

Indian Institute of Technology, Madras - BS in Data Science and Applications

Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✗ icon are incorrect.

Question Paper Name :

IIT M FOUNDATION AN4 EXAM QPF4 16
JULY 2023

Subject Name :

2023 July: IIT M FOUNDATION AN4 EXAM
QPF4

Creation Date :

2023-07-10 18:54:05

Duration :

240

Total Marks :

705

Display Marks:

Yes

Share Answer Key With Delivery Engine :

Yes

Actual Answer Key :

Yes

Calculator :

Scientific

Magnifying Glass Required? :

No

Ruler Required? :

No

Eraser Required? :

No

Scratch Pad Required? :

No

Rough Sketch/Notepad Required? :

No

Protractor Required? :

No

Show Watermark on Console? :

Yes

Highlighter :

No

Auto Save on Console?

Yes

Change Font Color :

No

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406531928587. ✓ The Minimum value of the quotient $q(x)$ is 0.

6406531928588. ✖ $p(x)$ is an odd degree polynomial.

6406531928589. ✓ End behavior $p(x) \rightarrow +\infty$ as $x \rightarrow +\infty$

6406531928590. ✓ End behavior $p(x) \rightarrow +\infty$ as $x \rightarrow -\infty$

Sem1 Statistics1

Section Id :	64065339054
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	40
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065382478

Question Shuffling Allowed :No

Is Section Default? :null

Question Number : 74 Question Id : 640653577504 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER 1: STATISTICS FOR DATA SCIENCE I (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531928597. ✓ YES

6406531928598. ✗ NO

Sub-Section Number :2

Sub-Section Id :64065382479

Question Shuffling Allowed :Yes

Is Section Default? :null

Question Number : 75 Question Id : 640653577505 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

A researcher wants to investigate the relationship between studying hours and exam scores. He collects the data on studying hours and exam scores from a sample of 100 students and perform a

correlation analysis. Which branch of statistics does this analysis belong to?

Options :

6406531928599. ✔ Descriptive Statistics.

6406531928600. ✖ Inferential Statistics.

6406531928601. ✖ Both Descriptive and Inferential Statistics.

6406531928602. ✖ Neither Descriptive nor Inferential Statistics.

Sub-Section Number :

3

Sub-Section Id :

64065382480

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 76 Question Id : 640653577506 Question Type : MSQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Table 1 represents quarterly data of oil production of the years 2019 and 2020.

Year	Oil Production
2019-Q1	10000
2019-Q2	12000
2019-Q3	15000
2019-Q4	13000
2020-Q1	8000
2020-Q2	9000
2020-Q3	10000
2020-Q4	11000

Table 1: Production Data

Which of the following option(s) is/are correct?

Options :

6406531928603. ✔ It is a time series Data.

6406531928604. ✖ It is a cross sectional Data.

6406531928605.

✔ It is a structured Data.

6406531928606. ✖ It is an unstructured Data.

Question Number : 77 Question Id : 640653577507 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are correct?

Options :

6406531928607. ✖ Mean and Mode can only be defined for a numerical data.

6406531928608. ✔ Mode can be defined for a categorical data.

6406531928609. ✔ There can be more than one mode for a data.

6406531928610. ✖ Median can be measured for a categorical variable only if the variable is nominal.

6406531928611. ✔ The sum of relative frequencies of all the observations in a given data set is always equal to 1.

Sub-Section Number :	4
Sub-Section Id :	64065382481
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 78 Question Id : 640653577515 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

Table 4 represents the data of values and corresponding frequencies. If the mean of the dataset is 5, then find the value of x .

Value	Frequency
3	$x + 5$
4	15
$x + 1$	20
$x + 3$	x

Table 4:

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 79 **Question Id :** 640653577516 **Question Type :** SA **Calculator :** None

Response Time : N.A **Think Time :** N.A **Minimum Instruction Time :** 0

Correct Marks : 4

Question Label : Short Answer Question

The mean and sample variance of the data set consisting of 10 observations is 22 and 81 respectively. Later it is noted that one observation 20 is wrongly noted as 15. what is the sample standard deviation of the original data set?(Enter the answer correct to two decimal accuracy)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

8.68 to 8.71

Sub-Section Number : 5

Sub-Section Id : 64065382482

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653577508 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (80 to 82)

Question Label : Comprehension

Table 2 represents the movies released in 2022 on the OTT platform.

Genre	Number of Movies	Relative Frequency
Action	54	0.27
Comedy	d	0.085
Drama	68	a
Romance	41	b
Thriller	c	0.1

Table 2: Movie Data

Based on the information, answer the given subquestions.

