

Chapter 8: Use of Statistical Tools

NCERT · Class 11 · Statistics

Project activities

Question 1

Consider yourself as an advisor to Transport Minister who aims to bring about a better and coordinated system of transportation. Prepare a project report.

Solution

GUIDED ANSWER **Objective:** to assess current transport facilities (buses, metro, autos, trains) and suggest a better, coordinated system. **Target group:** daily commuters — students, office-goers, traders — across both urban and rural routes. **Data to collect (primary, by questionnaire):** mode used, average daily travel time, waiting time, fare paid, frequency of service, level of crowding, and a satisfaction rating (1–5). **Tools:** tabulate responses; show modal share by a *pie diagram* and average waiting time by a *bar diagram*; compute the *mean* travel time and fare and the *standard deviation* to show how uneven service is; use *correlation* between waiting time and satisfaction. **Conclusion:** recommend, on the evidence, more buses on overloaded routes, integrated ticketing and better last-mile connectivity, then list your bibliography.

Question 2

You may be working in a village cottage industry. It could be a unit manufacturing dhoop, agarbatti, candles, jute products, etc. You want to start a new unit of your own. Prepare a project proposal for getting a bank loan.

Solution

GUIDED ANSWER **Objective:** to prepare a project proposal showing that a new cottage unit (say agarbatti) is viable, so a bank will sanction a loan. **Target group / data:** survey raw-material suppliers and existing units for cost data; survey shops/customers for demand. Use *secondary data* for market prices and government subsidy schemes (MUDRA/MSME). **Tools:** tabulate the estimated cost of land, machinery, raw material, labour and the expected monthly sales; show projected income vs expenditure as a *bar diagram*; compute the *mean* monthly profit and a simple break-even point; estimate the loan

amount and repayment schedule. **Conclusion:** state the loan required, the projected returns and how the loan will be repaid, with a bibliography of the secondary sources used.

Question 3

Suppose you are a marketing manager in a company and recently you have put up advertisements about your consumer product. Prepare a report on the effect of advertisements on the sale of your product.

Solution

GUIDED ANSWER **Objective:** to measure whether advertisements have raised the sale of a consumer product. **Target group:** retailers and customers in the area where the advertisements ran. **Data:** monthly sales figures before and after the campaign (*secondary data* from company records); a customer survey on which advertisement they saw and where (TV, newspaper, internet). **Tools:** show monthly sales as a *bar diagram*; compute the *mean* sale before and after to see the rise; compute *correlation* between advertising expenditure and sales; show media reach by a *pie diagram*. **Conclusion:** state whether sales rose, which medium was most effective, and whether the campaign was worth its cost.

Question 4

You are a District Education Officer, who wants to assess the literacy levels and the reasons for dropping out of school children. Prepare a report.

Solution

GUIDED ANSWER **Objective:** to assess literacy levels in the district and find why children drop out of school. **Target group:** households with school-age children, plus schools, in selected villages/wards (use *random sampling*). **Data:** number of children enrolled vs out of school, gender, class at which they left, and reasons (poverty, child labour, distance, lack of toilets, early marriage). **Tools:** compute the *literacy rate* (a percentage); show reasons for dropping out as a *bar diagram* and gender split as a *pie diagram*; tabulate dropout by class. **Conclusion:** identify the main reasons and recommend measures (mid-day meals, free books, schools nearer to habitations), with a bibliography.

Question 5

Suppose you are a Vigilance Officer of an area and you receive complaints about overcharging of goods by traders i.e., charging a higher price than the Maximum Retail Price (MRP). Visit a few shops and prepare a report on the complaint.

Solution

GUIDED ANSWER **Objective:** to verify whether traders charge more than the MRP printed on goods.

Target group: a sample of shops in the area and the customers buying from them. **Data:** for selected items, record the printed MRP and the actual price charged; note the type of shop and the item. **Tools:** tabulate 'MRP vs price charged'; compute the *mean* overcharge per item and the *percentage* of shops overcharging; show overcharging item-wise as a *bar diagram*. **Conclusion:** report whether overcharging is common, which items and shops are involved, and recommend action (warnings, display of MRP, consumer awareness).

Question 6

Consider yourself to be the head of Gram Panchayat of a particular village who wants to improve amenities like safe drinking water to your people. Address your issues in a report form.

Solution

GUIDED ANSWER **Objective:** to study the availability of safe drinking water in the village and suggest improvements. **Target group:** all households of the village (a *census* is possible in a small village).

