

AUDIT SAMPLING

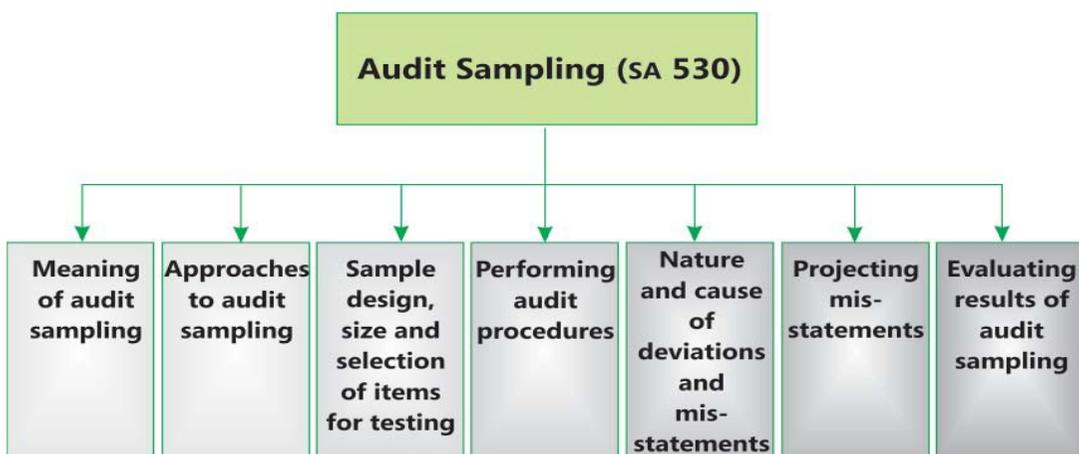


LEARNING OUTCOMES

After studying this chapter, you will be able to:

- ❑ Define Audit Sampling as per Standards on Auditing 530 and its importance.
- ❑ Identify the Approaches to Audit Sampling and Sample Selection Methods.
- ❑ Gain the knowledge of sample design, size and selection of items for testing and Sampling Risk.
- ❑ Understand the sampling techniques and how/when to apply them to audit procedures.

CHAPTER OVERVIEW





1. SAMPLING: AN AUDIT PROCEDURE

No conscious effort in human society is divested of economic considerations and auditing is no exception. There is a growing realisation that the traditional approach to audit is economically wasteful because all the efforts are directed to check all transactions without any exception. This invariably leads to more emphasis on routine checking, which often is not necessary in view of the time and the cost involved. With the shift in favour of formal internal controls in the management of affairs of organisations, the possibilities of routine errors and frauds have greatly diminished i.e the internal controls as designed by the management are for the very purpose of Prevention, Detection and Correction of Frauds and Errors. Thus the auditors often find extensive routine checking as nothing more than a ritual because it seldom reveals anything material. Now the approach to audit and the extent of checking are undergoing a progressive change in favour of more attention towards the questions of **principles and controls** with a curtailment of non-consequential routine checking. By routine checking we traditionally think of extensive checking and vouching of all the entries, disregarding the concept of materiality.

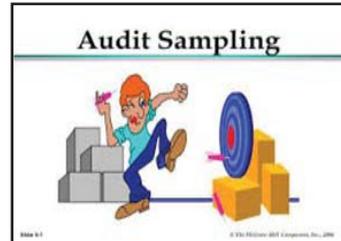
The extent of the checking to be undertaken is primarily a matter of judgment of the auditor, there is nothing statutorily stated anywhere which specifies what work is to be done, how it is to be done and to what extent it has to be done. It is also not obligatory that the auditor must adopt the sampling technique. What he is to do as an auditor is to express his opinion on the financial statements and become bound by that.

To ensure good and reasonable standard of work, he should adopt standards and techniques that can lead him to an informed professional opinion. On consideration of this fact, it can be said that it is in the interest of the auditor that if he decides to form his opinion on the basis of a part checking (i.e sampling), he should adopt standards and techniques which are widely followed and which have a recognised basis.

Since statistical theory of sampling is based on a scientific law, it can be relied upon to a greater extent than any arbitrary technique which lacks in basis and acceptability. This enables the auditor to make conclusions and express fair opinion without having to check all of the items within the financial statements.

2. MEANING OF AUDIT SAMPLING

According to SA 530 "Audit sampling", 'audit sampling' refers to the application of audit procedures to less than 100% of items within a population relevant under the audit, such that all sampling units (i.e all the items in the population) have a equal chance of selection. This is to ensure that the items selected represent the entire population which enables the auditor to draw conclusions and express his opinion based on a pre-determined objective..



The objective of the auditor when using audit sampling is to provide a reasonable basis for the auditor to draw conclusions about the population from which the sample is selected.

Scope of SA-530

SA 530 becomes applicable when the auditor has decided to use audit sampling in performing audit procedures. This standard deals with the **auditor's use of -**

- ◆ **Statistical and**
- ◆ **Non-statistical sampling**

when designing and selecting the-

- (i) audit sample,
- (ii) performing tests of controls and tests of details, and
- (iii) evaluating the results from the sample.

SA 500 "Audit Evidence", deals with the auditor's responsibility to design and perform audit procedures to *obtain sufficient appropriate* audit evidence to be able to draw reasonable conclusions on which to base the audit opinion.

SA 500 lays down the means available to the auditor for selecting the items for testing. One of those is Audit Sampling. Hence SA 530 complement SA 500.

2.1 Population

Population refers to the entire set of data from which a sample is selected and about which the auditor wishes to draw conclusions.

The auditor should select sample items in such a way that the sample can be expected to be representative of the population. This requires that all items in the population have an opportunity of being selected.

2.1.1 Characteristics of Population

1. Appropriateness: The auditor will need to determine that the population from which the sample is drawn is appropriate for the specific audit objective. Appropriate means population from which the samples are drawn shall be **relevant** for the specific objective under audit this is because when the samples are drawn, the audit procedures are applied on the sample and the conclusions are projected on the population.

It is important for the auditor to ensure that the population is appropriate to the objective of the audit procedure, which will include consideration of the direction of testing

Example

If the auditor's objective were to test for overstatement of accounts receivable, the population could be defined as the accounts receivable listing. On the other hand, when testing for understatement of accounts payable, the population would not be the accounts payable listing, but rather subsequent disbursements, unpaid invoices, suppliers' statements, unmatched receiving reports, or other populations that would provide audit evidence of understatement of accounts payable.

2. Completeness: The population also needs to be complete, which means that if the auditor intends to use the sample to draw conclusions about whether a control activity is operated effectively during the financial reporting period, the population needs to include all relevant items i.e all the activities that form part of that relevant internal control, throughout the entire period. If population is complete in all respects, the conclusions drawn on the population will be considered to be reasonable.

