R JAYARAMAN (jaya_r54@ yahoo.com)

DEPRECIATION METHOD EXAMPLES & VALUATION OF TENANTED PROPERTIES

Methods of Calculating Depreciation

There are several methods of a calculating depreciation. Some of these are arbitrary whereas others are based on theory. The methods have been divided into two broad heads: a) Non interest methods b) Methods based on interest theories

1. Good-as-new assumption method: the assumption that the assets never depreciate since the assets are well maintained, its service efficiency and output capacity are practically undiminished are assumed as good as new. Obviously, this assumption is entirely erroneous and has no basis.

2. Direct appraisal method: It is assumed that a valuer's intuition can decide arbitrarily, after inspection and without reasoning, giving an ad-hoc depreciation without applying any method. This method is arbitrary having no basis and will not stand in a court of law.

3. Arbitrary lump sum method: this method now practically abandoned; many enterprises make arbitrary lump sum allocations as expense for depreciation. This method also has no basis.

4.Depreciation as a percentage of revenue: Estimating cost depreciation as a percentage of revenue involves the same motive as found in the arbitrary lump sum method. The percentage of gross revenue method seems not to have been used much.

5.Sum of digits method: This method is also known as the sum of the years' digits method. The sum of the years' digits method is an arbitrary method of allocation in which the depreciation base is held constant and the yearly rate decreased. As with the declining balance method, the result is to allocate the larger amount of depreciation to the first year and to decrease the amount each succeeding year. The method is difficult to apply to groups of units, and because the declining balance method achieves similar results with greater ease and flexibility.

6. Declining balance method: This method is also known as constant or equal percentage method of depreciation. The constant percentage method is referred to as

the linear method. TOTAL Depreciation = C (1−(1 − rd) ^{m}): rd = Rate of Depreciation = 1/N, M = BUILDING AGE, N = TOTAL LIFE. In this case, no scrap value is assumed.

In accounting terms, depreciation is used, for writing off the value of the asset over its useful life. It is the decrease in the value of the fixed asset due to use, time period and technological obsolescence.

Reducing Balance Method charges depreciation at a higher rate in the earlier years of an asset. The amount of depreciation reduces as the life of the asset progresses.

Depreciation per annum = (Net Book Value - Residual Value) x Rate%

Where: Net Book Value is the asset's net value at the start of an accounting period. It is calculated by deducting the accumulated (total) depreciation from the cost of the fixed asset. Residual Value is the estimated scrap value at the end of the useful life of the asset. Rate of depreciation is defined according to the estimated pattern of an asset's use over its life term.

7. Straight line depreciation method: this method allocates the depreciable base of a property unit uniformly throughout its service life except when the estimate of service life is changed. depreciation per cent D is calculated as:

$$D = \frac{\text{(Total life - Future life)}}{\text{Total life}} \times \text{(100\% less salvage value)}$$

This is a simple equation which is used for estimating depreciation of existing buildings. For estimating depreciation by this method, the total life, future life and percentage salvage value are necessary. This method Estimation of the Total Life of the Structure. There are no fixed rules for estimating the lives of various types of structures which depend upon many factors such as quality of construction, maintenance, etc.

This fixed percentage depreciation method is more widely used in depreciation calculations than any other. It is the one method most generally used for determining depreciation for tax purposes and for profit and loss financial statements. It is the method prescribed by most agencies.

Accounting principles require companies to depreciate its fixed assets using this method. cost of fixed asset is reduced uniformly over useful life of asset. Since depreciation expense charged to income statement in each period is same, the carrying amount of the asset on balance sheet declines in a straight line.

Question 1.

It is a 20 years old load bearing structure of 1275 sqft of Plinth area. Total Life of the building is 60 years. What is the depreciated value of the building by adopting straight line method if Replacement rate is Rupees1,650/sq.ft. with a Salvage value of 10%?

a) Rs. 16,83,000
b) Rs. 14,72,625
c) Rs. 21,03,750
d) Rs. 13,72,625

Solution:

Method to be adopted	**=** straight line method
Plinth area of the building	= 1275 sqft
Age of the building	= 20 years
Total Life of the building	= 60 years.
Replacement rate	= Rs 1,650/sq.ft
Salvage value	= 10%
Replacement value of the building	= 1275 x Rs 1650 =Rs 21,03,750
Depreciation percentage	= 20 / 60 x (100%-10%)= 30%
Depreciated value of the building	= Rs 21,03,750x (100% - 30%)
	= **Rs 14,72,625 (Ans: b)**

Question 2.

It is a load bearing structure. Age is 5 years. Life is 60 years. What is the depreciation by constant percentage method?

a) 9.18%
b) 10.38%
c) 11.38%
d) 8.20 %

Solution

Method to be adopted	**=** constant percentage method
Age	= 5 years
Life	= 60 years
Depreciation formula	= 1- (1-(R/100**))**^{n}
	= R =100/60 = 1.67
	= 1 - (1- (1.67/100))^{5}
	= 1 - (0.983)^{5}
	= 1- 0.918 = 0.082
	= 8.20% (**Ans: d)**

R = Depreciation Rate
= (100 / total life)
n = age

Question 3

If the machinery costing Rs. 18,000 is sold after 2 years for Rs. 16,000. The depreciation rate is 10 percent per annum on SLM method, then the profit or loss from sale of machine is

a) Rs. 3,600 (Profit)
b) Rs. 1600 (loss)
c) Rs. 1600 (profit)
d) No profit no loss

Solution:

Machine cost	= Rs 18,000
Depreciation rate	= 10%
No. of years	= 2 years
Method to be adopted	Straight line method
Depreciation	= Rs 18,000 x 2 years x 10%
	= Rs 3600
Depreciated value	= Rs 18000 - Rs 3600
	= Rs 14,400
Sale value	= Rs 16,000
Profit on sale	= Rs 16,000 – Rs 14,400
	= Rs 1600 (**Ans: c)**

Question 4.

