INDIAN STATISTICAL INSTITUTE

QUESTION PAPERS

for

The Computer's Certificate Examination

&

The Statistical Field Surveys Certificate Examination

August 1955

.INDIAN STATISTICAL INSTITUTE

COMPUTER'S CERTIFICATE EXAMINATION, AUGUST, 1955

PART IA : SECTION I

Time : 3 Hours   Full Marks : 100

N.B. (a) Answers to the different groups are to be given in separate books.

      (b) Attempt ANY TWO questions from each group.

      (c) All questions carry equal marks.

      (d) Use of Calculating Machines is not permitted.

GROUP A

1. The following table gives the percentage annual expenditure on consumer items, based on a total expenditure of Rs. 3593,304, relating to 3141 sample households. The last row gives expenditure per household calculated from these percentages. Correct any mistakes you detect and copy out the Table with, improvements in arrangement.

TABLE : Annual expenditure on consumption in the rural area : July 1949–June 1950.

Number of sample households : 3141
Total expenditure of the households : Rs. 3593,304

(i) Items	Food	Fuel	Rent	Clothing	Other	Total
(ii) Percentage expenditure	66.3	3.3	0.6	10.5	19.3	100.0
(iii) Expenditure per household (Rs.)	37	748	7	221	121	1144

2. The table below shows the relationship between denominations of weight under three systems :

TABLE

Denomination	System I	System II	System III
Maund	40 seers	40 seers	40 seers
Seer	4 poas	4 poas	5 poas
Poa	4 chhataks	4 chhataks	3 chhataks
Chhatak	5 tolas	6 tolas	4 tolas
Tola	180 grains	180 grains	200 grains

      (i) Taking system I as the standard, express the denominations under systems II and III in terms of standard denominations.

      (ii) Assuming that the maund under all the three systems is of the same magnitude, what are the relative magnitudes of chhatack under the three systems ?

(iii). Assuming that the grain is of the same magnitude in all the three systems, what are the relative magnitudes of pon under the three systems ?

3. Draw a square 2½ inches by 2½ inches with five rows and five columns, partition it into 25 square cells of equal size. In each cell put a letter out of the five letters: A, B, C, D, E, such that the same letter does not appear more than once in any column or row.

GROUP B

4. The following is an account of the performance of students appearing for a certain examination for six colleges :

"Out of 30 students in the first college, 25 appeared for the examination. In the remaining five colleges the total number of students was 53, 36, 40, 34 and 19 respectively. In the second and sixth colleges three candidates each failed to appear in the examination. In each of the remaining three colleges, the number of candidates who failed to sit for the examination was four. The number of students who passed the examination as percentage of those who appeared was as high as 60 per cent in the first and fifth colleges and 50 per cent in the fourth and sixth colleges. From the third, fourth and fifth colleges an equal number of students passed the examination. The number of students who passed out from the second college equals the total number of students who passed from both the first and sixth colleges."

Arrange the above information in tabular form. So far as the performance of the students who appeared for the examination is concerned, which college has the best record ?

5. Complete the following calculations :—

Serial No.	p	q	$p+q$	$p-q$	$2pq$	p^2-q^2	p^2+q^2+2pq :
1	18	12					
2	5	27					
3	16	11					
4	26	19					
5	13	22					
6	4	31					
7	15	0					
8	20	7					
9	4	16					
10	9	5					
Total :							

6. Out of 1200 families investigated in an enquiry, 34 per cent were in the income group less than Rs. 150/- per month, 43 per cent in the income group Rs. 150/- to Rs. 300/- per month, 12 per cent in the income group Rs. 300/- to Rs. 500/- per month and the remaining 11 per cent in the income group Rs. 500/- and above. The expenditure per month per family for 'conveyance' for these four groups of families amounted to Rs. 1428/-, Rs. 2891/-, Rs. 1332/- and Rs. 1584/- respectively. Verify that the average expenditure per family on conveyance by families in the income group Rs. 500/- and above was very nearly twice the corresponding average expenditure for all the 1200 families.

COMPUTER'S CERTIFICATE EXAMINATION, AUGUST, 1955

PART IA : SECTION II

Time : 3 Hours   Full Marks : 100

N.B. (a) Answers to the different groups are to be given in separate books.
   (b) Attempt ANY TWO questions from each group.
   (c) All questions carry equal marks.
   (d) Use of Calculating Machines is not permitted.

GROUP A

1. (a) Solve the equation $98x^2 + 273x = 245$.
   (b) Simplify $1786^3 - 8412^2 + 682^2 \times 123^3 - 10612^2 + 560^3 \times 126^3$.

2. Calculate the standard deviation and the standard error of the mean of the following measurements in inches :

48, 44, 94, 37, 59, 47, 70, 79, 54, 72, 56, 95, 54, 57, 63, 78, 52, 70, 42, 80, 55, 70, 50, 74, 64, 76, 56, 66, 57, 81, 72, 83, 57, 52, 55, 78, 70, 34, 64, 70, 44, 68, 70, 54, 63.

3. The price of flour at each of the 25 shops at town A is Re. 1/- per seer, at each of 16 shops at town B is —/13/6 'pies per seer, at each of the 30 shops at town C is Re. 1/4/- per seer, at each of the 20 shops at town D is -/12/ 9 pies per seer, and at each of the 24 shops at town E is Re. 1/6/- per seer.

(a) What will be the average price of the seer of flour if you buy one seer of flour from each and every shop of all these five towns ?

(b) Will the average price of a seer of flour be different if you take a seer from only one shop of each town ? What is the difference in the price ?

(c) Assuming the average price per seer as calculated in (a) above as the base price, express the price per seer of flour at towns C and E as an index of the same ?

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4. The length of the shadow cast by a vertical pole on the ground was observed at different times on the forenoon of a day and the observations are given below :—

Time at which observations were made	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 noon
Length of the shadow in feet	17.3	10.0	5.8	2.7	0.0

Calculate by simple linear interpolation

(a) the length of the shadow at 10·45 a.m.

(b) the time at which the length of the shadow was 15 feet.

5. The following table gives the average output of paddy per acre and average human labour days required for the cultivation of an acre of land for different size-classes of holdings.

Size of holdings in acres	Output in maunds per acre	Human labour days per acre
0—1	16.54	59.47
1—2	16.42	46.78
2—3	15.35	41.80
3—4	12.66	43.34
4—5	14.20	41.70
5—6	14.04	39.47

Represent the above data graphically to show the relative variations of output of paddy and labour days per acre with increasing size of holdings.

6. The dry weight and ash weight in grams of 20 sample seedlings are given below :

Sample seedling No.	Dry wt. in gms.	Ash. wt. in gms.	Sample seedling No.	Dry. wt. in gms.	Ash wt. in gms.
1	15.5	4.5	11	19.3	5.3
2	10.0	4.0	12	26.2	8.2
3	20.3	6.1	13	18.0	5.8
4	19.6	7.2	14	8.5	3.6
5	20.8	5.6	15	15.0	4.4
6	15.1	5.7	16	20.6	7.5
7	16.7	5.9	17	16.1	5.1
8	23.7	7.1	18	20.9	7.6
9	18.3	6.6	19	20.3	6.5
10	14.6	4.0	20	14.0	5.1

Show the relationship between ash weight and dry weight of the seedlings graphically wherefrom derive the average ash weight of seedlings having dry weight of 15 gms.

PART IB : SECTION I (FOR BATCH I)

Time : 3 Hours   Full Marks : 100

N.B. (a) Answers to the different groups are to be given in separate books.

(b) Figures in the margin indicate full marks.

(c) Use of Calculating Machines is permitted.

`GROUP A`

1. Measurements of height nearest to inches and of body-weight nearest to units of ten pounds were recorded for 100 workers.

There was only one worker with a height of 61 inches and a weight of 8 units.

Out of 7 cases with a height of 62 inches,—one, three, two and one weighed 8, 9, 10 and 11 units respectively.

Out of 11 cases with a height of 63 inches,—one, two, six and two weighed 8, 9, 10 and 11 units respectively.

Out of 19 cases with a height of 64 inches,—one, three, four, eight, two and one weighed 8, 9, 10, 11, 12 and 13 units respectively.

Out of 21 cases with a height of 65 inches,—one, six, nine, four and one weighed 9, 10, 11, 12 and 13 units respectively.

Out of 23 cases with a height of 66 inches,—two, four, eleven, three, two and one weighed 9, 10, 11, 12, 13 and 14 units respectively.

Out of 8 cases with a height of 67 inches,—one, three, two, one and one weighed 10, 11, 12, 13 and 14 units respectively.

Out of 8 cases with a height of 68 inches,—one, two, three, one and one weighed 10, 11, 12, 13 and 14 units respectively.

Out of 2 cases, with a height of 69 inches, one weighed 12 units and the other had a weight of 15 units.

Calculate the correlation coefficient between height and body-weight.   (25)

2. On the data given above, calculate β_1 and β_2 for body-weights.   (25)

Or,

3. On data given in Q. 1, compute the Mean body-weight together with the standard deviation and the coefficient of variation, separately for the two groups enumerated below :—

(a) those with a height of 65 inches or below

(b) those with a height above 65 inches   (25)

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4. The data given below relate to the conversion efficiency measured daily of a pressure oxidation plant for the manufacture of nitric acid from ammonia. After seven days the plant is stopped temporarily and the catalyst subjected to a re-vivyfying treatment.

MEASURES OF CONVERSION EFFICIENCY

Run No.	1	2	3	4	5	6	7
Day 1	60	64	14	30	67	72	35
2	62	63	46	41	42	38	35
3	58	63	46	40	43	46	33
4	52	36	39	41	38	47	46
5	31	34	42	37	37	38	47
6	23	32	43	17	33	60	47
7	26	27	57	12	26	41	38

Analyse whether there are significant variations in the efficiencies between the various days and between the various runs. (30)

5. On certain operations in one machine shop, subgroups of five components were measured every half-hour. The means X of the subgroups are as follows :—

Subgroup No. t	X_t
1	0.6417
2	0.6418
3	0.6424
4	0.6431
5	0.6433
6	0.6437
7	0.6433
8	0.6436
9	0.6441
10	0.6444
11	0.6456
12	0.6457
13	0.6454

Fit a parabola of the second degree

$$X = a + \beta t + \gamma t^2$$

by the method of least squares. (20)

PART IB : SECTION I (FOR BATCH 2)

Time : 3 Hours   Full Marks : 100

N.B. (a) Answers to the different groups are to be given in separate books.

(b) Figures in the margin indicate full marks.

(c) Use of Calculating Macihincs is permitted.

GROUP A

1. Measurements of height, waist-grith and body-weight for 60 workers are given below :—

Work out :—

(a) Coefficient of correlation between waist-girth and body-weight.

(b) Linear regression coefficients of body-weight on waist-girth.   (25)

Serial No.	Height (Inches)	Body wt. (lbs.)	Waist Girth (inches)	Serial No.	Height (inches)	Body Wt. (lbs.)	Waist Girth (inches)
1	66	106	25	31	68	126	26
2	64	106	27	32	65	111	27
3	68	100	24	33	64	98	26
4	66	129	28	34	63	105	24
5	66	131	29	35	65	112	25
6	72	135	30	36	62	138	32
7	66	116	27	37	64	98	26
8	67	105	25	38	65	111	27
9	66	145	32	39	65	122	29
10	67	108	25	40	66	131	31
11	66	116	30	41	63	106	27
12	66	126	29	42	66	90	23
13	66	180	40	43	68	112	28
14	66	117	28	44	64	98	25
15	66	113	27	45	68	139	31
16	67	123	31	46	65	126	31
17	67	111	26	47	69	130	28
18	64	102	25	48	66	111	26
19	64	106	26	49	62	102	25
20	65	104	24	50	67	122	26
21	63	111	26	51	64	135	33
22	65	104	24	52	66	136	43
23	66	136	33	53	63	98	26
24	68	143	32	54	66	94	24
25	68	148	33	55	62	130	31
26	67	164	36	56	62	105	26
27	67	139	34	57	66	111	25
28	59	110	29	58	70	161	36
29	61	94	24	59	63	145	36
30	59	89	26	60	67	108	26

2. For the data of Question 1, find the average body-weight for each of the following classes of workers :— (25)

    (a) those with a height of 65 inches or below and a waist-girth below 30 inches.

