FREE SAMPLE | Buy the complete pack at notesbazar.in | page 1 of 11

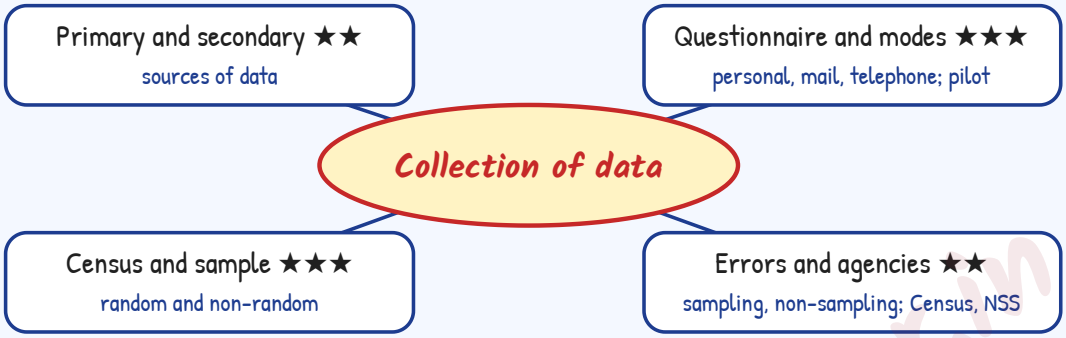


# Chapter 2
# Collection of Data




NCERT Statistics for Economics (Class 11), Reprint 2026-27 · CBSE 2026-27

## Chapter map (★ = asked often in school and annual exams)




## What is inside

1. Concept notes with comparison tables
2. NCERT exercises: all 14 questions fully solved
3. Important exam questions, fully solved
4. Quick-reference sheet; practice A–G, 20 MCQs, 6 A–R, answers, summary

## Colour code used

red = key term  green = definition

purple = sub-heading  black = explanation

★ = high-frequency exam topic

1 = mark the examiner gives for that point

★ **Exam tip:** Favourite questions: census vs sample, the three modes of survey with merits and demerits, the qualities of a good questionnaire, and sampling vs non-sampling errors.

NB **Prepared by Notes Bazar** · Every answer written and checked by hand against NCERT and the CBSE marking schemes. Doubt or mistake? WhatsApp 88240 98091.

SAMPLE · notesbazar.in

# 1-3. Data, sources and the questionnaire ★★★

The purpose of collecting data is to provide evidence for a sound and clear solution to a problem. A quantity whose value changes is a **variable** (X, Y, Z); each value is an **observation**.

| X (year) | 1970-71 | 1978-79 | 1990-91 | 2001-02 | 2016-17 |
|---|---|---|---|---|---|
| Y (food grains, million tonnes) | 108 | 132 | 176 | 212 | 272 |

## Sources of data

| basis | primary data | secondary data |
|---|---|---|
| meaning | collected first hand by the investigator by an enquiry | already collected and processed by another agency |
| originality | original | not original (used again) |
| cost and time | high | low (saves time and cost) |
| suitability | made for the purpose | may need adjustment |
| sources | survey, interviews | government reports, books, newspapers, websites |

Data are primary to the agency that collects them first and secondary to everyone who uses them later.

## Qualities of a good questionnaire

1. Not too long; as few questions as possible.
2. Easy to understand; no ambiguous or difficult words.
3. Comfortable order; from **general to specific** (electricity supply regular? before charges justified?).
4. Precise and clear (not "... in order to look presentable").
5. Not ambiguous: give ranges (less than ₹ 200, ₹ 200-300 ...) instead of "a lot".
6. No double negatives ("Don't you think ...?").
7. No leading questions ("this high-quality tea").
8. Should not suggest the alternatives ("job or housewife?").

| closed-ended (structured) | open-ended (unstructured) |
|---|---|
| two-way (yes/no) or multiple choice; easy to score and code | free answers; individual responses |
| hard to write; may restrict answers ("any other" helps) | hard to interpret and score |

★ *Exam tip:* A **questionnaire** is filled in by the respondent; an **interview schedule** is filled in by the enumerator who asks the questions.