3. Reliable: When performing the audit sampling, the auditor performs audit procedures to ensure that the information upon which the audit sampling is performed is sufficiently complete and accurate. Auditor should obtain evidence about the reliability of population. If population is not reliable with respect to accuracy and source, the sample drawn will definitely not be relevant for the specific audit objective.

Sampling Unit

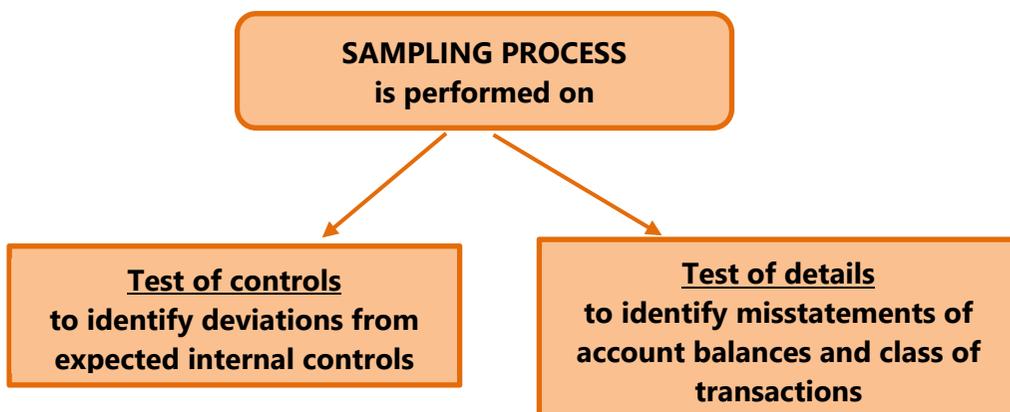
The individual items that make up the population are known as sampling units. The population can be divided into sampling units in a variety of ways. It is a selection from the population that is used as an extrapolation of the population. Audit procedures are applied on these units and the conclusions drawn from them are projected on the population.

In simple words, conclusions drawn on the sample becomes the conclusion of the population from where it is drawn.

Example: If the auditor's objective were to test the validity of accounts receivables, the sampling unit could be defined as customer balances or individual customer invoices. The auditor defines the sampling unit in order to obtain an **efficient and effective** sample to achieve the particular audit objectives. The conclusion on the population is based on the audit procedures applied on the sampling unit.

Sample must be representative

Whatever may be the approach non-statistical or statistical sampling, the sample must be representative. This means that it must be closely similar to the whole population although not necessarily exactly the same. The sample must be large enough to provide statistically meaningful results.

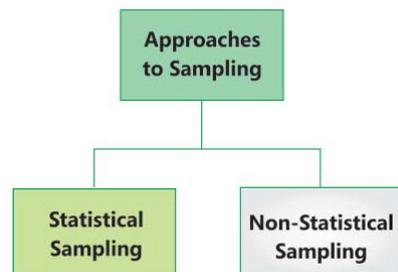


3. APPROACHES TO SAMPLING

Audit sampling enables the auditor to obtain and evaluate audit evidence about **some characteristic of the items selected** in order to form or assist in forming a conclusion about the population, from which the sample is drawn. Audit sampling can be applied using either

- ◆ **non-statistical** or
- ◆ **statistical** sampling approaches.

Statistical sampling is an approach to sampling that has the random selection of the sample units; and the use of probability theory to evaluate sample results, including measurement of sampling risk characteristics.



Sample is chosen by applying certain mathematical and statistical methods. A sampling approach that does not have the above features is considered as **non-statistical sampling**.

1. An approach to sampling that has the random selection of the sample items,

2. The use of probability theory to evaluate sample results, and

3. The use of probability theory including measurement of sampling risk characteristics.

Characteristics of Statistical sampling approach

3.1 Statistical Sampling- More Scientific

- ◆ Audit testing done through this approach is more scientific than testing based entirely on the auditor's own judgment because it involves use of **mathematical laws of probability** in determining the appropriate sample size in varying circumstances.
- ◆ Statistical sampling has reasonably wide application where a population to be tested consists of a large number of similar items and more in the case of transactions involving compliance testing, trade receivables' confirmation, payroll checking, vouching of invoices and petty cash vouchers.
- ◆ There is no personal bias of the auditor in case of statistical sampling. Since it is scientific, the results of sample can be evaluated and projected on the whole population in a more reliable manner.

In larger organisations, with huge transactions, statistical sampling is always recommended as it is unbiased and the samples selected are not prejudged.

For Example: An auditor while verifying the Purchases during the year realised that the purchase transactions in that year are more than 45000 in number, then in such case, statistical sampling will be highly recommended in the audit program. Random Sampling (discussed ahead in this topic) is the method you decide to choose sample in such a situation.

3.2 Non-Statistical Sampling

Under this approach, the sample size and its composition are determined on the basis of the ***personal experience and knowledge*** of the auditor.

This approach has been in common application for many years because of its simplicity in operation. Traditionally, the auditor on the basis of his personal experience will determine the size of the sample and express it in terms that number of pages or personal accounts in the purchases or sales ledger to be checked. **For example**, March, June and September may be selected in year one and different months would be selected in the next year, On basis of value of items, top 10 highest value. Etc.

An attempt would be made to avoid establishing a pattern of selection year after year, i.e the way of selecting samples, to maintain an element of surprise as to what the auditor is going to check. It is a common practice to check large number of items towards the close of the year so that the adequacy of cut-off procedures can also be determined. Also, because year end transaction are prone to high risk of misappropriation.

The non-statistical sampling is criticized on the grounds that it is neither objective nor scientific. The expected degree of objectivity cannot be assured in non-statistical sampling because the risk of personal bias in selection of sample items cannot be eliminated.

The closeness of the qualities projected by the sample results with that of the whole population cannot be measured because the sample has not been selected in accordance with the mathematically based statistical techniques. However, it may be stated that the auditor with his experience and knowledge of the client's business can evaluate accurately enough the sample findings to make audit decision and the mathematical proof of accuracy in some cases may be a luxury which the auditor cannot afford.

This method is simple to operate but sometimes the sample may not be a true representative of the total population because of personal bias and no scientific method of selection.

Sampling Vs Traditional method of Auditing

In most of the circumstances, the evidence available is not conclusive and the auditor always takes a calculated risk in giving his opinion. Even by undertaking hundred percent checking of the transactions, the auditor does not derive absolute satisfaction.

This state of uneasiness led pragmatic auditors to adopt the statistical theory of sampling to derive the necessary satisfaction about the state of affairs by checking only a part of the total population of entries.

Auditors realised that they can derive good satisfaction by undertaking a much lesser checking by adoption of this technique in the auditing process. It is a mathematical truth that the sample, if picked purely on a random basis would reveal the features and characteristics of the population.

