FINANCIAL FUNCTIONS

- Excel facilitates efficient business calculations with a wide range of financial functions.

BASIC CONCEPTS

- Future value (fv) –It is the value of an investment or loan after all payments have been made.
- No. of periods (nper)- Total number of payments of an investment
- Payment (pmt) – The amount paid periodically to an investment or loan.
- Present value (pv) – The value of an investment or loan at the beginning of investment period.
- Rate (rate) – The interest rate or discount rate for an investment or loan.
- Type – The time point at which payment is made
  - beginning of the period – type is taken as 1
  - end of the period – type is taken as 0
- There are two types of payments – annuity and lump sum.
- Lump sum is the amount paid at one time, generally at the beginning of the period.
- Annuity is the series of cash payments , made over continuous equally spaced periods.
- Payments made (such as deposits/ emi) are represented as negative number
- Payments received (dividends)are represented as positive number

FV

- It returns the future value of an investment based on periodic constant payments at constant interest rate.

=FV(rate , nper , pmt, pv , type)

Q1. If Pravin deposits Rs. 1000 every year in an account for 10 years , with interest rate at 10%, how much he will have at the end of the year?

- Rate = 10% , nper = 10 , pmt = -1000, pv =0, type = 0
- = fv (10% , 10 , -1000 , 0 , 0)

Q2. Nachiket deposits Rs. 1000 at beginning of every month in an account for 5 years . The bank gives interest rate at 12% p.a. Find future value of the deposit.

- Rate = 12% p.a.= 1% p.m. , nper = 5*12 = 60 , pmt = -1000, pv =0, type = 1
- = fv (1% , 60 , -1000 , 0 , 1)

PV

- It returns the present value of an investment based on periodic constant payments at constant interest rate.
- PV(rate , nper , pmt, fv , type)
- Fv of loan is assumed to be 0 , as entire loan will be repaid at the end of the period.

Q1. Abhay wants to take a loan which he can repay at the end of every month, by paying Rs. 5000 for 5 years at the rate of 10% interest p.a. Find amount of loan that he can get .

- Rate = 10%/12 , nper = 5*12 = 60 , pmt = -5000 , fv = 0 , type = 0
- = pv(10%/12 , 60 , -5000, 0 , 0)

Q2. Priya has taken a car loan of Rs. 1,00,000 from a bank . She pays Rs.2700 at the end of every month, for 5 years at the rate of 15% interest p.a. Find present value of her loan.

- Rate = 15%/12 , nper = 5*12 = 60 , pmt = -2700 , fv = 0 , type = 0
- = pv(15%/12 , 60 , -2700, 0 , 0)

PMT

Q1. It is used to calculate the repayment amount of loan based on constant payments and constant interest rate.

- =PMT(rate , nper , pv , fv , type)
- Ajay has taken housing loan of Rs. 20 lakh @ 8.5% p.a. interest and agreed to repay in 15 years. He wishes to repay the entire loan in monthly installments paid at the beginning of the month. Find amount of payment he has to make every month
- Rate = 8.5%/12 , nper = 15 *12 = 600 , pv= -2000000 , fv =0 , type =1
- =PMT(8.5%/12 , 15 *12 , -2000000 , 0 , 1)

Q2. Suppose you wish to save each month so that you have Rs. 300000 at the end of 3 years at the interest rate 7% p.a. How much you should save every month?

- Rate = 7%/12 , nper = 3*12 , pv = -300000 ,
- Fv = 0 , type = 0
- = PMT(7%/12 , 3*12 , -300000 ,0,0)
-

PPMT & IPMT

- PPMT – It returns the payment of the principal for a given investment , based on periodic constant payments at a constant interest rate.
- =PPMT(rate , per, nper , pv , fv , type)
- IPMT – It returns the interest payment on the principal for a given investment , based on periodic constant payments at a constant interest rate.
- =IPMT(rate , per, nper , pv , fv , type)
- Per is period for which payment is to be calculated
- PMT = PPMT +IPMT

Q1. If a loan of Rs. 12000 is being repaid in 4 equal annual installments paid at the end of the year & if rate of interest is 12% p.a., then find yearly installment with its break up as principal and interest component

- Yearly installment will be
- = PMT (12%, 4, -12000, 0,0)
- Principal component
- =PPMT(12%, 1, 4, -12000, 0, 0) for 1st year
- =PPMT(12%, 2, 4, -12000, 0, 0) for 2nd year
- =PPMT(12%, 3, 4, -12000, 0, 0) for 3rd year
- =PPMT(12%, 4, 4, -12000, 0, 0) for 4th year
- Interest component
- =IPMT(12%, 1, 4, -12000, 0, 0) for 1st year
- =IPMT(12%, 2, 4, -12000, 0, 0) for 2nd year
- =IPMT(12%, 3, 4, -12000, 0, 0) for 3rd year
- =IPMT(12%, 4, 4, -12000, 0, 0) for 4th year