# 3-4. Modes of collection; census and sample ★★★

| mode | advantages | disadvantages |
|---|---|---|
| personal interview | highest response; all types of questions; clarification; reactions observed | most expensive; slow; interviewer may influence answers |
| mailed questionnaire | least expensive; reaches remote areas; no influence; anonymity; good for sensitive questions | not for illiterates; long response time; no clarification; low response |

SAMPLE - notesbazar.in

| | | |
|---|---|---|
| telephone interview | low cost; quick; clarification possible; relatively high response | only people with phones; reactions not seen; some influence |

Online and SMS surveys are modern forms of the mailed survey.

A **pilot survey** (pre-testing) is a try-out of the questionnaire on a small group before the main survey. It reveals weak questions and checks the clarity of instructions, the performance of enumerators and the cost and time of the survey.

**Population (universe)**: all items under study. **Census (complete enumeration)**: every unit is studied. **Sample**: a representative part of the population studied to draw conclusions about the whole.

Census of India: every ten years (since 1881; first after Independence 1951; last 2011): population 121.09 crore in 2011 (102.87 crore in 2001; 23.83 crore in 1901). Growth rate 2.2% (1971–81) → 1.97% (1991–2001) → 1.64% (2001–11).

| *basis* | *census* | *sample* |
|---|---|---|
| coverage | every unit | a part |
| cost, time, staff | high | low |
| accuracy | high, but non-sampling errors possible | reasonably accurate; sampling error |
| detail | less intensive | intensive enquiry possible |
| suitable | small or varied population; population count | large, similar population; destructive tests |

**Example**: study of agricultural labourers in Churachandpur (Manipur): population = all agricultural labourers of the district; sample = 10% of them.

★ *Exam tip:* Most surveys are sample surveys: cheaper, faster, more detailed and easier to supervise.

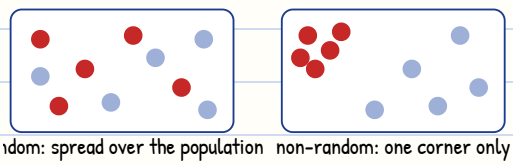
## Sampling methods; errors; Census and NSS ★★

### Random sampling

Every unit has an **equal chance** of selection; the list of all units is the **sampling frame**. **Lottery method**: write the names of all 300 households on slips, mix, draw 30 one by one. **Random number tables** (or a computer) give the same result without slips. Exit polls use a random sample of voters leaving the booth.

### Non-random sampling

Units chosen by judgement, purpose, convenience or quota; not all units have an equal chance, so there is the investigator's **bias**.



ıdom: spread over the population  non-random: one corner only

*Red dots = units selected*

### S. Errors

**Sampling error** = population parameter − sample estimate. It falls as the sample grows. Example: incomes of 5 Manipur farmers 500, 550, 600, 650, 700: population mean 600; sample (500, 600) mean 550; sampling error = 600 − 550 = 50.

SAMPLE - notesbazar.in

**Non-sampling errors** are more serious: a larger sample does not remove them, and even a census can have them.

- **Sampling bias**: some members of the population cannot be included.
- **Non-response**: a person cannot be contacted or refuses.
- **Errors in data acquisition**: wrong measurement (different tapes), price varying by shop and quality, recording 13 for 31.

### 6. Agencies

| agency | work |
|---|---|
| Census of India (Registrar General) | size, density, sex ratio, literacy, migration, rural–urban: every 10 years |
| National Sample Survey (NSS) | continuous rounds on socio-economic issues; journal *Sarvekshana*; 60th round (2004) morbidity and health care; 68th round (2011–12) consumer expenditure |
| others | CSO, DGCIS (trade), Labour Bureau |

## NCERT exercises, fully solved

**1.** Frame at least four multiple-choice options for: (i) Which of the following is the most important when you buy a new dress? (ii) How often do you use computers? (iii) Which newspapers do you read regularly? (iv) Rise in the price of petrol is justified. (v) What is the monthly income of your family?

> **Ans.** (i) (a) price (b) quality of cloth (c) design and colour (d) brand (e) any other.
> (ii) (a) daily (b) two or three times a week (c) once a week (d) rarely or never.
> (iii) (a) The Hindu (b) The Times of India (c) Dainik Jagran (d) Hindustan Times (e) any other (please specify).
> (iv) (a) strongly agree (b) agree (c) disagree (d) strongly disagree (e) cannot say.
> (v) (a) below ₹ 20,000 (b) ₹ 20,000–40,000 (c) ₹ 40,000–60,000 (d) above ₹ 60,000.

