profit over total cost to cover interest and other costs.

Required:

i) Calculate cost per kilometer.

ii) Calculate the toll rate per vehicle (assume there is only one type of vehicle).

(A) (NEW SM) (ANS.: COST PER KILOMETER: RS. 8,87,333.33, TOLL RATE PER VEHICLE: RS.13.31)

Concept question: What is the impact on the question If profit is 50% over total cost.

Note:_____

MODEL 10: COSTING FOR FINANCIAL INSTITUTIONS

PROBLEM 16: (PRINTED SOLUTION AVAILABLE) The loan department of a bank performs several functions in addition to home loan application processing task. It is estimated that 25% of the overhead costs of loan department are applicable to the processing of home-loan application. The following information is given concerning the processing of a loan application:

Direct professional labour:

Particulars	Rs.
Loan processor monthly salary: (4 employees @ Rs. 20,000 each)	80,000
Loan department overhead costs (monthly)	
Chief loan officer's salary	5,000
Telephone expenses	750
Depreciation Building	2,800

Legal advice	2,400
Advertising	400
Miscellaneous	650
Total overhead costs	12,000

You are required to compute the cost of processing home loan application on the assumption that one hundred home loan applications are processed each month.

(C) (NEW SM) (ANS.: PROCESSING COST PER HOME LOAN APPLICATION: RS. 830)

Concept question: What is the impact on the question If number of home loan application are150.

MODEL 11: COSTING FOR INSURENCE

PROBLEM 17: Sanziet Life care Ltd. operates in life insurance business. Last year it has launched a new term insurance policy for practicing professionals 'Professionals Protection Plus'. The company has incurred the following expenditures during the last year for the policy:

Particulars	Amount (Rs.)
Policy development cost	11,25,000
Cost of marketing of the policy	45,20,000
Sales support expenses	11,45,000
Policy issuance cost	10,05,900
Policy servicing cost	35,20,700
Claims management cost	1,25,600
IT cost	74,32,000
Postage and logistics	10,25,000
Facilities cost	15,24,000
Employees cost	5,60,000
Office administration cost	16,20,400

Number of policy sold- 528

Total insured value of policies- Rs.1,320 crore

Required:

i) Calculate total cost for Professionals Protection Plus' policy segregating the costs into four main activities namely (a) Marketing and Sales support, (b) Operations, (c) IT and (d) Support functions.

ii) Calculate cost per policy.

iii) Calculate cost per rupee of insured value. *(B) (RTP N18(N))*

(ANS.: I) TOTAL COST (A): RS.67,90,000; (B) RS. 46,52,200; (C) RS. 74,32,000; (D) RS. 47,29,400; II) RS. 44,703.79; III) RS. 0.0018)

Concept question: What is the impact on the question If no of policy sold are 700.

Note:

PRINTED SOLUTIONS TO SOME SELECTIVE PROBLEMS

PROBLEM NUMBERS TO WHICH SOLUTIONS ARE PROVIDED: 4, 6, 7, 9, 10, 12, 14, 15, 16

PROBLEM NO. 4

a) Working Notes:

Particulars	For 4 weeks	For 1 week (by dividing by 4)
Total distance travelled (40 km × 2 × 2 trips × 5 days × 4 weeks)	3,200 km	800 km
Total tonne km (40 km × 10 tonnes × 2 × 5 days × 4 weeks)	16,000 tonne km	4,000 tonne km

i) Statement showing Operating Cost

	Particulars	For 4 weeks	For 1 week (by dividing by 4)
A.	**Fixed Charges:**		
	Drivers' wages (2,500 x 4 weeks	10,000	2,500
	Garage rent (Rs.800 × 4 weeks)	3,200	800
	Insurance {(Rs.18,200 ÷ 52 weeks) × 4 weeks}	1,400	350
	Vehicle license {(Rs.7,800 ÷ 52 weeks) × 4 weeks}	600	150
	Other overheads cost {(Rs.41,600 ÷ 52 weeks) × 4 weeks}	3,200	800
	Total (A)	18,400	4,600
B.	Running Cost:		
	Cost of diesel {(3,200 ÷ 8 kms) × 60}	24,000	6,000
	Engine Oil (Rs.200 × 4 weeks)*	800	200
	Repairs (Rs.600 × 4 weeks)*	2,400	600
	Depreciation on vehicle (9,50,000-1,50,000/1,60,000 km*3200 km)	16,000	4,000
	Depreciation on tyres (52,500/25,000 km*3200 km)	6,720	1,680
	Total (B)	49,920	12,480
C.	**Total (A+B)**	68,320	17,080

*Cost of engine oil & repairs may also be treated as fixed cost, as the question relates these with time i.e. in weeks instead of running of vehicle.

ii) Calculation of vehicle operating cost:

Operating cost per km. = 68,320/3200 kms (or) 17,080/800 kms = 21.35

Operating cost per Tonne-km. = 68,320/16,000 (or) 17,080/4000 = 4.27

PROBLEM NO. 6

i) Statement of Expenses of operating bus/ buses for a year

	Particulars	Rate (Rs.)	Per Bus per annum (Rs.)	Fleet of 5 buses p.a. (Rs.)
a)	**Standing Charges:**			
	Driver's salary	4,500 p.m	54,000	2,70,000
	Cleaner's salary	3,500 p.m	8,400	42,000
	Licence fee, taxes etc.	8,600 p.a.	8,600	43,000
	Insurance	10,000 p.a.	10,000	50,000
	Depreciation (15,00,000- 3,00,000) ÷ 12 yrs	1,00,000 p.a.	1,00,000	5,00,000
b)	**Maintenance Charges:**			
	Repairs & maintenance	35,000 p.a.	35,000	1,75,000
c)	**Operating Charges:**			
	Diesel (Working Note 1)		1,62,000	8,10,000
	Total Cost [a) + b) + c)]		3,78,000	18,90,000
	Cost per month		31,500	1,57,500
	Total no. of equivalent students		150	750
	Total Cost per half fare equivalent student		Rs. 210	Rs. 210

ii) Average cost per student per month:

A. Students coming from distance of up to 4 km. from school

$$= \frac{\text{Total cost per month}}{\text{Total no. of equivalent students}} = \frac{\text{Rs.31,500}}{\text{150 students}} = \text{Rs.210}$$

B. Students coming from a distance beyond 4 km. from school

= Cost of per half fare student × 2 = Rs. 210 × 2 = Rs. 420

WORKING NOTES:

1. **Calculation of Diesel cost per bus:**

Distance travelled in a year: (8 round trip × 8 km. × 25 days × 9 months)

Distance travelled p.a.: 14,400 km.