By adopting the sampling technique, the auditor only checks a part of the whole mass of transactions. The satisfaction he used to derive earlier, by checking all the transactions, can be derived by a sample checking provided he can put reliance on the internal controls and checks within the client's organisation because they provide the reliability of the records. Sampling is used as a part of Test of controls. Auditor will check few internal controls and their operating effectiveness. Based on the conclusion derived, he can then design the sample size for test of details (i.e checking of transactions and balances)

If the internal control is satisfactory in its design and implementation, a much smaller sample can give the auditor the necessary reliability of the result he obtains.

On the other hand, if in certain areas controls are slack or not properly implemented, the auditor may have to take a much larger sample for getting satisfactory result.

Another truth about the sampling technique should be noted. It can never bring complete reliability; it cannot give precisely accurate results. It is a process of estimation. It may have some error. What error is tolerable for a particular matter under examination is a matter of the individual's judgment in that particular case.

Example

Mr. X may consider that in his estimation of stores valuation, an error of 2% may not be material; he also decides that he needs at least 98% reliability of the result. He is to pick up the requisite number of items of the stores for reliability of the result. The requisite number he can get from the random number table. The question of reliability of the result is directly linked with the reliability of the internal control and of the books and records; when these are satisfactory, lesser degree of reliability of the sampling estimation may suffice – if these are not satisfactory, the auditor may have to decide upon a higher degree of reliability which can only be obtained from a larger sample.

Very often we come across this term when an audit is conducted on the basis of a part checking. This, it is said, owes its origin to the statistical theory of sampling.

The decision whether to use a statistical or non-statistical sampling approach is a matter for the auditor's judgement. However, sample size is not a valid criterion to distinguish between statistical and non-statistical approaches.

The factors that should be considered for deciding upon the extent of checking on a sampling plan are following:

- (i) Size of the organisation under audit.
- (ii) State of the internal control.
- (iii) Adequacy and reliability of books and records.
- (iv) Tolerable error range.
- (v) Degree of the desired confidence.

3.3 Appropriateness of Sampling Approaches

In statistical sampling, the sample results are measurable as to the adequacy and reliability of the audit objectives whereas in non-statistical sampling the auditor's opinion determines the sample size but it cannot be measured how far the sample size would fulfill the audit objective.

The advantages of statistical sampling may be summarized as follows -

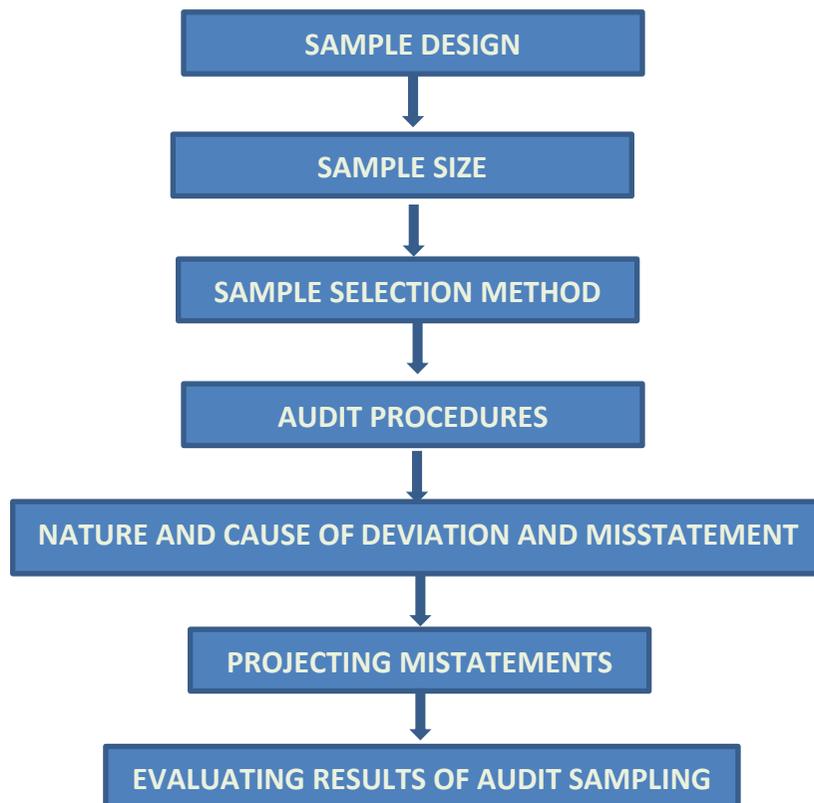
- (1) The amount of testing (sample size) does not increase in proportion to the increase in the size of the area (universe) tested.
- (2) The sample selection is more objective and thereby more defensible.
- (3) The method provides a means of estimating the minimum sample size associated with a specified risk and precision.
- (4) It provides a means for deriving a "calculated risk" and corresponding precision (sampling error) *i.e.* the probable difference in result due to the use of a sample in lieu of examining all the records in the group (universe), using the same audit procedures.
- (5) It may provide a better description of a large mass of data than a complete examination of all the data, since non-sampling errors such as processing and clerical mistakes are not as large.

- (6) It is widely accepted way of sampling as it is more scientific, without personal bias and the result of sample can be evaluated and projected in more reliable way.

Under some audit circumstances, statistical sampling methods may not be appropriate. The auditor should not attempt to use statistical sampling when another approach is either necessary or will provide satisfactory information in less time or with less effort. For instance, when exact accuracy is required or in case of legal requirements etc.

Sometimes the audit staff has no knowledge about sampling technique used, in such circumstances using statistical sampling becomes complex and inappropriate.

SAMPLING PROCESS





4. SAMPLE DESIGN, SIZE AND SELECTION OF ITEMS FOR TESTING

When designing an audit sample, the auditor shall consider the purpose of the audit procedures and the characteristics of the population from which the sample will be drawn. The auditor shall determine a sample size sufficient to reduce sampling risk to an acceptably low level. The auditor shall select items for the sample in such a way that each sampling unit in the population has a chance of selection. Sample selected must be representative of the population.

4.1 Sample Design

When designing an audit sample,

- ◆ the auditor's consideration includes the **specific purpose** to be achieved and the **combination of audit procedures** that is likely to best achieve that purpose.
- ◆ Consideration of the **nature of the audit evidence** sought and possible deviation or misstatement conditions or other characteristics relating to that audit evidence will assist the auditor in defining what constitutes a deviation or misstatement and what population to use for sampling.
- ◆ In fulfilling the requirement of **SA 500 "Audit Evidence"**, when performing audit sampling, the auditor performs audit procedures to obtain evidence that the population from which the audit sample is drawn is complete.

The auditor's consideration of the purpose of the audit procedure includes a clear understanding of what constitutes a deviation or misstatement so that all, and only, those conditions that are relevant to the purpose of the audit procedure are included in the evaluation of deviations or projection of misstatements.

Example

In a test of details relating to the existence of accounts receivable, such as confirmation, payments made by the customer before the confirmation date but received shortly after that date by the client, are not considered a misstatement. Also, a wrong posting between customer accounts does not affect the total accounts receivable balance.

