

Question No: 01

This is a subjective question, hence you have to write your answer in the Text-Field given below.

a). Manufacturer of a drug claims that the one of their patented drugs is effective in curing pulmonary diseases with 75% efficiency. It is observed that 380 out of 500 patients used this drug found that it is effective in curing pulmonary diseases. Validate the claim at 1% level of significance by using an appropriate test. [3M]

b). Discuss the Significance of Correlation and regression in understanding the data. And Find correlation coefficient & linear regression( $y = f(x)$ ) of the following data. [7M]

X	5	6	9	8	4
Y	8	4	4	9	6

Question No: 02

This is a subjective question, hence you have to write your answer in the Text-Field given below.

a). Consider  $y = f(x_1, x_2)$  with corresponding probabilities given below and find

$P(y = 1 / x_1 = 1, x_2 = 0)$ .

[5M]

$x_1$	$x_2$	$y$	$P(x_1, x_2, y)$
1	1	0	0.20
1	1	1	0.15
1	0	1	0.02
0	0	0	0.15
0	0	1	0.25

Question No: 02

$P(y = 1/x_1 = 1, x_2 = 0)$ .

[5M]

$x_1$	$x_2$	$y$	$P(x_1, x_2, y)$
1	1	0	0.20
1	1	1	0.15
1	0	1	0.02
0	0	0	0.15
0	0	1	0.25
1	0	0	0.10
0	1	0	0.05
0	1	1	0.08

Question No: 02

b) A corporate Hospital wants to name their hospital with specialization like XYZ Centre for cancer care / XYZ Centre for Cardiac care / XYZ Centre for Orthocare by consider the following data. Suggest a suitable name by using a relevant statistical tool/procedure. Justify it.  
[5M]

Disease	Admitted Cases	Cured after treatment
Cancer	35%	30%
Cardiac	40%	25%
Ortho related issues	25%	40%

Question No: 03

This is a subjective question, hence you have to write your answer in the Text-Field given below.

a). For the month of March 2023, actual demand for a product is 250 units whereas the forecast is 280 units. Is it possible to forecast the demand for the month of April 2023? If possible, forecast for April 2023 using an appropriate time series model. [5M]

b). An unfair coin is tossed 50 times and following are the outcomes noted. [5M]

H	T	H	T	T	T	H	T	T	H	T	T	H	T	T	H	T	T	H	T	T	H	T	H
T	H	H	T	T	H	T	T	T	H	T	T	H	H	T	T	T	H	H	H	H	H	H	H

Is it possible to find Maximum Likelihood estimates? If possible find ML Estimates. If not state the reason and validate.

Question No: 04

This is a subjective question, hence you have to write your answer in the Text-Field given below.

a). It is observed that average life of product 'A' follows normal distribution. Manufacturer of product 'A' claims that average life of the product is at least 120 months with variance 25 months. A random sample of 10 of these is with mean 125 months and standard deviation 4 months. Validate the claim of the manufacturer at 5% level of significance. [5M]

b). Consider the following data related to education loan taken or not for pursuing higher education. Formulate a suitable hypothesis and validate it by using an appropriate statistical procedure. [5M]

Education Loan	Boys	Girls
Loan taken	300	100
Not taken	150	250