Cost of diesel (per bus p.a.): $\frac{14,400\text{km}}{4\text{kmpl}}$ x Rs. 45 = Rs.1,62,000

2. **Calculation of equivalent number of students per bus:**

Seating capacity of a bus	50 students
Half fare students (50% of 50 students)	25 students
Full fare students (50% of 50 students)	25 students

3. **Total number of students equivalent to half fare students**

Full fare students (25 students × 2)	50 students
Add: Half fare students	25 students
Total Equivalent number of students in a trip	75 students
Total number of equivalent students in two trips (Senior + Junior)	150 students

PROBLEM NO. 7

Calculation of Cost per annum

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Teachers' salary (W.N-1)	16,80,000	21,00,000	25,20,000	63,00,000
R-apportionment of Economics & Mathematics teachers' salary (W.N- 2)	(84,000)	1,45,091		
Principal's salary (W.N-3)	1,24,800	1,87,200	2,88,000	6,00,000
Lab assistants' salary (W.N-4)	-	-	1,72,800	1,72,800
Salary to library staff (W.N-5)	43,200	28,800	57,600	1,29,600
Salary to peons (W.N-6)	31,636	94,909	47,455	1,74,000
Salary to other staffs (W.N-7)	38,400	1,15,200	57,600	2,11,200
Examination expenses (W.N- 8)	86,400	2,59,200	1,29,600	4,75,200
Office & Administration expenses (W.N- 7)	1,21,600	3,64,800	1,82,400	6,68,800
Annual Day expenses (W.N-7)	36,000	1,08,000	54,000	1,98,000
Sports expenses (W.N- 7)	9,600	28,800	14,400	52,800
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400

i) **Calculation of cost per student per annum**

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400
No. of students	120	360	180	660
Cost per student per annum	17,397	9,533	19,238	13,610

ii) **Calculation of profitability**

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Total Fees per annum	12,000	12,000	12,000	
Cost per student per annum	17,397	9,533	19,238	
Profit/ (Loss) per student per annum	(5,397)	2,467	(7,238)	
No. of students	120	360	180	
Total Profit/ (Loss)	(6,47,640)	8,88,120	(13,02,840)	(10,62,360)

iii) Computation of fees to be charged to earn a 10% profit on cost

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)
Cost per student per annum	17,397	9,533	19,238
Add: Profit @10%	1,740	953	1,924
Fees per annum	19,137	10,486	21,162
Fees per month	1,595	874	1,764

Working Notes:

1. Teachers' salary

Particulars	Arts	Commerce	Science
No. of teachers	4	5	6
Salary per annum (Rs.)	4,20,000	4,20,000	4,20,000
Total salary	16,80,000	21,00,000	25,20,000

2. Re-apportionment of Economics and Mathematics teachers' salary

Particulars	Economics		Mathematics	
	Arts	Commerce	Science	Commerce
No. of classes	832	208	940	160
Salary re-apportionment (Rs.)	(84,000)	84,000	(61,091)	61,091
	$\left(\frac{Rs.4,20,000}{1,040} x 208\right)$		$\left(\frac{Rs.4,20,000}{1,100} x 160\right)$	

3. Principal's salary has been apportioned on the basis of time spent by him for administration of classes.

4. Lab attendants' salary has been apportioned on the basis of lab classes attended by the students.

5. Salary of library staffs are apportioned on the basis of time spent by the students in library.

6. Salary of Peons are apportioned on the basis of number of students. The peons' salary allocable to higher secondary classes is calculated as below:

Particulars	Amount (Rs.)
Peon dedicated for higher secondary (1 peon × Rs.10,000 × 12 months)	1,20,000
Add: 15% of other peons' salary	54,000
{15% of (3 peons × Rs.10,000 × 12 months)}	

7. Salary to other staffs, office & administration cost, Annual day expenses and sports expenses are apportioned on the basis of number of students.

8. Examination Expenses has been apportion taking number of students and number examinations into account.

PROBLEM NO. 9

Total cost statement of KR Resort (P) Limited

Particulars	Cost per annum (Rs. in lakhs)
Staff Salaries	780.00
Room Attendant's Wages (Refer working note 3)	286.20
Lighting, Heating & Power	350.00
Repairs, Maintenance & Renovation	220.00
Linen	60.00
Laundry charges	34.00
Interior Decoration	85.00
Sundries	36.28
Depreciation: (Refer working note 4)	
- Building	45.00

- Furniture & Fixture	9.00
- Air Conditioners	7.50
Total cost for the year	1912.98

Computation of profit:

Let Rs. x be the rent for deluxe from.

Equivalent deluxe room days are 90,720 (Refer working note 2)

Total takings = Rs. 90,720x

Profit is 25% of total takings.

Profit = 25% of Rs. 90,720x = Rs. 22,680x

Total takings = Total Cost + Profit

Rs. 90,720x = Rs. 19,12,98,000 + Rs. 22,680x

Rs. 90,720x -Rs. 22,680x = Rs. 19,12,98,000

Rs. 68,040x = Rs. 19,12,98,000

$$X = \frac{Rs.19,12,98,000}{Rs.68,040} = Rs.\ 2,811.55$$

Rent to be charged for deluxe room	Rs. 2,811.55
Rent to be charged for super deluxe room = Rent of deluxe room x 2 = Rs. 2,811.55 x 2	Rs. 5,623.10
Rent to be charged for luxury suite = Rent of Super Deluxe room x 1.5 = Rs. 5,623.10 x 1.5	Rs. 8,434.65

Working Notes:

1. **Computation of Room Occupancy**

Type of Room	No. of rooms x no. of days x occupancy %	Room days
Deluxe Room	100 rooms x 360 days x 90% occupancy	32,400
Super Deluxe Room	60 rooms x 360 days x 75% occupancy	16,200
Luxury Suite	40 rooms x 360 days x 60% occupancy	8,640
	Total	57,240

2. **Computation of equivalent deluxe room days:** Rent of 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and luxury suite' is 3 times of 'deluxe room'. Therefore, equivalent room days would be:

Type of Room	Room days	Equivalent deluxe room days
Deluxe Room	32,400 x 1	32,400
Super Deluxe Room	16,200 x 2	32,400
Luxury Suite	8,640 x 3	25,920
	Total	90,720

3. **Computation of room attendant's wages:** Room occupancy days @ Rs. 500 per day = 286.2 lakhs (i.e. 57,240 days ×Rs. 500)

4. **Computation of Depreciation per annum**

Particulars	Cost (Rs.)	Rate of Depreciation	Depreciation (Rs.)
Building	9,00,00,000	5%	45,00,000
Furniture & Fixtures	90,00,000	10%	9,00,000
Air Conditioners	75,00,000	10%	7,50,000

PROBLEM NO. 10

Working Notes:

i) **Total Room days in a year:**

Season	Occupancy (Room-days)	Equivalent Full Room charge days
Season – 80% Occupancy	200 Rooms × 80% × 6 months × 30 days in a month = 28,800 Room Days	28,800 Room Days × 100% = 28,800

Off-season – 40% Occupancy	200 Rooms × 40% × 6 months × 30 days in a month = 14,400 Room Days	14,400 Room Days × 50% = 7,200
Total Room Days	28,800 + 14,400 = 43,200 Room Days	36,000 Full Room days

ii) Lighting Charges:

It is given in the question that lighting charges for 8 months is Rs.110 per month and during winter season of 4 months it is Rs.30 per month. Further it is also given that peak season is 6 months and off season is 6 months.

It should be noted that – being Hill station, winter season is to be considered as part of Off season. Hence, the non-winter season of 8 months include – Peak season of 6 months and Off season of 2 months.