**2.** Frame five two-way questions (yes or no).

> **Ans.** (i) Do you own a mobile phone? (ii) Do you travel to school by bus? (iii) Is there a public library in your locality? (iv) Do you read a newspaper every day? (v) Has your family paid income tax this year? (Each is answered Yes / No.)

**3.** True or false: (i) there are many sources of data (ii) telephone survey is most suitable when the population is literate and spread over a large area (iii) data collected by the investigator are secondary (iv) there is bias in non-random selection of samples (v) non-sampling errors can be minimised by taking large samples.

> **Ans.** (i) **False**: there are only two sources, primary and secondary (the NCERT view). (ii) **False**: when people are literate and spread widely, a mailed questionnaire suits best; telephone is limited to people with phones. (iii) **False**: they are primary. (iv) **True**: the investigator's judgement decides selection. (v) **False**: a larger sample reduces sampling error, not non-sampling error.

**4.** What is wrong with these questions? (i) How far do you live from the closest market? (ii) If plastic bags are only 5% of our garbage, should they be banned? (iii) Wouldn't you be opposed to increase in price of petrol? (iv) Do you agree with the use of chemical fertilisers? (v) Do you use fertilisers in your fields? (vi) What is the yield per hectare in your field?

> **Ans.** (i) Vague: no unit or ranges; give options (less than 1 km, 1–2 km, more than 2 km). (ii) Leading: the "only 5%" pushes the answer towards no. (iii) Double negative: "Wouldn't you be opposed" leads to bias; ask "Do you support the increase in petrol price?" (iv) and (v) are in the wrong order: the specific (iv) should come after the general (v) "Do you use fertilisers?". (vi) Hard to answer: a farmer may not know yield per hectare; ask total output and area separately.

SAMPLE · notesbazar.in

**5.** Design a questionnaire on the popularity of Vegetable Atta Noodles among children.

**Ans.** **Questionnaire** (tick the right option): 1. Name and age. 2. Do you eat noodles? Yes / No. 3. Which brand do you eat most? (a) Brand A (b) Brand B (c) Vegetable Atta Noodles (d) any other. 4. How often do you eat Vegetable Atta Noodles? daily / weekly / monthly / never. 5. What do you like most about them? taste / health / price / advertisement. 6. Rate the taste: excellent / good / average / poor. 7. Do your parents prefer them to other noodles? Yes / No. 8. Would you recommend them to friends? Yes / No. 9. Any suggestion for improvement? ____ (Short, general to specific, no leading or double-negative questions.)

**6.** In a village of 200 farms, 50 farms were surveyed; 50% grew only wheat. Population and sample size?

**Ans.** Population = all **200 farms** of the village; sample size = **50 farms** (25 of them grew only wheat).

**7.** Two examples each of sample, population and variable.

**Ans.** Population: all students of Class 11 in Delhi; all wheat farms of Punjab. Sample: 500 Class 11 students selected at random from Delhi schools; 200 wheat farms selected from Punjab. Variable: marks of students; yield of wheat per hectare (also income, price, age).

**8.** Which gives better results, census or sample, and why?

**Ans.** A **sample** usually gives better results in practice: it gives reasonably accurate results at lower cost and time, allows intensive enquiry, and a smaller trained team makes fewer non-sampling errors. A census is better only where every unit must be counted (population census) or the population is small and varied.

**9.** Which error is more serious, sampling or non-sampling, and why?

**Ans.** **Non-sampling error**: sampling error can be reduced by taking a larger sample, but non-sampling errors (bias, non-response, wrong recording) are not reduced by a larger sample and occur even in a census.

**10.** There are 10 students in your class. You want to select three. How many samples are possible?

**Ans.** Number of samples = ${}^{10}C_3 = \dfrac{10 \times 9 \times 8}{3 \times 2 \times 1}$ = **120** (order does not matter).

**11.** How would you use the lottery method to select 3 students out of 10?

**Ans.** Write the name (or roll number) of each of the 10 students on identical slips; fold them and put them in a box; mix well; draw one slip without looking, then a second and a third (without replacement). The 3 students drawn form the random sample; every student had an equal chance.