Therefore, it may not be appropriate to consider this a misstatement in evaluating the sample results of this particular audit procedure, even though it may have an important effect on other areas of the audit, such as the assessment of the risk of fraud or the adequacy of the allowance for doubtful accounts.

In considering the characteristics of a population, for tests of controls, the auditor makes an assessment of the expected rate of deviation based on the auditor's understanding of the relevant controls or on the examination of a small number of items from the population. This assessment is made in order to design an audit sample and to determine sample size.

Example

If the expected rate of deviation is unacceptably high, the auditor will normally decide not to perform tests of controls.

Similarly, for tests of details, the auditor makes an assessment of the expected misstatement in the population. If the expected misstatement is high, 100% examination or use of a large sample size may be appropriate when performing tests of details.

In considering the characteristics of the population from which the sample will be drawn, the auditor may determine that stratification or value-weighted selection is appropriate.

4.1.1 Stratification and Value-Weighted Selection

In considering the characteristics of the population from which the sample will be drawn, the auditor may determine that stratification or value-weighted selection technique is appropriate. SA 530 provides guidance to the auditor on the use of stratification and value-weighted sampling techniques.

Stratification: Audit efficiency may be improved if the auditor stratifies a population by dividing it into discrete sub-populations which have an identifying characteristic.

The objective of stratification is to reduce the variability of items within each stratum and therefore allow sample size to be reduced without increasing sampling risk.

When performing *tests of details*, the population is often stratified by monetary value. This allows greater audit effort to be directed to the larger value items, as these items may contain the greatest potential misstatement in terms of overstatement.

Similarly, a population may be stratified according to a particular characteristic that indicates a higher risk of misstatement, for example, when testing the *allowance for doubtful accounts* in the valuation of accounts receivable, balances may be stratified by age.

Stratification: Dividing a population into discrete sub population which have identifying characteristics is called as Stratification. Each Sub population is called as Stratum and units under those sub population are referred to as Strata.

The results of audit procedures applied to a sample of items within a stratum can only be projected to the items that make up that stratum. To draw a conclusion on the entire population, the auditor will need to consider the risk of material misstatement in relation to whatever other strata make up the entire population.

The results of samples from the units drawn under each sub population are projected to that respective stratum. In order to draw an opinion on the overall population, the auditor needs to combine the results of all the stratum to check for possible deviation or risk of material misstatement.

Projected misstatements of each stratum will be combined together to consider the possible effect of misstatement in the account balances and class of transactions.

Example

20% of the items in a population may make up 90% of the value of an account balance. The auditor may decide to examine a sample of these items. The auditor evaluates the results of this sample and reaches a conclusion on the 90% of value separately from the remaining 10% (on which a further sample or other means of gathering audit evidence will be used, or which may be considered immaterial).

Value-Weighted Selection: When performing tests of details it may be efficient to identify the sampling unit as the individual monetary units that make up the population. Having selected specific monetary units from within the population, for example, the accounts receivable balance, the auditor may then examine the particular items, for example, individual balances, that contain those monetary units.

One benefit of this approach to defining the sampling unit is that audit effort is directed to the larger value items because they have a greater chance of selection, and can result in smaller sample sizes.

This approach may be used in conjunction with the systematic method of sample selection and is most efficient when selecting items using random selection.

In value weighted selection, the sample size, its selection and evaluation will result in a conclusion in monetary amounts.

4.2 Sample Size

The auditor shall determine a sample size sufficient to reduce sampling risk to an acceptably low level.

The level of sampling risk that the auditor is willing to accept affects the sample size required.

The lower the risk the auditor is willing to accept, the greater the sample size will need to be.

The sample size can be determined by the application of a statistically-based formula or through the exercise of professional judgment. There are various factors typically have on the determination of sample size. When circumstances are similar, the effect on sample size of factors will be similar regardless of whether a statistical or non- statistical approach is chosen.

4.2.1 Examples of Factors Influencing Sample Size for Tests of Controls

The following are factors that the auditor may consider when determining the sample size for tests of controls. These factors, which need to be considered together, assume the auditor does not modify the nature or timing of tests of controls or otherwise modify the approach to substantive procedures in response to assessed risks.

- ◆ When there is an increase in the extent to which the auditor's risk assessment takes into account relevant controls. The more assurance the auditor intends to obtain from the operating effectiveness of controls, the lower the auditor's assessment of the risk of material misstatement will be, and the larger the sample size will need to be. When the auditor's assessment of the risk of material misstatement at the assertion level includes an expectation of the operating effectiveness of controls, the auditor is required to perform tests of controls. ***Other things being equal, the greater the reliance the auditor places on the operating effectiveness of controls in the risk assessment, the greater is the extent of the auditor's tests of controls*** (and therefore, the sample size is increased). Thus, sample size will increase.
- ◆ If there is an increase in the tolerable rate of deviation. Then sample size will decrease, as lower the tolerable rate of deviation, larger the sample size needs to be. Tolerable error is the maximum error in the population that auditor is ready to accept in a given sample size. Smaller the tolerable error, larger will be the sample size.

- ◆ When there is an increase in the expected rate of deviation of the population to be tested then sample size will increase, as **higher the expected rate of deviation, larger the sample size** needs to be so that the auditor is in a position to make a reasonable estimate of the actual rate of deviation. Factors relevant to the auditor's consideration of the expected rate of deviation include the auditor's understanding of the business (in particular, risk assessment procedures undertaken to obtain an understanding of internal control), changes in personnel or in internal control, the results of audit procedures applied in prior periods and the results of other audit procedures. High expected control deviation rates ordinarily warrant little, if any, reduction of the assessed risk of material misstatement.
- ◆ An increase in the auditor's desired level of assurance that the tolerable rate of deviation is not exceeded by the actual rate of deviation in the population will **increase the sample size**. Thus, the greater the level of assurance that the auditor desires that the results of the sample are in fact indicative of the actual incidence of deviation in the population, the larger the sample size needs to be.
- ◆ In case of large populations, the actual size of the population has little, if any, effect on sample size. For small populations however, audit sampling may not be as efficient as alternative means of obtaining sufficient appropriate audit evidence. Therefore, there will be **negligible effect** on sample size due to increase in the number of sampling units in the population.

4.2.2 Examples of Factors Influencing Sample Size for Tests of Details

The following are factors that the auditor may consider when determining the sample size for tests of details. These factors, which need to be considered together, assume the auditor does not modify the approach to tests of controls or otherwise modify the nature or timing of substantive procedures in response to the assessed risks.