Accordingly, the lighting charges are calculated as follows:

SeasonOccupancy (Room-days)

Season & Non-winter – 80%

Occupancy

200 Rooms × 80% × 6 months × Rs. 110 per

month = Rs. 1,05,600

Off- season & Non-winter –

40% Occupancy (8 – 6 months)

200 Rooms × 40% × 2 months × Rs.110 per

month = Rs. 17,600

Off- season & -winter – 40%

Occupancy months)

200 Rooms × 40% × 4 months × Rs. 30 per

month = Rs. 9,600

Total Lighting charges Rs. 1,05,600+ Rs. 17,600 + Rs. 9,600 = Rs. 132,800

Statement of total cost:

(Rs.)

Staff salary 8,00,000

Repairs to building 3,00,000

Laundry 1,40,000

Interior 2,50,000

Miscellaneous Expenses 2,00,200

Depreciation on Building (Rs. 300 Lakhs × 80% × 5%) 12,00,000

Depreciation on Furniture & Equipment (Rs. 300 Lakhs × 20% × 15%) 9,00,000

Room attendant's wages (Rs. 15 per Room Day for 43,200 Room

Days)

6,48,000

Lighting charges 1,32,800

Total cost 45,71,000

Add: Profit Margin (20% on Room rent or 25% on Cost) 11,42,750

Total Rent to be charged 57,13,750

Calculation of Room Rent per day:

Total Rent / Equivalent Full Room days = Rs. 57,13,750/ 36,000 = Rs. 158.72

Room Rent during Season – Rs. 158.72

Room Rent during Off season = Rs. 158.72 × 50% = Rs. 79.36

a) Statement of Total cost:

Particulars	Amt.
Staff salary	4,00,000
Room attendants salary (10 × 46,800 room-days)	4,68,000
Lighting expenses (250 × 1,560 room-months)	3,90,000
Power expenses (100 × 480 room-months)	48,000
Repairs to building	50,000
Linen	24,000
Sundries Expenses	70,770
Interior decoration and furnishing	50,000
Depreciation on Building (20 Lakhs × 5%)	1,00,000
Depreciation on other Equipment (Rs. 5 Lakhs × 10%)	50,000
Total cost excluding interest	16,50,770
Add: Profit Margin (20% on cost excluding interest)	3,30,154
Add: Interest on investments (25 Lakhs × 5%)	1,25,000
Total Rent to be charged	21,05,924

Calculation of Room Rent per day: Total Cost / Equivalent Room days = Rs. 21,05,924 ÷ 46,800 = 44.99 or 45

Note: It is assumed that staff salary of Rs. 4,00,000 is per annum

Working Notes: Total Room days in a year

Season	Occupancy (Room-days)	Equivalent occupied room-month
Summer– 90% Occupancy	200 Rooms × 90% × 6 months × 30 days in a month = 32,400 Room Days	32,400 ÷ 30 days = 1,080 room-month
Winter – 40% Occupancy	200 Rooms × 40% × 6 months × 30 days in a month = 14,400 Room Days	14,400 ÷ 30 days = 480 room-month
Total Room Days	32,400 + 14,400 = 46,800 Room Days	1,560 room-month

PROBLEM NO. 12

WORKING NOTES:

1. **Calculation of number of Patient days**

   35 Beds × 150 days = 5,250

   25 Beds × 80 days = 2,000

   Extra beds = 750

   Total = 8,000

2. **Statement of Profitability**

Particulars	Amount	Amount
Income for the year (Rs. 2,000 per patient per day × 8,000 patient days)		1,60,00,000
Less : Variable Costs :		
Doctor Fees (Rs. 2,50,000 per month × 12)	30,00,000	
Food to Patients (Variable)	8,80,000	
Other services to patients (Variable)	3,00,000	
Laundry charges (Variable) - (Rs.)	6,00,000	
Medicines (Variable) - (Rs.)	7,50,000	
Bed Hire Charges (Rs.100 × 750 Beds)	75,000	
Total Variable costs		56,05,000
Contribution		1,03,95,000
Less : Fixed Costs:		
Rent (Rs. 75,000 per month × 12)	9,00,000	

Supervisor (2 persons × Rs.25,000 × 12)	6,00,000	
Nurses (4 persons × Rs. 20,000 × 12)	9,60,000	
Ward Boys (4 persons × Rs. 5,000 × 12)	2,40,000	
Repairs (Fixed)	81,000	
Other fixed expenses - (Rs.)	10,80,000	
Administration expenses allocated - (Rs.)	10,00,000	
Total Fixed Costs		48,61,000
Profit		55,34,000

a) Calculation of Profit per Patient day

Total Contribution - Rs.55,34,000

Total Patient days - 8,000

Contribution per Patient day - Rs. 55,34,000 / 8,000 = Rs. 691.75

b) Calculation of contribution per Patient day

Total Contribution - Rs.1,03,95,000

Total Patient days - 8,000

Contribution per Patient day - Rs. 1,03,95,000 / 8,000 = Rs. 1,299.375

Breakeven Point = Fixed Cost / Contribution per Patient day

= Rs. 48,61,000 / Rs. 1,299.375 = 3,741 patient days

PROBLEM NO. 14

Working Notes:

1. Calculation of Cost per month and Overhead absorption rate

Particulars	Total p.a (in Rs.)	Per Person p.a (in Rs.)	Per Person p.m (in Rs.)
Salary to Software Engineer (5 Persons)	15,00,000	3,00,000	25,000
Salary to Project Leaders (2 persons)	9,00,000	4,50,000	37,500
Salary to Project Manager	6,00,000	6,00,000	50,000
Total	30,00,000		1,12,500

2. Total Overhead =Repairs & maintenance + Administration overheads

= Rs. 3,00,000 + Rs.12,00,000 = Rs.15,00,000

3. Calculation of Overhead absorption rate

= Total Overhead / Total Salary = Rs.15,00,000 / Rs.30,00,000 = 50%

Project Cost Sheet:

	(Rs.)
Salary Cost:	
Salary of Software Engineers (3 ×Rs. 25,000 × 6 months)	4,50,000
Salary of Project Leader (Rs. 37,500 × 6 months)	2,25,000
Salary of Project Manager (Rs. 50,000 × 2 months)	1,00,000
Total Salary	7,75,000
Overheads (50% of Salary)	3,87,500
Travel Expenses	1,87,500
Depreciation on Laptops (Rs.1,00,000 / 2 years × 6 months)	25,000
Total Project Cost	13,75,000

PROBLEM NO. 15

Statement of cost

Particulars	Working Note	(Rs.)
A. Apportionment of capital cost	$\left(\frac{Rs.600crore}{10years} \times \frac{1}{12months}\right)$	5,00,00,000
B. Operating Cost		
Salary to Collection	Personnel (3 Shifts × 4 persons per shift × 30 days ×Rs.150 per day)	54,000
Salary to Supervisor	(2 Shifts × 1 persons per shift × 30 days ×Rs.250 per day)	15,000
Salary to Security Personnel	(3 Shifts × 2 persons per shift × 30 days ×Rs.150 per day)	27,000
Salary to Toll Booth Manager	(2 Shifts × 1 person per shift × 30 days ×Rs.400 per day)	24,000
Electricity		80,000
Telephone		40,000
		2,40,000
C. Maintenance cost		30,00,000
Total (A + B + C)		**5,32,40,000**

i) Calculation of cost per kilometer:

$$= \frac{Total\,cost}{Total\,km.} = \frac{Rs.\,5,32,40,000}{60\,km.} = Rs.\,8,87,333.33$$

ii) Calculation of toll rate per vehicle:

$$= \frac{Total\,cost + 25\%\,profit}{Vehicles\,per\,month} = \frac{Rs.5,32,40,000 + Rs.1,33,10,000}{50,00,000\,vehicles} = Rs.13.31$$