The W.D.V of an asset after three years of depreciation on the reducing balance method @ 10 percent p.a. is Rs. 36,450. What was its original value?

a) Rs. 40,000
b) Rs. 50,000
c) Rs. 45,000
d) Rs. 70,250

Solution;

Depreciation method to be adopted	= Written Down Value method
Rate of Depreciation	= 10%
After 3 years the asset value	:= Rs 36,450
Formula	= $C \times (1-d)^n$
	:=$C \times (1-0.1)^3$ = Rs 36,450
Capital value	= Rs 36,450 / $(1-0.1)^3$
	= Rs 50,000 (**Ans: b)**

Question 5

A machine was purchased for Rs. 1,00,000/- @ 15% depreciation of SLM. What is the written down value after 2 years?

a) Rs. 70,000/-
b) Rs. 80,000/-
c) Rs. 60,000/-
d) Rs. 90,000/-

Solution:

Depreciation for 1 year by Straight line method = 1,00,000 x 0.15
Depreciation amount = Rs. 15,000/year
Depreciated value after 1 year = 1,00,000 - 15,000 = Rs. 85,000/-
Depreciated value after the second year = 85,000 - 15,000
= Rs. 70,000/-
Written down value after 2 years = Rs. 70,000/- (**Ans: a)**

Question 6

Total age of building 4 years. After four years the depreciated value is equal to 24% of the cost. Find out the % of depreciation (near to answer) by WDV method?

a) 24
b) 25
c) 30
d) 35

Solution;

Depreciation method to be adopted = Written Down Value method
Rate of Depreciation = Not known
After 4 years the asset value = 24% of the cost value
Depreciation Formula = $(1\text{-}d)^{n}$
= $(1\text{-}d)^{4}$ = 24%
Depreciation Percentage = 24% / $(1\text{-}d)^{4}$
(1-d) = $(24\%)^{1/4}$ = 0.699 = 0.70
Depreciation = (1.00 - 0.70) = 0.30 = 30% (**Ans: c)**

Question 7.

'A' purchased a mine for Rs 2,50,000 minerals in the mine were expected to be 5,00,000 tonnes. In the first year, 50,000 tonnes of minerals were used. What is the depreciation for the first year?

a) Rs 20000 b) Rs 25000

c) Rs 10000 d) Rs 15000

Solution:

Mine purchase cost = Rs 2,50,000

Mine mineral worth = 5,00,000 tonnes

First year production = 50,000 tonnes

Production %age for 1st year = 50000 / 5,00,000 ton = 10%

Depreciation % age for 1st year = 10%

Depreciation amount for 1st year = Rs 2,50,000 x 10%

= Rs 25,000 (**Ans: b)**

Question 8.

Cost of machine Rs. 1,00,000/-, scrap value Rs. 10,000/-, life 4 years, what will be the amount of depreciation according to sum of years' digit method in the first year.

Note: The life period, scrap value can be changed

a) Rs. 40,000/- b) Rs. 45,000/-

c) Rs. 36,000/- d) Rs. 38,000/-

Solution: Net cost value = Rs 1,00,000 – scrap value Rs 10,000 = Rs 90,000

Depreciation value in the first year = 90, 000 x 4/10 = Rs 36,000 (Ans: c)

year	Net cost value	Residual life	Depreciation fraction	Depreciation value	Net Book value
1	90,000	4	4/10	36,000	54,000
2	90,000	3	3/10	27,000	27,000
3	90,000	2	2/10	18,000	9,000
4	90,000	1	1/10	9,000	-
Total sum of years' digit		4+3 +2+ 1= 10			

Question 9.

6. A machine was purchased for Rs 20,000. At the end of 5th year by uniform depreciation method by declining in a straight-line form, the carrying value of the asset works out to Rs 5,000. What is the depreciation amount by uniform depreciation method by declining in a straight-line form?

Note: The life period, carrying value can be changed

a) Rs 2,000 b) Rs 2,500

c) Rs 3,000 d) Rs 4,000

Solution:

Depreciation amt = Rs 20,000 - Rs 5,000 = Rs 15000 / 5 years = Rs 3,000 (**Ans: c)**

Net Value	Depreciation	Carrying value
Purchase date	-	Rs 20,000
1st year	Rs 3,000	Rs 17,000
2nd year	Rs 3,000	Rs 14,000
3rd year	Rs 3,000	Rs 11,000
4th year	Rs 3,000	Rs 8,000
5th year	Rs 3,000	Rs 5,000

Question 10.

A machine was purchased for Rs 20,00,000. The life of the machine is 3 years. The depreciation will be charged at 50% every year, with a residual value of Rs 5,00,000. At the end of the 3rd year what will be Net Book Value by Reducing Balance Method?

Note: This question is for 3rd year end. The question can be changed for 2nd year end also. The life period may be also changed

a) Rs 7,50,000 b) Rs 8,75,000

c) Rs 3,75,000 d) Rs 5,00,000

Solution: Rs 8,75,000 (Ans b)

Year ending	Net book value	Residual value	Depn %age	Depreciation Amount	Accumulated Depreciation
1	Rs 20,00,000	Rs 5,00,000	50%	Rs 7,50,000	Rs 7,50,000
2	Rs 12,50,000	Rs 5,00,000	50%	Rs 3,75,000	Rs 11,25,000
3	**Rs 8,75,000**	Rs 5,00,000	50%	Rs 3,75,000	Rs 15,00,000

Question 11.

Factory building has 1200 S.M. built-up area. Plot are is 2000 S.M. Building is 25 years old and total life is 50 years. Replacement cost today is Rs. 25000 per S.M. industrial plot is available for Rs. 8000 per S.M. which of the following is the fair sale price (ignoring salvage) for the property?

a) Rs 46000000 b) Rs 31000000

c) Rs 16 000000 d) Rs 18400000

Solution:

Plot		= 2000 sqm
Building		= 1200 sqm
Building Age		= 25 years
Total life		= 50 years
A. Land value	= 2000 sqm x Rs 8000 per sqm	= Rs 1,60,00,000
B. Building value	= 1200 sqm x Rs 25,000 per sqm	= Rs 3,00,00,000
Depreciated value	= Rs 3,00,00,000 x 25/50	= Rs 1,50,00,000
Fair sale price (Rs 1,60,00,000 + Rs 1,50,00,000)		= Rs 3,10,00000 **(Ans b)**

Question 12.

An assessee has spent Rs. 1,20,00,000 in his new building in the year 2014. What will be the written down value of the above building as on 2019 assuming a rate of depreciation as 10%? This is required for preparing balance sheet for IT purpose.

a) Rs. 87,48,000 b) Rs. 70,86,000

c) Rs. 97,20,000 d) Rs. 78,60,000

Solution;

Depreciation method to be adopted	= Written Down Value method
Rate of Depreciation	= 10%
Building construction cost as on 2014	= Rs 1,20,00,000
Building construction year	= 2014
Building Depreciated cost to be determined	= 2019
Number of years depreciation required	= 5 years
Depreciation Formula	= $(1\text{-}d)^{n} = (1\text{- }10\%)^{5}$ = 59.05%
written down value of the building as on 2019	= Rs 1,20,00,000 x 59.05%
	= Rs 70,86,000 **(Ans b)**

Question 13.

