

# [Calculation of future values exam question essay](https://assignbuster.com/calculation-of-future-values-exam-question-essay/)

Q1. Given the recent drop in mortgage interest rates, you have decided to refinance your home. Exactly 4 years ago, you obtained a Rs. 275, 000. 00 15-year mortgage with a fixed of 11% APR, compounded monthly. Today, you can get a 15-year loan for the currently outstanding loan balance at 8% interest, compounded monthly.

This loan, however, requires you to pay a Rs. 250 appraisal fee and 3 points at the time of the refinancing (1 point equals 1% of the amount borrowed). Ignore tax considerations. If you refinance, how much will your new monthly payments be after you refinance? Answer – 1Solution:-Borrowed AmountP. V. A (11%, 15yrs) (Refer P.

V. A table)Now, we will ascertain the interest amount for 4 yearsa) So, 2, 75, 000 – 38242 = 2, 36, 758 (11%, 15yrs)So, the monthly installment amount would be 3, 1862, 36, 758 – 33, 909 = 2, 02, 849 (11%, 14yrs)2, 02, 849 – 30, 051 = 1, 72, 798 (11%, 13 yrs)1, 72, 798 – 26, 617 = 1, 46, 180 (11%, 12 yrs)Working of part 1 sums:-Appraisal Charges – 250/- (1)And 3% \* 1, 46, 180 = 4, 386 (2)So, adding 1 & 2 we get 4, 636Again, by applying the formula we can find out per month instalments charges on 1, 46, 180Borrowed AmountP. V. A (8%, 15yrs) (Refer P. V.

A table)= 17, 077 for 1 year12= 1, 423 for one month @ 8%Q2. Ramesh and Laxmi wish to buy a new home. The price is Rs56, 500. 00 and they plan to put 12% down. New Rahat Savings and Loan will lend them the remainder at a 12% fixed rate APR (Annual Percent Rate) for 30 years, with monthly payments to begin in one month.

(Ignore taxes.) Suppose Ramesh wants to pay off the loan in 15 years. How much extra must he pay each month to do so? Answer – 2Solution:-Formula: NFA = A (1/i – 1/i(1+i)n)56500\*12/100 = 6780 (56500-6780 = 49720)49720 = Annuity (1/0. 01 – 1/0. 01(1.

01)360)49720 = Annuity (1/0. 01 – 1/0. 339)= Annuity (100 -2. 78)= 97. 22511.

42 for 30 YEARS49720 = Annuity(1/0. 01 – 1/0. 01(1. 01)180 )= 1/0. 01 – 1/0. 01(5.

99)= 1/0. 01 – 1/0. 0599)=(100 – 16. 69)596. 87 for 15 years Answer: 85.

46Q3. You are trying to plan for retirement in 24 years and currently you have Rs63, 000. 00 in a savings account and Rs24, 500. 00 in stock.

In addition you plan on adding to your savings by depositing Rs7, 000. 00 per year in your SAVINGS account at the end of each of the next 10 years and then Rs19, 000. 00 per year at the end of each year for the final 14 years until retirement. Assuming your savings account returns 8% compounded annually while your investment in stocks will return 2% compounded annually, how much will you have when you retire in 24 years? [Ignore taxes.]Answer – 3Given, 1.

Present value of savings = Rs. 63, 000Rate of interest = 8% compounded annuallyTime Period = 24 years2. Present value of stock = Rs. 24, 500Rate of interest = 2% compounded annuallyTime Period = 24 years3.

Present value = Rs. 7, 000Time Period = 10 years4. Present value = Rs. 19, 000Time Period = 14 yearsWe will have to find the future value of the savings and stocks available now. Solution:-Formula: Future Value = Present Value (1+r/100) n=> Future Value of savings = 63, 000 (1+8/100)24= 63, 000 (1. 08)24= 63, 000 \* 6.

34approx.= Rs. 3, 99, 494. 38=> Future Value of stocks = 24, 500 (1+2/100) 24= 24, 500 (1. 02) 24= 24, 500 \* 1. 608= Rs.

39, 396=> Future value = 7000[(1. 08)10-1/0. 08]= 7000 \* 14. 375= Rs. 1, 00, 625=> Future Value = 19000[(1. 08)14-1/0.

08]= 19000 \* 24. 212= Rs. 4, 60, 037. 5Now adding up all the four, we find out that when we retire after 24 years we are left with (Future Value), Rs. (3, 99, 494. 38+ 39, 396+ 1, 00, 625+ 4, 60, 037.

5) = Rs. 9, 99, 552. 88Q4. Suppose you buy a new Toyota for Rs15, 000. 00, paying nothing down.

You agree to a repayment schedule of sixty (60) equal monthly payments beginning one month from today. The banker’s required return is 10% annually. How much will you owe on the car after 16 months? Answer – 4Given, Present value of future annuity= Rs. 15, 000Interest= 0.