    (b) those with a height of 65 inches or below and a waist-girth above 30 inches.

    (c) those with a height above 65 inches and a waist-girth below 30 inches.

    (d) those with a height above 65 inches and a waist-girth above 30 inches.

Or,

3. For the data of Question 1, calculate β_1 and β_2 for 'height'. (25)

GROUP B

4. In a factory, where finished product is packed in sacks of 50 Kgs each, the weighing and packings are carried out by 6 machines which are fed from the same store. At certain intervals a control sack is taken from each machine and its weight noted. The data are given below :—

WEIGHTS OF CONTROL SACKS
(in Kgs)

Sample No.	Machine No.					
	1	2	3	4	5	6
1	50.6	50.5	50.7	50.2	50.5	50.4
2	50.1	50.4	50.5	50.2	50.1	50.4
3	50.1	50.6	50.8	50.4	50.7	50.8
4	50.2	50.4	50.0	50.2	50.0	50.5
5	50.1	50.5	50.7	50.1	50.3	50.3
6	49.2	49.3	49.3	49.2	49.3	49.0
7	50.1	50.3	50.3	50.3	50.0	50.1
8	49.9	50.3	49.9	50.1	49.8	50.2
9	49.8	50.1	50.2	50.0	49.7	50.1
10	49.8	50.1	50.0	49.9	49.7	49.9

Examine whether there are significant variations between the various samples and between the various machines. (30)

5. The following table gives the percentage dry matter (x) in fresh spinach and the percentage preserved ascorbic acid (y) after drying at 90°C.

x	y	x	y
10.0	70.9	9.5	61.9
8.9	74.0	10.8	65.2
8.9	58.6	11.1	77.2
9.2	80.6	11.2	89.6
7.8	69.4	12.5	74.2
10.2	76.0	12.3	83.1
9.0	66.4	10.0	66.7
8.2	50.9		

    (i) Find the regression line of y and x.

    (ii) Obtain the graduated values for y and plot them on a graph paper together with the observed value. (20)

PART IB : SECTION II (FOR BATCH 1)

Time : 3 Hours   Full Marks : 100

N.B. (a) Answers to the different groups are to be given in separate books.
     (b) All questions carry equal marks.
     (c) Use of Calculating Machines is permitted

GROUP A

1. Evaluate the following :—
   (a) (i) $\log 55.6782$,
           2.3596

   (ii) z^{z^z} where $z = 2.345$

   (b) A potential buyer of light bulbs bought 50 bulbs of each of two brands. Upon testing these bulbs he found that brand A had a mean life of 1282 hours with a standard deviation of 80 hours, whereas brand B had a mean life of 1208 hours with a standard deviation of 94 hours. Do the two brands differ in quality ?

2. The frequency distribution of weights in gms. of a number of iron balls is shown below :—

Weight	Frequency
67.8—69.0	6
69.0—70.2	30
70.2—71.4	42
71.4—72.6	66
72.6—73.8	94
73.8—75.0	120
75.0—76.2	102
76.2—77.4	60
77.4—78.6	54
78.6—79.8	14
79.8—81.0	12

Fit a normal curve to the above frequency distribution and draw the fitted curve. Obtain the expected frequencies for the classes: 69.0—70.2, 72.6—73.8, 73.8—75.0, 76.2—77.4, 78.6—79.8.

GROUP B

3. Supply any three of the following items of information (official publications may be used) :—

(i) Find out the total quantity and value of mica exported from India during three consecutive years (latest figures to be given). The share of the different States should be shown separately in a tabular form.

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(ii) Which state in India exported the maximum amount of oil seeds to West Bengal during the half-year ending on 30-9-52 ? The amount of exports from other States to West Bengal may also be shown in a tabular form.

(iii) Calculate the expenditure incurred on Education in 1946-47 for 100 (a) College students, (b) School students for Bombay, Madras, U.P. and West Bengal.

(iv) Estimate the proportion of area under cultivation to total area in those regions of Indian States for which statistics are avaiable for the year 1938-39. For the above tract of land, calculate the proportion of irregated areas under rice and wheat to the total area under those crops.

4. Draw up a cumulative frequency graph of the following distribution of consumption of electricity in KillowattHours used by 75 residential consumers in one month and hence find (a) the median and (b) the two quartiles.

KILOWATT-HOURS OF ELECTRICITY USED IN
ONE MONTH BY 75 RESIDENTIAL CONSUMERS

Consumption in Kilowatt-Hours	Number of consumers
5— 24	4
25— 44	6
45— 64	14
65— 84	22
85—104	14
105—124	5
125—144	7
145—164	3
Total :	75

Or,

(i) Draw bar diagram to represent the following facts :—

India imported 223,142 tons of sugar in 1935, 201,158 tons in 1936, 23,075 tons in 1947, 14,389 tons in 1939. Of the total quantities the share of Java was 176,146 tons in 1935; 150,416 tons in 1936; 15,022 tons in 1947; 10,293 tons in 1938 and 24,510 tons in 1939 and the rest came from various countries.

(ii) Represent the following figures suitably on a graph paper and predit the population for 1955 :

GROWTH OF POPULATION IN WEST BENGAL

Year	Number
1891	1,46,86,000
1901	1,58,34,000
1911	1,67,93,000
1921	1,64,01,000
1931	1,76,63,000
1941	2,18,37,000
1951	2,48,10,000

Time : 3 Hours   Full Marks : 100

N.B. (a) Answers to the different groups are to be given in separate books.

   (b) All questions carry equal marks.

   (c) Use of Calculating Machines is permitted.

GROUP A

1. (a) (i) Find the ordinates of the curve

$$Y = 1363.71 \left(1 + \frac{x^2}{276.16} \right) - 22.63$$

at $x = 1.9791$, 2.9791, 3.9791 and 5.9791.

   (ii) Making use of Fisher and Yates' tables, find the 5 per cent point of z with

$$\begin{array}{ll} \text{(i)} \ n_1 = 20, & n_2 = 20 \\ \text{(ii)} \ n_1 = 50, & n_2 = 30 \end{array}$$

   (b) The data below given the numbers of persons with black and brown eyes observed in five groups of families :—

	F_1	F_2	F_3	F_4	F_5
Black	21	51	94	106	125
Brown	15	18	34	15	15

   Does the proportion of black and brown differ from family to family ?

2. Given below is the distribution of 500 rivets according to diameter of their heads in millimetres.

Class midpt.	No. of rivets	Class midpt.	No. of rivets
13.07	1	13.47	72
13.12	4	13.52	68
13.17	4	13.57	41
13.22	18	13.62	18
13.27	38	13.67	12
13.32	56	13.72	2
13.37	63	13.77	1
13.42	96		
		Total :	560

   Fit a normal curve to the above frequency distribution and draw the fitted curve.

   Obtain the expected frequencies for the classes with mid points 13.27, 13.32, 13.37, 13.42, 13.47, 13.52.

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3. (i) Represent the data graphically and write a critical note.

FOREIGN TRADE OF INDIA
(Merchandise only Rs. in crores)

Year	Import	Export	Balance of Trade
1939-40	164.75	213.57	48.82
1943-44	117.68	209.99	02.31
1946-47	288.44	319.28	30.84
1947-48	398.62	403.19	4.57
1948-49	518.00	422.82	05.18
1949-50	553.00	463.34	89.66
1950-51	548.53	579.84	31.31

(ii) Construct a pie chart for the following data which represent the 'Revenue Expenditure' of a State for a particular month under five different heads mentioned below, assuming that these represent the total expenditure :—

1.	Irrigation	..	Rs. 9,41,388/-
2.	General Administration	..	Rs. 21,17,328/-
3.	Police	..	Rs. 47,40,107/-
4.	Education	..	Rs. 48,04,422/-
5.	Medical and public health	..	Rs. 42,54,102/-

(i) Prepare a table showing the area, population and density of population for each State (Part A and Part B) of India during Census 1951.

(ii) Find out the area under Chillies, tobacco and mulberry in Malda district of the West Bengal State during 1931, 1941 and 1951 Census.

Or,

(i) Represent graphically the Index Numbers (July 1914 = 100) of whole-sale prices of following places. Also write a critical note on the same.

PRICE INDICES

Year	Bombay	Karachi	Calcutta
1923	181	148	172
1924	182	154	173
1925	163	151	159
1926	149	140	148
1927	147	137	148
1928	146	137	145
1929	145	133	141
1930	126	108	116
1931	109	95	06
1932	109	99	91
1933	98	97	87
1934	95	96	89
1935	99	99	91
1936	96	103	91
1937	106	108	102

(ii) Show by means of circular diagrams the following information regarding the number of female scholars in recognised institutions in India :

	1930-31	1935-36
In Arts Colleges	2,744	5,329
In High Schools	85,879	1,23,949
In Middle Schools	1,70,897	2,16,010
In Primary Schools	19,81,549	25,05,077

COMPUTER'S CERTIFICATE EXAMINATION, AUGUST, 1955

PART IC : SECTION I

Time : 4 Hours   Full Marks : 100

N.B. (a) Answers to the different groups are to be given in separate books.

(b) All questions carry equal marks.

(c) Use of Calculating Machines is permitted.

GROUP A

1. (a) For a certain distribution of 25 observations the mean was found to be 56 inches and the standard deviation 2 inches. After these results were computed it was discovered that a mistake had been made in one of the observations which was recorded as 64 inches. Find the mean and the standard deviation if the incorrect observation 64 is omitted.

* (b) Find graphically a value of x lying between 15 and 20 satisfying the equation

$$2 \cdot 5 \, \log_{10}x + \frac{x^2}{100} = 6.35$$

2. In the table given below the first and last columns form a frequency distribution and columns (1) to (8) its subdistributions whose totals add upto 260 which is also the sum of the last column.

y	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	f
135					2	3	2		7
125			1	3	1	4	4	4	17
115			5	7	8	11	8	7	46
105		2	1	10	12	9	8	2	44
95	1	3	12	11	7	12	7	1	54
85	2	1	5	6	16	8	5		43
75	2	5	5	8	8	6	1		35
65	2	3	3	4	1	1	1		14

Find the mean and variance of each of the columns (1) to (8) separately and using these computed values find the mean and variance of the combined distribution. Check the last two results suitably.

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(Answer ANY TWO QUESTIONS)

3. The following table gives the potato yields (y) in lbs, per acre conducted in a randomised block experiment together with the number of plants (n) per plot. The treatments used are different types of fertilizers.

Fertilizer		BLOCKS			
		1	2	3	4
None	y	34.0	53.4	19.9	48.5
(o).	n	91	94	90	90
Superphosphate	y	48.5	49.1	44.9	49.2
(p)	n	90	88	89	94
Muriate of Potash	y	45.2	69.0	41.3	67.6
(k)	n	93	94	87	96
p+k	y	71.1	48.5	68.9	61.3
	n	91	91	92	91

Is there any significant difference between the fertilizers ? Does your answer differ when the yield figures are adjusted for the No. of plants ?

4. The following data given the weight of sun flowers on the different days

Day	Weight	Day	Weight
1	3.20	6	3.23
2	3.23	7	3.18
3	3.25	8	3.13
4	3.26	9	3.06
5	3.25	10	2.98

Fit a parabola of (i) the second degree

(ii) the third degree

to the above data and find the residual sum of squares in each case.

Also plot the actual and estimated weights. Do you think that the cubic gives a better fit than the quadratic ?