A vacant plot taken on lease for 30 years. The lessee has constructed a building in the plot. As per the lease terms, the lessee has to surrender the vacant plot. What will be the depreciation percentage after 20 years? The life of RCC Framed structure is 80 years.

a) 33.33% b) 66.66%

c) 25% d) None of the above

Solution

Total life of the building = 80 years

It is mentioned in the question, that the lessee has to surrender the vacant plot after demolishing the building after expiry of lease period. Hence, the building life is restricted to 30 years.

Legal life of the building = 30 years

Depreciation percentage after 20 years = 20 / 30 = 66.66% **(Ans b)**

Note: Life of the building is termed as legal life (life due to legal constraints). If the lease term is with renewable clause for further period then legal life will be extended to the lease life as per renewable clause

Question 14.

A fully developed building in a plot has a total of 4 floors. Total plot area is 1,000 sq.m. and total built up for area of the building is 250 sq.m / per floor. Permissible FSI is 1.00. There are 4 tenants per floor and tenants of lower 2 floors pay a rent of Rs. 750 / month / tenement. which includes property tax. Top 2 floors are occupied by the owners of the property itself. Total property taxes are Rs. 25,000 / 6 months for 4 floors.

Tenant's rent includes 50% of total tax, Non - agricultural (N.A.) tax of the plot is Rs. 800 / year and building insurance premium is Rs. 1,000 / year. Assume repair cost at 6% of the gross rent and collection & management charges at 3% of the gross rent. Stamp duty paid at the time of purchase is Rs. 9,000/-. The land is of freehold tenure. Prevalent land rate of freehold land in the locality at present is Rs. 8,000/sq.m. The rate of ownership flats in the locality for similar construction as on today is Rs. 30,000/sq.m.

Questions:

1. What will be the total annual rent receivable by the landlord from all the tenants?

a) Rs. 6,000/- b) Rs. 72,000/-

c) Rs. 1,44,000/- d) Rs. 12,000/-

2. What will be the total outgoings including repairs allowance & collection charges for the tenanted portion of the building?

a) Rs. 32,380/- b) Rs. 57,380/-

c) Rs. 33,280/- d) Rs 38,230/-

3. What will be the present market value of the tenanted portion of the building if rental income is assumed to be in perpetuity & rate of capitalization is adopted @ 8%

a) Rs. 9,90,500/- b) Rs. 1,50,00,000/-

c) Rs. 77,50,000/- d) Rs. 4,95,250/-

4. What will be the present market value of the owner-occupied portion of the building?

a) Rs. 75,00,000/- b) Rs. 1,50,00,000/-

c) Rs. 10,00,000/- d) Rs. 78,00,000/-

5. Which of the following is not considered as outgoing for computing net rent received by the landlord?

a) Property tax b) Repair cost

c) Stamp duty paid d) Management charges

6. What is the market value of the balance potential in the property?

a) Rs. 1,50,000/- b) Rs. 15,00,000/-

c) Zero d) Reversionary value of land

Data:

Property tax for 4 floors	= Rs. 25,000 / 6 months
Non- Agricultural tax for Mumbai	= Rs. 800 / year
Building insurance	= Rs. 1,000 / year
Repair cost & maintenance	= 6% Gross rent
Rent collection charge	= 3% Gross rent
Market rate of land	= Rs. 8,000 / sq.m.
Prevalent market rate of flat	= Rs. 30,000 / sq.m.

Solution:

1.Rent received by the owner*:*

Tenants occupied portions	= GF & FF
Number of tenants in each flat	= 4
Total number of flats in all flats	= 2 x 4 = 8
Monthly rent for each flat	= Rs. 750/-
Monthly rent for all flats	= 750 x 8 = Rs. 6,000
Yearly rent for all flats	= 6,000 x 12 = Rs. 72,000/-
	(Ans: b)

2.Outgoings:

Property tax	= Rs. 50,000
N.A. (Non-Agricultural tax)	= Rs. 800
Insurance premium	= Rs. 1,000
	= Rs. 51,800

Since the tenants are bearing 50% of the above expenses,

the actual outgoings of the owner	= Rs. 25,900
Maintenance charges 6% of gross rent (0.06 x 72,000)	= Rs. 4,320
Rent collection charge 3% of gross rent (0.03 x 72,000)	= Rs. 2,160
Total outgoings	= Rs. 32,380/- **(Ans: a)**

3.Capitalization amount:

Gross income	= Rs. 72,000
Outgoes	= Rs. 32,380
Net income	= Rs. 39,620
Yield	= 8%
Capitalized amount	= 39,620 x (100 / 8)
	= Rs. 4,95,250/- **(Ans: d)**

4.Value of the building - free holder (land owner):

FSI	= 1
Area of the flat 2 x 250	= 500 sq.m.
Market rate of flat	= Rs. 30,000/sq.m.
Market Value 500 x 30,000	= Rs. 1,50,00,000/- **(Ans: b)**

5. While computing net rent received by the landlord, Stamp duty is not to be considered. (It is onetime payment for purchase of the property) (**(Ans: c)**

6. Since the allowable FSI is fully utilized, there is no balance market potential in the property. Hence, the market value of the balance potential is zero**. ((Ans: c)**

Question 15.

An apartment carries 4 floors built on a plot of area 1,000 sq.m. Each floor area is 250 sq.m. The GF & FF have been rented and SF & TF is in possession of the owner. Each floor carries 4 tenements, and tenants pay @ Rs. 750 / tenement as rent. The property tax being paid is @ Rs. 25,000 / six month. Rs. 900 / year is non agri - tax. 6% per annum towards management cost. The tenants are bearing 50% of the property tax, N.A. tax. Rs. 9,000/- stamp duty cost. 3% towards rent collection charge. Cost of land is Rs. 2,000 / sqm and cost of construction is Rs. 25,000 / sqm, FSI is 1. Age of the building is 20 years and total building life is 60 years. (salvage 10% Calculate the following:

1. What is the total rent?
2. What are the total outgoes?
3. What is the valuation of owner-occupied portion?
4. What is the balance potential in building?
5. What is the depreciated cost of building @ 10% salvage value?
6. What is the tenanted portion value @ rate of return of 8% PA?