Sub questions

Question Number : 80 Question Id : 640653577509 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Find the total number of released movies in 2022 on OTT Platform.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

200

Question Number : 81 Question Id : 640653577510 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Find the number of Thriller and Comedy movies released in 2022 on OTT Platform.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

37

Question Number : 82 Question Id : 640653577511 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Calculate $a + b$. (Enter the answer correct to three decimal accuracy)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.542 to 0.548

Sub-Section Number : 6

Sub-Section Id : 64065382483

Question Shuffling Allowed : No

Is Section Default? :

null

Question Id : 640653577512 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (83 to 84)

Question Label : Comprehension

Based on the given data in the Table 3 , answer the subquestions.

Stock	Category	Growth Rate	Stock Price(INR)	No. of Employees
XYZ Ltd.	Technology	10%	500	500
ABC Pvt. Ltd.	Healthcare	8%	250	200
PQR Corp.	Energy	5%	100	1000
DEF Ltd.	Finance	12%	800	300
MNO Pvt. Ltd.	Consumer Goods	6%	400	400

Table 3: Stocks Data

Sub questions

Question Number : 83 Question Id : 640653577513 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true?

Options :

6406531928615. ✖ XYZ Ltd. is a variable.

6406531928616. ✔ Number of employees have a ratio scale of measurement.

6406531928617. ✔ Growth Rate (%) is a variable.

6406531928618. ✖ Category have an interval scale of measurement.

Question Number : 84 Question Id : 640653577514 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

What is the scale of measurement of “Category”?

Options :

6406531928619. ✖ Ordinal Scale.

6406531928620. ✖ Ratio Scale.

6406531928621. ✔ Nominal Scale.

6406531928622. ✖ Interval Scale.

Sub-Section Number :	7
Sub-Section Id :	64065382484
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653577517 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (85 to 86)

Question Label : Comprehension

Table 5 represents the data set about Advertising Expenditure and the Sales Revenue of a company. An analyst wants to investigate the relationship between the Advertising Expenditure (in Lakhs of rupees) and the monthly Sales Revenue (in Lakhs of rupees) of a company over a period of 6 months.

Month	Advertising Expenditure	Sales Revenue
1	20	80
2	15	75
3	25	90
4	18	82
5	22	88
6	17	80

Table 5: Advertising Expenditure and Sales Revenue

Based on the information, answer the given subquestions.

Sub questions

Question Number : 85 Question Id : 640653577518 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which measure(s) will help you to determine the existence of the relation between Sales Revenue and the Advertising Expenses?

Options :

6406531928625. ✓ Covariance

6406531928626. ✗ Mean of both Sales and Advertising

6406531928627. ✓ Correlation Coefficient

6406531928628. ✗ None

Question Number : 86 Question Id : 640653577519 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

What is the sample covariance between the Sales Revenue and Advertising Expenses?(Enter the answer correct to one decimal accuracy)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

18.6 to 19.2

Sub-Section Number : 8

Sub-Section Id : 64065382485

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653577520 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (87 to 89)

Question Label : Comprehension

A clothe retailer wants to analyze the prices of different brands of t-shirts in his store. He randomly collected 10 t-shirts and prices (in rupees) of the t-shirts are 150, 550, 700, 240, 300, 750, 200, 180, 320, 420 respectively.

Based on the information, answer the given subquestions.

Sub questions

Question Number : 87 Question Id : 640653577521 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Price below which 25% of the t-shirts fall.

Options :

6406531928630. ✓ It is a measure of Q_1 .

6406531928631. ✓ 200 Rs.

6406531928632. ✗ It is a measure of Q_3 .

6406531928633. ✗ 550 Rs.

Question Number : 88 Question Id : 640653577522 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Price of the t-shirt that separates price of the highest 25% of the data from the lower 75%.

Options :

6406531928634. ✗ It is a measure of Q_2

6406531928635. ✓ 550 Rupees

6406531928636. ✓ It is a measure of Q_3

6406531928637. ✗ 310 Rupees

Question Number : 89 Question Id : 640653577523 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

How many outliers are in the given data set?

Options :

6406531928638. ✓ 0

6406531928639. ✗ 1

6406531928640. ✗ 2

6406531928641. ✖ Can't determined.

Sem2 Intro to Python

Section Id :	64065339055
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065382486
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 90 Question Id : 640653577524 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER 2:
INTRODUCTION TO PYTHON (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?