5. The following data are for intelligence test (I.T.) score grade point averages (G.P.A.) and reading rates (R.R.) for 16 students :

I.T.	295	152	214	171	131	178	225	141
G.P.A.	2.4	0.6	0.2	0.0	1.0	0.6	1.0	0.4
R.R.	41	18	45	29	28	38	25	26
I.T.	116	173	230	195	174	177	219	236
G.P.A.	0.0	2.6	2.6	0.0	1.8	0.0	0.4	1.8
R.R.	22	33	39	38	24	32	26	29

(a) Find the equation of the regression line of G.P.A. on I.T. scores and R.R.

(b) Find the equation of the regression plane of G.P.A. on I.T. scores and R.R.

(c) By making appropriate tests of significance, determine whether (b) is considerably better than (a) for estimating G.P.A.

PART IC : SECTION II

Time : 4 Hours
Full Marks : 100

N.B. (a) Answers to the different groups are to be given in separate books.

(b) Answer ANY FIVE questions.

(c) All questions carry equal marks.

(d) Use of Calculating Machines is permitted.

GROUP A

1. Evaluate the following determinant :—

3429	−5536	1047
−7351	6207	2231
−4415	−4192	7603

2. The following data represent the results of a randomised block design for five treatments in four blocks :—

Treatment		A	B	C	D	E
Block	I	227	480	341	252	342
	II	221	408	312	171	431
	III	160	457	303	203	257
	IV	119	454	276	289	470

Draw the analysis of variance table and test the following :—

(i) whether the effects of all treatments are equal,

(ii) whether the effects of treatments B and E are equal.

3. Find out β_1 and β_2 for the following frequency-distribution :—

Class interval	Frequency
0— 4	11
5— 9	116
10—14	274
15—19	451
20—24	432
25—29	267
30—34	116
35—39	16

Find out the suitable Pearsonian curve that may be fitted to the data and draw the curve over the Histogram. Calculate the expected frequency in the class-interval 5–9.

GROUP B

4. (a) Using a suitable interpolation formula, find the value of $\sin x$, at $x = 23.578°$, when the function is given for the following values of x :—

$$\begin{array}{cc}
x & \sin x \\
0° & 0 \\
10° & 0.17365 \\
20° & 0.34202 \\
30° & 0.50000 \\
40° & 0.64279 \\
50° & 0.76604
\end{array}$$

(b) From the given table of values of $x^{\frac{1}{3}}$, evaluate $(33.2416)^{\frac{1}{3}}$.

$$\begin{array}{cc}
x & x^{\frac{1}{3}} \\
29 & 4.07232 \\
30 & 3.10723 \\
31 & 3.14318 \\
32 & 3.17480 \\
33 & 3.20753 \\
34 & 3.23961
\end{array}$$

5. The following table gives data on total monthly expenditure of a Government from April 1949–March 1953 (in thousands of rupees). [March 1949, figures is 736].

	1949-50	1950-51	1951-52	1952-53
April	760	765	910	854
May	787	659	794	832
June	525	554	658	592
July	559	560	681	590
August	557	519	665	574
September	850	781	1038	1049
October	993	1104	1140	1025
November	789	963	968	974
December	680	893	792	788
January	685	873	801	886
February	694	696	726	810
March	685	773	705	784

Find the seasonal indices by the method of moving average.

6. Indicate the sources of information and compile the data required, for the following items, by using the statistical reports or publications supplied to you.

    (a) Total number of engineering graduates and general arts and science under-graduates in Indian Union for latest available two consecutive years.

    (b) Total number of inland telegrams in the Indian Union for three consecutive years.

    (c) Total yield of food-grains, with separate figures for rice, wheat, etc., in Indian Union for two consectuive years.

    (d) Figures for monthly exports of pig-iron, for latest available one year period.

    (e) Total number of labourers employed in the Jute Mills, and other factory workers separately for the latest available period.

INDIAN STATISTICAL INSTITUTE

STATISTICAL FIELD SURVEYS CERTIFICATE EXAMINATION, AUGUST, 1955

PART 1 : SECTION A. (THEORETICAL)

Time : 3 Hours   Full Marks : 100

N.B. (a) Figures in the margin indicate full marks.

(b) Whenever you are asked to give information for your native State or Stae of Domicile, mention the name of the State.

1. What are the different classes of railway travel and the basic rates charged for each of the Indian State Railways ?

Calculate the fare from Howrah to Nagpur, a distance of 703 miles, by 2nd class and 3rd class when travelling by (a) the Bombay Mail, and (b) the Nagpur Passenger train. (10)

2. Answer *any two* of the following :—

(a) Name the Districts, Sub-divisions and important railway junction stations of your native State. (6)

(b) Mention the acreage, yield and sowing and harvesting seasons of any three of the following crops in your State during the last two years—Paddy, Wheat, Sugar-cane, Jute, Oilseeds. (6)

(c) Mention the names of the Districts of your State which are mainly one cropped or multiple cropped. State reasons why some of them are one cropped. Do you think the one cropped land can be conveniently converted into double or multiple cropped area ? If the answer is in the affirmative, describe your suggestions. If the answer is negative, give reasons. (6)

(d) What are the important crops which are grown in the largest area of the State. Give the total area and yield of two of them in either 1953 or 1954. Compare them with the area and yield as in the previous year. Give reasons for the changes, if any. (6)

3. Answer *any three* of the following :

(a) What is the density of population in your State according to the last census ? Name the districts of your State with the *highest* and lowest density. (6)

(b) Mention the principal flooded areas, forest areas and hilly areas of your State naming districts in which they are situated. Also mention the districts of the State which are adjoining those districts. (6)

(c) State the administrative organisations, if any, in the village, union, circle and tehsil of one district of your State giving short notes on their functions. (6)

(d) Describe the journey from the capital of your State to the Head quarters of the district of the State which is farthest therefrom, by railway, streamer, or any other transport mentioning the places of change, if any, enroute. (6)

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3

4.   *Either*

(a) An officer brought a ticket for a journey by first class on a mail train of Indian railways for Rs. 38/8/- and got his personal belongings weighed. He was charged Rs. 5/4/- as the freight of the excess luggage. Calculate the miles he travelled and the weight of the excess luggage. What would have been the expenses if he travelled by second class ?   (8)

Or,

(b) (i) What are the postal charges for sending some mauza maps weighing 44 tolas when sent by (a) registered parcel, (b) a registered book post ?   (4)

(ii) Rs. 80/12/- are to be sent to an investigator. What are the charges when sent by (a) money order, (b) telegraphic money order and (c) express telegraph money order when the name and address of the payee consists of 12 words ?   (4)

5. Answer *any one* of the following :—

(a) (i) In an election, there were two candidates *A* and *B*. Two fifths of the electors who gave votes, voted for *A* who was elected by a majority of 200 votes over *B*, while one-third of the electors did not vote at all. How many electors were there altogether ?   (4)

(ii) If oranges are bought at 12 for 10 as. and sold at 10 for 12 as., what is the gain per cent ?   (4)

Or,

(b) It was decided to apply chemical manure to a paddy plot of 12′ × 12′ in three dozen at the rate of 100 lbs. per acre, 80 lb. per acre and 80 lbs. per acre respectively. How many ounces of manure are required ?   .   (8)

6. Answer *any two* of the following :—

(a) Express 200 sq. miles in acres.   (5)

(b) $\dfrac{2.6 \times 2.6 \times 2.6 + 4.5 \times 4.5 \times 4.5}{7.1}$ of Rs. 6·4 as.   (5)

(c) Evaluate

(0.3 of Rs. 4·6·10 p) + ¼ of (Rs. 17·8·5 p) − ⅔ of (Rs. 13·1·5 p)   (5)

(d) The area of a village map was found as 288 sq. inches. The scales of the map was 16 inch = 1 mile. Calculate the area of the village.   .   (5)

7. Answer *any one* of the following :—

(a) The annual assessable income of a man is Rs. 10,000/-. He pays income tax at the rate of 9 pies per rupee for the first Rs. 3000/- and one anna per rupee for the rest. Find the income tax for one year.   (6)

(b) Spending at the rate of Rs. 100/- per month for 7 years, I had incurred some debt which was subsequently cleared by reducing my yearly expenditure to Rs. 880/- for 9 years. Find out my annual income which remained unchanged during the whole period.   (6)

8. Answer *any two* of the following :—

(a) Find by practice the cost of 12 tons 13 cwt. 3 qr. 26 lbs. of coal at Rs. 20·6as.·8ps. per ton.

(b) Two persons going to the same place had 8 maunds of luggage between them and were charged excess fare for the luggage at Rs. 8/- and Rs. 4/- respectively. Had all the luggage belonged to one person, he would have been charged Rs. 14/- for excess. Calculate how much luggage is allowed free and how much each had. (6)

(c) Three villages x, y and z are situated in such a way that y is just 5 miles on the north of x and z is 12 miles on west of x. Find the distance between y and z. (6)

9. The family budgets of three middle class families F_1, F_2 and F_3 during a half-yearly period were as under :—

Period	F_1		F_2		F_3	
	Income	Expenditure	Income	Expenditure	Income	Expenditur
1st month	236	253	169	186	210	224
2nd -do-	217	234	183	171	197	186
3rd -do-	198	245	175	189	203	193
4th -do-	219	211	172	175	215	226
5th -do-	244	239	157	187	193	201
6th -do-	224	228	164	190	200	212

Calculate the average income and average expenditure for (a) each family per month, (b) all families taken together month by month.

Making use of all relevant data, express in percentage the surplus or deficit of average income per family during the entire period over the corresponding average expenditure. (12)

Neatness. .(4)

STATISTICAL FIELD SURVEYS CERTIFICATE EXAMINATION, AUGUST, 1955

PART 1 : SECTION B (THEORETICAL)

Time : 3 Hours   Full Marks : 100

N.B (a) Figures in the margin indicate full marks.
   (b) Mention the name of Native State or State of Domicile whenever you are asked to give information about your State.

1. Answer any two of the following :—
   (a) Name all the Part B States of Indian Union and their Headquarter towns. (8)

   (b) Describe the course (Name the States in Indian Union through which it flows) of any one of the following rivers mentioning the name of the important towns situated on its banks. (8)
       (i) Ganges, (ii) Jamuna, (iii) Godavari, (iv) Kaveri, (v) Brahmaputra,

   (c) Give any four of the following information in respect of your Native State or State of Domicile :— (8)
       (i) No. of Divisions, (ii) No. of districts (iii) No. of Tehsils or circles,
       (iv) No. of Thanas, (v) No. of villages, (vi) Names of towns, if any, having more than two lakhs population.

2. Answer *any four* of the following :—

(a) What will be the postal charges for remitting Rs. 80/- by express tele-graph money order to the address given below :—

> Samir Bose,
> 48/F, Daryaganje,
> Delhi.

with a message of 8 words ? (4)

· (b) What will be the charges for remitting Rs. 750/- by Insured Post or by M.O. ? How can this be sent by M.O. ? (3)

(c) What will be the charges for sending a packet weighing 100 tolas by registered parcel and by unregistered bookpost ? (4)

(d) After how many miles of travelling can a passenger having a First Class single journey ticket for 1223 miles, (4)

  (i) break his journey first ?
  .. (ii) at how many stations can be break journey thereafter ?
    (iii) for how many days in any one station ? and
    (iv) for how many days in all ?

(e) Name (i) three articles which cannot be carried as personal luggage, (ii) two classes of persons who are not allowed to travel in passenger trains. (4)

(f) You have purchased a ticket from station A to station B. You want to proceed further to station C by same train. How would you obtain a ticket for journey from B to C ? (4)

3. (a) Name five most important crops of your Native State in order of import-ance and state the seed rate per acre and the seasons for ploughing, sowing or trans-planting and harvesting seasons of the last two of your list. (8)

(b) Give the following information for the most important cereal crop and also for the most important cash crop in your State or State of Domicile for last two years.