Data:

Property tax	= Rs. 25,000 / 6 months
Non-Agricultural tax (for Mumbai)	= Rs. 900 / year
Management cost	= 6%
Stamp duty	= Rs. 9,000/-
Cost of land	= Rs. 2,000/sq.m.
Cost of construction	= Rs. 25,000/sq.m.
Rent collection charge	= 3%
Building Age	= 20 years
Total life of the building	= 60 years

Solution:

1. Rent received by the owner:

Tenants occupied portions	= GF & FF

Number of tenants in each flat	= 4
Total number of flats in all flats	= 2 x 4 = 8
Monthly rent for each flat	= Rs. 750/-
Monthly rent for all flats	= 750 x 8 = Rs. 6,000
Yearly rent for all flats	= 6,000 x 12 = Rs. 72,000/-

2. Outgoings*:*

Property tax	= Rs. 50,000
N.A. (Non-Agricultural tax)	= Rs. 900
	= Rs. 50,900

Since the tenants are bearing 50% of the above expenses,

the actual outgoings for the owner	= Rs. 25,450
Management charges 6% of gross rent (0.06 x 72,000)	= Rs. 4,320
Rent collection charge 3% of gross rent (0.03 x 72,000)	= Rs. 2,160
Total outgoings	= Rs. 31,930/-

3. Value of the building - free holder (land owner) :

FSI	= 1
Area of the flat 2 x 250 (SF & TF)	= 500 sq.m.
Cost of construction	= Rs. 25,000/sq.m.
Replacement cost	= 500 x Rs 25,000
	= Rs 1,25,00,000
Building Age	= 20 years
Total life of the building	= 60 years
Salvage value percentage	= 10%
Depreciation percentage	= (20/60) x 90 = 30%
Depreciation value	= 0.30 x Rs 1,25,00,000
	= Rs. 37,50,000/-
Depreciated value for free holder portion (1.25 cr – 37.50 lks)	= Rs. 87,50,000/-

4. Since the allowable FSI is fully utilized, there is no balance market potential in the property. Hence, the market value of the balance potential in the property is zero.

5. Depreciated cost of the building.

FSI	= 1
Area of the building	= 1000 sq.m.
Cost of construction	= Rs. 25,000/sq.m.
Replacement cost	= 1000 x Rs 25,000
	= Rs 2,50,00,000
Building Age	= 20 years
Total life of the building	= 60 years
Salvage value percentage	= 10%
Depreciation percentage	= (20/60) x 90 = 30%
Depreciation cost	= 0.30 x Rs 2,50,00,000
	= Rs. 75,00,000/-
Depreciated cost (2.50 cr – 75.00 lks)	= Rs. 1,75,00,000/-

6. Capitalization amount:

Gross income	= Rs. 72,000
Outgoes	= Rs. 31,930
Net income	= Rs. 40,070
Yield	= 8%
Capitalized amount	= 40,070 x (100 / 8)
	= Rs. 5,00,875/-

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VALUATION TABLES & LEASEHOLD PROPERTIES

1. Simple Interest	P x N x R
2. Compound Interest	P x $(1+R)^n$
3. Capitalized Value (CV)	Net Income x Years' Purchase
4. Years' Purchase	100 / Rate of Return
5. Present Value / discount rate	C X $\frac{1}{(1+R)^n}$
6. Amount of Re1 per Annum	C X $\frac{((1+R)^n-1)}{R}$
7. Gross Sinking Fund	C x $\frac{R}{(1+R)^n-1}$
8. Present value of future income Single rate	C x $\frac{1-\frac{1}{(1+R)^n}}{R}$ = C x $\frac{1-PV}{R}$
9. Present value of future income (Dual rate)	$\frac{1}{R+S} = \frac{1}{\text{Capitalisation Rate+Sinking Fund}}$

COMPOUND INTEREST

Question 1.

What will be the sum of Rupees.5,000 at the end of 5 years @ 5% compound interest per annum?

Solution

Amount A = P x $(1+R)^n$ = Rs 5,000 $(1 + 5\%)^5$

= Rs 5,000 x $(1.05)^5$ = Rs 5,000 x 1.276

= **Rs. 6,380/-**

Question 2.

In 2013, a valuer valued a residential property in a mofusil town for Rs. 68.56 lakhs. Assuming an annual escalation of 10% per year, what will be the value of the property as on 2018 by applying the formula?

Solution:

Property value assessed = Rs. 68,56,000

Rate of escalation = 10%

Number of years (2018 – 2013) = 5 years

Amount $A = P (1 + r)^n$ = 68,56,000 $(1 + 10\%)^5$

= 68,56,000 x $(1.1)^5$

= 68,56,000x 1.6105

= **Rs. 110.42 lakhs**

Question 3.

A Contractor took a loan of Rs. 36,00,000/- from a bank for construction of modern building 2 years back. He has to repay the loan at the Interest of 10%. If the sale of the property is yet to take one year, calculate the amount to be paid by the contractor?

a) Rs. 46,00,000 b) Rs. 48,91,600

c) Rs. 49,00,000 d) Rs. 47,91,600

Solution:

Amount borrowed = Rs. 36,00,000

Amount to which Re. 1/- will accumulate @ 10% in 3 years

= $(1 + i)^n$ = = $(1 + 0.1)^3$ = = 1.331

Amount to be repaid by the contractor

= (1.331 x 36,00,000) = Rs. 47,91,600/- **(Ans: d)**

YEARS' PURCHASE

Question 4.

Which of the following mathematical formula is used to find out Years' Purchase for annuity receivable in perpetuity?

a) 100/Rate of interest

b) 1 / {1-(100/rate of interest) ^n}

c) ((100/rate of interest) ^n)-1

d) {((100/rate of interest) ^n)-1}/rate of interest

Question 5.

The net income was reported at Rs.21,000 and the property sold for Rs.300,000. What capitalization rate applied for this sale?

a) 0.075 b) 0.080

c) 0.065 d)0.070

Solution

Net income = Rs 21000

Sale value = Rs 3,00,000

YP (Capitalization Rate) = NI / CV = 21,000 /3,00,000

= 7% or 0.070 **(Ans: d)**

Question 6.