0083Time= 60 installmentsWe have to find out the annuity. Solution:-Present value of F. A. = Annuity [1/i-1/i (1+i)n ]15, 000= Annuity [1/0.

0083-1/0. 0083 (1. 0083)60]15, 000= Annuity (1/0. 0083-1/0. 01362)15, 000= Annuity (120.

48-73. 42)15, 000= Annuity (47. 06)Annuity = 15, 000/47. 06Annuity = Rs.

318. 742Q5. Brijesh, who recently sold his Scorpio, placed Rs16, 000. 00 in a savings account paying annual compound interest of 7%.

Calculate the amount of money that will have accrued if he leaves the money in the bank for 19 years. Answer – 5Given, Present value of savings= Rs. 16, 000Rate of interest = 7%Time period = 19 yearsWe need to find out the future value of the current savings. Solution:-Future value = present value (1+r/100)n= 16, 000(1+7/100)n= 16, 000(1. 07)19= 16, 000(3. 616)Therefore, the Future Value of the current savings = Rs.

57, 864. 44Q6. You need to have Rs18, 000. 00 in 5 years.

If money is placed into a savings account paying annual compound interest of 2%, how much money must be deposited today in order to have the required amount? Answer – 6Given, Future value of the current saving = Rs. 18, 000Time Period = 5 yearsRate of interest = 2%We need to find out the money to be deposited today to get the required amount. Solution:-Future value= present value (1+r/100)n==; 18, 000 = present value (1+2/100)5==; 18, 000 = present value (1. 02)5==; 18, 000 = present value (1.

104)==; Present value = 18, 000/1. 104Therefore, the present value of the investment will be, Rs. 16, 304. 35Q7.

You are going to place Rs11, 000. 00 in an investment paying compound interest of 16%, compounded monthly. Calculate the APY (Annual Percent Yield) on this investment? Answer – 7Given, Rate of Interest = 16%Present value of investment = Rs. 11000Interest on monthly basis = 16/12 = 1. 33We have to find out the Annual Percent Yield.

Solution:-Future Value = Present Value (1+r/100) n= 11, 000 (1+0. 0133)12= 11, 000 (1. 1718)Annual Percent Yield (APR) = Rs. 12889.

88Q8. You need to have Rs56, 000. 00 in 8 years. If you place Rs1, 000. 00 into a savings account today, what interest rate per year must you earn in order to have the required amount? Answer – 8Given, Future value = Rs. 56, 000Present value = Rs.

1, 000Time Period = 8 yearsWe need to find the rate of interest at which we must earn in order to have the required amount. Solution:-FV = PV (1+i)^n56000 = 1000(1+i)^8= 0. 65 i. e.

0. 65\*100 = 65%Therefore, the rate of interest is 65%Q9. You need to have Rs57, 000. 00. If Rs18, 000. 00 is placed into a savings account today that pays annual compound interest of 16%, how many years will it be before you have the required amount? Answer – 9Given, Future value = Rs.

57, 000Present value = Rs. 18, 000Rate of interest = 16%We need to find the time period by which we will get the return. Solution:-Future value= present value (1+rate/100)n57, 000= 18, 000(1+16/100)nLog 57 = Log18+ n log 1. 16n = 8.

33Therefore, the time period is 8. 33. Q10. Bank A is advertising that they are paying compound interest of 9%, compounded Semi-annually. What rate would Bank B advertise if they compound Quarterly? (Convert Bank A’s rate to Bank B’s compounding interval)Answer – 10Solution:-For solving the above question we assume the amount to be as Rs.

1000 then when the rate is calculated semi annually then time period= 6\*2= 12When compounded quarterly will give = 6\*4= 24 (since the rate of bank A is being converted into rate of bank B)When compounded semi annually: We write the expression as 1000(1+9/100) ^12 which comes out to be Rs 2812 (equation 1)When compounded quarterly: We write the expression as 2812(1+r/100) ^24 (equation 2)When the equation 1 ; 2 is solved we get the rate as 39%. AnalysisAnswer – 1For the new monthly payments be after you refinance the borrowed amount is to be calculated using the present value of annuity in order to get our desired output. Answer – 2Ramesh and Laxmi has to pay some extra amount if they wants to payoff in 15 years which is to be calculated using Net Factor of Annuity. Answer – 3We find out that when we retire after 24 years we are left with a desired amount using the formula of future value of the savings and stock. Answer – 4For calculating the amount left at the end of 16 mts we calculate it through annuity. Answer – 5The amount of money that will have accrued if he leaves the money in the bank for 19 years by calculating it through Future Value. Answer – 6Money that must be deposited today in order to have the required amount is to be calculated using Future Value. Answer – 7The APY(Annual Percent Yeild) on this investment is to be calculated using its formula. Answer – 8Interest rate per year must you earn in order to have the required amount through Future Value. Answer – 9Years that will be needed before you have the required amount is to be calculated by Future Value. Answer – 10Rate at which would be taken by Bank B advertise if they compound Quarterly will be calculated by Compound rate of interest.???????? Financial Management