- ◆ **The higher the auditor's assessment of the risk of material misstatement, the larger the sample size needs to be.** The auditor's assessment of the risk of material misstatement is affected by inherent risk and control risk. For example, if the auditor does not perform tests of controls, the auditor's risk assessment cannot be reduced for the effective operation of internal controls with respect to the particular assertion. Therefore, in order to reduce audit risk to an acceptably low level, the auditor needs a low detection risk and will rely more on substantive procedures. The more audit evidence that is obtained from tests of details (that is, the lower the detection risk), the larger the sample size will need to be. Thus we can say that there will be an increase

in sample size in case of an increase in the auditor's assessment of the risk of material misstatement.

- ◆ **The more the auditor is relying on other substantive procedures** (tests of details or substantive analytical procedures) to reduce to an acceptable level the detection risk regarding a particular population, the less assurance the auditor will require from sampling and, therefore, **the smaller the sample size can be**. Hence, if there is an increase in the use of other substantive procedures directed at the same assertion, the size of sample will decrease.
- ◆ An increase in the auditor's desired level of assurance that tolerable misstatement is not exceeded by actual misstatement in the population will **increase the sample size**. Hence, greater the level of assurance that the auditor requires that the results of the sample are in fact indicative of the actual amount of misstatement in the population, the larger the sample size needs to be.
- ◆ **An increase in tolerable misstatement will decrease the sample size** as lower the tolerable misstatement, the larger the sample size needs to be.
- ◆ **The greater the amount of misstatement the auditor expects to find in the population, the larger the sample size** needs to be in order to make a reasonable estimate of the actual amount of misstatement in the population. Factors relevant to the auditor's consideration of the expected misstatement amount include the extent, to which item values are determined subjectively, the results of risk assessment procedures, the results of tests of control, the results of audit procedures applied in prior periods, and the results of other substantive procedures. So sample size will increase in case of an increase in the amount of misstatement the auditor expects to find in the population.
- ◆ **When stratification of the population is appropriate then sample size will decrease** as when there is a wide range (variability) in the monetary size of items in the population, it may be useful to stratify the population. When a population can be appropriately stratified, the aggregate of the sample sizes from the strata generally will be less than the sample size that would have been required to attain a given level of sampling risk, had one sample been drawn from the whole population.
- ◆ There will be **negligible effect** on sample size due to number of sampling units in the population. For large populations, the actual size of the population has little, if any, effect on sample size. Thus, for small populations, audit sampling is often not as efficient as alternative means of obtaining

sufficient appropriate audit evidence. (However, when using monetary unit sampling, an increase in the monetary value of the population increases sample size, unless this is offset by a proportional increase in materiality for the financial statements as a whole (and, if applicable, materiality level or levels for particular classes of transactions, account balances or disclosures.)

4.3 Selection of Items for Testing

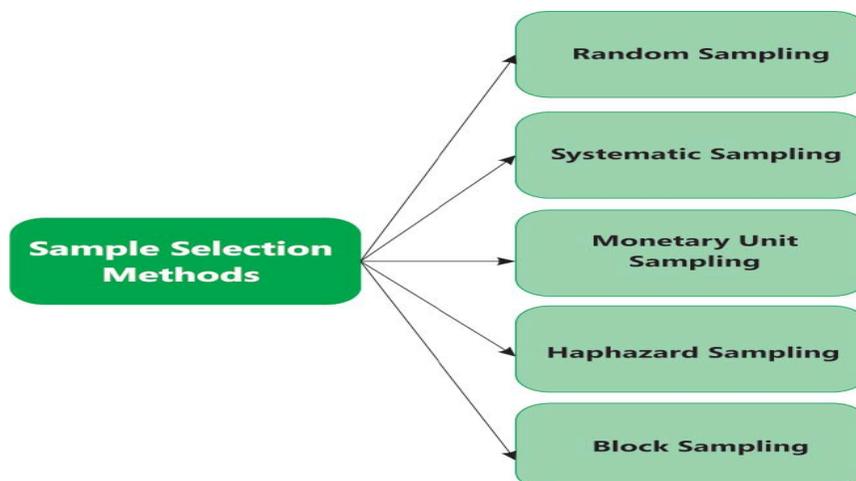
The auditor shall select items for the sample in such a way that each sampling unit in the population has a chance of selection.

With statistical sampling, sample items are selected in a way that each sampling unit has a known probability of being selected. With non-statistical sampling, judgment is used to select sample items. Because the purpose of sampling is to provide a reasonable basis for the auditor to draw conclusions about the population from which the sample is selected, it is important that the auditor selects a representative sample, so that bias is avoided, by choosing sample items which have characteristics typical of the population.

The principal methods of selecting samples are the use of random selection, systematic selection and haphazard selection.

4.4 Sample Selection Methods

Sample should be selected in such a manner that it is representative of the population from which the sample is being selected. It will necessitate that each item in the population has an equal chance of being included in the sample.



Some of the important methods of selecting the sample are discussed below -

(1) Random Sampling: Random selection ensures that all items in the population or within each stratum have a known chance of selection. It may involve use of *random number tables*. Random sampling includes two very popular methods which are discussed below-

(i) Simple Random Sampling: Under this method each unit of the whole population e.g. purchase or sales invoice has an equal chance of being selected. It is considered that random number tables are simple and easy to use and also provide assurance that the auditors' bias does not affect the selection. ***Each item in a population is selected by use of random number table either with a help of computer or picking up a number in a random way (may be randomly from a drum).*** Today random numbers are also generated using various applications on the cellphones like the random number generator.

This method is considered appropriate provided the population to be sampled consists of reasonably similar units and fall within a reasonable range i.e it is suitable for a homogeneous population having a similar range. Example

The population can be considered homogeneous, if say, trade receivables balances fall within the range of ₹ 55,000 to ₹ 2,25,000 and not in the range between ₹ 525 to ₹ 10,50,000.

(ii) Stratified Sampling: This method involves dividing the whole population to be tested in a few separate groups called strata and taking a sample from each of them. Each stratum is treated as if it was a separate population and if proportionate of items are selected from each of these stratum. The number of groups into which the whole population has to be divided is determined on the basis of auditor judgment.

Example

1. In the above case, trade receivables balances may be divided into four groups as follows:-

- (a) balances in excess of ₹ 10,00,000;
- (b) balances in the range of ₹ 7,75,001 to ₹ 10,00,000;
- (c) balances in the range of ₹ 5,50,001 to ₹ 7,75,000;

- (d) balances in the range of ₹ 2,25,001 to ₹ 5,50,000; and
- (e) balances ₹ 2,25,000 and below.

From these above groups the auditor may pick up different percentage of items from each of the group. From the top group *i.e.* balances in excess of ₹ 10,00,000, the auditor may examine all the items; from the second group 25 per cent of the items; from the third group 10 per cent of the items; and from the lowest group 2 per cent of the items may be selected. Random sample is chosen from each stratum using random number tables.

The reasoning behind the stratified sampling is that for a **highly diversified population**, weights should be allocated to reflect these differences. This is achieved by selecting different proportions from each strata. It can be seen that the stratified sampling is simply an extension of simple random sampling.

