

**Number Of Columns : 70**

**Text Areas : PlainText**

**Question Number : 33 Question Id : 640653445461 Question Type : SA Calculator : None**

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

**Correct Marks : 2.25**

**Question Label : Short Answer Question**

**Mention some suggestions to improve the program.**

**NOTE:** Your answer should not exceed 300 words.

**Response Type : Alphanumeric**

**Evaluation Required For SA : No**

**Max Word Count : 300**

**Show Word Count : Yes**

**Min Word Count : 0**

**Highlight min word : Yes**

**Single Line Response : No**

**Number of Rows : 10**

**Number Of Columns : 70**

**Text Areas : PlainText**

## Maths2

<b>Section Id :</b>	64065328976
<b>Section Number :</b>	2
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	8
<b>Number of Questions to be attempted :</b>	8
<b>Section Marks :</b>	25

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 :	64065363281
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 34 Question Id : 640653445462 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/DIRECT ENTRY DIPLOMA : MATHEMATICS FOR DATA SCIENCE 2](#)"

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 :

6406531484357.  YES

6406531484358.  NO

Sub-Section Number :	2
Sub-Section Id :	64065363282
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 35 Question Id : 640653445478 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406531484383. ✓ Every matrix is similar to itself.

6406531484384. ✓ If  $A$  is similar to  $B$ , then  $A^{-1}$  is similar to  $B^{-1}$ .

6406531484385. ✗  $\begin{bmatrix} 2 & 1 \\ 0 & 2 \end{bmatrix}$  is similar to  $\begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$ .

6406531484386. ✗ If  $A$  is similar to  $B + C$ , then  $\text{rank}(A) = \text{rank}(B) + \text{rank}(C)$ .

Sub-Section Number :

3

Sub-Section Id :

64065363283

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 36 Question Id : 640653445463 Question Type : MSQ Is Question

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

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406531484359. ✗ If  $A$  is a non-zero matrix of order  $4 \times 3$  and rank of  $A$  is 3, then the rows of  $A$  are linearly independent.

6406531484360. ✓ If  $A$  is a non-zero matrix of order  $4 \times 3$  and rank of  $A$  is 3, then the columns of  $A$  are linearly independent.

6406531484361. ✓ If  $A$  is a non-zero matrix of order  $m \times (m + 1)$ ,  $m > 1$ , then the maximum possible nullity of  $A$  is  $m$ .

6406531484362. ✓ If  $A$  is a non-zero matrix of order  $4 \times 5$  and rank of  $A$  is 3, then the dimension of

the solution space of the homogeneous system  $Ax = 0$  is 2.

Sub-Section Number :	4
Sub-Section Id :	64065363284
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653445467 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 : (37 to 38)

Question Label : Comprehension

Let  $W$  be a proper subspace of an inner product space  $V$ , where  $\dim(V) = 3$  and  $P_W$  be the projection of  $V$  on  $W$ . Answer the subquestion based on the given data.

Sub questions

Question Number : 37 Question Id : 640653445468 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1

Question Label : Short Answer Question

If  $v \in V$  is vector of norm 5, then the maximum possible norm of the vector  $P_W(v)$  is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 38 Question Id : 640653445469 Question Type : MSQ Is Question

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

**Correct Marks : 1 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following option is/are true?

**Options :**

6406531484370. ✓ Let  $v \in V$ , then  $v - P_W(v)$  is orthogonal to  $W$ .

6406531484371. ✗ If dimension of  $W$  is 2, then dimension of the null space of  $P_W$  may not be 1.

6406531484372. ✓ Zero vector is orthogonal to every vector of  $V$ .

6406531484373. ✓ If  $v \in W$ , then  $P_W(v) = v$ .

<b>Sub-Section Number :</b>	5
<b>Sub-Section Id :</b>	64065363285
<b>Question Shuffling Allowed :</b>	No
<b>Is Section Default? :</b>	null

**Question Id : 640653445464 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 : (39 to 40)**

Question Label : Comprehension

Consider  $V = \mathbb{R}^2$  with respect to the inner product defined as

$$\langle (x_1, x_2), (y_1, y_2) \rangle = x_1 y_1 - (x_1 y_2 + x_2 y_1) + 2x_2 y_2, \text{ for all } (x_1, x_2), (y_1, y_2) \in \mathbb{R}^2$$

Answer the Subquestions based on the given data.

**Sub questions**

**Question Number : 39 Question Id : 640653445465 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  $\|(1, 3)\|^2$ .

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

13

**Question Number : 40 Question Id : 640653445466 Question Type : MSQ Is Question**

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

**Correct Marks : 2 Selectable Option : 0**

Question Label : Multiple Select Question

Which of the following is/are unit vectors in  $V$ ?

**Options :**

6406531484364. ✓  $(1, 1)$

6406531484365. ✓  $\frac{1}{2}(2, 2)$

6406531484366. ✗  $\frac{1}{\sqrt{13}}(2, 3)$

6406531484367. ✗  $(0, 1)$

6406531484368. ✗ None of these

**Question Id : 640653445474 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 : (41 to 43)**

Question Label : Comprehension

Consider two linear transformations  $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$  such that  
 $T(x, y, z) = (x + y, y + z)$  and  $S : \mathbb{R}^2 \rightarrow \mathbb{R}^3$  such that  $S(x, y) = (x, y, x + y)$ .  
Let  $\beta = \{(1, 0, 0), (0, 1, 0), (0, 0, 1)\}$  be an ordered basis for  $\mathbb{R}^3$  and  $\gamma = \{(1, 0), (0, 1)\}$  be an ordered basis for  $\mathbb{R}^2$ . Answer the subquestions based on the given data.

