Time Value of Money

Work book – Section I – True, False type questions

State whether the following statements are true (T) or False (F)

1.1 Money has time value because you forgo something certain today for something uncertain tomorrow.

1.2 The uncertainty factor increases with time – the distant the cash flows, the more uncertain they become.

1.3 The lower is the compounding period, the higher is the effective rate of interest.

1.4 With high inflation rate, the interest rates tend to increase.

1.5 One of the reasons for attributing time value to money is that individuals prefer future consumption to current consumption.

1.6 The nominal rate of interest is equal to the effective rate of interest when interest is compounded annually.

1.7 The rule of 72 is more precise (provides a better estimate) than the rule of 69 to find the period required to double your initial amount.

1.8 Financial analysis require an explicit consideration of time value of money because most financial problems at corporate and individual level involves cash flows occurring at different points in time.

1.9 Given a principal amount of Rs. 10,000 to be invested for 9 months, it is better to invest in a scheme that offers 12% annual compound interest than investing in a scheme that earns 12% simple interest.

1.10 A bank that pays 10% interest compounded annually pays a higher effective rate of interest than a bank that pays 10% interest compounded quarterly.

1.11 The formula for effective rate of interest (re) is- $re= (1+r/m)^n -1$

1.12 A regular (deferred) annuity is one in which a series of periodic cash flows of equal amount occur at the beginning of each period.

1.13 The rule of 72 is useful in determining the future value of an annuity given the rate of interest.

1.14 Frequency of compounding has no effect on interest earned.

1.15 Maximum benefit of compounding occurs when money is compounded daily.

1.16 Present value of an uneven stream of cash flows can be calculated with the help of present value of annuity table.

1.17 While investing money it is always better to insist on a higher frequency of compounding.

1.18 Increased frequency of compounding means the same thing as decrease in compounding period.

1.19 The benefits from increased compounding frequency decrease with each successive increase in compounding frequency.

1.20 In case of most of banks, fixed deposit money is compounded quarterly.

1.21 Effective rate of interest depends on the compounding period.

1.22 Higher the compounding period, higher is the effective rate of interest.

1.23 In simple interest, interest for each year in same.

1.24 The process of determining present value is often called discounting.

1.25 Continuous compounding results in the maximum possible future value for given rate of interest and time period.

1.26 A perpetuity is an annuity that continues for 100 years.

1.27 In perpetuity, the principal amount remains intact.

1.28 The present value of any future sum is inversely related with rate of interest.

1.29 Continuous compounding occurs when interest is compounding daily.

1.30 Sinking fund factor is used to determine the periodic fixed amount that must be invested regularly to accumulate a specified sum at the end of a given period at a given rate of interest.

1.31 When debt(loan) is amortized in periodic fixed installments, the principal component of installment declines over time.

1.32 The compound value of any sum invested today varies directly with rate of interest (r) and time period (n).

1.33 Money has time value because a sum of money to be received in future is more valuable than the same amount today.

1.34 The process of compounding assumes discounting at same rate.

1.35 An annuity due is one in which periodic cast flows of equal amount occur at the beginning of each period.

1.36 Compounding over the same time period, annuity due will have a higher future value than ordinary annuity.

1.37 An amortization schedule tells us about the interest component and principal repayment component of each fixed installment paid by borrower towards loan repayment.

1.38 Annuity tables can be used far all types of cash flows.

1.39 For a given rate of interest(r) and given number of years(n), the present value annuity factor will be greater than future value annuity factor.

1.40 In present value tables, all values are less than 1.

1.41 Present value of annuity due is equal to present value of ordinary annuity x (1 + r).

1.42 Future value of annuity due = present value of ordinary annuity x (1 + r)

1.43 1 ÷ PVAF (Present value Annuity Factor) is knows as capital recovery factors.

1.44 1 ÷ FVAF (Future value Annuity Factor) is known as sinking fund factors.

1.45 The price of any asset today is the present value of all the future cash flows associated with the asset.

1.46 Bond prices vary inversely with the rate of interest.

1.47 An annuity is a stream of constant cash flows occurring at regular intervals of time.

1.48 A perpetuity is an annuity that continues for ever i.e., till infinity.

1.49 The present value of a mixed stream of cash flows is the sum of the present values of the individual cash flows.

1.50 An investment option that comes with specified present value and future value after given period has hidden rate of interest.