Stratification means dividing heterogeneous (Diversified) population into Homogeneous (having similar characteristics) sub population, where samples are drawn from each sub population.

Therefore, we can say that random selection method is applied through random number generators, for example, random number tables

(2) Interval Sampling or Systematic Sampling: Systematic selection is a selection method in which the number of sampling units in the population is divided by the sample size to give a sampling interval, for example 50, and having determined a starting point within the first 50, each 50th sampling unit thereafter is selected. Although the starting point may be determined haphazardly, the sample is more likely to be truly random if it is determined by use of a computerized random number generator or random number tables.

When using systematic selection, the auditor would need to determine that sampling units within the population are not structured in such a way that the sampling interval corresponds with a particular pattern in the population.

Example

If in a population of branch sales, particular branch sales occur only as every 100th item and the sampling interval selected is 100. The result would be that either the auditor would have selected all or none of the sales of that particular branch.

If Accountant A is responsible to record all transaction in a particular month and Accountant B for next month ; if this structure is same throughout the year, and the

auditor determines as his sample to check every transaction of alternate months, then only one accountant's work is checked by the auditor i.e either Accountant A or B depending upon which month the checking started from. The work of other is overlooked and there could be a possibility of material misstatement in the transactions recorded by him.

Therefore, systematic sampling when chosen as a method should be carefully applied to bring together every type of transaction within its purview. More than one starting point can be considered to minimize such risk.

To minimise the effect of the possible known buyers through a pattern in the population, more than one starting point may be taken. The multiple random starting point is taken because it minimises the risk of interval sampling pattern with that of the population being sampled.

(3) Monetary Unit Sampling: It is a type of value-weighted selection in which sample size, selection and evaluation results in a conclusion in monetary amounts.

(4) Haphazard sampling: Haphazard selection, in which the auditor selects the sample without following a structured technique. Although no structured technique is used, the auditor would nonetheless avoid any conscious bias or predictability (**for example, avoiding difficult to locate items, or always choosing or avoiding the first or last entries on a page**) and thus attempt to ensure that all items in the population have a chance of selection. Haphazard selection is not appropriate when using statistical sampling.

Haphazard sampling has no structured approach, does not involve judgement and does not even use the random number tables.

(5) Block Sampling: This method involves selection of a block(s) of contiguous items from within the population. Block selection cannot ordinarily be used in audit sampling because most populations are structured such that items in a sequence can be expected to have similar characteristics to each other, but different characteristics from items elsewhere in the population. Although in some circumstances it may be an appropriate audit procedure to examine a block of items, it would rarely be an appropriate sample selection technique when the auditor intends to draw valid inferences about the entire population based on the sample. Usually a range of continuous transaction shall have similar characteristics, therefore, selection of a group at one time will not give a reasonable basis for opinion on the overall population as different types of transactions and unusual transactions may not be covered in the group taken all at once. Further, if the client

has the idea of the block selection pattern of the auditor, then material misstatements and deviations can be easily overlooked by management's practice of recording them.

Example

Take the first 200 sales invoices from the sales day book in the month of September; alternatively take any four blocks of 50 sales invoices. Therefore, once the first item in the block is selected, the rest of the block follows items to the completion.

There is a close similarity between this method and non-statistical sampling. Consequently it has similar characteristics, namely, simplicity and economy. On the other hand there is a risk of bias and of establishing a pattern of selection which may be noted by the auditees.

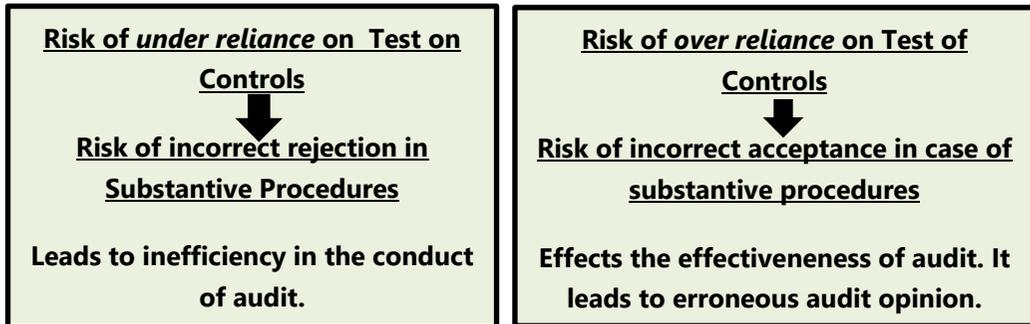
4.5 Sampling and Non-Sampling Risk

Sampling Risk. The risk that the auditor's conclusion based on a sample may be different from the conclusion if the entire population were subjected to the same audit procedure. This risk will always be in existence when auditor uses sampling technique in conducting his audit.

IF THE ACCEPTABLE SAMPLING RISK IS LOW, LARGER SAMPLE SIZE IS NEEDED.

Sampling risk can lead to two types of erroneous conclusions:

- (i) In the case of a **test of controls**, that controls are more effective than they actually are, or in the case of a **test of details**, that a material misstatement does not exist when in fact it does. The auditor is primarily concerned with this type of erroneous conclusion because it affects audit effectiveness and is more likely to lead to an inappropriate audit opinion. This is because of over reliance on the internal controls.
- (ii) In the case of a **test of controls**, that controls are less effective than they actually are, or in the case of a **test of details**, that a material misstatement exists when in fact it does not. This type of erroneous conclusion affects audit efficiency as it would usually lead to additional work to establish that initial conclusions were incorrect. This is because of under reliance on the test of controls and detailed substantive procedures performed by the auditor. Here risk of giving wrong opinion is minimum but it will lead to more detailed checking which is time consuming.



Non-Sampling Risk

The risk that the auditor reaches an erroneous conclusion for any reason not related to sampling risk.

Example

Examples of non-sampling risk include use of inappropriate audit procedures, or misinterpretation of audit evidence and failure to recognize a misstatement or deviation.

Sources of Non Sampling risk are:

Human Mistakes	Misinterpreting the sample results
Applying audit procedures not appropriate to the objectives of audit	
Relying on erroneous information e.g. erroneous confirmation	

Non sampling risk can never be mathematically measured.

5. PERFORMING AUDIT PROCEDURES

- ◆ The auditor shall perform audit procedures, appropriate to the purpose, on each item selected.
- ◆ If the audit procedure is not applicable to the selected item, the auditor shall perform the procedure on a **replacement item**.
- ◆ If the auditor is unable to apply the designed audit procedures, or suitable alternative procedures, to a selected item, the auditor shall treat that item



FIG. 2: Performing Audit Procedures*

as a deviation from the prescribed control, in the case of tests of controls, or a misstatement, in the case of tests of details.