### Sub questions

**Question Number : 41 Question Id : 640653445475 Question Type : SA Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**  
**Correct Marks : 1**

Question Label : Short Answer Question

If  $A$  is the matrix representation of  
 $S \circ T$  (the transformation defined by  
 $(S \circ T)(x, y, z) = S(T(x, y, z))$  with  
respect to the ordered basis  $\beta$  for  
both the domain and codomain and order  
of  $A$  is  $m \times n$ , then find the value of  $m + n$ .

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

6

**Question Number : 42 Question Id : 640653445476 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

If  $K = \{(x, y, z) \mid ax + by = 0, cy + dz = 0\}$   
is the null space of  $S \circ T$ , then find the  
value of  $\left(\frac{a}{b}\right) - 2\left(\frac{c}{d}\right)$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

-1

**Question Number : 43 Question Id : 640653445477 Question Type : SA Calculator : None**

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

**Correct Marks : 1**

Question Label : Short Answer Question

Rank of  $S \circ T$  is

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

2

**Sub-Section Number :**

6

**Sub-Section Id :**

64065363286

**Question Shuffling Allowed :**

No

**Is Section Default? :**

null



**Question Id : 640653445470 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 : (44 to 46)**

Question Label : Comprehension

Consider a linear transformation  $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$  such that the matrix representation of  $T$  is  $A = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 2 & 3 \end{bmatrix}$  with respect to the ordered bases  $\beta = \{(1, 0, 0), (0, 1, 0), (1, 1, 1)\}$  and  $\gamma = \{(1, 0), (1, 1)\}$  for the domain and codomain, respectively. Answer the subquestions based on the given data.

### Sub questions

**Question Number : 44 Question Id : 640653445471 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

Nullity of the matrix  $A$  is

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

1

**Question Number : 45 Question Id : 640653445472 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Which of the following option is true?

**Options :**

6406531484375. ✖ *T* is one-one.

6406531484376. ✔ *T* is onto.

6406531484377. ✖ *T* is an isomorphism.

6406531484378. ✖ *T* is neither one-one nor onto.

**Question Number : 46 Question Id : 640653445473 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

If  $T(x, y, z) = (mx + ny + sz, px + qy + rz)$ ,  
then find the value of  
 $(m + n + s) - 3(p + q + r)$

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

-6

**Question Id : 640653445479 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 : (47 to 49)**

Question Label : Comprehension

The teacher asked Soumya and Sohini to consider an affine space each.

Soumya considered the affine subspace  $L$  and Sohini considered the

affine subspace  $L'$  of  $\mathbb{R}^3$ , where  $L = U$  and  $L' = (2, 0, 1) + U'$ ,

for some vector subspaces  $U = \text{Span}\{(2, 0, 1), (1, 1, 0), (0, 1, 0)\}$

and  $U' = \text{Span}\{(1, 0, 1), (0, 1, 1)\}$  of  $\mathbb{R}^3$ . Suppose there is a linear transformation

$T : U \rightarrow U'$  such that  $(0, 1, 0) \in \ker(T)$ ,  $T(2, 0, 1) = (0, 1, 1)$  and

$T(1, 1, 0) = (1, 0, 1)$ . An affine mapping  $f : L \rightarrow L'$  is obtained by

defining  $f(u) = (2, 0, 1) + T(u)$ , for all  $u \in U$ . By using the above

information answer the given subquestions:

### Sub questions

**Question Number : 47 Question Id : 640653445480 Question Type : MCQ Is Question**

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

**Time : 0**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Which of the following affine subspaces was considered by Soumya?

**Options :**

6406531484387. ✖  $L = \{(x, y, z) \mid x - y - 2z = 0\}$

6406531484388. ✖  $L = \{(x, y, z) \mid x + y - z = 1\}$

6406531484389. ✖  $L = \{(x, y, z) \mid x + y - z = 0\}$

6406531484390. ✔  $L = \mathbb{R}^3$

**Question Number : 48 Question Id : 640653445481 Question Type : MCQ Is Question**

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

**Time : 0**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Which of the following affine subspaces was considered by Sohini?

**Options :**

6406531484391. ✖  $L' = \{(x, y, z) \mid x - y - 2z = 0\}$

6406531484392. ✔  $L' = \{(x, y, z) \mid x + y - z = 1\}$

6406531484393. ✖  $L' = \{(x, y, z) \mid x + y - z = 0\}$

6406531484394. ✖  $L' = \mathbb{R}^3$

**Question Number : 49 Question Id : 640653445482 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

Which of the following functions represents  $f$  correctly?

**Options :**

6406531484395. ✔  $f(x, y, z) = (x - 2z + 2, z, x - z + 1)$

6406531484396. ✖  $f(x, y, z) = (x - 2z + 2, \frac{x}{2}, x - z + 1)$

6406531484397. ✖  $f(x, y, z) = (x - 2z, z, x - z)$

6406531484398. ✖ It cannot be determined from the given information.

# Statistics2

Section Id :	64065328977
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
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 :	64065363287
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 50 Question Id : 640653445483 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/DIRECT ENTRY DIPLOMA : STATISTICS FOR DATA SCIENCE 2"

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 :

6406531484399.  Yes

6406531484400.  No