**12.** Does the lottery method always give a random sample? Explain.

**Ans.** Yes, provided the slips are identical in size and shape, are mixed thoroughly and are drawn blindly. If slips differ (some folded more, heavier) or are not mixed, some units get a better chance and the sample is no longer random.

**13.** Explain how to select a random sample of 3 out of 10 students using random number tables.

**Ans.** (1) Number the students 01 to 10 (two digits, since 10 has two digits). (2) Open the random number table at any page and start from any point. (3) Read two-digit numbers in order (row or column), ignoring numbers above 10 and repeats. (4) The first three valid numbers, e.g. 07, 02, 10, give the students selected.

**14.** Do samples provide better results than surveys? Give reasons.

**Ans.** A sample survey is itself a survey; the comparison is with a **census** survey. Samples often give better (more reliable) results because: they cost less and take less time; more detailed information can be collected; fewer, better-trained enumerators reduce non-sampling errors; and results can be checked. But a sample must be representative; a biased sample gives poor results.

★ ***Exam tip:*** Number of samples of r from n = nCr: 3 from 10 = 120; 2 from 5 = 10.

SAMPLE · notesbazar.in

# Important exam questions, fully solved

Questions of the kind set in school and annual exams, with complete answers and mark steps.

## A. MCQs and Assertion–Reason (1 mark each)

*Exam-style* Which mode suits respondents in remote areas best? (A) personal interview (B) mailed questionnaire (C) telephone (D) pilot survey [1]

> **Ans.** (B)

*Exam-style* The Census of India is conducted every: (A) 5 years (B) 10 years (C) 15 years (D) year [1]

> **Ans.** (B)

*Exam-style* Population mean 60, sample mean 57. Sampling error: (A) 117 (B) 3 (C) 57 (D) 0 [1]

> **Ans.** 60 − 57 = 3. (B)

*Exam-style* Assertion (A): Non-sampling errors are more serious than sampling errors. Reason (R): Non-sampling errors cannot be reduced by increasing the sample size. [1]

> **Ans.** Both true; R explains A. (A)

## B. Short answer (3 marks)

*Exam-style* Distinguish primary and secondary data (three points). [3]

> **Ans.** Primary are original, first hand; secondary are collected earlier by others 1. Primary cost more time and money; secondary save both 1. Primary suit the purpose exactly; secondary may need adjustment 1.

*Exam-style* What is a pilot survey? State two uses. [3]

> **Ans.** A try-out of the questionnaire on a small group before the main survey 1. Uses: finds weak or unclear questions 1; checks enumerators' performance and the cost and time of the survey 1.

## C. Long answer (4–6 marks)

*Exam-style* Explain the three modes of collecting primary data with one merit and one demerit each. [6]

> **Ans.** Personal interview: face-to-face 1; merit: highest response and clarification; demerit: most expensive and slow 1. Mailed questionnaire: sent by post, email or SMS 1; merit: cheapest, reaches remote areas; demerit: not for illiterates, low response 1. Telephone interview 1; merit: cheap and quick; demerit: only for people with phones, reactions not seen 1.

*Exam-style* Explain the types of non-sampling errors. [4]

> **Ans.** Errors not due to sampling, more serious 1: sampling bias (some members cannot be included) 1; non-response (person not contacted or refuses) 1; errors in data acquisition (wrong measurement or recording, e.g. 13 for 31) 1.

*Exam-style* Why are sample surveys preferred to census? [4]

> **Ans.** Lower cost 1; less time 1; more detailed (intensive) enquiry 1; small team, easy to train and supervise, fewer non-sampling errors 1.

SAMPLE · notesbazar.in

## Quick-reference sheet

| term | meaning |
|---|---|
| variable | a quantity that changes (X, Y) |
| primary data | first hand, by the investigator |
| secondary data | collected earlier by another agency |
| questionnaire | list of questions filled in by respondent |
| pilot survey | pre-test on a small group |
| population | all units under study |
| census | every unit studied |
| sample | representative part |
| random sample | equal chance for every unit |
| sampling error | parameter – estimate |
| non-sampling error | bias, non-response, wrong recording |
| NSS | continuous sample surveys; *Sarvekshana* |

**Case study (practice): 'School canteen survey'.** The school council wants to know what students think of the canteen. There are 1,200 students. The council gives a printed questionnaire to the 60 students who eat at the canteen most often, and 15 of them do not return it. One question reads: "Don't you think the canteen food is too costly?"
(i) Identify the population and the sample. (ii) Is the sample random? Why? (iii) Name the error caused by 15 students not returning the form. (iv) Rewrite the faulty question.