WORKING:

No. of vehicles using the highway per month:

$$\frac{Total\,estimated\,vehicles}{10\,years} \times \frac{1\,month}{12\,months} = \frac{60\,crore}{10\,years} \times \frac{1\,month}{12\,months} = 50\,lakhs$$

PROBLEM NO. 16

Statement showing computation of the cost of Processing a Typical Home Loan Application

Particulars	(Rs.)
Direct professional labour cost (4 employees @ Rs. 20,000 each)	80,000
Service overhead cost (25% of Rs. 12,000)	3,000
Total processing cost per month	83,000
No. of applications processed per month	100
Total processing cost per home loan application	830

ASSIGNMENT PROBLEMS

MODEL 1: TRANSPORT COSTING

PROBLEM 1: A lorry starts with a load of 24 tonnes of goods from station A. It unloads 10 tonnes at station B and rest of goods at station C. It reaches back directly to station A after getting reloaded with 18 tonnes of goods at station C. The distance between A to B, B to C and then from C to A are 270 kms, 150 kms and 325 kms respectively. Compute 'Absolute tonnes km.' and 'Commercial tones-km'.

(C) (OLD PM) (ANS.: ABSOLUTE TONNE KM-14,430 TONNE KM; COMMERCIAL TONNE KM- 13,906.67 TONNE KM)

PROBLEM 2: A transport company has a fleet of three trucks of 10 tonnes capacity each plying in different directions for transport of customer's goods. The trucks run loaded with goods and return empty. The distance travelled, number of trips made and the load carried per day by each truck are as under:

Truck No.	One way Distance Km	No. of trips per day	Load carried per trip / day tonnes
1	16	4	6
2	40	2	9
3	30	3	8

The analysis of maintenance cost and the total distance travelled during the last two years is as under:

Year	Total distance travelled	Maintenance Cost (Rs.)
1	1,60,200	46,050
2	1,56,700	45,175

The following are the details of expenses for the year under review:

Diesel: Rs. 10 per litre. Each litre gives 4 km per litre of diesel on an average.

Driver's salary: Rs. 2,000 per month.

Licence and taxes: Rs. 5,000 per annum per truck.

Insurance: Rs. 5,000 per annum for all the three vehicles.

Purchase Price per truck: Rs. 3,00,000 Life 10 years. Scrap value at the end of life is Rs. 10,000.

Oil and sundries: Rs. 25 per 100 km run.

General Overhead: Rs. 11,084 per annum.

The vehicles operate 24 days per month on an average.

Required:

i) Prepare an Annual Cost Statement covering the fleet of three vehicles.

ii) Calculate the cost per km. run.

iii) Determine the freight rate per tonne km. to yield a profit of 10% on freight

(B) (MTP N16, OLD PM, SIMILAR: MTP1 M19 (N&O)) (ANS.: I) RS. 6,00,436, II) RS. 4.4548, III) RS. 1.27)

PROBLEM 3: Happy Transport Service is a Delhi based national goods transport service provider, owning four trucks for this purpose. The cost of running and maintaining these trucks are as follows:

Particulars	Amount (Rs.)
Diesel cost	Rs.13.75 per km.
Engine oil	Rs. 4,200 for every 13,000 km.
Repair and maintenance	Rs. 12,000 for every 10,000 km.
Driver's salary	Rs.18,000 per truck per month
Cleaner's salary	Rs.7,500 per truck per month
Supervision and other general expenses	Rs.12,000 per month
Cost of loading of goods	Rs.150 per Metric Ton (MT)

Each trucks were purchased for Rs. 20 lakhs with an estimated life of 7,20,000 km. During the next month, it is expecting 6 bookings, the details are as follows:

S. No.	Journey	Distance in km	Weight- Up (in MT)	Weight- Down (in MT)
a)	Delhi to Kochi	2,700	14	6
b)	Delhi to Guwahati	1,890	12	0
c)	Delhi to Vijayawada	1,840	15	0

d)	Delhi to Varanasi	815	10	0
e)	Delhi to Asansol	1,280	12	4
f)	Delhi to Chennai	2,185	10	8
	Total	10,710	73	18

Required:

i) Calculate the total absolute Ton-km for the vehicles.

ii) Calculate the cost per ton-km. *(B) (RTP M17, MTP M17, MTP M18 (N&O)) (ANS.: I) 1,72,240 TON-KM; II) 2.99)*

PROBLEM 4: Calculate total passenger kilo metres from the following information:

Number of buses 6, number of days operating in a month 25, trips made by each bus per day 8, distance covered 20 kilo metres (one side), capacity of bus 40 passengers, normally 80% of capacity utilization. *(C) (OLD PM) (ANS.: 15,36,000 PASSENGER KMS.)*

PROBLEM 5: P Ltd. distributes its goods to dealers using a delivery van. The dealer's premises are 40 kilometers away from the company's office. The van has a capacity of 10 tonnes and makes the journey twice a day fully loaded on the outward journeys and empty on return journey. The following information is available for a four weekly period during the year 2016:

Diesel consumption	10 kilometers per liter
Diesel cost	Rs. 48 per liter
Lubricant oil	Rs. 600 per week
Drivers salary	Rs. 12,000 per month
Repairs & Maintenance	Rs. 1,800 per month
Garage rent	Rs. 4,800 per months
Cost of van (excluding tyres)	Rs.16,00,000
Life of van	3,80,000 kilometers
Insurance	Rs. 5,400 per annum
Cost of tyres	Rs. 22,000
Life of tyres	80,000 kilometers
Estimated sale value of van at end of its life	Rs.2,40,000

Vehicle permit fee Rs. 3,600 per annum

Other overhead cost Rs. 66,000 per annum

The van operates five-day a week.

Required:

i) A statement to show the total monthly cost of operating the vehicle.

ii) Calculate the operating cost per kilometer and per tonne kilometer. *(A) (RTP N16)*

(ANS.: TOTAL COST: 54,943; OPERATING COST PER KILOMETER: RS.17.17; COST PER TONNE-KM: RS.3.43)

PROBLEM 6: S Travels has been promised a contract to run a tourist car on a 20 km. long route for a multinational firm. He buys a car costing Rs. 4,50,000. The annual cost of insurance and taxes are Rs. 7,500 and Rs. 1800 respectively. He has to pay Rs. 2500 per month for a garage where he keeps the car when it is not in use. The annual repair costs are estimated at Rs. 12,000. The car is estimated to have a life of 10 years at the end of which the scrap value is likely to be Rs. 50,000.

He hires a driver who is to be paid Rs. 3,000 per month plus 10% of the takings as commission. Other incidental expenses are estimated at Rs. 2,000 per month. Petrol and oil will cost Rs. 220 per 100 kms. The car will make 4 round trips each day. Assuming that a profit of 15% on takings is desired and that the car will be on the road for 25 days on an average per month, what should he charge per roundtrip?

