



## Holocraft Sticker

Seat No 4550  
 Slk. No 3302956  
 Sub. BST  
 Centre 1312

SAVITRIBAI PHULE PUNE UNIVERSITY

BST604MJ-BST



em:1 20324

Date 30/04/25-wed

Subject BUSINESS STATISTICS

Medium English

Seat No. : In figure &amp; in words

4550

four thousand five hundred and fifty

four thousand five hundred and fifty

Signature of Candidate

Signature of Examiner

## Instruction to Candidate

- Candidate has to confirm seat number, subject and centre number printed on Bar code and Write it on attendance sheet.  
 विद्यार्थ्याने प्रथम बार् कोडवरील असलेले प्रमाण, विषय व केंद्र प्रमाण तपासून घेणे आवश्यक आहे व त्याची नोंद अति उपस्थिती पत्रकावर घ्यावी.
- Paste Bar Code in prescribed space.  
 उपस्थितीपत्रकातील विहित जागेवर बार् कोड लावावा.
- Do not write anything on Bar code sticker, otherwise it will be treated as unfair means.  
 बार् कोड स्टिकरवर काहीही लिहू नये, अन्यथा परीक्षा गैरप्रकार समजले जाईल.

Specific remarks regarding malpractice (in Red Ink)

Total	Marks in Figure	Marks in Words	Sign
Examiner	2	Two	ⓐ
Moderator			

Q. No.	Examiner	Moderator
1	1	1
2	0	0
3	0	0
4	1	1
5	0	0
6		
7		
8		
9		
10		
11		
12		
Total in Figure	2	2
Total in Words	Two	Two
Signature	ⓐ	

१. विद्यार्थ्याने उत्तरपत्रिकेच्या मुखपृष्ठावर तसेच उपस्थिती पात्रकावर विहित जागेत आसन क्रमांक अंकात व अक्षरात धिक्चूक लिहून स्वाक्षरी करावी.
२. उत्तरपत्रिकेवर फक्त निळ्या अथवा काळ्या शाईचा उपयोग करावा, अन्यथा उत्तरपत्रिकेचे मूल्यामापन केले जाणार नाही.
३. उत्तरपत्रिकेच्या पृष्ठक्रमांक ३ पासून लिहिण्यास प्रारंभ करावा.
४. संबंधित प्रश्नाचे अथवा उपप्रश्नाचे उत्तर लेखून सुरू होते तेथेच समासात प्रश्न क्रमांक, उपप्रश्न क्रमांक अथवा व स्पष्ट लिहूना, घासारी येनायला शाईचा उपयोग करू नये.
५. प्रत्येक पानाच्या दोन्ही बाजूस लिहावे, उत्तरपत्रिका किंवा पुरवणी उत्तरपत्रिकेचे कोणतेही पान फाटू नये, फाडल्यास परीक्षा गैरप्रकार समजून पुढील कार्यवाही करण्यात येईल.
६. पेपर संपल्यापूर्वी १० मिनिटे अगोदर इरास घंटा होईल, त्यानंतर विद्यार्थ्याने उत्तरपत्रिका व पुरवणी उत्तरपत्रिकेवर होतोक्राफ्ट स्टिकर विहित जागेवरच लावावा.
७. काढी करणे किंवा दुसऱ्याच्या नावावर परीक्षेस बसणे यांसारख्या कृती 'महाराष्ट्र-प्रीव्हेनशन ऑफ मालप्रॅक्टिस अँड युनिव्हर्सिटी, बोर्ड अँड अदर स्पेसिफाईड एग्जामिनेशनस अँक्ट, १९८२' ( सा.फु.पु.वि. चा अध्यादेश क्रमांक ९) न्यानुसार संघत केलेला कायदा वा अन्यदे दंडही असले.

Candidate shall fill all information about seat number, paper etc. in prescribed space and sign on the answer book and attendance sheet.

Candidate shall use blue or black ink only. Otherwise answer book will not be evaluated.

Candidate shall start writing answer from page no. 3 of the answer book.

Candidate shall mention question number, sub question number correctly at the beginning of the same and shall not use ink other than blue or black.

Candidate shall write on both sides of pages and shall not tear off any page, it will be treated as unfair means.

Warning bell will be given before 10 minutes of the concluding time. Candidate shall paste Holocraft Sticker at appropriate space on the answer book.

An Act of Copying or Impersonations at an Examination is Punishable under 'The Maharashtra Prevention of Malpractices at University, Board and Other Specified Examinations Act, 1982' (Ordinance 9 of SPPU). The Act passed to the effect.

Examiner and Moderator has to write marks on all given appropriate place only. Examiner should give assessment tick(✓) or (x) in the margin.

Q. No.	Examiner	Moderator	Verification	Revaluation
1	1			
2	0			
3	0			
4	1			
5	0			
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11				
12				
Total				



Q.No.						TOTAL
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S. K. / Q. No.

Q. 13

ii)

→

y

12

10

8

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20

30

40

50

60

70

80

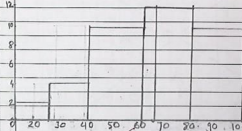
90

100

X

on y axis scale = 1 unit = 2 cm

on x axis scale = 1 unit = 10 cm.