Solutions : Section – I

1.1 T 1.2. T 1.3. T 1.4 T 1.5 F 1.6 T 1.7 F 1.8 T 1.9 F
1.10 F 1.11 F 1.12 F 1.13 F 1.14 F 1.15 F 1.16 F 1.17 T
1.18 T 1.19 T 1.20 T 1.21 T 1.22 F 1.23 T 1.24 T 1.25 T
1.26 F 1.27 T 1.28 T 1.29 F 1.30 T 1.31 F 1.32 T 1.33 F
1.34 T 1.35 T 1.36 T 1.37 T 1.38 F 1.39 F 1.40 T 1.41 T
1.42 F 1.43 T 1.44 T 1.45 T 1.46 T 1.47 T 1.48 T 1.49 T
1.50 T

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Work book – Section II – Fill in the blanks

Fill in the blanks with suitable answers

2.1 The process of determining present value is often called ..... and is the reverse of the ..... Process.

2.2 A ..... is an annuity that continues forever.

2.3 An ..... is a series of cash flows of fixed amount occurring at regular intervals of time.

2.4 A .....is the annual deposit or investment of fixed amount that is necessary to accumulate a specified future sum.

2.5 If a loan is to be repaid in equal periodic amounts, it is said to be an .....

2.6 Effective annual rate of interest is ..... to nominal rate of interest, when interest is compounded annually.

2.7 Effective annual rate of interest with half-yearly compounding is ..... than, with quarterly compounding.

2.8 The formula for effective annual rate of interest (re) is .....

2.9 If the repayment of a loan is to start after a gap of few years, it is called an ..... loan.

2.10 The general formula for intra year compounding is .....

2.11 Using the rule of 72 to find doubling period we .....72 by .....

2.12 Annuity (constant annual cash inflow) ÷ Rate of interest (r) is the formula to find present value of .....

2.13 Lower is the compounding period, the ..... is the effective annual rate of interest.

2.14 The formula to find the growth of money with continuous compounding is .....

2.15 Present or future value of annuity due = present or future value of ordinary annuity x .....

2.16 1 ÷ PVAF (present value annuity factor) refers to .....

2.17 1 ÷ FVAF (future value annuity factor) refers to .....

2.18 When cash flows of constant amount occur at the beginning of each period, the annuity is called an .....

2.19 Compound interest is more than simple interest because in ..... interest is earned on interest.

2.20 ..... compounding results in maximum possible future value at the end of n periods for a given rate of interest.

Answers to section II

2.1 Discounting, compounding 2.2 perpetuity 2.3 Annuity
2.4 sinking fund 2.5 amortized loan 2.6 equal 2.7 less
2.8 re = $(1 + r/m)^m$ -1 2.9 deferred 2.10 FVn= $(1 + r/m)^{mn}$
2.11 divide, r 2.12 perpetuity 2.13 higher 2.14 FVn = Po. × e^{rn}
2.15 (1+r) 2.16 capital recovery factor 2.17 sinking fund factor
2.18 annuity due 2.19 compound interest 2.20 continuous.

Time Value of Money

Work book – Section III – Multiple choice questions

Mark (✓) the right answer from given alternatives :

3.1 Money has time value because:

a. Individuals prefer future consumption to present consumption.

b. Money today is more certain than money tomorrow

c. Money today is wroth more than money tomorrow in terms of purchasing power.

d. There is a possibility of earning risk free return on money invested today.

e. (b), (c) and (d) above.

3.2 Given an investment of Rs. 10,000 to be invested for one year;

a. It is better to invest in a scheme that pays 10% simple interest.

b. It is better to invest in a scheme that pays 10% annual compound interest.

c. Both (a) and (b) provide the same return

3.3 Given an investment of Rs. 10,000 for a period of one year, it is better to invest in a scheme that pays:

a. 12% interest compounded annually

b. 12% interest compounded quarterly

c. 12% interest compounded monthly

d. 12% interest compounded daily

3.4 Given an investment of Rs. 10,000 over a period of two years, it is better to invest in a scheme that pays;

a. 10% interest in the first year and 12% in second year.

b. 12% interest in the first year and 10% in second year.

c. Both (a) and (b) above provide the same return

3.5 The rule of 72 is used to find;

a. Approximate doubling period, given the interest rate (r)

b. Approximate interest rate, given the doubling period (n)

c. Both (a) and (b) above.