(B) (MTP M15) (ANS.: ROUND TRIP CHARGES - RS.285.44)

PROBLEM 7: ABC Transport Company has given a route 40 kilometers long to run bus.

a) The bus costs the company a sum of Rs.10,00,000

b) It has been insured at 3% p.a. and

c) The annual tax will amount to Rs. 20,000

d) Garage rent is Rs. 2,000 per month.

e) Annual repairs will be Rs. 20,000

f) The bus is likely to last for 5 years

g) The driver's salary will be Rs. 3,000 per month and the conductor's salary will be Rs. 2,000 per month in addition to 10% of takings as commission [To be shared by the driver and conductor equally].

h) Cost of stationery will be Rs. 1,000 per month.

i) Manager-cum-accountant's salary is Rs. 7,000 per month.

j) Petrol and oil will be Rs.500 per 100 kilometers.

k) The bus will make 3 up and down trips carrying on an average 40 passengers on each trip.

l) The bus will run on an average 25 days in a month.

Assuming 15% profit on takings, calculate the bus fare to be charged from each passenger.

(B) (NEW SM) (ANS.: FARE PER PASSENGER KM: RS. 0.375)

PROBLEM 8: A mini bus, having a capacity of 32 passengers, operates between two places - 'A' and 'B'. The distance between the place 'A' and 'B' is 30 km. the bus makes 10round trips in a day for 25 days in a month.

On an average, the occupancy ratio is 70% and is expected throughout the year. The details of the other expenses are as under:

Particulars	Amounts
Insurance	15,600 per annum
Garage rent	2,400 per quarter
Road tax	5,000 per annum
Repairs	4,800 per quarter
Salary of operating staff	7,200 per month
Types and tubes	3,600 per quarter
Diesel: (one litre is consumed for every 5kms.)	13 per litre
Oil and sundries	22 per 100km run
Depreciation	68,000 per annum

Passenger tax @ 22% on total taking is to be levied and bus operator requires a profit of 25% on total takings.

Prepare operating cost statement on the annual basis and find out the cost per passenger kilometer and one-way fare per passengers. ***(A) (OLD PM, M 15 - 8M)***

(ANS.: COST PER PASSENGER KM.- RS.0.018; ONE-WAY FARE PER PASSENGER - RS.10.20)

PROBLEM 9: AXA Passenger Transport Company is running 5 buses between two towns, which are 40 kms apart. Seating capacity of each bus is 40 passengers. Following details are available from their books, for the month of April 20X7:

	Amount (Rs.)
Salary of Drivers, Cleaners and Conductors	24,000
Salary to Supervisor	10,000
Diesel and other Oil	40,000
Repairs and Maintenance	8,000

Taxation and Insurance	16,000
Depreciation	26,000
Interest	20,000
	1,44,000

Actual passengers carried were 75% of the seating capacity. All the five buses run on all days for the month. Each bus made one round trip per day. Calculate cost per passenger - Kilometer.

(B) (NEW SM) (ANS.: COST PER PASSENGER KM: 0.400)

PROBLEM 10: Mr. X owns a bus which runs according to the following schedule:

i) Delhi to Chandigarh and back, the same day
Distance covered: 250 kms. one way.
Number of days run each month: 8
Seating capacity occupied 90%.

ii) Delhi to Agra and back, the same day.
Distance covered: 210 kms. one way.
Number of days run each month: 10
Seating capacity occupied 85%.

iii) Delhi to Jaipur and back, the same day.
Distance covered: 270 kms. one way.
Number of days run each month: 6
Seating capacity occupied 100%.

iv) Following are the other details:

Cost of the bus	Rs.12,00,000
Salary of the Driver	Rs. 24,000 p.m.
Salary of the Conductor	Rs. 21,000 p.m.
Salary of the part-time Accountant	Rs. 5,000 p.m.
Insurance of the bus	Rs. 4,800 p.a.
Diesel consumption 4 kms per litre at	Rs.56 per litre
Road tax	Rs. 15,915 p.a.
Lubricant oil	Rs.10 per 100 kms.
Permit fee	Rs.315 p.m.
Repairs and maintenance	Rs. 1,000 p.m.
Depreciation of the bus	@ 20% p.a.
Seating capacity of the bus	50 persons.

Passenger tax is 20% of the total takings. Calculate the bus fare to be charged from each passenger to earn a profit of 30% on total takings. The fares are to be indicated per passenger for the journeys:

(i) Delhi to Chandigarh **(ii)** Delhi to Agra **(iii)** Delhi to Jaipur.

(B) (NEW SM - TYK, OLD SM) (ANS.: FARE TO BE CHARGED: DELHI TO CHANDIGARH - RS.225.00, DELHI TO AGRA - RS.189.00, DELHI TO JAIPUR - RS.243.00)

PROBLEM 11: EPS is a Public School having 25 buses each plying in different directions for the transport of its school students. In view of large number of students availing of the bus service, the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The workload of the students has been so arranged that in the morning, the first trip picks up senior students and the second trip plying an hour later picks up junior students.

Similarly, in the afternoon, the first trip takes the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus, one way is 16 kms. The school works 24 days in a month and remains closed for vacation in May and June. The bus fee, however, is payable by the students for all the 12 months in a year.

The details of expenses for the year 2013-2014 are as under:

Driver's salary - payable for all the 12 months Rs. 5,000 per month per drive.

Cleaner's salary payable for all the 12 months Rs. 3,000 per month per cleaner.

(one cleaner has been employed for every five buses).

Licence Fees, Taxes etc. Rs. 2,300 per bus per annum

Insurance Premium Rs. 15,600 per bus per annum.

Repairs and Maintenance Rs. 16,400 per bus per annum.

Purchase price of the bus Rs. 16,50,000 each.

Life of the bus 16 years

Scrap value Rs. 1,50,000

Diesel Cost Rs. 18.50 per litre

Each bus gives an average of 10 kms per litre of diesel. The seating capacity of each bus is 60 students. The seating capacity is fully occupied during the whole year.

The school follows differential bus fees based on distance traveled as under:

Students picked up and dropped within the range of distance from the school	Bus fee	Percentage of students availing this facility
4 kms	25% of Full	15%
8 kms	50% of Full	30%
16 kms	Full	55%

Ignore interest. Since the bus fees has to be based on average cost, you are required to

a) Prepare a statement showing the expenses of operating a single bus and the fleet of 25 buses for a year.

b) Work out average cost per student per month in respect of:

i) Students coming from a distance of up to 4 kms from the school.

ii) Students coming from a distance of up to 8 kms from the school; and

iii) Students coming from a distance of up to 16 kms from the school *(B) (OLD PM)*

(ANS.: A. TOTAL EXPENSES - RS. 2,52,082 PER BUS, B. I) RS. 59.34, II) RS. 118.68, III) RS. 237.36)

MODEL 2: COSTING FOR EDUCATIONAL INSTITUTIONS

NIL

MODEL 3: AIR TRAVEL COSTING

PROBLEM 12: DKG Airlines owns single passenger aircraft and operates between Melbourne and Delhi only. Flight leaves Melbourne on Monday and Thursday and departs from Delhi on Wednesday and Saturday. DKG Airlines cannot afford any more flight between Melbourne and Delhi. Only economical class seats are available on its flight and all tickets are booked by travel agents. The following information are collected.