> (i) Total acreage, (ii) Yield per acre in maunds, (iii) Seed required per acre, (iv) Total yield in suitable units (unit of measurement should be mentioned). (8)

4. Answer *any two* of the following :— •

  (a) A rectangular field 120 ft.×100 ft. has a grass plot 60ft.×50 ft. in the centre Find the cost of paving the rest of the area at Rs. 4/8/- per square yard ? (8)

  (2) Find the value of $\sqrt{119025} - (5.96)^2$ correct to 2 places of decimals. (8)

  (3) A sum of money trebles itself in 40 years. In how many years did it double itself ? (8)

5. (a) When two or three crops are grown in a plot in mixture (as distinct from one crop following the other in the same plot during the same season) how would you estimate the proportion of area and outturn under each crop separately so as to make them comparable with the usual procedure of estimation in the case of single crop cultivated in a plot ? (8)

(b) In crop-cutting experiment, how do you locate and mark out a sample cut within a paddy plot chosen at random ? What procedure do you adopt in respect of plants falling along the proremeter (border) of the sample area ? (8)

6. A part of a filled-in schedule is given below. Scrutinise the schedule and point out the mistakes, if any. (Answer should be written in the answerpaper and attached to the answer book). (16)

  Neatness. (4)

STATE: Punjab,   DISTRICT: Ferozepur,   THANA: Mukmar,   VILLAGE: Chaklamochar,   SAMPLE HOUSEHOLD No. 5.

HOUSEHOLD SIZE: 6,   MONTHLY EXPENDITURE CLASS: Rs. 50–100,   LAND POSSESSED: 0.06 ACRES.

BLOCK II

Sr. No.	Item	Unit of measurement			Purchase in exchange of				Consumption out of home grown		Total consumption		
		Standard	Local	Standard units per local unit	Money		Goods and				Quantity		Values Rs. 00
					Qty. local 00.00	Value Rs. 00.00	Qty.	Value Rs. 00.00	Qty. local 00.00	Value Rs.	Local 00.00	Std. 00.00	
1.	Paddy (unhusked)	Sr.	Sr.	1.00	5.00	10.00					5.00		10.00
2.	Rice (husked)	Sr.	Sr.	1.00	30.00	16.00			60.00	3.00	36.00		48.00
3.	Wheat	Sr.	Mds.	1/40	0.50	13.00					0.50		13.00
4.	Milk	Sr.	No.	1.00									
5.	Bananas	No.											
6.	Orange	No.	No.	1.00	12.00	0.75					12.00		0.75
7.	Foreign Liquor	Pint	Bottle	4.00					1.00	10.00	1.00		10.00
8.	Tea (cup)	No.	No.	1.00			50.00	3.12			50.00		3.12
9.	Tea (lb)	lb.											
10.	Matches	No. of sticks	Match box	1/40	4.00	0.19					4.00		0.19
11.	Dhoti	Yds.	No.	1/5									
12.	Saree	Yds.	No.		3.00	9.75					3.00		9.75
13.	Shirts	No.	No.	1.00	2.0	4.00					2.00		4.00
14.	Certain, Table clothings	No.	Yds.	1.00									
15.	Other Expenses	Yds.			13.00	22.50					15.00		22.50

PART 1 : SECTION C (THEORETICAL)

N.B. (a) Figures in the margin indicate full marks.

    (b) Use of Calculating Machines is not permitted.

    (c) Wherever you are asked to give information about your State, mention the name of the State.

Time : 3 hours   Full Marks : 100

1. Answer *any three* of the following :—

(a) Describe a journey from London to Bombay *via* the Cape of Good Hope. State the countries you would pass through with the names of the oceans traversed.   (4)

(b) What do you know of *any three* of the following :—

    (i) Ottawa, (ii) Montreal, (iii) The Andes, (iv) The Nile, (v) Canberra, (vi) The Volga.   (4)

(c) State the name of the important ports of the following countries —

    (i) Soviet Russia, (ii) Canada, (iii) China and (iv) Turkey.   (4)

(d) State the names of the countries which lie (i) north of Pakistan, (ii) east of Turkey and (iii) South west of China.   (4)

(e) What is the shortest land route from Kabul to Paris ?   (4)

2. Answer any *three* of the following :—

(a) What is the total scheduled caste population of your State (excluding scheduled tribes), according to the last census ? Which is the district with the highest concentration of scheduled castes ? In which district is the concentration lowest ?   (4)

(b) Give the area of your State under (i) current fallow, (ii) cultivable waste excluding current fallows, (iii) area not available for cultivation. Define the categories and mention the source of your information.   (4)

(c) What is the total cropped area of your State and the area sown more than once ? State the cropping programme followed in respect of the latter area.   (4)

(d) Give the total number of milch and other cows of your State according to the last Cattle Census. What do you know of Free Inidia's Cattle improvement programme ?   (4)

(e) What are, according to the latest published census reports, the districts of concentrations of minority community in your State ? What percentage of the total population of the District such minority community constitutes ?   (4)

3. Answer any *three* of the following :

(a) Describe the seasonal pattern of rainfall in your State and their relation with the crop seasons.   (6)

(b) What are the reasons for preference to cultivation of each of the following four crops in India ? (i) Paddy, (ii) Wheat, (iii) Jute and (iv) Cotton.   (6)

(c) What are the irrigation implements in use in your State ? What are the present sources of irrigation ? Also give the percentage of irrigated area to cultivated area of your State at present. (6)

(d) What are the districts with the lowest rainfall in your State ? What are the methods of artificial irrigation, if any adopted for the cultivation of major crops of the districts ? State briefly the sources of irrigation and implements in use. (6)

4. Answer any *three* of the following :—

(a) What are the rules and terms of share cropping in your State ? Do you think the system of share-cropping is favourable for the adoption of improved agricultural practices ? Give reasons for your reply. (6)

(b) What are the usual wage rates and other conditions of employment of, rural labourers in your States ? Are there any variations in the types of work in which they are employed in the different quarters of the year beginning from January ? (6)

(c) What are the sources from which you can obtain the following :—
  (i) List of households and list of plots in villages and classification thereof,
  (ii) Prevalent rates of wages for labourers
  (iii) Prevalent wholesale and retail prices of ordinary commodities used by people in rural areas. (6)

(d) State briefly the functions and designations of the principal officials of the following in the Districts of your State :—
  (i) Union Board, (ii) Village Panchayat, (iii) Revenue Administration,
  (iv) Civil Justice, (v) Irrigation. (6)

5. What are the merits and demerits of a random sample survey and a complete census ? (10)

* 6. It is proposed to carry out a random sample survey regarding the extent of rural indebtedness, underemployment and unemployment in rural areas of your State.

The survey will be restricted to 500 sample villages. A list of households will have to be prepared for each such village and 30 households will be selected by random sampling in each of these villages for the enquiry.

Assuming that six schedules designed for the enquiry can be filled up by an Investigator per day and that there will be an Inspector over 4 Investigators and one supervisor over 6 inspectors to ensure adequate supervision, give a detailed estimate of staff and cost for field survey, if the survey has to be carried out in three months including all operations and usual wastage. (20)

7. What are the various types of possible non-sampling errors, which may reflect in the estimates arrived through a sample survey based on interview method ? Mention some of the important sources of such errors and the steps you take to reduce them. (10)

—————

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N.B. (a) Attempt *any four* questions.
      (b) Figures in the margin indicate full marks.
      (c) Use of calculating machines is not permitted.

Time : 3 hours   Full Marks : 100

1. (a) The value of consumption (in thirty days) of food grains of a random sample of 100 families in an urban area are given in the attached sheet.

Prepare frequency chart with 12 equal class intervals and calculate the standard deviation and coefficient of variation and give your comments on the result from administrative point of view.   (15)

(b) The acreage under jute for six years and its percentage to normal acreage are given below. Five figures are missing. Find out these missing figures.

Year	Acreage under Jute during the year	Percentage of the years acreage to the normal
1945	8467	107.31
1946	6328	80.20
1947	6496	.... (b)
1948	.... (a)	.... (c)
1949	9726	123.27
1950	7650	.... (d)
6 years average	7861	.... (e)

                                                         (10)

2. (a) Prepare a schedule of enquiry with a view to bring out the present economic conditions of any *one* of the following small scale manufacturing establishments in your State—(i) handloom, (ii) Bidi, (iii) carpentry.   (15)

(b) What are the major items of information included in your schedule ? Discuss the nature of inference that is intended to be drawn from these data either by themselves or in conjunction with others.   (10)

3. It is proposed to conduct an integrated sample survey in a state with an area of 25,000 sq. miles for :—

(a) An area survey with a sample of 10 cluster of 40 plots each from each of 400 villages,

(b) A study of the socio-economic conditions relating to employment and unemployment and consumer expenditure pattern from 12 households from each of a sub-sample of 200 villages, and

(c) A crop yield survey by crop-cutting experiments with two cuts per cluster in the first two clusters in a village from a sub-sample of 100 villages.

The crop survey and crop-cutting is to be done in respect of the following crops of which sowing/transplanting periods and harvesting periods are shown below :—

Crop	Sowing/transplanting period	Harvesting period
Autumn (Bhadui)	March-April	July-August
Winter	June-July	December-January
Rabi	October-November	March-April

(a) Draw up a complete list of field organisation that would be necessary for carrying out the above work mentioning the work-load proposed for each field worker and inspecting staff.

(b) Draw up also a time programme for the above work on the assumption that each house-hold would have to be visited once a quarter during a continuous period of 12 months (mention the actual period of 12 months which would be most appropriate for carrying out the work) (25)

. 4. (a) A sample survey for ascertaining the general economic condition of the population of a town was conducted. Information from 1000 families out of a selected sample 1500 was collected. The rest refused to give any information of the investigators who approached them. What would you do under these circumstances ? In case you want to adopt more than one line of action simultaneously or one after another, mention same. (7)

(b) What are the special advantages of having two independent half samples surveyed by two different parties of investigators in the field operations. What would be the effect of half sampling on the field strength ? If the full sample calls for a primary strength of 500 investigator months, what will be the overall effect on the entire field budget ? Very rough indication will suffice. Assume that the work has to be completed in 10 months and the area coverage of survey about 500 sq. miles. (18)

5. (a) A Government servant who moved on a transfer in November last year, has just submitted a transfer T.A. bill charging fares for (a) self, (b) eldest son aged 24 who was temporarily out of employment and (c) dependent daughter-in-law, (d) married daughter aged 18, (e) wodowed dependent mother and (f) cripple dependent brother all of whom moved with the Government servant. He also claimed T.A. for (g) dependent son aged 20 who was in a college hostel at the old station and came on holiday on May last with (h) the youngest dependent son aged 14 who was left behind with a friend to complete his school annual examination before joining the family at the new station.

For which of the relations, do you think, transfer T.A. is not admissible ? Name the particular code or rules on which you rely, if any. (8)

There was a wayside misconnection and for no fault of theirs the family on transfer journey had to pass an extra night en-route in the railway premises. Will halting allowance be admissible for it ? (2)

(b) State the action you would take in any *three* of the following cases.

(i) An inspector has submitted a T.A. bill for a journey which does not tally with the town details indicated in his tour diary. (5

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(ii) An inspector has recommended the suspension of an investigator, pending enquiry, on the ground the inspector on a surprise visit, could not find the investigator in the Union (group of villages) in which he was to have been working.