- ◆ An example of when it is necessary to perform the procedure on a replacement item is when a voided check (Cancelled cheque) is selected while testing for evidence of payment authorization. If the auditor is satisfied that the check has been properly cancelled such that it does not constitute a deviation, an appropriately chosen replacement is examined. A replacement would then mean a proper and valid cheque through which payment has been made.
- ◆ An example of when the auditor is unable to apply the designed audit procedures to a selected item is when documentation relating to that item has been lost. If the documentation of a sales is lost, like the sales order record, sales invoice, document for dispatch etc, then confirmation can be sought from the debtor as per SA 505. If it is a cash sale, the cash book can be cross verified for the existence of such transactions.
- ◆ An example of a suitable alternative procedure might be the examination of subsequent cash receipts together with evidence of their source and the items they are intended to settle when no reply has been received in response to a positive confirmation request.
- ◆ Another example for replacement of a sample could be, if all transactions of computerized sales are being checked, for example sales recorded through a bar code scanner, and incidentally a sample of manual billing gets selected, then such item can be replaced after adequately checking the correctness of the manual bill with the supporting documents available. If replacement is not possible or reasonable, alternative audit procedure can be applied.



6. NATURE AND CAUSE OF DEVIATIONS AND MISSTATEMENTS

- ◆ In analyzing the deviations and misstatements identified, the auditor may observe that many have a **common feature**, for example, type of transaction, location, product line or period of time.
- ◆ In such circumstances, the auditor may decide to identify all items in the population that possess the common feature, and extend audit procedures to those items. In addition, such deviations or misstatements may be intentional, and may indicate the possibility of fraud.

- ◆ Therefore, the auditor shall investigate the nature and causes of any deviations or misstatements identified, and evaluate their possible effect on the purpose of the audit procedure and on other areas of the audit.
- ◆ In the extremely rare circumstances when the auditor considers a misstatement or deviation discovered in a sample to be an **anomaly**, the auditor shall obtain a high degree of certainty that such misstatement or deviation is not representative of the population.
- ◆ The auditor shall obtain this degree of certainty by performing additional audit procedures to obtain sufficient appropriate audit evidence that the misstatement or deviation does not affect the remainder of the population.

Anomaly may be defined as a misstatement or deviation that is demonstrably not representative of misstatements or deviations in a population.

7. PROJECTING MISSTATEMENTS

- ◆ The auditor is required to project misstatements for the population to obtain a broad view of the scale of misstatement but this projection may not be sufficient to determine an amount to be recorded.
- ◆ When a misstatement has been established as **an anomaly**, it may **be excluded** when projecting misstatements to the population. However, the effect of any such misstatement, if uncorrected, still needs to be considered in addition to the projection of the non-anomalous misstatements.
- ◆ For tests of details, the auditor shall project misstatements found in the sample to the population whereas for tests of controls, **no explicit projection of deviations** is necessary since the sample deviation rate is also the projected deviation rate for the population as a whole.

8. EVALUATING RESULTS OF AUDIT SAMPLING

The auditor shall evaluate-

- (a) The results of the sample; and
- (b) Whether the use of audit sampling has provided a reasonable basis for conclusions about the population that has been tested.

For tests of controls, an unexpectedly high sample deviation rate may lead to an increase in the assessed risk of material misstatement, unless further audit evidence substantiating the initial assessment is obtained.

- ◆ For tests of details, an unexpectedly high misstatement amount in a sample may cause the auditor to believe that a class of transactions or account balance is materially misstated, in the absence of further audit evidence that no material misstatement exists.
- ◆ In the case of tests of details, the projected misstatement plus anomalous misstatement, if any, is the auditor's best estimate of misstatement in the population.
- ◆ When the projected misstatement plus anomalous misstatement, if any, exceeds tolerable misstatement, the sample does not provide a reasonable basis for conclusions about the population that has been tested. The closer the projected misstatement plus anomalous misstatement is to tolerable misstatement, the more likely that actual misstatement in the population may exceed tolerable misstatement.
- ◆ Also if the projected misstatement is greater than the auditor's expectations of misstatement used to determine the sample size, the auditor may conclude that there is an unacceptable sampling risk that the actual misstatement in the population exceeds the tolerable misstatement.
- ◆ Considering the results of other audit procedures helps the auditor to assess the risk that actual misstatement in the population exceeds tolerable misstatement, and the risk may be reduced if additional audit evidence is obtained.

In case the auditor concludes that audit sampling has not provided a reasonable basis for conclusions about the population that has been tested, ***the auditor may request management***

- I. to investigate misstatements that have been identified and the potential for further misstatements and
- II. to make any necessary adjustments; or tailor the nature, timing and extent of those further audit procedures to best achieve the required assurance.

For example, in the case of tests of controls, the auditor might extend the sample size, test an alternative control or modify related substantive procedures.

Few Important terms to make the understanding better

Stratification – The process of dividing a population into sub-populations, each of which is a group of sampling units which have similar characteristics (often monetary value).

Tolerable misstatement – A monetary amount set by the auditor in respect of which the auditor seeks to obtain an appropriate level of assurance that the monetary amount set by the auditor is not exceeded by the actual misstatement in the population.

Tolerable rate of deviation – A rate of deviation from prescribed internal control procedures set by the auditor in respect of which the auditor seeks to obtain an appropriate level of assurance that the rate of deviation set by the auditor is not exceeded by the actual rate of deviation in the population.

SUMMARY

SA 530 "Audit Sampling", defines 'audit sampling' as application of audit procedures to less than 100% of items within a population of audit relevance such that all sampling units have a chance of selection in order to provide the auditor with a reasonable basis on which to draw conclusions about the entire population.

The objective of the auditor when using audit sampling is to provide a reasonable basis for the auditor to draw conclusions about the population from which the sample is selected.

Audit sampling can be applied using either non-statistical or statistical sampling approaches.

The factors that should be considered for deciding upon the extent of checking on a sampling plan are size of the organisation under audit, state of the internal control., adequacy and reliability of books and records, tolerable error range and degree of the desired confidence.

Sample should be selected in such a manner that it is representative of the population from which the sample is being selected. Some of the sample selection methods are Random Sampling (Simple/Stratified), Systematic Sampling, Monetary Unit Sampling, Haphazard Sampling, Block Sampling etc.

The auditor shall perform audit procedures, appropriate to the purpose, on each item selected. The auditor is also required to project misstatements for the population to obtain a broad view of the scale of misstatement but this projection may not be sufficient to determine an amount to be recorded.

The auditor shall evaluate the results of the sample; and whether the use of audit sampling has provided a reasonable basis for conclusions about the population that has been tested.