★ **Exam tip:** Always write population and sample with units ("all 1,200 students", "60 students").

## Practice set: test yourself *Exam-style*

Try every question before looking at the answers at the end of the chapter. 69 or more out of 86 means you are ready for the exam.

### A. Fill in the blanks (1 mark each)

1. Data collected first hand are ___ data.
2. A try-out of a questionnaire is a ___ survey.
3. The totality of items under study is the ___.
4. In ___ sampling, every unit has an equal chance.
5. Questions with only yes/no answers are ___ questions.
6. The journal of the NSS is ___.
7. Sampling error falls as sample size ___.
8. The last Census of India was held in ___.

### B. True or false? (1 mark each)

1. Secondary data save time and money.
2. A census has no errors.

SAMPLE · notesbazar.in

3. Mailed questionnaires suit illiterate respondents.
4. Leading questions should be avoided.
5. Non-random samples involve bias.
6. Open-ended questions are easy to score.
7. Personal interviews have the highest response rate.
8. The lottery method is a random method.

## C. Very short answer (1 mark each)

1. Give one source of secondary data.
2. What is a sampling frame?
3. Number of samples of 2 from 5.
4. Give one example of a leading question.
5. Who publishes census data?
6. What is non-response?
7. Give one use of a pilot survey.
8. Population mean 40, sample mean 38: sampling error?
9. Name the 68th NSS round subject.
10. Give one demerit of telephone interviews.

## D. Short answer I (3 marks each)

1. State three qualities of a good questionnaire.
2. Distinguish census and sample (three points).
3. Explain random sampling with an example.
4. Explain non-random sampling.
5. Explain sampling error with an example.
6. Distinguish closed-ended and open-ended questions.
7. State three merits of a mailed questionnaire.
8. Explain the work of the NSS.

**My score** (fill in after checking the answers)

| Section | A /8 | B /8 | C /10 | D /24 | E /24 | F /12 | G (bonus) | Total /86 |
|---|---|---|---|---|---|---|---|---|
| My marks | | | | | | | | |

Rough work

SAMPLE - notesbazar.in

## E. Short answer II (4 marks each)

1. Explain four points to be kept in mind while drafting a questionnaire.
2. Explain personal interview with its merits and demerits.
3. Explain why a sample survey is preferred to a census.
4. Explain the types of non-sampling errors.
5. Explain the Census of India and the information it gives.
6. Explain the lottery method and random number tables.

## F. Long answer (6 marks each)

1. Explain the modes of collecting primary data and their merits and demerits.
2. Explain census and sample methods; which is better and why?

## G. HOTS (higher-order thinking)

1. Why may exit polls predict wrongly?
2. A survey on smartphone use is done only by online forms. What error can arise?
3. Why should questions move from general to specific?
4. When would a census be preferred to a sample?

## 20 MCQs

1. Data collected by the investigator himself are:
   (a) secondary (b) published (c) primary (d) estimated
2. Secondary data are obtained from:
   (a) published reports (b) interviews (c) pilot surveys (d) questionnaires sent by the investigator
3. A questionnaire should be:
   (a) long (b) leading (c) full of technical words (d) short and clear
4. "Don't you think smoking should be banned?" is a fault of:
   (a) length (b) double negative (c) order (d) clarity of options
5. The most expensive mode is:
   (a) mail (b) personal interview (c) telephone (d) SMS
6. Mailed questionnaires cannot be used for:
   (a) remote people (b) literate people (c) sensitive questions (d) illiterate people
7. A pilot survey is a:
   (a) pre-test on a small group (b) final survey (c) census (d) secondary source
8. A census covers:
   (a) a sample (b) only urban areas (c) every unit of the population (d) 10% of units
9. Most surveys are:
   (a) census (b) mailed only (c) pilot (d) sample surveys
10. In random sampling every unit has:
    (a) no chance (b) an equal chance (c) more chance if known (d) chance by judgement