(iii) An investigator, while returning from a survey in the evening was bitten by a snake and had to remain in hospital for a week. He has applied for this period to be treated as duty or special leave with pay.　(5)

(iv) A cashier, at the time of verification of cash, cannot produce an amount of Rs. 210/- and a crossed cheque for Rs. 400 which was to have been in the iron safe under his charge. He states that he has left these for safe custody at his home and wants to produce the same on the following day.　(5)

(v) A peon was sent to post a registered and insured covering containing Rs. 200/-. He returns to office and reports that the cover was snatched from his hands when he was entering post office.　(5)

DATA FOR QUESTION 1

VALUE OF CONSUMPTION OF FOODGRAINS IN THIRTY DAYS OF 100 FAMILIES

Sl. No. of family	Value Rs.	Sl. No. of family	Value Rs.	Sl. No. of family	Value Rs.	Sl. No. of family	Value Rs.
1	9.1	26	20.7	51	16.1	76	17.3
2	11.2	27	19.6	52	16.3	77	18.4
3	12.1	28	18.5	53	17.4	78	19.5
4	14.7	29	17.4	54	18.5	70	17.6
5	7.6	30	16.3	55	19.6	80	18.1
6	10.4	31	15.2	56	20.7	81	21.0
7	17.2	32	14.1	57	21.8	82	20.0
8	18.0	33	13.0	58	22.9	83	22.0
9	6.3	34	12.9	59	23.0	84	23.1
10	12.2	35	11.8	60	24.1	85	24.2
11	14.6	36	10.7	61	24.2	86	22.3
12	21.5	37	9.6	62	24.3	87	25.1
13	26.7	38	8.5	63	25.4	88	26.3
14	10.3	39	7.4	64	25.5	89	24.4
15	11.0	40	6.3	65	25.6	90	27.2
16	12.1	41	11.1	66	26.7	91	28.3
17	13.2	42	11.2	67	26.8	92	26.4
18	14.3	43	12.3	68	27.9	93.	28.1
19	15.4	44	12.4	69	28.0	94	28.7
20	16.5	45	13.5	70	28.1	95	29.3
21	26.2	46	13.6	71	29.4	96	30.1
22	27.3	47	14.7	72	30.5	97	31.2
23	28.4	48	14.8	73	31.2	98	7.3
24	29.5	49	15.9	74	16.1	99	8.9
25	30.6	50	16.0	75	15.2	100	10.2

PART 2 : SECTION B (THEORETICAL)

Time : 3 Hours   Full Marks : 100

N.B. (a) Attempt *any four* questions.

(b) All questions carry equal marks.

1. In a proposed *ad hoc* socio-economic survey, as the person responsible for the field organisation, you have been asked to give your requirements.

About 12,000 schedules are to be filled in from the sample households of a city, three satelite towns and twenty-four neighbouring villages. The field work is to be completed in the four month period November-February with 15 days before for mobilising and training of staff and 15 days after for closing down operation. In a preliminary try-out each schedule took about 2¾ hours to fill in.

Give a detailed statement of your field staff requirements, with justifications, suggesting salaries and allowances. Also give an abstract budget of your total estimated field expenditure.   (25)

2. The diaries of Investigators and Inspectors and the filled in schedules in respect of a survey have been received by you and you have to take an apprisal of the work of each Inspector and Investigator for purposes of recommending promotions, other rewards, warnings or punishments. The Inspectors have also given subjective reports regarding reliability, sincerity ,active or lazy habits, tact and persuasiveness, knowledge of the subject of enquiry and methodology thereof, initiative and conduct.

(a) Outline a form of an investigator's diary, routine inspection report and also a proforma of subjective reporting by the inspector so that all important facts for a proper apprisal is well considered.   (15)

(b) Could you suggest items for incorporation into the working schedules that will help in making a quality apprisal.   (10)

3. Outline the actions that you as the Superintendent of Field Work in a survey by the interview method will take in the *any five* of the following situations, giving reasons in brief :—

(a) Investigators has sent an express letter requesting you to secure police help as the villagers refused him information and assumed threatening attitude : the sample village is disturbed with a serious tenant-landlord dispute which has made the general body of villagers suspicious and hostile to all officials.   (5)

(b) Telegraphic information is received that Investigator in a remote village is down with suspected cholera : it was known that cholera in epidemic form had broken out in the area.   (5)

(c) Inspector reports that Investigator has left sample village in a hurry for his distant home town, on information that his father was on death-bed, on making

an informal request in a post card that he may be granted 2 to 3 weeks' leave. Investigator completed house listing and detailed enquiry in a few sample households. (5)

(d) Information is received that Investigator who made an abandoned temple outside the main village his temporary abode was arrested on suspicion following an excise raid in which unlicensed cultivation of excisable plants was discovered in the backyard of the temple. (5)

(e) A retired superior railway official, head of a sample household refuses to co-operate and the Investigator and Inspector failed to bring him round. He says he was not satisfied as to what useful purpose the survey was to serve and not convinced why he had been singled out in the neighbourhood for special attention. (5)

(f) It has been brought to your notice, through an anonymous letter that one of your Investigators has travelled in third class but has claimed second class fare. (5)

4. Write short explanatory notes on any *five* of the following :— (25)

    (a) border bins in sample cuts

    (c) cottage and household industries

    (d) occupation and means of livelihood

    (e) reference period of an enquiry

    (f) running and fixed travelling allowances

    (g) cereal and cash crop and their operating seasons.

5. (a) A comprehensive memorandum is required to be submitted by November this year to assist in policy decisions about external trade, crop promotion and price support schemes of next year. All statisticial information available in official publications or records about acreage, production, stocks, export-import, prices and consumption of the major cereals, particularly rice and wheat, for the past few years, are to be presented in the memorandum for the country as a whole.

You have been asked to collect the material for preparation of the memorandum. List out the publications and records that you will consult, mentioning the items of information that you will get from each.

Current acreage and production forecasts are also to be taken into account with a view to make best use of the latest available information. (15)

(b) Suppose you are required to stay 3 days for inspecting the work of primary investigators in regard to crop cutting and socio-economic survey in a village.

Describe what points you would look for and exactly how you would proceed (mention time, stops and actions for entire period). Would the method of your inspection be different if you stay in a small wayside town, 5 miles away from the village ? (10)

STATISTICAL FIELD SURVEYS CERTIFICATE EXAMINATION, AUGUST 1955

PART 1 : SECTION A (PRACTICAL)

N.B. Figures in the margin indicate full marks.

Name of candidate :   Roll No.......

Native State
State of Domicile

(Time allowed for questions 1, 2 and 3 : 40 minutes)

(Answer here) ..

1. (a) State the types of maps most com-
        monly in use in your State along
        with the different scales for each
        type.   (5)

    (b) What are the different scales of a
        map in which individual plots
        (survey numbers) are shown ? Isn't
        one standard scale adequate for all
        places ?   (5)

2. State what are signified by *any three*
    of the following symbols *in a district*
    map :—   (6)

    (1)

    (2)

    (3)

    (4)

    (5)

    (6)

                                Or,

    Draw symbols of *any three* of the
    following which are shown in tehsil or
    thana map :—

    (i)   Cart track
    (ii) Railway line
    (iii) Church
    (iv) Canals
    (v)   Deserted village site
    (vi) Marshy land (Beel).

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3. (a) What equipments would you take   1.
for carrying out crop cutting experi-
ments in sample cuts (of 25 sq. ft.   2.
each) within a paddy or a wheat
field. Dry weights will also be   3.
required.

4.   (4)

(b) State in brief how would you locate   (4)
a sample cut within the crop field

(c) If you are asked to select two crop
plots at random in a village and take
one cut per plot, what would you
do under the following circums-
tances :—   (6)

   (i) The crop in the first sample cut
   is found to be totally damaged.

   (ii) The crop in the second sample
   cut is found to be immature.

   (iii) On account of flood, the crop-
   plot for experiments, is found
   to have already gone under
   knee-deep water and the culti-
   vator wants to harvest the crop
   without any delay.

4. (a) Identify three plots on the ground which are shown to you on the cadastral
map furnished.   (9)

   (b) Identify three plots on the map from plots shown to you on the ground.
    (9)

5. Prepare a list of 25 households with some particulars and record in Form IA-1.
The locality for listing will be specified by the examiner.   (20)

6. For the list of 5 plots supplied to you, find out by inspection the anna pro-
portions of their land utilisation (crop as well as non-crop accounting for 16 annas of
the plot) and record in Form No. IA-2.   (20)

7. Viva Voce on filled in schedule and problems arising in conducting field work.
    (12)

———

State..
Thana..
Urban Block......................................

District...
Village/Town.....................................Tl. No...........
Road...

Sl. no. of h.h.	Name of head of household	Major h.h. occupation	No. of unemployed as reported by h.h.	Total No. of members in h.h.	No. of literates				No. of illiterates			
					Adults		Children		Adults		Children	
					M	F	M	F	M	F	M	F
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

M = Male;   F = Female   Adults : persons of age 14 and above.

1. Name of the candidate.............................   2. Roll No...........
3. Signature of candidate............................   4. Date of survey.........
5. Time of starting.................................   6. Time of returning................
7. Total time taken................................

N.B. Timings should be recorded in the presence of the Examiner.

FORM IA-2 : Land Utilisation††

State.......... District.......... Tehsil/Tamluk/Thana..........
Name of village or Mauza of town.......... Mouza No....
Name of major crop (in the locality)..........

Serial no.	Survey no.	Area proportions under																								Percentage in Anna
		Autumn paddy	Winter paddy	Bajra	Maize	Jowar	Ragi	Pulses	Sugarcane	Oilseeds	Jute	Cotton	Vegetables	Orchards & gardens	Other crops	Cultivable waste	Fallow	Tank, ponds	House site	Theatram	Barren	Other if any	Crop total	All total	Major crop (personal)	Cause × ×	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	
1																											
2																											
3																											
4																											
5																											

Major crop of the season

Codes : cause of damage—heavy rains-1, draught-2, Flood-3, others-4.

†† Separate eye-estimations of each of crops in intermixture are to be recorded in their respective columns (e.g., if a plot is under jute (unmixed)—six annas and jute with paddy mixed in equal proportions—ten annas, the entry in column 12 should be 6, and in column 3 or 4 : 6†, '†' sign being used 6† to indicate the mixed portion).

1. Name of the investigator/candidate..........
2. Signature of the investigator/candidate..........   ....Roll No..........
3. Date of survey..........
4. Time of starting..........   } Timings should be recorded in the
5. Time of returning..........   presence of the examiners.
6. Total hours taken..........

PART 1 : SECTION B (PRACTICAL)

N.B. Figures in the margin indicate full marks

Full Marks : 100

Name :   Roll No.........

1. Extract the area of five plots indicated on a village map of scale 16 inches equal to 1 mile supplied to you without the help of acre comb; use of foot rule, pencil and divider is allowed. (10)

Thana	Name of Mouza	T.C. No.
		....
Plot No.	Area	

2. Estimate in yards by *eye estimation* :—

(i) length and breadth of a plot shown to you. (4)

(ii) length of the two diagonals of a plot shown to you. (4)

(iii) distance (from the place you are standing) of a building, or a tree or a flag shown to you. (4)

3. Estimate the area in acres and decimals of four plots shown to you on the ground by *eye estimation* only. (8)

4. Identify five plots indicated on the mouza map supplied to you and give annawari estimate and eye estimation of area of the land utilisation under as many heads of utilisation as possible. (15)

Thana		Name of Mouza	T.C. No........
Plot No.	Item of utilisation	Annawari proportion	Eye estimate of crop area

5. Fill up the schedule (Form 1B-1) by enquiry for any one of the following households with cultivation as principal occupation.

Serial No.	Name of head with father's name	Address

(Marks allocation : Block I-2, Block II-8, Block III-12, Block IV-6, Block V-10, Block VI-12).

6. Viva Voce (10)

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5

Block I : *Identification of household*

1. District .... 2. Sub-division ....

3. Thana............................ 4. Mouza ....

5. Hamlet.......................... 6. Nearest Rly. Station............

7. Name of the head of household..

Block II : *Housing Conditions*

(Answers which are not appropriate should be struck off or put
ring round the appropriate code.)

1. House (a) Type   (b) Owned-1/Rented-2
†Pucca-1, Katcha-2.

(c) If rented, rent per month Rs..............

2. Bed rooms—(a) Number.......... (b) Area of floor space (sq. ft.)............

(c) No. of doors................. (d) No. of windows....................