TEST YOUR KNOWLEDGE

Correct/Incorrect

State with reasons (in short) whether the following statement is correct or incorrect:

- (i) The method which involves dividing the population into groups of items is known as block sampling.
- (ii) Universe refers to the entire set of data from which a sample is selected and about which the auditor wishes to draw conclusions.
- (iii) Non Statistical sampling is an approach to sampling that has the random selection of the sample items; and the use of probability theory to evaluate sample results, including measurement of sampling risk characteristics.
- (iv) Sample need not be representative
- (v) The objective of stratification is to increase the variability of items within each stratum and therefore allow sample size to be reduced without increasing sampling risk.
- (vi) When statistical sampling is used to select a sample, sample need not be representative because the statistical sampling takes care of the representation.
- (vii) Stratified Sampling is used for homogeneous population.
- (viii) Non statistical sampling is considered to be more scientific than the statistical sampling.
- (ix) In case of Statistical sampling, auditor's bias in choosing sample is involved.
- (x) In stratified sampling, the conclusion drawn on each stratum can be directly projected to the whole population.
- (xi) Low acceptable sampling risk requires larger sample size.

Theoretical Questions

1. What is the meaning of Sampling? Also discuss the methods of Sampling. Explain in the light of SA 530 "Audit Sampling".

2. With reference to Standard on Auditing 530, state the requirements relating to audit sampling, sample design, sample size and selection of items for testing.
3. While planning the audit of S Ltd. you want to apply sampling techniques. What are the risk factors you should keep in mind?
4. Write short notes on the following:
 - (a) Advantages of Statistical sampling in Auditing.
 - (b) Stratified sampling
5. What precautions should be taken by the auditor while applying test check techniques?
6. Explain the factors to be considered while determining the extent of checking on a sampling plan.

ANSWERS/SOLUTIONS

Answers to Correct/Incorrect

- (i) **Incorrect:** The method which involves dividing the population into groups of items is known as cluster sampling whereas block sampling involves the selection of a defined block of consecutive items.
- (ii) **Incorrect:** Population refers to the entire set of data from which a sample is selected and about which the auditor wishes to draw conclusions.
- (iii) **Incorrect:** Statistical sampling is an approach to sampling that has the random selection of the sample items; and the use of probability theory to evaluate sample results, including measurement of sampling risk characteristics.
- (iv) **Incorrect:** Whatever may be the approach non-statistical or statistical sampling, the sample must be representative. This means that it must be closely similar to the whole population although not necessarily exactly the same. The sample must be large enough to provide statistically meaningful results.
- (v) **Incorrect:** The objective of stratification is to reduce the variability of items within each stratum and therefore allow sample size to be reduced without increasing sampling risk.
- (vi) **Incorrect:** Whatever may be the approach non-statistical or statistical sampling, the sample must be representative. This means that it must be closely similar to the whole population although not necessarily exactly the same. The sample must be large enough to provide statistically meaningful results.

- (vii) **Incorrect:** Stratified sampling is used when the population is diversified i.e heterogeneous. The population is divided into sub population having similar characteristics. Sample are then chosen from these sub populations which are called as Stratum. Therefore, stratified sampling is not useful in case of homogeneous population.
- (viii) **Incorrect:** Statistical sampling uses scientific method of choosing samples from a given population. The use of probability theory is involved in statistical sampling so that every sampling unit has an equal chance of getting selected. In the non statistical sampling, auditors' judgment and past experience is used to choose samples without any scientific method.
- (ix) **Incorrect:** Statistical sampling uses scientific method choosing samples from a given population. The use of probability theory is involved in statistical sampling so that every sampling unit has an equal chance of getting selected. In the non statistical sampling, auditor's judgment and past experience is used to choose samples without and scientific method. Hence, personal bias is involved in Non statistical sampling and not Statistical.
- (x) **Incorrect:** In case of stratified sampling, the conclusions are drawn on the stratum. The combination of all the conclusions on stratum together will be used to determine the possible effect of misstatement or deviation. Hence the samples are used to derive conclusion only on the respective stratum from where they are drawn and not the whole population.
- (xi) **Correct:** Sampling risk arises from possibility that the auditor's conclusion based upon sample may be different from conclusion that would have been reached if same audit procedures were applied on the entire population. If acceptable sampling risk is low, large sample size is needed.

Answers to Theoretical Questions

1. **Meaning of Audit Sampling:** "Audit Sampling" means the application of audit procedures to less than 100% of items within a population of audit relevance such that all sampling units have a chance of selection in order to provide the auditor with a reasonable basis on which to draw conclusions about the entire population. The objective of the auditor when using audit sampling is to provide a reasonable basis for the auditor to draw conclusions about the population from which the sample is selected.

Refer Para 4.4 for methods of selecting samples.

2. **Audit Sampling:** As per SA 530 on "Audit Sampling", the meaning of the term Audit Sampling is – the application of audit procedures to less than 100% of items within a population of audit relevance such that all sampling units have a chance of selection in order to provide the auditor with a reasonable basis on which to draw conclusions about the entire population.

The requirements relating to sample design, sample size and selection of items for testing are explained below-

Sample design - When designing an audit sample, the auditor shall consider the purpose of the audit procedure and the characteristics of the population from which the sample will be drawn.

Sample Size- The auditor shall determine a sample size sufficient to reduce sampling risk to an acceptably low level.

Selection of Items for Testing- The auditor shall select items for the sample in such a way that each sampling unit in the population has a chance of selection.

3. **Risk Factors while applying Sampling Techniques:** As per SA 530 "Audit Sampling", sampling risk is the risk that the auditor's conclusion based on a sample may be different from the conclusion if the entire population were subjected to the same audit procedure. Sampling risk can lead to two types of erroneous conclusions-

(i) In the case of a test of controls, that controls are more effective than they actually are, or in the case of tests of details, that a material misstatement does not exist when in fact it does. The auditor is primarily concerned with this type of erroneous conclusion because it affects audit effectiveness and is more likely to lead to an inappropriate audit opinion.

(ii) In the case of test of controls, the controls are less effective than they actually are, or in the case of tests of details, that a material misstatement exists when in fact it does not. This type of erroneous conclusion affects audit efficiency as it would usually lead to additional work to establish that initial conclusions were incorrect.

4. (a) **Advantages of Statistical Sampling in Auditing:** Refer Para 3.3.

(b) **Stratified Sampling:** Refer Para 4.4.

5. Precautions to be taken while applying test check techniques are

- Thorough study of accounting system should be done before adopting sampling

- Proper study of internal control systems.
 - Areas which are not suitable for sampling should be carefully considered. Eg: compliance with statutory provisions, transactions of unusual nature etc.
 - Proper planning for Sampling methods to be used and explaining the staff,
 - Transactions and balances have to be properly classified (stratified)
 - Sample size should be appropriately determined.
 - Sample should be chosen in unbiased way,
 - Errors located in the sample should be analysed properly.
6. The factors that should be considered for deciding upon the extent of checking on a sampling plan are following:
- (i) Size of the organisation under audit.
 - (ii) State of the internal control.
 - (iii) Adequacy and reliability of books and records.
 - (iv) Tolerable error range.
 - (v) Degree of the desired confidence.