Time: 3 Hours   Total Marks: 70

Instructions:

1. All questions are compulsory.
2. Write answer of each section in separate answer books.
3. Figures to the right indicate marks of questions.

Section I

Q-1 **(A)** A simple random sampling survey in respect of monthly earnings of semi-skilled workers in two cities gives the following statistical information. Test the hypothesis at 5% level that there is no difference between monthly earnings of workers in the two cities.(Z_{tab}=1.96)   **[06]**

City	Mean monthly earnings (Rs)	Standard deviation of data of monthly earning	Size of sample
A	695	40	200
B	710	60	175

(B) A sample of 900 members is found to have a mean of 3.47cm. Can it be reasonably regarded as a simple sample from a large population with mean 3.23 cm and standard deviation 2.31 cm. Use 5 percent level of significance. (Z_{tab}=1.96)   **[06]**

OR

Q-1 **(A)** The mean produce of wheat of a sample of 1000 fields in 200 lbs per acre with a standard deviation of 10 lbs. Another sample of 150 fields gives the mean of 220 lbs. with a standard deviation of 12 lbs. Can the two samples be considered to have been taken from the same population whose standard deviation is 11 lbs? Use 5 percent level of significance. (Z_{tab}=1.96)   **[06]**

(B) A sample of 400 male students is found to have a mean height 67.47inches.can it be reasonably regarded as a sample from a large population with mean height 67.39 inches and standard deviation 1.30 inches? Test at 5% significant level. (Z_{tab}=1.96)   **[06]**

Q-2 **(A)** Two random samples drawn from two normal populations are: **[06]**

Sample 1	20	16	26	27	23	22	18	24	25	19	--	--
Sample 2	27	33	42	35	32	34	38	28	41	43	30	37

Test using variance ratio at 1 per cent level of significance whether the two populations have the same variances.(F_{tab}=5.20)

(B) A die is thrown 132 times with following results: Is the die unbiased? Find chi square value and degree of freedom .(χ^2_{tab}=11.071)   **[05]**

Number turned up	1	2	3	4	5	6
frequency	16	20	25	14	29	28

OR

Q-2 **(A)** Answer using F-test whether the following two samples have come from the same population: Use 5% level of significance. (F_{tab}=3.73)   **[06]**

Sample 1	17	27	18	25	27	29	27	23	17
Sample 2	16	16	20	16	20	17	15	21	--

(B) The table given below shows the data obtained during outbreak of smallpox: Test the effectiveness of vaccination in preventing the attack from smallpox. Test your result with the help of χ^2 at 5 per cent level of significance. .(χ^2_{tab}=3.84)   **[05]**

	Attacked	Not Attacked	Total
Vaccinated	31	469	500
Non vaccinated	185	1315	1500
total	216	1784	2000

Q-3 (A) How to measure central tendency. Explain in detail. [06]

(B) Find correlation coefficient using rank correlation of following data: [06]

X	5	10	15	20	25	30
Y	16	19	23	26	30	35

Section II

Q-4 (A) Explain the distinctive points of Applied and Fundamental research. [06]

(B) Which sort of technique is involved in defining a problem? [06]

OR

Q-4 (A) Explain the block diagram of Research process in detail. Explain any two blocks in detail. [06]

(B) List out the step for sample design and explain any two of them in detail with example. [06]

Q-5 (A) Explain sequential sampling using necessary example. [06]

(B) Define the following terms: [05]
  1) Dependent and Independent variable
  2) Confounded relationship
  3) Experimental unit
  4) Research hypothesis

OR

Q-5 (A) Explain the different types of research design. [06]

(B) Give difference between observation method and interview method. [05]

Q-6 (A) On what basis the Scaling procedure is classified? Explain any three. [06]

(B) Explain the four different types of Measurement scales. [06]

END OF PAPER