Seating capacity per plane	360
Average passengers per flight	250
Flights per week	4

Flights per year	208
Average one-way fare	Rs.50,000
Variable fuel cost	Rs.28,00,000 per flight
Food service to passengers (not charged to Passengers)	Rs.2,600 per passenger
Commission to travel agents	15% of fare
Fixed annual lease cost allocated to each flight	Rs. 15,30,000 per flight
Fixed ground services (maintenance, check in, Baggage handling cost) allocated to each flight	Rs.1,70,000 per flight
Fixed salaries of flight crew allocated to each flight	Rs.6,50,000 per flight

For the sake of simplicity assume that fuel cost is unaffected by the actual number of passengers on a flight.

Required:

i) CALCULATE the operating income that DKG Airlines makes on each way flight between Melbourne and Delhi?

ii) The market research department of DKG Airlines indicates that lowering the average one-way fare to Rs. 48,000 and increase in agents' commission to 17.5% will increase the average number of passenger per flight to 275. DECIDE whether DKG Airlines should lower its fare or not?

(B) (MTP2 N18 (N&O)) (ANS.: I) OPERATING INCOME (ONE WAY) (MELBOURNE TO DELHI): RS. 48,25,000; II) EXCESS CONTRIBUTION: RS. 2,00,000, DGK AIRLINES SHOULD LOWER ITS FARE)

MODEL 4: HOTEL COSTING

PROBLEM 13: A company runs a holiday home. For this purpose, it has hired a building at a rent of Rs. 10,000 per month along with 5% of total taking. It has three types of suites for its customers, viz., single room, double rooms and triple rooms.

Following information is given:

Type of suite	Number	Occupancy percentage
Single room	100	100%
Double rooms	50	80%
Triple rooms	30	60%

The rent of double rooms suite is to be fixed at 2.5 times of the single room suite and that of triple rooms suite as twice of the double rooms suite.

The other expenses for the year 2006 are as follows:

Particulars	(Rs.)
Staff salaries	14,25,000
Room attendants' wages	4,50,000
Lighting, heating and power	2,15,000
Repairs and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000

Provide profit @ 20% on total taking and assume 360 days in a year.

You are required to calculate the rent to be charged for each type of suite. ***(C) (NEW SM, OLD PM, RTP M19 (N&O))***

(ANS.: RENT TO BE CHARGED: SINGLE ROOM - RS.33.75, DOUBLE ROOM -RS.84.325, AND TRIPLE ROOM - RS.168.65)

PROBLEM 14: The Non-Resident Hotel has three types of rooms for its customers, viz., Deluxe, Super Deluxe and Executive Deluxe respectively. State the rent to be charged for each type of room on the basis of the following information:

1. The number of rooms of each type is as under: Deluxe - 100, Super Deluxe - 30 & Executive Deluxe - 20.

2. The rent of Super Deluxe room is to be fixed as 1.5 times the Deluxe type and that of Executive Deluxe Room as twice the Deluxe type.

3. The occupancy of each type of room is as follows:

	Summer	Winter
Deluxe	90%	50%
Super Deluxe	80%	20%
Executive Deluxe	60%	20%

4. The annual expenses are as follows:

   a) Staff salaries: Rs. 22,00,000.

   b) Room attendant's wages per day when occupied:

	Summer	Winter
Deluxe	Rs.20	Rs.30
Super Deluxe	Rs.30	Rs.45
Executive Deluxe	Rs.40	Rs.60

   c) Lighting, heating and power for a full month when occupied:

	Lighting	Power
Deluxe	Rs.400	Rs.200
Super deluxe	Rs.600	Rs.300
Executive Deluxe	Rs.800	Rs.400

   d) Repairs - Rs. 4,20,000, Linen etc. - Rs. 4,50,000, Interior decoration - Rs.5,00,000 & Sundries - Rs. 3,15,500.

   e) Depreciation is to be charged as under: Building @ 5% on Rs. 1,40,00,000, Furniture & fixtures @ 10% on Rs. 10,00,000, Air-conditioner @ 10% on Rs. 20,00,000.

5. Summer is for 7 months and winter is for 5 months in a year. A month consists of 30 days.

6. Profit on investment @ 25% on cost.

(B) (ANS.: DELUXE - RS. 200, SUPER DELUXE - RS. 300, EXECUTIVE DELUXE - RS. 400)

MODEL 5: CANTEEN COSTING

NIL

MODEL 6: COSTING FOR HOSPITALS

PROBLEM 15: A New Hospital runs an Intensive Care Unit as a separate Profit center. The unit runs from a building hired at a rent of Rs.5,000 per month. The unit consists of 25 beds and 5 more beds can be accommodated when the occasion demands. The permanent staff attached to the unit are as follows:

a) 1 Supervisor at a salary of Rs. 2,000 per month.

b) 2 Nurses, each at a salary of Rs. 2,000 per month.

c) 3 Ward boys, each at a salary of Rs. 1,000 per month.

Though the unit was open for the patients for 300 days during 2001, only for 120 days the unit had the full capacity of 25 patients per day and for another 120 days it had on an average 15 beds only occupied per day. Yet, there were occasions when the beds were full and extra beds were hired at a charge Rs.10 per day. The total hire charges for the extra beds incurred for the whole year amounted to Rs.2,000. The ICU engaged expert doctors from outside to attend on the patients and their fees were paid on the basis of the number of patients attended and this on an average worked out to Rs.3,00,000. The other expenses, all fixed, were Rs.48,000 p.a.

a) If the unit recovered Rs.100 per day on an average from each patient, what is the profit per patient day made by the unit in 2001.

b) Assuming that same revenue and expenses prevail in 2002, workout the number of patient days required by the unit to break even in 2002. *(C) (ANS.: 20.3 PER DAY, CONTRIBUTION 53.53, BEP: 4035)*

PROBLEM 16: A group of 'Health Care Services' has decided to establish a Critical Care Unit in a metro city with an investment of Rs. 85 lakhs in hospital equipments. The unit's capacity shall be of 50 beds and 10 more beds, if required, can be added.

Other information for a year are as under:

	Amount (Rs.)
Building Rent	2,25,000 per month
Manager Salary (Number of Manager-03)	50,000 per month to each one
Nurses Salary (Number of Nurses-24)	18,000 per month to each Nurse
Ward boy's Salary (Number of ward boys' -24)	9,000 per month per person
Doctor's payment (Paid on the basis of number of patients attended and time spent by them)	5,50,000 per month
Food and laundry services (variable)	39,53,000
Medicines to patients (variable)	22,75,000 per year
Administrative Overheads	28,00,000 per year
Depreciation on equipments	15% per annum on original cost

It was reported that for 200 days in a year 50 beds were occupied, for 105 days 30 beds were occupied and for 60 days 20 beds were occupied.

The hospital hired 250 beds at a charge of Rs. 950 per bed to accommodate the flow of patients. However, this never exceeded the normal capacity of 50 beds on any day.