(e) If there is possibility of free circulation of air—Yes/No

3. Kitchen   (a) separate/within bed room

(b) Is there good outlet for smoke—Yes/No

4. Store—separate/within the bed room/within the kitchen.

5. Latrine—separate/joint with other household.

6. Drinking water—filtered tap/tube well/other sources.

Pucca or katcha according to 2 or more of plinth, walls, roof are pucca
or katcha.

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Block III : Members of household and their occupation.

Sl. no.	Relation to Head	Sex (Male −1 Female −2)	Age last birth day (yrs.)	Literate 1 Illiterate 2	Marital Status †	Economic Status ††	Usual Occupation	
							Principal	Subsidiary (in order of importance to be written one after another

† Married-1, Never married-2, Widowed-3, Others-4.
†† Earner-1, Earning dependent-2, Non-earning dependent-3.

Block IV : Income and expenditure during the last 3 months (90 days) from the date preceeding the date of enquiry.

Average income per month during the last 3 months (Rs.)	Average expenditure per month during the last 3 months (Rs.)	Average per capita expenditure per month during the last 3 months
(1)	(2)	(3)

N.B. Attach working sheet if any (blank sheet will be supplied).

1B-1.1

BLOCK V : LANDS—OWNED, POSSESSED, UTILISATION ETC.

Survey No. or plot No. or owned or possessed	Total area of plot	Owned (acres) 00.00	Leased in (acres) 00.00	Leased out (acres) 00.00	Land Possessed (acres) 00.00	Utilisation of possessed land in Kharif season 1954 (write name of crop and anna proportions in bracket)					
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

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Block IV : Receipts and Expenditures during 30 days preceding the day of enquiry.

	Receipts	Rs.		Domestic Expenditures	Rs.
1.	From Principal Occupation		1.	Cereals and pulses	
2.	From Subsidiary occupation		2.	Milk and milk products	
3.	By incurring loan (cash or kind)		3.	Other food articles	
4.	Sale of property and assets		4.	Sub-total (food articles)	
5.	Other sources (describe)		5.	Education	
	(i)		6.	Medical	
	(ii)		7.	House rent (excluding tax)	
	(iii)				
	(iv)		8.	Furniture, utensils	
			9.	Clothings, beddings etc.	
			10.	Other expenses	
			11.	Sub-total (other than food articles)	
			12.	Total (4+11)	

1. Name of Investigator...

2. Signature........................... 3. Date........................

4. Time of receiving the schedule..

5. Time of returning the schedule..

PART IC : PRACTICAL

Full Marks : 100

1. Enlist 30 households in a specified area. Select six households systematically with a random start. (10)

(Right hand digit of the roll No. of the candidate should be the column number of the random number chart to be used by the candidate. In the case the right hand digit is 0, the column No. will be 10.)

Fill up schedule IC-1 for the selected six households. (8)

2. (a) Fill up schedule IC-2 for a selected household which is spending Rs. 250/- or more per month on consumer goods and has not less than five resident members in the household. (40)

Block I-2, Block II-8, Block III-6, Block IV-12, Block V-12.

(b) Narrate briefly your conversation with the informant at the time of collecting the data for schedule IC-2. How do you infer that the informant gave you reasonably correct information ? If you have got any doubt about some of the figures, mention the reasons of suspicion. What should be the correct approach to convince this type of household ? (10)

3. Intelligence Test. (20)

4. (a) Estimate the weight of a given mass without weighment. (6)

(b) Look round a place for a minute or so and answer a question. (6)

5. Viva voce. (6)

LISTING OF HOUSEHOLDS

Serial No.	Holding No.	Name of head of household	No. of h.h. members	Expenditure per month in Rs. (00)	No. of selected household
(1)	(2)	(3)	(4)	(5)	(6)
1					
2					
⋮ 30					

IC-1

Serial No. (Col. 1 of listing Sch.)	No. of members		No. of			No. of		Age		Employment condition	
	Male	Female	Earners	Earning deptts.	Non-earning deptts.	Literates	Illi-terates	Upto 14 years	Others	Employed gainfully	Others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

BLOCK II.   IC-2

Serial No. of person	Relation to head	Length of stay (in months)	Sex in code Male 1 Female 2	Age last birth day	Marital Status Code*	Educa-tion Code*	Economic Status Code*	Means of livelihood Descrip-tion	Job Preference Industry Descrip-tion	Available for addl. work		Intensity Code*
										Industry Descrip-tion		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)

* Marital Status—Single—1, Married—2, Widowed—3, Divorced or separated—4.
Education—Cannot read—0, can read and write—Premary—1, Middle English—2, Matric—3, above—4.
Economic Status—Earner—1, Earning dependent—2, non-earning dependent—3.
Intensity—full—1, half or more than half—2, less than half—3, nominal—4.

(Fill up for two pairs according to seniority)

Identi-fication	Age at			Identi-fication	Age at		
Sr. No. as in Bl.II	Marriage (yrs.)	Present (yrs.)	Death (yrs.)	Sr. No. as in Bl.II	Marriage (yrs.)	Present (yrs.)	Death (yrs)
Husband				**Husband**			
Wife				**Wife**			
sl. no.	Sex of child Male 1 Female 2	Interval period (month)	Present (years) / Death (years)	Sl. no.	Sex of child Male 1 Female 2	Interval period (month)	Present (years) / Death (years)
1				1			
2				2			
3				3			
4				4			
5				5			
6				6			
7				7			
8				8			

Block I

1. Household Serial No..................... ....
   (as in Schedule IC-1)

2. Head of household..

3. State......................... 4. District ....

5. Town .... 6. Ward/Union ....

7. Street......................... 8. Household No.....................

9. Name of the candidate..

10. Roll No.........................

Exchange and consumption during month ended on........

Sl. No.	Item	Standard	Purchased in exchange				Consumption	
			Money		Goods & Services		Quantity (00.00)	Value (00.00) (Rs.)
			Qty. (00.00)	Value (Rs.) (00.00)	Qty. (00.00)	Value (Rs.) (00.00)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Rice	Sr.						
2	Rice products	Sr.						
3	Wheat	Sr.						
4	Wheat products	Sr.						
5	Other cereals	Sr.						
6	Other cereal products	Sr.						
7	Pulses	Sr.						
8	Oil etc.	Sr.						
9	Vegetables	Sr.						
10	Fish	Sr.						
11	Salt	Sr.						
12	Other food articles	Sr.						
13	Food sub-total	×						

BLOCK V

Receipts and disbursements during month ended on.............

	Receipts			Disbursements	
Sl. No.	Item	Value (Rs. 00.00)	Sl. No.	Item	Value. (Rs. 00.00)
(1)	(2)	(3)	(1)	(2)	(3)
1	Sale of agricultural produce		1	Expenses for the enterprises	
2	Sale of non-agricultural produce		2	Expenses for services	
3	Earnings of Trade		3	Taxes etc.	
4	Earnings of Transport		4	Salaries, Wage etc.	
5	Salary, Wages		5	Rent of land, house etc.	
6	Pension		6	Rent of other commodities	
7	Rent of houses or other articles		7	Cash Deposits (banks, insurance, Provident Fund)	
8	Loan		8	Purchase of Govt. paper, share, land etc.	
9	Sale of commodities etc.		9	Purchase of other assets and their improvements	
10	Remittances, Gifts etc.		10	Purchase of consumable goods	
11	Others		11	Remittances, gifts, loan repaid etc.	
12	Total		12	Total	

3. INTELLIGENCE TEST

Time : 20 Minutes

Figures in the margin indicate full marks

Full Marks : 20

Answers to be written on this paper

(a) Name   0

(b) Roll No.   0

(c) How many common words can be formed from the letters in the word 'There' without re-arranging the order of any of the letters ?   *Answer*   1

(d) A boy swmins upto 4/7 of a pond and then finding himself tired returns to the starting point. Was it possible for the boy to cross the pond ?   *Answer*   1

(e) Mrs. Roy has 13 children all born one and one-half years apart. What is the age of her oldest child who is just 7 times older than the youngest ?   *Answer*   4

(f) A goes 15 miles in 4 hrs. and B goes at the rate of 3½ miles per hr. Who is faster ?   *Answer*   1

(g) A clock takes 6 seconds to strike the hour of six. How many sedonds will it take to strike the hour of eleven ?   *Answer*   1

(h) How many posts will be required to fence a field 60 yds. × 60 yds. when the posts are placed 10 yds. part ?   *Answer*   2

(i) How many pieces of cloth measuring 4 ft. × 4 ft. can be taken from a piece of cloth measuring 16 ft. × 16 ft. ?   *Answer*   1

(j) Find out the missing figures in each of the series shown :—   4
   (1) 67, 70, 76, 85, ..., ..., ..., .
   (2) 17.4, 17.5, 17.8, 18.3, ..., ..., ...,
   (3) 4, 14, ..., 34, ..., 54,
   (4) 25, 49, 81, ..., ...,

(k) Fill up the blanks in the division worked out :—   2

```
2**)6*87*(*76
     50*
     ――――
     1927
     17*1
     ――――
      156*
      1518
      ――――
       ⁔7
```

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(l) Find the missing figures in the following table :—

	20	?	?	Total
x	20	?	?	125
y	?	45	?	143
Total	75	130	65	270

(m) A ladder whose foot in placed on the ground 20 ft from the front of a house, reach a window at a hoight of 48 ft. what in tho length of the ladder ?

STATISTICAL FIELD SURVEYS CERTIFICATE EXAMINATION, AUGUST 1955

PART 2 : SECTION A (PRACTICAL)

Figures in tho margin indicato full marks

Full Marks : 100

1. A schedule 2A is attached. Fill up the schedule for any ono of tho households residing in tho addresses mentioned below ; (60)

Serial No. *Addresses of the households* (to bo fillod up by tho examiners)

1

2

3

2. (a) What, in your opinion, is tho most suitable timo to approach tho informant to fill up a schedule ? Give reasons. Is it possible for any informant of the household to answer all tho queries ? Whom do you think to bo the most suitable person to help tho informant and why ? (5)

(b) What aro the questions which tho informant did not like to answer readily ? What is the cause of this delicacy ? (8)

(c) Describe the difficulties, if any, that you faced in collecting the figures for different items of this schedule. Discuss the items which should have been split up into more items to elicit better figures. Suggest improvements of the schedule for a family budget enquiry. (12)

(d) How do you propose to verify the statements made by the informant ? What are the important items which can reasonably be verified to arrive at correct figures ? (15)

Due consideration will be made for neatness in awarding marks.

Allocation of marks for filling up the different blocks in the schedule for Question 1.

I	5
II	10
III	10
IV	10
V	10
VI	10
VII	5
	60

Form 2·A

Family Budget Survey

Name of candidate... Roll No...........

Date of survey................ Starting time............ Returning time.........

Time for : Journey Both   Filling   Contacting
(Hrs. Min.)   ways.........   schedule........ household...........

Block I

Name of head of household...

Name of Informant............................... Relation to head..............

Head available—Yes/No.   If No, why....................................

Name of Street...........................House No........... Rent..........

No. of storeys of the house.............. No. of rooms (possession)................

Floor space in sq. ft. (possession)................ Household size..................

Land possessed (acres).................. Monthly Expenditure (Rs.)..............