3.6 The relation between effective annual rate of interest (re) and nominal rate of interest (r) is best represented by;

a. $re = (1 + r / m)^{mn} - 1$

b. $re = (1 + r/m)^{m} - 1$

c. $r = (1 + re/m) - 1$

d. None of the above

3.7 To find the present value of a sum of Rs. 10,000 to be received at the end of each year for the next 5 years at 10% rate, we use:

a. Present value of a single cash flow table

b. Present value of annuity table.

c. Future value of a single cash flow table

d. Future value of annuity table

3.8 Sinking fund factor is the reciprocal of :

a. Present value interest factor of a single cash flow.

b. Present value interest factor of an annuity.

c. Future value interest factor of a single cash flow.

d. Future value interest factor of an annuity.

3.9 According to the 'Rule of 69' doubling period of an investment at an interest rate of 15% is :

a. 4.6 years

b. 4.2 years

c. 4.95 years

d. 5.25 years

3.10 If the effective rate of interest compounded quarterly is 16%, then the nominal rate of interest is :

a. 14.6% b. 15%

c. 14.8% d. 15.12%

3.11 If the interest rate on a loan is 1% per month, the effective annual rate of interest is :

a. 12%

b. 12.36%

c. 12.68%

d. 12.84%

3.12 If a loan of Rs. 30,000 is to be paid in 5 annual installments with interest rate of 12% p.a. then the equal annual installment will be;

a. Rs. 7400

b. Rs. 8100

c. Rs 7812

d. Rs. 8322

3.13 X took a housing loan of Rs. 25,00,000. The loan is to be redeemed in 120 monthly installments of Rs. 31,000 each to be paid at the end of each month. What is the implied interest rate per annum.

a. 8.50%

b. 8.1%

c. 7.70%

d. 9.12%

3.14 The difference between effective annual rate of interest with monthly and quarterly compounding, when nominal rate of interest is 10% is;

a. 0.10%

b. 0.14%

c. 0.21%

d. 0.09%

3.15 A bond has a face value of Rs. 1000 and a coupon rate of 10%. It will be redeemed after 4 years at 10% premium. Find the present value of bond at a required rate of 12% :

a. Rs. 1002.80

b. Rs. 960.72

c. Rs. 980.84

d. Rs. 1020.12

3.16 Axis bank offers 10% nominal interest for a three year fixed deposit to senior citizens. If the compounding is done quarterly, then effective annual rate of interest is :

a. 10.25%

b. 10.38%

c. 10.46%

d. 10.52%

3.17 X deposits Rs. 2500 at the end of every month in a bank for 5 years. If the interest rate offered by bank is 8% p.a. compounded monthly, the accumulated sum X will get after 5 years will be:

a. Rs. 1,76,802

b. Rs. 1,83,692

c. Rs. 1,91,507

d. Rs. 1,94,752

3.18 You invest Rs. 1500 at the end of year one and Rs. 2000 at the end of second year and Rs. 5000 each year from third to tenth. Find the present value of stream at discount rate of 10%

a. Rs. 25,062

b. Rs. 24,712

c. Rs. 26,502

d. Rs. 24,242

3.19 If you take a loan of Rs 1,00,000 today and return Rs. 1,51,807 after 4 years to clear off the loan, what effective annual interest rate is paid by you:

a. 12%

b. 13%

c. 11%

d. 12.4%

3.20 In how much period Rs. 1 becomes Rs. 3 at 12% rate of interest compounded annually.

a. 12 years
b. 8 years
c. 10.42 years
d. 9.69 years

3.21 Which of the following statements is true?

a. Frequency of compounding, has no effect on rate of interest.

b. An annuity is a series of cash flows of variable amount.

c. The nominal rate of interest is equal to or more than the effective rate of interest.

d. Cash flows occurring in different time periods cannot be compared unless they are discounted to a common date.

3.22 If a 12% loan is to be paid back after 10 years, the sinking fund factor will be equal to:

a. 0.03471
b. 0.05698
c. 0.04231
d. 0.09109

3.23 Mr X has decided to deposit Rs. 70,000 per year in his public provident fund account for next 15 years. At 8% interest compounded annually, how much money will accumulate in his accounts?

a. Rs. 19,00,648
b. Rs. 20,14,340
c. Rs. 16,05,151
d. Rs. 19,91, 243

3.24 If a bank offers to double your money in 8 years, what is the effective rate of interest?

a. 8.9%

b. 9.7%

c. 10.2%

d. 9.05%

3.25 An investment of Rs.5000 in a deep discount bond will return Rs. 1,00,000 in 20 years. Find the interest rate implicit in the offer?