A property has a net income of Rs.30,000. One appraiser decides to use a 12 Percent capitalization rate, while a second appraiser uses a 10 percent rate. Use of the higher rate results in_____ in appraisal value.

a) Rs.50,000/- increase

b) Rs.50,000/- decrease

c) Rs 2,50,000

d) Rs 3,00,000

Solution;

Valuer	Net Income	capitalization rate	CV = NI x YP	Total value arrived at
Valuer 1	Rs 30, 000	12%	30000 x 100 / 12	Rs 2,50,000
Valuer 2	Rs 30, 000	10%	30000 x 100 / 10	Rs 3,00,000
Use of the higher rate results by Valuer 1 in Rs.50,000/- decrease in appraisal value. **(Ans: b)**				

Question 7.

The monthly rent (Net) of a shop of 540 sq.ft. is Rs. 12,000/-. Calculate the approximate value by adopting a rate of return as 5%.

Solution:

Monthly rent = Rs. 12,000

Yearly rent = 12,000 x 12 = Rs. 1,44,000/-

Rate of return adopted = 5%

Capitalized value = 1,44,000 x 100/5 = **Rs. 28,80,000/-**

Question 8.

The net monthly rent of a residential building of 1,250 sq.ft. is Rs. 16,500/-. Find the approximate value of the property by rent capitalization method by adopting a rate of return as 3%.

Solution:

Monthly rent	= Rs. 16,500
Yearly rent	= 16,500 x 12 = Rs. 1,98,000/-
Rate of return	= 3%
Capitalized value = 1,98,000 x 100 /3	= **Rs. 66,00,000/-**

Question 9.

A freehold site is rented out for 99 years to a developer at a ground rent of Rs. 1,00,000 per annum, net of outgoings. It is renewable. The lessee developer has constructed a building fetching an annual rent of Rs. 5,00,000/-. Value the freeholder's interest assuming a yield of 6%.

Solution:

Value in the hands of lessor:

Net income from ground rent	= Rs. 1,00,000
Yield (Rate of return)	= 6%
Years purchase = 100 / R = 100 / 6	= 16.67
Value in the hands of lessor	= Rs 1,00,000 x 16.67
	= **Rs. 16,67,000/-**

Question 10.

Value the freehold interest of a shop which has been let out for a rent of Rs. 1,00,000 (Net) per month. The rent is renewable. Yield is 5%.

Solution:

Yearly rent = 1,00,000 x 12	= Rs. 12,00,000
Net income	= Rs. 12,00,000
Y.P. for a yield of 5% = 100/5	= 20
capitalized value = 12,00,000 x 20	= **Rs. 2,40,00,000/-**

Question 11.

A new shop was purchased for Rs. 10,00,000 which was rented out for Rs. 5,000 per month. What is the yield?

Solution:

Capital value	= Rs. 10,00,000
Yearly rent = Rs. 5,000 x 12	= Rs. 60,000

Yield = 60,000 x 100 / 10,00,000 = **6%**

Question 12.

An industrial corporation has decided to lease 40,000 sq.ft. plot for a user for 60 years period. The land rate is 2,000 per sq.ft. Assuming a yield of 6%, what will be the monthly lease?

Solution:

Extent of land = 40,000 sq.ft.
Market rate = Rs. 2,000/sq.ft.
Value of land = Rs. 8,00,00,0000
Lease rent yield = 6%
Annual rent = 8,00,00,000 x6 /100 = Rs. 48,00,000
Monthly rent = 48,00,000/12 = **Rs. 4,00,000/-**

Question 13.

A private trust had leased 10,000 sq.ft. plot for 99 years lease which can be renewed for further period. Fix lease rent if the land rate is Rs. 1,500/sq.ft. Assume lease rent as 8%.

Solution:

Extent of land = 10,000 sq.ft.
Land rate = Rs. 1,500/sq.ft.
Land value = Rs. 1,50,00,000
Lease rent yield assumed = 8%
Annual lease rent = 1,50,00,000 x 8 / 100 = 12,00,000
Monthly lease rent = **Rs. 1,00,000/-**

Question 14.

An apartment building consists of 12 flats of super built up area 1,050 sq.ft. The net monthly rent of a flat is Rs. 9,000. The prevailing rate of return is 2.5%. Find the approximate value of one flat by rent capitalization method.

Solution:

Net monthly rent = Rs. 9,000
Yearly rent = Rs. 1,08,000
Rate of return = 2.5%
Value = 1,08,000 x 100 / 2.5 = **Rs. 43,20,000/-**

PRESENT VALUE / DISCOUNT RATE

Question 15.

What is the Present value of rupee for Capital amount receivable at a future date of Rs 10,00,000 at 6 % compound interest rate for 10-year term?

a) Rs 5,85,390
b) Rs 5,58,390
c) Rs 8,55,390
d) Rs 5,26,850

Solution:

Present worth of amount receivable = PVA = **C X** $\frac{1}{(1+R)^n}$

PVA = Rs10,00,000 X $\frac{1}{(1+0.06)^{10}}$ = Rs10,00,000 x 0.55839 = Rs5,58,390/- **(Ans: b)**

Question 16.

An investment pays Rs 300 annually for 5 years, with the first payment occurring today. The present value (PV) of the investment discounted at 4% annual rate is approximately-----

a) Rs 1,336
b) Rs 1,389
c) Rs 1,625
d) Rs 1,925

Solution:

Discount rate formula : $\frac{1}{(1+R)^n}$

Instalment	Amount paid	Rate per month	Discount rate $\frac{1}{(1+R)^n}$	Net Present Value
1	Rs 300	0.04 (4%)	-	Rs 300.00
2	Rs 300	0.04 (4%)	0.9615	Rs 288.45
3	Rs 300	0.04 (4%)	0.9245	Rs 277.35
4	Rs 300	0.04 (4%)	0.8890	Rs 266.70
5	Rs 300	0.04 (4%)	0.8548	Rs 256.44
			(Ans: b)	Rs 1388.94

AMOUNT OF RE 1 PER ANNUM

Question 17.

Amount of Re.1 per annum is worked out by which of the following formula?

a) r / ((1+r) ^{n} - 1}

b) ((1+r) ^{n} – 1) / r

c) r / ((1+r) ^{n} + 1)

d) ((1+r) ^{n} + 1) / r

Question 18.