45

BLOCK II

Demography particulars as on the date of enquiry

sl. no.	Rela- tion to head	Length of stay	Sex	Educa- tion	Econo- mic status	Particulars of industrial status			Means of Liveli- hood (Describe)	Able to take up addl. work			
						Indus- trial status	Duration	Average intensity per day**		Indus- try (des- cribe)	Loca- lity	Aver- age inten- sity per day**	Regula- rity†
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(13)

** Full day—1, half day—2, less than half day—3, nominal—4.
† Continuous—1, intermittent—2, casual—3.

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Expenditure on food for a week ending on........................
(date previous to the day of enquiry)

Sl. No.	Commodities	Unit	Price per unit	Consumed		
				Quantity		Value
				Seer	Ch.	Rs. 00.00.
1	Rice	Sr.				
2	Rice products	,,				
3	Wheat	,,				
4	Wheat products	,,				
5	Other cereals	,,				
6	Other products	,,				
7	Cereal sub-total	,,	×			
8	Musur	,,				
9	Mung	,,				
10	Gram	,,				
11	Other pulses	,,				
12	Pulses sub-total	,,	×			
13	Milk	,,				
14	Milk products	,,				
15	Cooking oil	,,				
16	Green vegetables	,,				
17	Leafy vegetables	,,				
18	Fruits	,,				
19	Meat, fish, eggs	,,				
20	Others	,,				
21	Other food sub-total	,,	×			
22	Beverages	Cup				
23	–do–	sr.				
24	Intoxicants	×	×	×		
25	Subtotal (22–24)	×	×	×		

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BLOCK IV

Expenditure on articles other than food on household account for a month
ended on............................

Sl. No.	Commodities	Unit	Price per unit	Consumed Quantity		Consumed Value
				Seer	Ch.	Rs. 00.00
26	Duty, sari etc	Yds.				
27	Coating, shirting					
28	Garments with servicing					
29	Others Wearing etc.					
30	Sub-total		×			
31	Toilet goods	×	×	×		
32	Paper etc.	×	×	×		
33	Sports goods	×	×	×		
34	Musical instruments	×	×	×		
35	Amusement	×	×	×		
36	Medicine	×	×	×		
37	All services	×	×	×		
38	Conveyance	×	×	×		
39	Ceremonials	×	×	×		
40	Rents Taxes	×	×	×		
41	Equipments	×	×	×		
42	Furniture	×	×	×		
43	Ornaments	×	×	×		
44	Sub-total	×	×	×		

Receipts and disbursements during the month ended on........

Sl. No.	Receipts	Value (Rs. 00.00)	Sl. No.	Disbursements	Value (Rs. 00.00)
1	Sale price and value of home grown produce consumed (both agricultural and non-agricultural)		1	Purchase of goods and articles for use in the enterprises	
2	earnings from transport		2	Servicing purchased	
3	Sale of merchandise		3	Taxes and other levies	
4	Value of merchandise consumed at home		4	Salary and wages	
			5	Rent	
5	Salary, wages, pension		6	Insurance, provident fund etc.	
6	Dearness, travelling etc. allowances		7	Purchase of shares, real assets etc.	
7	Rent and taxes		8	Construction etc. of real assets	
8	Withdrawal from past savings				
9	Sale of land, buildings		9	Domestic expenses	
10	Sale of all other assets		10	Others	
11	remittances, dowry etc.		11	Total	
12	Others				
13	Total				

7

BLOCK VI
Indebtedness

Purpose	Date of borrowing	Source	Security	Principal	Rate of interest	Total paid Principal	Total paid Interest	Method of payment	Total outstanding Principal	Total outstanding Interest
Marriage										
Funeral										
Assets purchased										
Illness										
Litigation										
Bazar										
Miscellaneous										

BLOCK VII
Details of Housing

Ownership, Company, Private or Self-owned	Rent 1950	Rent Present	Description Roof	Description Floor	Description Walls	Rooms No.	Rooms Size	No. of persons	Used for	Doors No.	Doors Size	Windows No.	Windows Size
							L×B×H				L×B		L×B

Kitchen Location	Kitchen Size	Water supply Type	Water supply No.	Water supply Distance	Water supply Persons using	Latrine Type	Latrine No.	Latrine Distance	Latrine Persons using	Plinth Ht.	Living rooms	Kitchen	Distance of house from place of work
	L×B×H												

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PART 2 : SECTION B (PRACTICAL)

Time : 4 hours   Full marks : 100

N.B. (a) All question carry equal marks; neatness carries 4 marks.
       (b) Use of calculating machines is not permitted.

Answer *any four* of the following:

1. A sample enquiry was under taken in 1941 in different districts of Bengal to determine the size of holding and their distribution. Occupational distribution of the local people was also studied at that time.

     After the famine of 1943 a sample survey was undertaken in the famine striken areas in 1946 to study the after effects of the famine. Some of the results as obtained in 1941 and 1946 are shown in table 2B-1 and table 2B-2.

     Write a short note showing the after effects of famine as are seen from the tables supplied.   (24)

2. A survey was conducted in 1948-49 in the State of West Bengal to assess the number of refugee population in the state and their general economic condition.

     The enquiry was conducted in two phases. In the first phase a complete count of the refugee population was taken. Detailed enquiry of a sample of 10% families selected systematically was undertaken during the second phase of enquiry.

     The whole operation was completed in 6 months time and a sum of Rs. 2,25,752 was spent.

     Some of the important results are given in tables 2B-3, 2B-4 and 2B-5.

     Examine the data and bring out as many deductions as you can   (24)

3. Table 2B-6 indicates districtwise distribution of agricultural families in respect of sizes of holdings as in 1947. Make a critical study of the distribution in the different districts in relation to the State-wise distribution and draw conclusions. (24)

4. Write a critical note on table 2B-7 showing the death rate of the different countries of the World from 1040 to 1047.   (24)

5. Critically examine the revenue positions of Pre-Partition Bengal as revealed in Table 2B-8.   (24)

6. Table 2B-9 shows All-India consumer expenditure per household by items of consumption in rural areas during the year 1949-50. Critically examine the data and bring out the main conclusions.   (24)

7. Study the table 2B-10 and bring out the main conclusion with particular reference to the regional trends of the rates of growth.   (24)

     Neatness.   (4)

. DISTRIBUTION OF THE SIZE OF HOLDING

size of holdings (acres)	No. of families having land as in col. (1) in 1941	No. of families having land as in col. (1) in 1946
(1)	(2)	(3)
0— 2	8752	6074
3— 4	1422	848
5— 6	2015	1856
7— 8	2693	2687
9—10	922	1045
11—12	882	938
13—14	874	1036
15—16	528	619
17—20	320	656
21—24	176	636
25—35	103	809
Above 35	82	1565
Total	18,769	18,769

TABLE 2B-2

OCCUPATIONAL DISTRIBUTION

Occupations	No. of persons following it	
	1941	1946
(1)	(2)	(3)
1) Agriculture	10325	6348
2) Agricultural Labourers	8642	10876
3) Industrial labourers	93	186
4) Domestic Servants	159	183
5) Other Labourers	1442	2557
6) Business	36	43
7) Small trade	338	442
8) Service	5492	5237
9) Profession	147	154
10) Running small industries	38	50
11) Big Industries	3	10
12) Other	455	538
13) Reasons without any occupation	1642	2357
Total	28812	28990

TABLE 2B-3

DISTRIBUTION OF MIGRANT FAMILIES

District	Number of families	Percentage
(1)	(2)	(3)
1) Jalpaiguri	3400	1.4
2) Coochbehar	1300	0.7
3) West Dinajpur	10191	4.0
4) Malda	1480	0.6
5) Mursidabad	5684	2.3
6) Nadia	13596	5.4
7) 24-Parganas	37371	14.7
8) Calcutta	140666	55.8
9) Hooghly	6824	2.7
10) Howrah	10022	4.3
11) Burdwan	15749	6.3
12) Birbhum	646	0.3
13) Bankura	454	0.2
14) Midnapore	3192	1.3
Total :	2,51,475	100.0
Refugee families in government camps (appox. number)	8,520	
Grand Total :	2,59,995	

TABLE 2B-4

NUMBER OF PERSONS (FAMILY MEMBERS) LEFT BY THE MIGRANT FAMILIES IN PAKISTAN

District	Total no. of families	No. of members left in Pakistan	No. of members now in West Bengal	Total family members
1) Jalpaiguri	3400	1752	17004	18756
2) Coochbehar	1300	934	8249	9183
3) West Dinajpur	10191	5927	50959	56886
4) Malda	1480	739	7407	8146
5) Mursidabad	5684	4210	28420	32630
6) Nadia	13596	10649	67079	78628
7) 24-Parganas	37371	25007	186855	211862
8) Calcutta	140666	84474	703329	787803
9) Hooghly	6824	3872	34118	37990
10) Howrah	10022	5144	54612	59756
11) Burdwan	15749	10642	78844	89486
12) Birbhum	646	343	3229	3572
13) Bankura	454	255	2260	2524
14) Midnapore	3192	1899	15959	17858
Total	2,51,475	1,55,847	12,59,233	14,15,080

OCCUPATIONAL DISTRIBUTION OF THE MIGRANT EARNERS AFTER MIGRATION

Name of occupation	No. of earners when in Pakistan following the occupation	No. of earners following the occupation after migration
1) Agriculture	29344	7372
2) Agricultural Labourers	14512	14132
3) Landlords and rent receivers	6725	2700
4) Cottage industries	35362	25106
5) Caste Profession	2345	....
6) Trade	75855	54842
7) Transport	806	288
8) Learned Profession	17559	9669
9) Service	135150	107552
10) Unspecified	5023	4168
11) Without occupation	....	97952
Total	3,23,781	3,23,781

TABLE 2B·0

DISTRIBUTION OF AGRICULTURAL FAMILIES IN 1947 IN RESPECT OF SIZES OF HOLDINGS

| Districts | Number of Agricultural population in 1947 (in thousand) | Number of agricultural families (in thousand) (taking average size of family = 4.8) | Number of agricultural families with size of holding as stated (in thousand) | | | | | |
| | | | less than 2 acres of land | 2·3 acres of land | 3·4 acres of land | 4·5 acres of land | 5·10 acres of land | More than 10 acres of land |
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1) 24-Parganas	2,075	432.3	244.2	46.3	37.2	20.3	47.1	31.1
2) Nadia	507	105.6	17.7	10.1	11.4	10.7	21.4	12.5
3) Murshidabad	1,092	227.5	87.1	23.0	21.2	17.1	38.4	17.5
4) Burdwan	944	196.7	56.3	21.4	17.5	21.2	52.3	25.2
5) Birbhum	609	130.4	21.0	14.1	10.3	11.8	26.8	11.4
6) Bankura	725	151.0	81.1	13.4	11.8	6.8	22.3	15.6
7) Midnapore	2,330	487.3	186.1	78.5	53.1	51.2	85.8	32.6
8) Hooghly	680	143.5	40.5	18.8	18.7	15.6	27.0	14.6
9) Howrah	581	121.0	64.4	17.3	6.2	5.4	21.2	6.5
11) Jalpaiguri	344	71.7	3.8	4.3	7.8	11.8	23.8	14.6
11) Darjeeling	95	19.8	—	—	—	—	—	—
12) Malda	564	117.5	63.6	0.2	9.9	8.1	18.7	8.0
13) West Dinajpur	469	97.7	23.6	8.7	10.8	10.0	27.6	14.7
Total West Bengal	11,093	2311.0	895.4	295.1	215.0	100.0	412.5	204.3

TABLE 2B-7

DEATH RATES OF DIFFERENT COUNTRIES OF THE WORLD

(compiled from the monthly Bulletin of Statistics, U.N.O., October 1948, and the
annual report of Public Health Commission, Govrnment of India)