SAMPLE · notesbazar.in

11. Selecting households known to you is:
(a) random (b) census (c) non-random sampling (d) lottery

12. Sampling error can be reduced by:
(a) larger sample (b) smaller sample (c) census errors (d) more questions

13. Non-response is a:
(a) sampling error (b) non-sampling error (c) parameter (d) variable

14. Number of samples of 3 from 10:
(a) 30 (b) 720 (c) 120 (d) 1,000

15. Census of India 2011 population:
(a) 102.87 crore (b) 140 crore (c) 23.83 crore (d) 121.09 crore

16. NSS publishes the journal:
(a) Sarvekshana (b) Yojana (c) Kurukshetra (d) Census

17. Yes/no questions are:
(a) two-way questions (b) open-ended (c) leading (d) ambiguous

18. Recording 13 instead of 31 is an error in:
(a) sampling (b) bias (c) non-response (d) data acquisition

19. Population mean 600, sample mean 550: sampling error:
(a) 1,150 (b) 50 (c) 550 (d) 0

20. Exit polls use:
(a) census (b) secondary data (c) random samples of voters (d) mail

*1 (c) · 2 (a) · 3 (d) · 4 (b) · 5 (b) · 6 (d) · 7 (a) · 8 (c) · 9 (d) · 10 (b) · 11 (c) · 12 (a) · 13 (b) · 14 (c) · 15 (d) · 16 (a) · 17 (a) · 18 (d) · 19 (b) · 20 (c)*

## Assertion–Reason (6)

(a) Both true, R explains A. (b) Both true, R does not explain A. (c) A true, R false. (d) A false, R true.

1. A: Secondary data save time and cost. R: They have already been collected by another agency.
2. A: A census is free from all errors. R: It covers every unit.
3. A: Personal interview gives the highest response. R: The interviewer can explain questions.
4. A: Mailed questionnaires suit illiterate people. R: They are the cheapest mode.
5. A: Random samples avoid the investigator's bias. R: Every unit has an equal chance.
6. A: A pilot survey is done after the main survey. R: It tests the questionnaire.

*Key: 1 (a) · 2 (d) · 3 (a) · 4 (d) · 5 (a) · 6 (d)*

## Answers to the practice set

**A.** 1. primary 2. pilot 3. population (universe) 4. random 5. two-way 6. Sarvekshana 7. increases 8. 2011

**B.** 1. T 2. F 3. F 4. T 5. T 6. F 7. T 8. T

**C.** 1. government reports (Census, NSS) 2. the list of all units of the population 3. 10 4. "How do you like this high-quality tea?" 5. Registrar General of India 6. a selected person cannot be contacted or refuses 7. finds faulty questions 8. 2 9. consumer expenditure 10. only people with phones can be reached

**D.** 1. short; clear; general to specific 2. p. 3 table 3. equal chance; lottery of 30 out of 300 households 4. judgement, convenience, quota; bias 5. 600 – 550 = 50 6. p. 2 table 7. cheap; remote areas; no influence 8. continuous surveys on literacy, employment, consumer expenditure, health; Sarvekshana

**E.** 1. p. 2 list 2. p. 3 table 3. cost, time, detail, supervision 4. bias, non-response, data acquisition 5. p. 3 and p. 4 6. pp. 4, 6

**F.** 1. p. 3 2. p. 3; sample usually better (NCERT Q8)

SAMPLE - notesbazar.in

**G.** 1. the sample of voters may not be representative, some refuse or answer falsely 2. sampling bias: people without internet are left out 3. it puts the respondent at ease and gives better answers 4. when every unit must be counted or the population is small and varied

**Case.** (i) population: all 1,200 students; sample: 60 students (ii) no: only frequent canteen users were chosen (judgement) (iii) non-response error (iv) "Do you think the canteen food is costly?" or give price-rating options

## Last-night summary

- Sources: primary (first hand) and secondary (already collected); data are a tool to solve problems.
- Good questionnaire: short, clear, general to specific, no leading or double-negative questions.
- Modes: personal interview, mailed questionnaire, telephone; pilot survey first.
- Census = every unit; sample = representative part; random (equal chance) vs non-random (judgement).
- Sampling error = parameter – estimate; non-sampling errors (bias, non-response, recording) are more serious. Agencies: Census, NSS.

SAMPLE · notesbazar.in