1. Slide 1 - Factor analysis – it’s a sttisticl analysis ment for dimentionality reduction. The rationl- the variance observed with 5 observed variables can be represented with one latent variable. Give a clear example here. For example if I have to choose a restaurant for dinner today and I got 6 variables like waiting time, cleanliness, staff behavior, taste of food, fresh food, etc which makes the decision complicated. Only service and quality of food is sufficient to help me in decision. Map the observed variables to latent variables properly in your example.
2. Slide -2 – Definition of latent variables. Examples of latent variables like morale, quality of life, business confidence, happiness etc. explain them clearly
3. Slide 3 – Assumptions of FA – No outlier or missing values, sample size = atleast 5 times of the number of factors, variables must be interrelated(Barrest test), Metric variables are expected (interval data), multivariate normality not necessary but the data should be normalized.
4. Slide-4 Purpose of FA dimenssinality reduction, latent variable discovery – like empathy cant be measured directly but can be factored out using some variables (give me the list of variables here), simplification of items into a subset of concepts (explain it properly with example), access the prper dimensionality nd homogeity in the data,
5. Slide 5 -Types of FA- EFA ( discover underline structure using correlation) and CFA (based on the insight derived from EFA, used to test if the data fits a priori expectation for data structure, uses Structural Equation modeling) EFA ids further devided into – PCA, Common Factor analysis or FA, image factoring, maximum likelihood analysis, alpha factoring and weight square
6. Issues with FA- use PCA or FA? How to interprete the result ? how many factors
   1. Slide -6 -PCA vs FA – pca seeks to identify variables that are composites of the observed variables where as fa assumes the existence of latent factors underlying the observed data. In pca we take total variance (unique, error, common) is taken into account to derive the factors. But in fa we we take only common variance is taken into consideration ( explain this difference properly). When we have > 30 variables the result of pca = result of fa. When we want to eliminate the variables with high variance then use pca when you want to find the latent variable using many variables use fa
   2. Slide -7 Issue of how to interprete the results – factor loading is the correlation coefficient for the variable and factor. Factor loading says the % of variance in the variable are explained by that factor. Lets say I have 10 variables which I want to factor into 3 factors. Create a table where var1, var2 are in rows and fa1,fa2 are in columns have appropriate values and vomplete the table here, remember these are correlation coefficients right so it should be between 0 to 1 . calculate the communality of the variables which is nothing but the horizontal sum of squares of the values in the table, calculate the eigen values for the factors by vertical sum of square. Explain what does communality and eigen values try to explain. If in a situation for one variable the correlation co efficient are same for fa1 and fa2 then cross loading situation arises and it needs rotation(explain clearly.
   3. Slide 8 -How many factors to select? Scree plot and the bend has to be noticed. Best method is to do latent root criterion where eigen values>1 include that factor to your analysis.
7. Basic logic of FA items you want to reduce, create mathematical combination to find the principal components or factors, new combination from residual variance from 2nd principal component, continue this till all the variance are been accounted for then select the minimal number of factors.interprete the facors with the help of loadings and rotations.