a. 16.72%

b. 15.234%

c. 17.121%

d. 16.159%

3.26 A machine is to be replaced after 5 years, when it is expected to cost Rs. 10,00,000. How much equal sum should be set aside and invested, at the end of each year at 12% p.a. to accumulate the desired sum?

a. Rs. 1,62,416
b. Rs. 1,57,410
c. Rs.1,75,115
d. Rs.1,53,429

Answer to Section III

3.1	e	3.2	c	3.3	d	3.4	c	3.5	c	3.6	b	3.7	b
3.8	d	3.9	c	3.10	d	3.11	c	3.12	d	3.13	a	3.14	d
3.15	a	3.16	b	3.17	b	3.18	a	3.19	c	3.20	d	3.21	d
3.22	b	3.23	a	3.24	d	3.25	d	3.26	b				

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Work book – Section IV

Practical Sums Based on Future (compound) Value and Present (Discount) Value Equation :

4.1 If you invest Rs. 10,000 today for a period of 5 years, what will be its maturity value if the interest rate p.a. is:

(a) 8% (b) 10% (c) 12% (d) 15%

4.2 If you invest Rs. 1000 today at interest rate of 10% p.a., what will be its maturity value after 100 years under:

(a) Simple interest (b) Compound interest

4.3 How many years will it take for Rs. 5000 invested today at 12% p.a. rate of interest to grow to Rs. 160,000? Use rule of 72.

4.4 In how much period your Rs. 10,000 becomes Rs. 20,000 at 15% rate of interest, using (a) Rule of 72, (b) Rule of 69.

4.5 How much a deposit of Rs. 50,000 grows at the end of 5 years if the nominal rate of interest is 12% p.a. and money is quarterly compounded? Compare this with the amount you get with annual compounding.

4.6 Nominal rate of interest is 12% p.a. Find the effective annual rate of interest when the money is compounded:

(a) Annually (b) Semi-annually (c) Quarterly (d) Monthly (e) Daily

4.7 Find the growth rate of sales from 1998 to 2004 from given data:

Year	1998	1999	2000	2001	2002	2004
Sales (in million of Rs.)	50	57	68	79	86	99

4.8 A company currently pays a dividend of Rs. 1 per share which is expected to grow to Rs. 3 per share in 10 years. Find the average annual compound growth rate?

4.9 You invest Rs. 3000 today and get Rs. 10,000 after 6 years. What is the implicit interest rate in this?

4.10 If you are given a choice between Rs. 4000 today and Rs. 15,000 after 10 years. Which one will you choose and what your choice implies?

4.11 Find, how much Rs. 10,000 will grow at 8% p.a. nominal rate of interest after 3 years when compounding is done: (a) monthly (b) annually (c) perpetually (continuously).

4.12 What is the present value of Rs. 1,00,000 to be received 10 years from now if rate of interest is 12% p.a.?

4.13 What is the present value of Rs. 50,000 receivable 40 years from now if rate of interest (r) is 8% p.a.?

4.14 What is the present value of following cash flow stream at 10% p.a. rate of interest.

Year	0	1	2	3	4	5
Cash flows (in rupees)	-10,000	2000	3000	4000	5000	2000

Answer to section IV

4.1 (a) Rs. 14693 (b) Rs. 16105 (c) Rs. 17623 (d) Rs. 20113

4.2 (a) Rs. 11000 (b) Rs. 1,37,80,612 4.3 30 years

4.4 (a) 4.8 years (b) 4.95 years 4.5 Rs. 90305, Rs. 88117

4.6 (a) 12% (b) 12.36% (c) 12.55% (d) 12.68% (e) 12.75%

4.7 12.058 % 4.8 11.612% 4.9 22.22% 4.10 14.13%

4.11 (a) Rs. 12702 (b) Rs. 12597 (c) Rs. 12712

4.12 Rs. 32197 4.13 Rs. 2301.54 4.14 Rs. 1959.68

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Workbook – Section V- Questions based on Annuities

Future value and Present value of Annuities

5.1 Mr. X deposits Rs. 10,000 at the end of every year for 5 years in his savings account paying 5% p.a. interest. How much money he will get at the end of 5 years?

5.2 Mr. X is planning to buy a car after 5 years when it is expected to cost Rs. 5 Lakh. How much he should save annually to reach his target if his savings earn a compound annual interest rate of 12%?

5.3 A machine is to be replaced after 10 years when it is expected to cost Rs. 10,00,000. How much money should be set aside and invested in a sinking fund at 12% interest p.a. to accumulate the funds needed for replacement?