Rate per thousand population

Country	1940	1941	1942	1943	1944	1945	1946	1947
I. *Africa*								
South Africa	9.4	9.4	9.4	9.5	9.3	9.3	8.7	8.7
II. *North America*								
Canada	9.8	10.0	9.7	10.1	9.7	9.4	9.4	9.4
Mexico	23.2	22.1	22.8	22.4	20.6	19.5	18.7	16.3
United States	10.8	10.5	10.4	10.9	10.6	10.6	10.0	10.1
III. *South America*								
Chile	21.5	19.8	20.3	19.8	19.6	20.0	17.2	16.7
Panamab	11.5	13.4	12.9	13.2	12.5	12.0	11.0	9.1
IV. *Asia*								
India	21.1	21.8	21.3	23.6	24.1	21.5	17.5	18.1
1. Assam	16.0	16.8	15.4	16.3	17.1	13.6	—	8.8
2. Ajmer-Merwara	42.2	24.1	26.8	24.9	27.7	24.2	—	—
3. Bihar	20.0	19.5	15.4	15.9	22.5	21.2	—	10.1
4. Bengal	18.7	19.6	19.9	31.1	28.1	19.8	—	—
5. West Bengal	17.1	18.1	16.3	29.0	27.3	21.3	19.6	18.2
6. Bombay	24.3	25.8	24.4	23.4	25.6	26.5	—	—
7. Central Provinces	30.3	32.2	33.3	27.6	30.0	39.1	—	33.5
8. Coorg	20.5	22.8	22.8	20.3	20.5	18.6	—	—
9. Delhi	19.7	20.9	22.3	23.0	23.1	17.8	—	—
10. Madras	22.5	23.0	22.5	25.2	25.4	22.2	—	20.1
11. North west frontier province	17.4	20.4	16.0	15.3	14.0	11.1	—	• —
12. Orissa	23.4	28.4	25.7	30.7	31.0	28.4	—	27.0
13. Punjab	23.5	24.7	28.3	25.0	25.3	19.5	—	19.5
14. Sind	11.9	13.2	11.3	11.4	11.5	9.5	—	—
15. United Provinces	19.3	19.3	18.5	19.2	18.7	19.0	—	16.4
Japan	16.4	15.7	15.8	16.3	17.4	29.2	17.6	14.8
V. *Europe*								
Austria	14.8	14.0	13.3	13.8	16.0	25.6	13.4	13.0
Belgium	16.3	14.7	14.8	13.6	16.0	14.9	13.6	13.3
Finland	19.9	20.0	15.1	13.4	18.2	13.3	12.0	11.9
France	18.6	17.3	17.0	16.6	19.8	16.6	13.3	13.0
Germany (French Zone)	13.2	12.0	10.8	13.6	15.8	19.0	13.1	12.8
Italy	13.6	13.8	14.2	15.1	15.8	13.8	12.0	11.3
Spain	16.6	18.8	14.8	13.3	13.1	12.2	12.9	11.9
Switzerland	12.0	11.1	11.0	11.0	12.0	11.6	11.3	11.3
United Kongdom	14.0	13.0	11.6	12.0	11.7	11.5	11.7	12.1
VI. *Ocenia*								
Australia	9.8	10.6	12.0	11.5	10.3	10.3	10.1	9.7

TABLE IIB-8

GENERAL STATEMENT OF ORDINARY REVENUE
(Compiled from the Budget of the Government of Bengal)
(figures are in thousand of rupees)

Head of Revenue	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45	1945-46	1946-47	1947-48 (1ch August 1947 to 31st March 1948)
Principal Heads of Revenue-Customs	2,21,27	2,21,07	1,50,17	1,65,55	1,10,09	1,16,82	1,28,35	1,36,25	2,51,04	1,06,04
Taxes on Income other than corporation tax	30,00	65,80	83,20	1,47,80	2,18,00	3,00,00	5,31,29	6,65,71	6,75,01	3,83,67
Salt	13	—	—	—	—	19	68	1,13	7	—
Land Revenue	3,24,10	3,86,10	3,58,04	3,54,41	3,61,29	4,00,85	4,49,43	3,87,15	4,04,29	1,40,40
Provincial Excise	1,59,35	1,65,28	1,74,47	1,88,56	2,53,65	4,08,74	7,53,84	8,17,26	6,41,83	3,54,01
Stamps	2,51,77	2,58,44	2,51,58	2,56,00	2,49,75	3,40,14	3,36,65	4,02,03	4,44,91	1,38,79
Forest	22,41	23,08	26,34	32,17	38,37	54,93	1,00,01	81,63	62,35	36,89
Registration	24,12	27,31	27,42	31,25	33,38	60,05	60,25	65,81	77,52	19,45
Receipts under Motor Vehicles Act	21,00	21,31	22,65	21,54	15,07	17,58	22,53	25,33	34,73	28,46
Other Taxes and Duties	38,94	40,61	63,05	69,75	1,60,28	2,80,79	5,08,47	7,42,57	0,69,70	4,32,80
Total	10,90,00	12,04,80	11,50,82	12,67,12	14,49,78	20,88,99	28,01,30	33,25,50	32,01,43	16,41,51

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TABLE 2B-9

	July 1949 to June 1950	April to June 1951
No. of sample villages	1085	1142
No. of sample households	3140	10870
Household size	5.21	5.31

items	July 1949 to June 1950 consumer expenditure (Rs.)			April 1951 to June 1951 consumer expenditure (Rs.)		
	per house-hold	per person	per-centage to total	per house-hold	per person	per-centage to total
(1)	(2)	(3)	(4)	(5)	(6)	7)
1. food grains	442.61	85.03	38.70	154.28	29.04	39.42
2. pulses	40.89	7.86	3.58	15.43	2.96	4.02
3. edible oil	43.31	8.32	3.79	13.37	2.57	3.49
4. vegetables	26.72	5.13	2.34	8.74	1.67	2.27
5. milk and products	88.82	17.06	7.77	24.04	4.50	6.11
6. meat, fish & egg	24.57	4.72	2.15	7.33	1.41	1.91
7. fruits	12.15	2.33	1.06	7.07	1.29	1.75
8. refreshments	14.10	2.71	1.23	4.24	0.77	1.05
9. salt	4.82	0.93	0.42	1.67	0.26	0.35
10. spices	31.00	5.93	2.71	9.90	1.93	2.62
11. sugar	29.28	5.62	2.56	11.31	2.19	2.97
food total	758.27	145.66	66.31	257.38	48.59	65.96
12. pan	9.17	1.76	0.80	3.09	0.64	0.87
13. tobacco	20.46	3.03	1.79	7.58	1.41	1.92
14. intoxicants	8.96	1.72	0.78	3.09	0.51	0.69
15. fuel and light	37.14	7.14	3.25	24.04	4.50	6.11
16. men's clothing	36.01	6.92	3.16			
17. women's clothing	42.36	8.14	3.70			
18. children's clothing	9.84	1.89	0.86	21.46	4.04	5.49
19. misc. clothing	6.35	1.22	0.56			
20. head-wear	4.61	0.89	0.40			
21. bedding	9.92	1.91	0.87	1.68	0.32	0.43
22. tailoring service	11.43	2.20	1.00			
23. foot-wear	9.66	0.21	0.84	2.39	0.45	0.61
24. cobbler service	1.12	0.64	0.10			
25. toilet	3.35	1.10	0.29	1.11	0.21	0.29

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TABLE 2B 9 *(contd).*

26.	toilet service	5.74	1.16	0.50			0.57
27.	amusements	6.04	0.56	0.53	2.22	0.42	0.57
28.	education	2.92	0.95	0.28	2.10	0.39	0.53
29.	educational services	4.95	0.10	0.43			
30.	news papers and periodicals	0.50	1.77	0.04			
31.	medical expenses	9.91	1.03	0.80	6.00	1.14	1.55
32.	medical service	5.35	1.59	0.47			
33.	misc. household articles	8.25	2.00	0.72	2.43	0.45	0.61
34.	domestic and household service	10.41	0.32	0.91	22.20**	4.17**	5.66**
35.	food service	1.68	0.55	0.15			
36.	furniture	2.87	0.55	0.25	0.67	0.13	0.18
37.	furniture service	0.73	0.14	0.06			
38.	utensils	7.24	1.39	0.63	1.08	0.20	0.27
39.	ceremonials	82.46	15.84	7.21	18.92	3.56	4.83
40.	non-recurring expenses	3.01	0.58	0.26			
41.	miscellaneous (excluding remittance)	17.20	3.30	1.50	9.90	1.87	2.54
42.	house rent and taxes	6.51	1.25	0.57	3.47	0.66	0.89
	non-food total	385.43	74.06	33.69	133.43	25.07	34.04
	All-India total	1143.70	219.72	100.00	390.81	73.66	100.00

** including all services.

TABLE 2B-10

CENSUS POPULATION IN THOUSANDS IN 1941 AND 1951 AND MEAN (DECIMAL) ARITHMETIC RATE OF GROWTH

Population zones and states	1941 census		1951 census			mean (decimal) arithmetic rate of growth (%)	
	total	rural	total	rural	urban	total	rural
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. North India							
1. Uttar Pradesh	56,532	49,347	63,216	54,590	8,626	+11.2	+10.1
2. East India							
2. Bihar	30,528	34,582	40,226	37,521	2,705	+ 9.6	+ 8.2
3. Orissa	13,788	13,355	14,646	14,520	594	+ 6.2	+ 5.1
4. West Bengal	21,837	17,108	24,810	18,657	6,153	+12.7	+ 8.1
5. Assam	7,503	7,444	9,044	8,620	414	+17.4	+14.7
6. Monipore	512	412	678	575	3	+12.0	+33.0
7. Tripura	613	405	639	596	43	+21.9	+18.5
8. Andaman & Nicobar islands	34	33	31	23	8	− 8.6	−35.7
Sub-total	80,785	73,519	89,974	80,054	9,920	+10.8	+ 8.5
3. South India							
9. Madras	49,831	41,881	57,016	45,832	11,184	+13.4	+ 0.0
10. Mysore	7,338	5,084	9,075	6,896	2,179	+21.2	+14.2
11. Travancore & Cochin	7,500	6,534	9,280	7,792	1,488	+21.2	+17.6
12. Coorg	169	158	229	213	16	+30.5	+29.8
Sub-total	64,837	54,557	75,600	60,734	14,807	+15.3	+10.7
4. West India							
13. Bombay	20,181	22,348	35,956	24,786	11,170	+20.8	+10.3
14. Saurashtra	3,561	2,542	4,137	2,744	1,393	+15.0	+ 7.0
15. Kutch	508	411	508	454	114	+11.0	+10.0
Sub-total	33,250	25,301	40,601	27,984	12,677	+20.1	+10.1

TABLE 2B-10—Contd.

Population zones of states (1)	1941 census total (2)	1941 census rural (3)	1951 census total (4)	1951 census rural (5)	1951 census urban (6)	mean (docimil) arithmetic rate of growth (%) total (7)	mean (docimil) arithmetic rate of growth (%) rural (8)
5. Central India							
16. Vindhya Pradesh	3,569	3,737	3,575	3,269	306	+ 0.2	— 3.1
17. Madhya Pradesh	10,032	14,420	21,248	18,370	2,877	+ 7.9	+ 5.3
18. Madhya Bharat	7,170	6,040	7,054	6,513	1,441	+10.4	+ 7.4
19. Bhopal	779	646	836	700	136	+ 7.2	+ 8.0
20. Hyderabad	16,327	14,114	18,055	15,179	3,476	+13.2	+ 7.1
Sub-total	47,476	41,041	52,268	44,031	8,237	+10.0	+ 5.6
6. North West India							
21. Rajasthan	13,306	11,204	15,291	12,041	2,649	+13.9	+12.1
22. Punjab	12,699	11,115	12,641	10,240	2,401	— 0.5	—18.8
23. Bilaspur	110	107	126	122	4	+13.3	+13.2
24. PEPSU	3,403	2,024	3,494	2,828	666	+ 2.0	+ 3.3
25. Ajmer	584	370	603	346	298	+17.2	+ 6.8
26. Delhi	918	222	1,744	307	1,437	+62.1	+32.2
27. Himachal Pradesh	917	104	893	942	41	+ 3.7	+ 4.1
Sub-total	31,067	20,846	34,972	27,477	7,496	+ 9.0	+ 2.3
All India Total	3,14,848	2,71,211	3,56,801	2,94,860	61,822	+12.5	+ 8.4

The last digit of each number has been individually rounded off to the correct numbers of thousands. In consequence, the totals and sub-totals given in this Table are not always identical with the corresponding Arithmetic Totals of the constituent numbers.