Rs 500 deducted every month and invested annually towards PF account from salary for a period of 20-year terms and at a 7% of compound interest?

a) Rs 2,56,000

b) Rs 2,46,000

c) Rs 2,26,000

d) Rs 1,50,000

Solution:

Accumulated sum of Re 1 / year (APA) = $\frac{((1+R)^{n}-1)}{R}$

= $\frac{((1+0.07)^{20}-1)}{0.07}$ = $\frac{((1.07)^{20}-1)}{0.07}$ = $\frac{(3.87-1)}{0.07}$ = $\frac{(2.87)}{0.07}$ = **41**

Gross Accumulated sum = Rs 500 x 12 x 41 = Rs 2,46,000/- **(Ans: b)**

ANNUAL SINKING FUND

Question 19.

Annual Sinking fund to be set aside each year for recouping Rs 1 at the end of 6 years, at 5 percent rate of interest is represented by formula----------

a) 0.05/ ((1+ 0.05)^{6}-1}

b) {(1+0.05)^{6}+1} / 0.05

c) 5 / (1+ 5)^{6}-1)

d) 0.05 / {(1+0.05)^{6}+1}

Question 20.

Which one of the following best defines Annual sinking fund?

1. **Annual sum required to be invested to an amount of Re. 1/- in specified years**
2. Monthly sum required to be invested to an amount of Rs. 10/- in specified years
3. Annual sum required to be invested to an amount of Rs. 10/- in specified years
4. Annual sum required to be invested to an amount of Rs. 100/- in specified years

Question 21.

To find out the depreciated worth of the building to set aside annually for 10 lakhs as Capital recoupment amount expected at a 4% interest rate for the period unexpired period of lease of 60 years

a) Rs 2,400 b) Rs 4,200

c) Rs 3,200 d) Rs 4,000

Solution:

Gross sinking fund GSF $= C \times \frac{R}{(1+R)^n - 1}$

GSF = Rs10,00,000 x $\frac{0.04}{10.52 - 1}$ = Rs10,00,000 x $\frac{0.04}{9.52}$

= Rs10,00,000 x 0.0042

= Rs 4,200 /- **(Ans: b)**

PRESENT VALUE OF FUTURE INCOME SINGLE RATE

Question 22.

Annual Rental income from property is Rs 48,000 /-. If the building is demolished after 40 years, what will be the present value of the property @ 7% interest rate?

a) Rs 6,00,000 b) Rs 6,39,936

c) Rs 6,28,745 d) Rs 6,93,935

Solution:

Asset value $= C \times \frac{1 - \frac{1}{(1+R)^n}}{R}$

C = Capital income (annuity) received each year R = Compound interest rate

N = Number of years YP = Year's Purchase

YP $= \frac{1 - \frac{1}{(1+R)^n}}{R} = \frac{1 - \frac{1}{(1+0.07)^{40}}}{0.07} = \frac{1 - \frac{1}{(1.07)^{40}}}{0.07} = \frac{1 - \frac{1}{14.974}}{0.07} =$ 13.332

Asset value = C X YP = Rs 48000 x 13.332 = Rs 6,39,936 /-

(Ans: b)

PRESENT VALUE OF FUTURE INCOME DUAL RATE

Question 23.

Which of the following represents the year purchase for Re.1 with remunerative rate of interest at 8% and annual sinking fund amount to be set aside for recouping Rs .1 is 0.021.

a) 1 / (0.08+0.021) b) 0.021/0.08

c) (0.08+0.021) / (0.021) d) 1/(0.08-0.021)

Question 24.

The annual rent received from the property is Rs 48000 /-. Expected rate of return is 10% future life of the building is 50 years. Recoupment rate is 4% on capital. Find the purchase price.

a) Rs 4,85, 672 b) Rs 4,50,672

c) Rs 4, 60,672 d) Rs 4,75,672

Solution:

Present value of Re.1 / year = YP = $\frac{1}{R+S}$

R = Remunerative rate of interest = 10%

S = Sinking fund = $\frac{R}{(1+R)^n - 1}$ = $\frac{0.04}{(1+0.04)^{50} - 1}$ = 0.0065

Asset Value = C x YP = C x $\frac{1}{R+S}$

= Rs 48000 x $\frac{1}{0.10+0.0065}$ = Rs 48000 x $\frac{1}{0.1065}$ = Rs 48000 x 9.389

= Rs 4,50,672/- **(Ans: b)**

Question 25.

A property fetches a leaseholder Rs. 30,000 per annum. The rent fixed to the paid to the superior landlord is Rs. 16,000 per annum. If freeholder expects a return of 8 percent, then the leaseholder should expect a rate as indicated below so that he makes a reasonable profit.

a) 0.09 b) 0.07 c) 1.00 d) 0.01

Solution:

If the property is assumed as freehold, then, the freeholder is expecting a rate of return of 8%. The lease holder must expect a minimum rate over and above this 8%.

In Sorab Talati vs Josheph Michem Appeal 101 of 1949 - Vol.- 2 of SOC – page 162 (Bombay) (Invest Theory of Rent) C) For leasehold properties, 1% extra yield on both types of investment was considered fair, to account for extra risk of investing capital. Hence, 9% is fair for the leaseholder, so that he makes a reasonable profit. **(Ans: a)**

Question 26.

An ownership flat with 140 sqm area is licensed for an amount of Rs 1,10,000 per month. Society maintenance charges are Rs 20,000 per 3 months. Which of the

following will be market value of the flat on income approach by adopting 4 percent as rate of capitalization?

a) Rs 3,10,00,000 b) Rs 1,10,00,000
c) Rs 2,00,00,000 d) Rs 1,32,00,000

Solution:

License amount per annum = Rs 1,10,000 x 12 = Rs 13,20,000
Less Society maintenance per annum
= Rs 20000 x 12 / 3 = Rs 80,000
Total per annum
= Rs 13,20,000 - Rs 80,000 = Rs 12,40,000
Rate of capitalization = 4 %
Capitalized value or Market value = Rs 12, 40,000 / 0.04
= Rs 3,10,00,000 **(Ans: a)**

Question 27.

Mr. 'X' is owning a vacant site of 8,000 sq.ft. near the bus stand. He wants to let out. The prevailing unit market rate is Rs. 10,000 and the guideline rate is Rs. 15,000 / sq.ft. Mr. Y wants this site or parking vehicles. Mr. Z also wants this site and wishes to construct a shed. Assuming rate of return of 4% & 5% as secured rent and unsecured rent respectively, what is the maximum rent that can be suggested for i) Y & ii) Z?