5.4 X Ltd has Rs. 10,00,000 worth of debentures outstanding. They are to be redeemed 5 years from now. If the interest rate is 12% p.a., how much money should be set aside and invested each year in a sinking fund to accumulate the funds needed for redemption?

5.5 A finance company advertises that it will pay Rs. 1,00,000 at the end of 5^{th} year to any person, who deposits Rs. 16,000 at the end of every year for 5 years. What interest rate is implicit in this offer?

5.6 A travel operator announces that it can take anybody on a world tour at a price of Rs. 2,00,000. I wish to avail this offer. I can save Rs. 25,000 annually and my savings earn 10% p.a. compound interest. How long I will have to wall?

5.7 You expect to receive Rs. 10,000 annually for 3 years at the end of each year. What is its present value at 10% rate?

5.8 You can afford to pay Rs. 10,000 per month for 3 years to a finance company for a housing loan. Finance company charges 1% interest per month. How much I can borrow?

5.9 You have borrowed Rs. 10,00,000 from HDFC to finance a house. It charges interest @ 1.25% per month. You can pay Rs. 15,000 per month. What will be the maturity period of loan?

5.10 Your father deposits Rs. 3,00,000 on retirement in a bank which pays 10% p.a. interest compounded annually. How much fixed amount (annuity) he can withdraw annually at the end of every year for 10 years?

5.11 If you deposit Rs. 1,00,000 today, a bank promises to pay you annually Rs. 20,000 for 6 years. What interest rate is implicit in this offer?

5.12 Firm X borrows Rs. 1,000,000 at 15% p.a. interest. The loan is to be paid back in 5 equal annual installments at the end of each year. Find the amount of each equated installment and also make amortization schedule.

Answers to Section V

5.1 Rs. 55256	5.2 Rs. 78705	5.3 Rs. 56984
5.4 Rs. 1,57,409.73	5.5 11.18%	5.6 6.167 years
5.7 Rs. 24869	5.8 Rs. 3,01,075	5.9 144 months
5.10 Rs. 48824	5.11 5.47%	5.12 Rs. 298315

Time Value of Money

Workbook – Section VI

Advance problems on time value of money

6.1 You invest Rs. 3000 a year for 3 years and Rs. 5000 a year for 7 years thereafter at interest rate of 12% p.a. What will be the maturity value at the end of 10 years?

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6.2 A company is offering to pay Rs. 10,000 annually for a period of 10 years, if you deposit Rs 50,000 now. What is implied interest rate in this offer?

6.3 Mr. X receives Rs. 1000 a year for the first 8 years and Rs. 4000 a year forever thereafter. Calculate the PV if interest rate is 12% p.a.

6.4 You invest Rs. 15000 at the end of year 1, Rs 20,000 at the end of year 2 and Rs 50,000 at the end of each year from 3rd year to 10th. Calculate the PV of this stream if the discount rate is 10%.

6.5 Sunil is due to retire 20 years from now. He wants to invest a lump sum now so as to be able to withdraw Rs. 10,000 every year, beginning from the end of the 20th year. How much he should invest now if r = 12%?

6.6 Sunil has deposited Rs 2,00,000 in a bank which pays interest @ 8% p.a. How much can he withdraw at the end of every year for a period of 25 years, so that there is no balance left in the end?

6.7 Mr X is going to retire soon. His employer gives him two options;

(a) an annual pension of Rs 8000 for as long as he lives, and

(b) a lump sum amount of Rs 50,000.

If he expects to live for 20 years and his time preference rate is 10%, which option is better for X?

6.8 How much do you need to invest now at interest rate of 10% p.a. to have a perpetual income of Rs 20,000 from the beginning of the 15^{th} year?

6.9 In order to accumulate Rs. 25000 at the end of 10^{th} year, how much you should invest at the beginning of each year if r = 10%?

6.10 You require Rs 10,000 at the beginning of each year from 10^{th} to 14^{th} year. How much you should invest at the end of each year from 1^{st} to 5^{th} year if interest rate is 10% p.a.?

6.11 Calculate the PV of an annuity of Rs. 5,000 receivable for 35 years, if the first receipt occurs after 15 years. Take discount rate as 12%.

6.12 Akshay takes a bank loan of Rs 10,000 to purchase a scooter. He has to pay an installment of Rs 500 p.m. for next 2 years. What is the implied interest rate?

6.13 As a potential investor you are considering the purchase of a bond that pays 10% per year on face value of Rs 1000. The bond will mature in 5 years at a premium of 5%. What price you should be willing to pay if you require 12% rate of return.