Data: source of drinking water (tap, handpump, well, tanker), distance to the source, whether water is treated, and water-borne illnesses reported. **Tools:** show sources by a *pie diagram*; compute the *mean* distance to a water source; tabulate households with and without safe water; compute the *percentage* served. **Conclusion:** recommend new taps/handpumps, water testing and rainwater harvesting where the data show gaps, with a bibliography.

Question 7

As a representative of a local government, you want to assess the participation of women in various employment schemes in your area. Prepare a project report.

Solution

GUIDED ANSWER **Objective:** to assess how many women take part in government employment schemes (e.g. MGNREGA, self-help groups) and the obstacles they face. **Target group:** women of working age in the area. **Data:** number of women enrolled vs actually working, days of work, wages received, and reasons for low participation (household work, lack of awareness, safety, child care).

Tools: compute the female *participation rate* (percentage); show participation scheme-wise by a *bar diagram*; compute the *mean* days of work and wage; show reasons for non-participation by a *pie*

diagram. **Conclusion:** recommend awareness drives, crèches and timely wage payment, then list the bibliography.

Question 8

You are the Chief Health Officer of a rural block. Identify the issues to be addressed through a project study. This may include health and sanitation problems in the area.

Solution

GUIDED ANSWER **Objective:** to identify the main health and sanitation problems of a rural block.

Target group: households of the block, with the local health centre as a secondary source. **Data:** households with/without toilets, drainage and clean water; common illnesses; access to a doctor or PHC; immunisation status of children. **Tools:** tabulate the data; show toilet/drainage coverage as a *bar diagram* and disease frequency as a *pie diagram*; compute the *percentage* of households with proper sanitation and the *mean* distance to a health centre. **Conclusion:** prioritise the worst problems (e.g. open defecation, unsafe water) and recommend toilets, awareness camps and a sub-centre, with a bibliography.

Question 9

As the Chief Inspector of Food and Civil Supplies department, you have received a complaint about food adulteration in the area of your duty. Conduct a survey to find the magnitude of the problem.

Solution

GUIDED ANSWER **Objective:** to find how widespread food adulteration is in the area. **Target group:** a sample of shops and vendors selling common items (milk, spices, oil, sweets). **Data:** for sampled items, record the result of a simple adulteration test (pass/fail), the item and the type of shop. **Tools:** tabulate item vs result; compute the *percentage* of adulterated samples; show adulteration item-wise as a *bar diagram*. **Conclusion:** report the magnitude (e.g. 'X% of milk samples failed'), name the riskiest items, and recommend stricter checks and consumer awareness, with a bibliography.

Question 10

Prepare a report on Polio immunisation programme in a particular area.

Solution

GUIDED ANSWER **Objective:** to study the coverage and effectiveness of the polio immunisation programme in an area. **Target group:** households with children below five years. **Data:** number of

eligible children, number immunised, number missed, awareness of pulse-polio dates, and reasons for missing doses (use *secondary data* from health records too). **Tools:** compute the *immunisation coverage rate* (percentage); show coverage area-wise by a *bar diagram*; tabulate reasons for missing and show them as a *pie diagram*. **Conclusion:** state how complete the coverage is, where gaps remain, and recommend better publicity and mobile vaccination camps, with a bibliography.

Question 11

You are a Bank Officer and want to survey the saving habits of the people by taking into consideration income and expenditure of the people. Prepare a report.

Solution

GUIDED ANSWER **Objective:** to study people's saving habits in relation to their income and expenditure. **Target group:** a sample of households or account-holders of different income levels. **Data:** monthly income, monthly expenditure, monthly saving, and the form of saving (bank deposit, post office, gold, etc.). **Tools:** tabulate income, expenditure and saving; compute the *mean* saving and the *standard deviation*; compute the *correlation* between income and saving (it should be positive); show the forms of saving by a *pie diagram*. **Conclusion:** conclude how saving rises with income and which saving instruments are popular, then recommend suitable bank schemes, with a bibliography.

Question 12

Suppose you are part of a group of students who wants to study farming practices and the problems facing farmers in a village. Prepare a project report.

Solution

GUIDED ANSWER **Objective:** to study the farming practices and the problems faced by farmers in a village. **Target group:** farmer households of the village (a near-census in a small village). **Data:** crops grown, area of land, source of irrigation, cost of inputs (seeds, fertiliser, labour), yield, selling price and main problems (water shortage, low price, debt, pests). **Tools:** tabulate crop-wise area and yield; show crops by a *pie diagram* and problems by a *bar diagram*; compute the *mean* cost and income per acre and the *net profit*; use *correlation* between irrigation and yield. **Conclusion:** identify the biggest problems and recommend solutions (better irrigation, fair prices, crop loans), with a bibliography.