For Y

a) Rs. 2,66,667 b) Rs. 3,33,333
c) Rs. 5,00,000 d) Rs. 4,00,000

For Z

a) Rs. 5,00,000 b) Rs. 3,33,333
c) Rs. 2,66,667 d) Rs. 4,00,000

Solution

For Y

Unsecured Ground Rent: A vacant ground given under lease & the lessee leases the vacant land for vehicle parking, materials storing without any construction or making any improvements

Land area = 8000 sqft

Market rate	= Rs 10,000 per sqft
Total value of land	= Rs 8,00,00,000
Unsecured Ground Rent	= 5%
Annual Rent for **Y**	**=** Rs 8,00,00,000 x 5%
	= Rs 40,00,000
Monthly Rent for **Y**	**=** Rs 40,00,000 / 12
	= Rs 3,33,333 **(Ans: b)**

For Z

Secured Ground Rent: A vacant ground given under lease and the lessee develop the land and make improvements and lease out the building he has constructed. He maintains the building and pay statutory taxes.

Land area	= 8000 sqft
Market rate	= Rs 10,000 per sqft
Total value of land	= Rs 8,00,00,000
Secured Ground Rent	= 4%
Annual Rent for **Z**	**=** Rs 8,00,00,000 x 4%
	= Rs 32,00,000
Monthly Rent for **Z**	**=** Rs 32,00,000 / 12
	= Rs 2,66,667**(Ans: c)**

Question 28.

A purchaser is offered a property with a net income of Rs. 52,000 per annum. The purchaser assumes that a first mortgage can be raised at 60% of the purchase price. The mortgage will be at an interest rate of 15% per annum. The purchaser will fund the balance of the purchase price and requires a 10% return on equity. What is the value of the property?

a) Rs 3,50,000 b) Rs 3,75,000

c) Rs 4,00,000 d) Rs 4,25,000

Solution:

Average Interest Rate = Mortgaged fund (borrowed) + Equity (purchaser own fund)

= (0.60 x 0.15) + (0.40 x 0.10) = 0.13

$$\text{Value} = \frac{52{,}000}{0.13} = \text{Rs. } 4{,}00{,}000$$ **(Ans: c)**

Question 29.

A government M.I.D.C. gives 8,000 sq.m. of land on 99 years lease @ 1/- P.A. lease rent and charged one time premium of Rs. 450 / sq.m. in the year 1998.

The lessee in the year 1998 constructed an industrial shed 4,000 sq.m. of BU area with his own expenditure. The age of the shed is 20 years as on year 2018 and total life of the shed is 40 years. Salvage value 10%

The land rate is Rs. 2,000 / sq.m. and replacement cost is Rs. 25,000 / sq.m.

Lease provides that the lessor is entitled to charge 50% unearned increase in land value as transfer / assignment charges in case of sale / transfer of the property. Calculate the following:

1. What is the lessor's interest?
2. What is the total value of property considering a freehold property?
3. What is the lessee interest?
4. What is the reversionary value of the leasehold land?
5. What is the depreciated value of shed?

Data:

Year of lease	=	1998
Period of lease	=	99 years
		One time premium
	=	Rs.450/sq.m. for land extent
Land area	=	8,000 sq.m.
Lease rent	=	Re. 1/year
Lessee built a factory of built-up area	=	4,000 sq.m.
Year of construction of factory by the lessee	=	1998
Land rate as on 2018 (date of valuation)	=	Rs. 2,000/sq.m.
Replacement cost of building in 2018	=	Rs. 25,000/sq.m.
Age of the shed 2018 - 1998	=	20 years
Total life of the building	=	40 years
Salvage value	=	10%
Date of valuation	=	2018

Opinion:

1. <u>Lessor's interest:</u>

This case of lease of land is by state government. It is assumed as a perpetual lease and reversionary value of land is negligible. The lease rent is only Re.

1/year and hence its capitalized value will be negligible. Lessor's interest in land value would be therefore is restricted to claim 50% of unearned increase in land value in case of sale.

Land area	=	8,000 sq.m.	
Prevailing land rate 2018	=	Rs. 2,000/sq.m.	
One time premium charged in 1998	=	Rs. 450/sq.m.	
Unearned increase 2,000 - 450	=	Rs. 1,550/sq.m.	
The percentage the lessor is entitled to charge in case of transfer	=	50%	
Unearned increase the lessor can enjoy	=	0.5 x 1,550	
	=	Rs. 775/sq.m.	
The lessor's value - 8,000 x 775	=	Rs. 62,00,000/-	(1)

2. Value of property assuming it is a freehold:

(i) Land :

Land area	=	8,000 sq.m.	
Unit rate of land	=	Rs. 2,000/sq.m.	
Land value - 8,000 x 2,000	=	Rs. 1,60,00,000/-	

(ii) Building:

Building area	=	4,000 sq.m.	
Replacement cost	=	Rs. 25,000/sq.m.	
Replacement value	=	4,000 x 25,000	
	=	Rs. 10,00,00,000/-	
Age of the building: 2018 - 1998	=	20 years	
Life of the factory	=	40 years	
Salvage value assumed	=	10%	
Depreciation percentage	=	(20/40) x 90 = 45%	
Depreciation value	=	0.45 x 10,00,00,000	
	=	Rs. 4,50,00,000/-	
Depreciated value (10,00,00,000 - 4,50,00,000)	=	Rs. 5,50,00,000/-	

(iii) Total value :

Value of land	=	Rs. 1,60,00,000/-	
Depreciated value of building	=	Rs. 5,50,00,000/-	
Total value	=	Rs. 7,10,00,000/-	(2)

3. Value of lessee's interest:

Total value of land: 8,000 x 2,000		=	Rs. 1,60,00,000/-
Value of lessee's interest		=	1,60,00,000 - 62,00,000
		=	Rs. 98,00,000/-
Lessee also holds in the building value.			
Depreciated value of building		=	Rs. 5,50,00,000/-
Total value:	Land	=	Rs. 98,00,000
	Building	=	Rs. 5,50,00,000
		=	Rs. 6,48,00,000/-

4. Reversionary value is negligible and hence not considered.

5. Depreciated value of shed = Rs. 5,50,00,000/-

Question 30.