Find out:

i) Profit per patient day, if hospital charges on an average Rs. 2,500 per day from each patient.

ii) Break-even point per patient day (Make calculation on annual basis) *(A) (M18 (N) - 10M)*

(ANS.: (I) PROFIT PER PATIENT DAY: RS. 485.17; II) BREAK-EVEN POINT PER DAY: 10,187 PATIENT DAYS)

MODEL 7: ELECTRICITY COSTING

PROBLEM 17: From the following particulars calculate the cost per them and the cost per unit for electricity generated for the month of Nov.

a) Details:

Plant	Cost	Residual	Life
Steam plant	Rs. 62,000	Rs. 2,000	10 Years
Generating plant	Rs.1,00,000	Rs.4,000	10 Years

b) Supervision cost, administrative costs and stores are to be distributed:

	Steam production	Generating Plant
Supervision cost	3	2
Stores	2	1
Repairs & maintenance	½	½

c) Steam production is 40,000 thems. 4/5 of the steam production is used for generation and the total electricity generated is 3,10,000 Units. Normal loss in generation is 10,000 Units.

d) Fixed and variable component of maintenance Coal 1,400 Quintals @ Rs.16 per quintal.

e) Water 1,50,000 litres @ Rs.1 per 1,000 litres.

f) Freight and handling of coal is 10% of the cost of coal.

g) Sales of ash Rs.1,540. Charge for ash disposal is Rs.200

h) Repairs and maintenance Rs.2,000 per month.

i) Stores Rs.1,500 per month

j) Supervision and administrative costs Rs.2,500 per month.

k) Wages and salaries of steam production unit 50 men @ Rs.150 per month.

l) Wages and salaries of Generating unit 10 men @ 300 per month.

(C) (ANS.: COST PER TERM/UNIT: STEAM DEPARTMENT - 0.874, GENERATING DEPT. - 0.11)

ADDITIONAL PROBLEMS FOR STUDENTS SELF PRACTICE

PROBLEM 1: A company is considering three alternative proposals for conveyance facilities for its sales personnel who has to do considerable traveling, approximately 20,000 kilo metres every year. The proposals are as follows:

i) Purchase and maintain its own fleet of cars. The average cost of a car is Rs. 6,00,000.

ii) Allow the Executive use his own car and reimburse expenses at the rate of Rs.10 per kilometer and also bear insurance costs.

Hire cars from an agency at Rs. 1,80,000 per year per car. The company will have to bear costs of petrol, taxes and tyres.

The following further details are available:

Petrol Rs.6 per km.	Repairs and maintenance Rs.0.20 per km.
Tyre Rs.0.12 per km.	Insurance Rs. 1,200 per car per annum
Taxes Rs. 800 per car per annum	Life of the car: 5 years with annual mileage of 20,000 km.

Resale value: Rs. 80,000 at the end of the fifth year.

Work out the relative costs of three proposals and rank them.

(B) (NEW SM - TYK, OLD SM) (ANS.: RELATIVE COSTS 2,32,400, 2,01,200, 3,03,200 AND RANKS II, I, III)

PROBLEM 2: A transport company has been given a 40 kilo metres long route to run 5 buses. The cost of each bus is Rs. 6,50,000. The buses will make 3 round trips per day carrying on an average 80 percent passengers of their seating capacity. The seating capacity of each but is 40 passengers. The buses will run on an average 25 days in a month. The other information for the year 2013-14are given below:

Garage rent	Rs. 4,000 per month
Annual repairs and maintenance	Rs. 22,500each bus
Salaries of 5 drivers	Rs. 3,000 each per month
Wages of 5 conductors	Rs. 1,200 each per month
Manager's salary	Rs. 7,500 per month
Road tax, permit fee, etc.	Rs. 5,000 for a quarter
Office expenses	Rs. 2,000 per month
Cost of diesel per litre	Rs. 33
Kilo metre run per litre for each bus	6 kilo metres
Annual depreciation	15% of cost
Annual Insurance	3% of cost

You are required to calculate the bus fare to be charged from each passenger per kilometer, if the company wants to earn profits of 33.33% on takings (total receipts from passengers).

(A) (OLD PM, M10 - 8M) (ANS.: BUS FARE PER PASSENGER KM: 0.405)

PROBLEM 3: The following information relates to a bus operator:

Cost of the bus	Rs.18,00,000
Insurance charges	3% p.a.
Manager-cum accountant's salary	Rs.8,000 p.m.
Annual Tax	Rs.50,000
Garage Rent	Rs.2,500 p.m.
Annual repair & maintenance	Rs.1,50,000
Expected life of the bus	15 years
Scrap value at the end of 15 years	Rs.1,20,000
Driver's salary	Rs.15,000 p.m.
Conductor's salary	Rs.12,000 p.m.
Stationery	Rs.500 p.m.
Engine oil, lubricants (for 1200 km.)	Rs.2,500
Diesel and oil (for 10 km.)	Rs.52
Commission to driver and conductor (shared equally)	10% of Collections
Route distance	20 km long

The bus will make 3 round trips for carrying on the average 40 passengers in each trip. Assume 15% profit on collections. The bus will work on the average 25 days in a month. Calculate fare for passenger-km. ***(A) (OLD PM, N 13 8M) (ANS.: RS. 1.004)***

PROBLEM 4: Arun travels have been given a permit to run a bus on a route 20 Km. long. The bus costs you Rs. 9,00,000. It has to be insured @ 3% p.a. and the annual tax will be Rs. 10,000. Garage rent is Rs. 10,000 p.m. Annual repairs will be Rs. 10,000 and the bus is likely to last for 5 years at the end of which the scrap value is likely to be Rs. 60,000.

The driver's salary will be Rs. 1,500 p.m. and the conductor's Rs. 1,000 together with 10% of the takings as commission (to be shared equally by both). Stationery will cost Rs. 500 p.m.

The manager-cum-accountant's salary will be Rs. 3,500 p.m.

Diesel and oil be Rs. 450 per hundred kilo metres. The bus will make 3 round trips for carrying on the average 40 passengers on each trip. Assuming 15% profit on takings, calculate the bus fare to be charged from each passenger. The bus will work on the average 25 days in a month. ***(B) (OLD SM)***

(ANS.: BUS FARE TO BE CHARGED FROM EACH PASSENGER PER KM: 0.5324)

PROBLEM 5: You are required to calculate a suggested fare per passenger-km from the following information for a Mini Bus:

i) Length of route: 30 km

ii) Purchase price Rs.4,00,000

iii) Part of above cost met by loan, annual interest of which is Rs. 10,000 p.a.

iv) Other annual charges: Insurance Rs. 15,000, Garage rent Rs. 9,000, Road tax Rs. 3,000, Repairs & maintenance Rs. 15,000, Administrative charges Rs. 5,000.

v) Running Expenses: Driver & Conductor Rs. 5,000 p.m., Repairs/Replacement of tyre-tube Rs. 3,600 p.a., Diesel and oil cost per km Rs. 5.

vi) Effective life of vehicle is estimated at 5 years at the end of which it will have a scrap value of Rs. 10,000.

vii) Mini Bus has 20 seats and is planned to make Six no. two way trips for 25 days/p.m.

viii) Provide profit @ 20% of total revenue.