Q2. Vilas wants to buy a car costing Rs. 25 L. he takes the loan of Rs. 25 L and agrees to repay in 5 years @ 15% p.a. in annual installments of equal amount. Find the interest that he will pay in all 5 years

- = IPMT (15%, 1, 5, -2500000, 0, 0)
- = IPMT (15%, 2, 5, -2500000, 0, 0)
- = IPMT (15%, 3, 5, -2500000, 0, 0)
- = IPMT (15%, 4, 5, -2500000, 0, 0)
- = IPMT (15%, 5, 5, -2500000, 0, 0)

RATE

- It returns interest rate per period of a loan or investment
- =Rate (Nper , pmt, pv, fv, type)
- A loan of Rs. 8L is repaid in 10 years by monthly installments of Rs.12000 each being paid at the end of the month. Find the rate of interest charged.
- =Rate (120 , 12000, -800000, 0,0)

NPER

- It returns number of periods for an investment based on periodic constant payment and constant rate of interest.
- =NPER(rate, pmt, pv, fv, type)
- Sagar wants to know how many periodic payments of Rs. 2000 he should make at the end of every month so that his total payment is Rs.3 L at 12% interest p.a.
- =nper(12%/12 , -2000, 0, 300000, 0)

Mathematical and Statistical functions

- It rounds up the number to specified number of digits

ROUND

- =ROUND(Number , Num-digits)
- =ROUND (732.4592, 2) will give 732.46
- =ROUND (732.4592, 1) will give 732.4
- =ROUND (732.4592, 0) will give 732
- =ROUND (732.4592, -1) will give 730
- =ROUND (732.4592, -2) will give 700

ROUND DOWN

- It rounds the number down towards zero to specified number of digits.

- The result is always less than the number
- =ROUNDDOWN(Number , Num-digits)
- =ROUNDDOWN (152.853, 2) will give 152.85
- =ROUNDDOWN (152.853, 1) will give 152.8
- =ROUNDDOWN (152.853, 0) will give 152
- =ROUNDDOWN (152.853, -1) will give 150
- =ROUNDDOWN (152.853, -2) will give 100

ROUND UP

- It rounds the number upwards, away from zero to specified number of digits.
- The result is always greater than the number
- =ROUNDUP(Number , Num-digits)
- =ROUNDUP (152.853, 2) will give 152.86
- =ROUNDUP (152.853, 1) will give 152.9
- =ROUNDUP (152.853, 0) will give 153
- =ROUNDUP (152.853, -1) will give 160
- =ROUNDUP (152.853, -2) will give 200

CEILING & FLOOR

- CEILING rounds the number up to the nearest multiple of significance
- = CEILING (Number , Significance)
- FLOOR rounds the number down to the nearest multiple of significance
- = FLOOR (Number , Significance)

CEILING

=CEILING(35,10) gives 40

=CEILING(68,5) gives 70

=CEILING(23,12) gives 24

=CEILING(70,3) gives 72

=CEILING(45,4) gives 48

FLOOR

=FLOOR(35,10) gives 30

=FLOOR(68,5) gives 65

=FLOOR(23,12) gives 12

=FLOOR(70,3) gives 69

=FLOOR(45,4) gives 44

INT

- INT displays integral part of the given number, by deleting decimal part
- =INT(24.27) gives 24
- =INT(824.75) gives 824
- =INT(97.148) gives 97
- =INT(56.934) gives 56

MAX & MIN

- MAX displays maximum value from the given range / set of numbers
- =MAX(100, -20, 72.5, 517) gives 517
- =MAX(8, 20 , “p”, 15 , 30) will give Error
- MIN displays minimum value from the given range / set of numbers
- =MIN(100, -20, 72.5, 517) gives -20

- = MIN(32, 17, “Yes”, 60 , 500) will give Error

ABS & SQRT

- ABS displays the absolute value of a given number ie it ignores the negative sign.
- = ABS(-135) gives 135
- = ABS(-28.95) gives 28.95
- = ABS(-16000) gives 16000
- SQRT displays square root of a positive number. If argument is negative , ERROR will be displayed
- =SQRT(144) gives 12
- =SQRT(1.2144) gives 1.1
- =SQRT(729) gives 27
- =SQRT(30*20+5*5) gives 25
- =SQRT(15*7-200) gives Error

AVERAGE & MOD

- AVERAGE displays arithmetic mean of given set of values.
- =AVERAGE (12,20,40,6) gives 19.5
- =AVERAGE (-50,30,-5,45) gives 5
- MOD returns the remainder after a number is divided by a divisor
- =MOD(number , divisor)
- =MOD(7,3) will give 1
- =MOD(-25,5) will give 0
- =MOD(-31,7) will give 3

SUM, COUNT & COUNTA

- SUM adds all the numbers in the specified range. It ignores other type of data.
- = SUM(20,15,30,25) gives 90
- COUNT gives number of cells containing numeric or date type of data in the specified range. It ignores other types of data.
- = COUNT(20,15,30,25) gives 4
- COUNTA gives number of non empty cells in the specified range.
- = COUNTA(20, Sales , 15,True,25) gives 5