A warehouse property is situated close to a port facility in a major port town. It is let out on a 50 years lease. The lessee is paying to the lessor an exclusive ground rent @ INR 2,000 per annum, after payment of a onetime premium of INR 25,00,000. The rack rental value on full repairing terms amounts to INR 1,20,000 per annum. The yield from freehold ware houses in similar locations is considered to be 10% and for long term lease is 15%.

Questions:

1. What is the outgoing for lessor?
2. What is the net income for the lessor during the term period?
3. What is the YP during the term period?
4. What is the YP during the reversionary value calculations?
5. What is the value of freeholder's interest?
6. What is the market rent?

Data:

Lease	=	50 years
Ground rent to lessor	=	Rs. 2000/- per annum
Premium paid to lessor	=	Rs. 25,00,000/-
Rack Rent on full repairing terms	=	Rs. 1,20,000/- per annum
Yield for freehold ware houses	=	10%
Yield for long term lease	=	15%

Answers:

1. What is the outgoing for lessor?

The outgoing for lessor is nil since the lease is on full repairing terms.

2. What is the net income for the lessor during the term period?

Rs. 2000/- per annum

3. What is the YP during the term period?

Y.P. = 100 / 15 = 6.66

4. What is the YP during the reversionary value calculations?

The YP during reversionary value calculations is 100 / 10 = 10.

5. What is the value of freeholder's interest?

Value of freeholder's interest = value of term + value of reversion

i) Value of term (lessor's interest) = 2000 x 6.66 = 13,320

ii) Value of reversion

Market value = Rs. 1,20,000/-

Y.P. @ 10% = 100 / 10 = 10

Capitalized value = 1,20,000 x 10 = 12,00,000

Y.P. in perpetuity deferred for 50 years @ 10%

$= (1/ (1 + 0.1)^{50})$

= 0.008518

Value of reversion = 12,00,000 x 0.008518

= 10,222

iii) Value of freeholder's interest = 13,320 + 10,222

= Rs. 23,542/-

6. What is the market rent?

Rs. 1,20,000/- per annum.

Notes:

1. Simple Interest Calculation: The gross amount accrued at the end of given period of term, at the given rate of simple interest. The total interest amount accrued in the given period total interest amount = I = P x N x R

Gross Amount (Annuity) = P + I = Principle Amount + Interest

P = Principal Amount: N = number of years: R = simple interest Rate

2. Compound interest amount Calculation: Single lump sum payments which are compounded at a given constant interest rate at the end of each definite time period at equal intervals of time. The gross amount accrued at the end of given period of term, at the given rate of compound interest.

Total interest = I = $(1+R)^{n}$

Gross Amount = P + I = P x $(1+R)^{n}$

= Principal Amount + compound Interest accrued

P = Principal Amount N = number of years R = Rate of compound interest

3. Present value of rupee Calculation: By this formula we can calculate the Present value of Re for a given period at a given rate of compound interest. This method is known as discounting or deferring of receivable at a future given period and at a given rate of compound interest.

Present value of a Rupee = PV = $\frac{1}{(1+R)^{n}}$

Present worth of amount receivable = PVA = C X $\frac{1}{(1+R)^{n}}$

C = Capital amount receivable at a future date R = Compound interest rate

N = Number of years

4. Amount of Re. 1 / year (annum) Calculation: Amount to calculate the annual regular investment of Re for a given period at a given rate of compound interest

Accumulated sum of Re 1 / year = (APA) = $\frac{((1+R)^{n}-1)}{R}$

Gross Accumulated sum = C X $\frac{((1+R)^{n}-1)}{R}$

C = Capital amount received / year R = Compound interest rate N = Number of years

5. Annual sinking fund Calculation: This calculation formula is used to find out the depreciated worth of the building. For this we have to consider a sinking fund amount to set aside annually at a given interest rate for the period equal to the building age or unexpired period of lease.

Annual sinking fund = ASF = $\frac{R}{(1+R)^{n}-1}$

Gross sinking fund = GSF = C x $\frac{R}{(1+R)^{n}-1}$

C = Capital recoupment amount expected

R = Compound interest rate N = Number of years

6. Present value of future income of Re. 1 / year (Single rate basis): Present worth of future annual income for a given time period and at a given rate of compound interest. This method is adopted for a perpetual income or by a long term lease with unexpired period is more where no annual sink fund is considered for calculation. Only remunerative rate of interest for the income is considered and hence it is called single rate method

Present value of Re.1 / year = YP = $\frac{1-\frac{1}{(1+R)^n}}{R}$

Asset value = C x $\frac{1-\frac{1}{(1+R)^n}}{R}$

C = Capital income (annuity) received each year R = Compound interest rate
N = Number of years YP = Year's Purchase

7. Present value of future income of Re.1/year (Dual rate): To calculate present worth of the future annual income flow for a given period of time and at a given rate of compound interest with taking in to account the sinking fund. It is calculated on the terminable income.

This method is usually adopted for an income with the remunerative rate of interest for the income and also a provisional annual sinking fund is considered.

Present value of Re.1 / year = YP = $\frac{1}{R+S}$

R = Remunerative rate of interest S = Sinking fund = $\frac{R}{(1+R1)^n-1}$

Asset Value = C x YP

C =Capital income (annuity) received each year R = Compound interest rate
N = Number of years YP = Year's Purchase

TYPES OF LEASE

Building lease: A vacant ground given by lessor under lease with ground rent and lessee develop the land and make improvements and lease out the building he has constructed. He maintains the building and pay statutory taxes.

The lease amount collected by the lessor is ground rent, which is here termed as Head Rent. If the building is rented out (sub lease) by the head lessee, the amount collected by him is called Rack rent.

Occupational lease: A building property given on lease to the lessee, which means,

both land and building in part and parcel has been leased out. The rent collected is termed as Rack Rent. The lessor has the right of evicting the lessee. Example: Residential house, Apartments, shops.

Full repair lease: If the lease agreement stipulates the lessee to undertake all outgoings apart from his head rent, the lease is called full repairing lease

Life lease: The lease period is fixed till the death of lessee. The lease period expires on the death of the lessee.

Sub lease: In the lease agreement if the lessee is permitted to give the lease hold property to other occupants for a shorter time less than his lease period, with an enhanced lease amount, then the lease agreement entered by the lessee with the incumbents is called a sub-lease. The main lessee is called the Head Lessee. Other sub lease holders are called sub lessee. The main lessee retains his reversion of lease under his control.

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