(B) (MTP N16, MTP N17) (ANS.: SUGGESTED FARE PER PASSENGER KM: RS.0.43)

PROBLEM 6: Gopal Milk Co-Operative Society (GMCS) collects raw milk from the farmers of Ramgarh, Pratapgarh and Devgarh panchayats and processes these milk to make various dairy products. GMCS has its own vehicles (tankers) to collect and bring the milk to the processing plant. Vehicles are parked in the GMCS's garage situated within the plant compound. Following are some information related with the vehicles:

Particulars	Ramgarh	Pratapgarh	Devgarh
No. of vehicles assigned	4	3	5
No. of trips a day	3	2	2
One way distance from the processing plant	24 k.m	34.k.m	16.k.m
Toll tax paid p.m. (Rs.)	2,850	3,020	--

All the 5 vehicles assigned to Devgarh panchayat, were purchased five years back at a cost of Rs.9,25,000 each. The 4 vehicles assigned to Ramgarh panchayat, were purchased two years back at a cost of Rs.11,02,000 each and the remaining vehicles assigned to Pratapgarh were purchased last year at a cost of Rs.13,12,000 each. With the purchase of each vehicle a two years free servicing warranty is provided. A vehicle gives 10 kmpl mileages in the first two year of purchase, 8 kmpl in next two years and 6 kmpl afterwards. The vehicles are subject to depreciation of 10% p.a. on straight line basis irrespective of usage. A vehicle has the capacity to carry 25,000 litres of milk but on an average only 70% of the total capacity is utilized.

The following expenditure is related with the vehicles:

Salary of Driver (a driver for each vehicle)	18,000 p.m.
Salary to Cleaner (a cleaner for each vehicle)	11,000 p.m.
Allocated garage parking fee	1,350 per vehicle per month
Servicing cost	3,000 for every complete 5,000 k.m. run.
Price of diesel per litre	58.00

From the above information you are required to calculate

i) Total operating cost per month for each vehicle. (Take 30 days for the month)

ii) Vehicle operating cost per litre of milk. ***(A) (OLD PM, RTP N 14) (ANS: (I) 73,815.75; 65,954; 57,218.40 (II) RS.0.053)***

PROBLEM 7: JRP Resorts (P) Ltd. offers three types of rooms to its guests, viz Deluxe room, Super Deluxe room and Luxury Suite. You are required to ascertain the tariff to be charged to the customers for different types of rooms on the basis of following information:

Type of Room	Number of Rooms	Occupancy
Deluxe Room	100	90%
Super Deluxe Room	60	75%
Luxury Suite	40	60%

Rent of 'Super Deluxe' room is to be fixed at 2 times of 'Deluxe room' and that of 'Luxury Suite' is 3 times of 'Deluxe room'. Annual expenses are as follows:

Particulars	Amount (Rs.in lakhs)
Staff salaries	680.00
Lighting, Heating and Power	300.00
Repairs, Maintenance and Renovation	180.00
Linen	30.00
Laundry charges	24.00
Interior decoration	75.00
Sundries	30.28

An attendant for each room was provided when the room was occupied and he was paid Rs. 500 per day towards wages. Further, depreciation is to be provided on building @ 5% on Rs. 900 lakhs, furniture and fixtures @ 10% on Rs. 90 lakhs and air conditioners @ 10% on Rs. 75 lakhs.

Profit is to be provided @ 25% on total taking and assume 360 days in a year. ***(B) (RTP M16, MTP M18 (N))***

(ANS.: RENT TO BE CHARGED: DELUXE ROOM - RS. 2,450, SUPER DELUXE ROOM - RS. 4,900, AND LUXURY SUITE - RS. 7,350)

PROBLEM 8: A lodging home is being run in a small hill station with 100 single rooms. The home offers concessional rates during six off- season months in a year. During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending on 31st March 20X7. [Assume a month to be of 30 days].

i) Occupancy during the season is 80% while in the off- season it is 40% only.

ii) Total investment in the home is Rs.200 lakhs of which 80% relate to buildings and balance for furniture and equipment.

iii) Expenses:

- Staff salary [Excluding room attendants]: Rs.5,50,000
- Repairs to building: Rs.2,61,000
- Laundry charges: Rs. 80,000
- Interior: Rs. 1,75,000
- Miscellaneous expenses: Rs. 1,90,800

iv) Annual depreciation is to be provided for buildings @ 5% and on furniture and equipment @ 15% on straight-line basis.

v) Room attendants are paid Rs. 10 per room day on the basis of occupancy of the rooms in a month. (vi) Monthly lighting charges are Rs.120 per room, except in four months in winter when it is Rs.30 per room and this cost is on the basis of full occupancy for a month. You are required to work out the room rent chargeable per day both during the season and the off-season months on the basis of the foregoing information. ***(C) (NEW SM)***

(ANS.: ROOM RENT DURING SEASON - RS.197; ROOM RENT DURING OFF SEASON - RS. 98.50)

PROBLEM 9: Following are the information given by the owner of M/s. Moonlight Co. running a hotel at Manali. You are requested to advise him regarding the rent to be charged from his customer per day so that he is able to earn 20% profit on cost other than interest.

a) Staff salaries Rs 4,00,000.

b) The room Attendants salary is Rs.10 per day. The salary is paid on daily basis and the services of room attendant are needed only when the room is occupied .There Is one room attendant for one room.

c) Lighting, heating and power:

ii) The normal lighting expenses for a room if it is occupied for the whole month is Rs.250.

iii) Power is used only in winter and normal charge per month if occupied for a room is Rs.100.

d) Repairs to Building Rs.50,000 per annum.

e) Linen etc.Rs.24,000 per annum

f) Sundries Rs.70,770 per annum

g) Interior decoration and furnishing Rs.50,000 per annum

h) Cost of building Rs.20,00,000, rate of depreciation 5%

i) Other equipment's Rs.5,00,000, rate of depreciation 10%

j) Interest @ 5% may be charged on its investments of Rs.25, 00,000 in the building and equipment.

k) There are 200 rooms in the hotel and 90% of the rooms are normally occupied in summer and 40% of the rooms are occupied in winter .You may Assume that period of summer and winter is six months each. Normal working days in a month may be assumed to be 30.

(A) (M19 (O) - 8M) (ANS: ROOM RENT PER DAY=44.99) (SOLVE PROBLEM NO 14 OF ASSIGNMENT PROBLEMS AS REWORK)

PROBLEM 10: Sachin travels to work by train to his 5-day week job. Instead of buying daily tickets he finds it cheaper to buy a quarterly season ticket which costs Rs.188 for 13 weeks. Rahul, a neighbour, who also makes the same journey, suggests that they both travel in Sachin's car and offers to give him Rs.120 each quarter towards his car expenses. Except for week-end traveling and using it for local college attendance near his home on three evenings each week to study for his PE II, the car remains in Sachin's garage. Sachin estimates that using his car for work would involve him, each quarter, in the following expenses:

Depreciation (Proportion of annual figure)	Rs.200
Petrol and oil	Rs.128
Tyres and miscellaneous	Rs.52

You are required to state whether Sachin should accept Rahul's offer and to draft a statement to show clearly the monetary effect of your conclusion. ***(ANS.: ACCEPT THE RAHUL'S OFFER)***

THE END