6.14 You deposit a sum of Rs 10,000 with a bank at 12%. If you want to withdraw Rs 1,500 every year, for how long can you do this?

6.15 A Rs 20,00,000 plant expansion is to be financed as follows; 15% down payment and remainder is borrowed at 9% interest. The loan is to be repaid in 8 equal installments starting 4 years from now. Find the amount of each equal annual installment.

6.16 Ten years from now Mr. X will start receiving a pension of Rs 3,000 a year. The payment will continue for 16 years. How much is the pension worth now at 10%?

6.17 You deposit Rs. 4,500 per year at the end of each year for next 25 years in an account that yields 10% p.a. How much you could withdraw at the end of each of the next twenty years following your last deposit?

6.18 A finance company makes an offer that if you deposit Rs 10,000 today, you can receive annual return of Rs 1,100 perpetually, starting from 5^{th} year. Should this offer be accepted if the rate of interest preference is 8% p.a. ?

6.19 A deposit is made in a bank that earns 10% compounded half yearly. It is desired to withdraw Rs 50,000 three years from now and Rs. 70,000 five years from now. What is the size of initial deposit?

6.20 A loan of Rs 1,00,000 is taken on which interest is payable @ 10%. The repayment is to start at the end of 3^{rd} year from now. What should be the annual payment if loan is to be repaid in 6 equal annual installments?

6.21 You want to buy a house costing Rs. 20 lakh. You approach a housing finance company and finance 50% of cost. Finance company charges interest @ 1% per month. You can pay Rs. 12,000 per month towards loan amortization. Calculate maturity period of loan. For installment No. 72, calculate interest portion and principal portion.

6.22 Expected cash flows of a project are as follows :

Year	0	1	2	3	4	5
Cash flows (in rupees)	-10,000	2000	3000	4000	5000	3000

Calculate the present value and future value of the above cash flows at 10%. Also calculate the implicit rate of return.

6.23 Abhijeet borrows Rs. 80,000 for a music system at a monthly interest rate of 1.25%. The loan is to be repaid in 24 equal monthly installments, payable at the beginning of each month. Calculate the amount of each installment?

6.24 Using a discount rate of 10% calculate present value of given cash flows:

Year	1	2	3	4	5	6	7
Stream A	1000	2000	3000	4000	5000	6000	7000
Stream B	10,000	9000	8000	7000	6000	5000	4000
Stream C	5,000	5000	5000	5000	5000	5000	5000

6.25 You deposited Rs. 70,000 in your Public Provident Fund A/C for 15 years at 8% interest. How much you will get on maturity.

6.26 You bought a share for Rs. 96 today. After one year, you received a dividend of Rs. 5 on it and sold it for Rs. 105. What is your return on share over a period of one year?

6.27 A finance company offers to triple your money in 10 years. What is the effective rate of interest implicit in the offer?

6.28 To buy your dream car, you can afford to pay Rs. 10,000 per month for 5 years. You call a finance company for loan. It is ready to offer finance over this period at 1% interest per month. How much you can borrow?

6.29 A Russian company has advertised that it can take any person to moon at a cost of $10 million. I can save $5 lakhs every year. How long I will have to wait if my savings earn interest @ 12% p.a. The cost is not likely to change in monetary terms.

6.30 Mr.X borrows Rs. 1,00,000 at 8% interest. Equal annual payments are to be made for 6 years. However at the time of 4th payment, X decides to pay off the entire loan. Find equal annual installment. Also calculate the amount to be paid at the end of 4th year.

Answers to Section VI

6.1 Rs.72824 6.2. 15.1% 6.3. Rs.18431 6.4 Rs.250617 6.5 Rs.9675 6.6 Rs.18736 6.7 option A 6.8 Rs.57933 6.9 Rs.1426 6.10 Rs.4665 611 Rs.8364 6.12 18.15% 6.13 Rs.956.27 6.14 14.2 years 6.15 Rs.397763 6.16 Rs.9954 6.17 Rs.51983 6.18 Yes 6.19 Rs.80285 6.20 Rs.27782.49 6.21 180 months, Rs.7964, Rs.4054 6.22 Rs.2580.6, Rs.4156, 18.69% 6.23 Rs.3831 6.24 Rs.17631, Rs.35921, Rs.24342 6.25 Rs.19,00,648 6.26 14.58% 6.27 11.61% 6.28 Rs.449550 6.29 10.8 years 6.30 Rs.21631.53, Rs.60206