T. R./Q.No.

Q.4A

1 <sup>st</sup> Judge = X	2 <sup>nd</sup> Judge = Y	3 <sup>rd</sup> Judge = Z	X <sup>2</sup>	Y <sup>2</sup>	Z <sup>2</sup>	XYZ
1	3	6	1	9	36	18
6	5	4	36	25	16	60
5	8	9	25	64	81	180
10	4	8	100	16	64	320
3	7	1	9	49	1	21
2	10	2	4	100	4	40
4	2	3	16	4	9	24
9	1	10	81	1	100	90
7	6	5	49	36	25	210
8	9	7	64	81	49	504

# sorry. 3R for



Q.No.						TOTAL
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2. W.Q.No.

Q.4A

1 <sup>st</sup> Judge	2 <sup>nd</sup> Judge	3 <sup>rd</sup> Judge	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	d = R <sub>1</sub> - R <sub>2</sub> - R <sub>3</sub>	d <sup>2</sup>
1	3	6	1	1	1	-2	1
6	5	4	2	2	2	-2	4
5	8	9	3	3	3	-3	9
10	4	8	4	4	4	-4	16
3	7	1	5	5	5	-5	25
2	10	2	6	6	6	-6	36
4	2	3	7	7	7	-7	49
9	1	10	8	8	8	-8	64
7	6	5	9	9	9	-9	81
8	9	7	10	10	10	-10	100

n=10

Σd<sup>2</sup> = 385

there is no repeated number in any column value in question so we can use Rank not Repeated formula for this.

$$= r_s = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$$

$$= 1 - \frac{6 \times 385}{10(10^2 - 1)}$$

$$= 1 - \frac{6 \times 385}{10 \times 99}$$

$$= 1 - \frac{2310}{990}$$

$$= 1 - 2.3333$$

$$= -1.3333$$

is nearest approach to common table.



Q.No.							TOTAL
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T. R./Q.No.

in beauty is approx =  $-1.3333$

explanation.

as this is the Karl Pearson's correlation coefficient problem.

and there is three method in this probability I know (1) is directly there you have only find value and put in the formula

(2) ranking method - in ranking there is submethod - Repeated values and non-repeated values.

For repeated values we have to find  $[m]$  and after that solve the equation

So but in this problem there is no repeated value so we directly make columns and find the value and solve this example.



Q.No.						TOTAL
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I. E. / Q. No.

Q.1A

(ii)

→ Business statistics is a Branch of mathematics that makes work on Data interpretation, analysing and calculation.

that support business Real world problem and various Research fields in analysis.

in Business statistics works on Big Data group, collection etc only work on that Data type.

doesn't work on qualitative Data. like emotions, Beauty, etc.

For performing operation in Business statistics we need data.

and for that we have different Data Sources that we can see.

- global population data or people's count data for counting population on earth or in any specific country or state.

every government of country has that data and for various reason.

like. findings genders on Big whole country data from them how many people from male gender female gender and others.

ex- Jan-gan-na that India took the data.



Q.No.						TOTAL
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S. No./Q.No.

Excel Data -

In various field of Business like  
marketing, IT, shoppings

for business purpose for growth every  
brand.

make ads and promotion strategies  
from this operation we can collect  
data regarding particular field or  
industry.

ex- Shampoo Brand - excel format or Graphical  
form Review

Now from this source collect too many  
data like various gender, ages, and  
marketing of people.

WHO

world health organization conduct  
the data every year in whole world  
for purpose of researching or or

Scientific solution or situation of population  
regarding health.

that also a Big source for data  
collection

ex. data of healthy people.





	Q.No.						TOTAL
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E. / Q.No.

Entertainment industry -

the entertainment industry having huge amount of data regarding people's choice of watching movies, web-series, shows etc.

Data like teenager, middle age old-age people watching time, and many more there is various data have

ex

Netflix, amazon, various platform can collect data from them.

~~data warehouse-~~

for various field and business there is data warehouses that stored all the raw data in int. and that can be the source.



Q.No.						TOTAL
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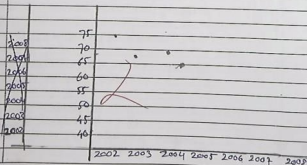
2. E, Q.No.

year value

2002	75	
2003	67	$200/2 = 100$
2004	68	$200/2 = 100$
2005	65	$183/2 = 91.5$
2006	50	$164/2 = 82$
2007	54	$145/2 = 72.5$
2008	41	

e-446.

the estimate the value for  
2011 is = 446.





Q.No.							TOTAL
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Q. No.

Q-3

B

I

→ if on an average 1 (one) ship in every 10 (ten)

five ships from the expected arrival  
Safe = 4.

$p(s)$  {safe unsafe, unsafe unsafe, safe safe  
unsafe safe}

for atleast four  
ships expected to ~~not~~ arrived safely.

$(su, ss, s)$

$$\frac{8}{4} = \frac{5}{2}$$

1.25

∴ the probability of if out of  
5 ships expected 4 ships atleast  
arrived safely so 3.

1.25

is the probability.



Q.No.							TOTAL
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T. R. Q.No.

Q.25

I	wages-X upto (Rs)	No of-y workers	$X - \bar{X}$	$d^2$	$xy$
	10	12	-35	1225	200
	20	30	-25	625	600
	30	65	-15	225	1950
	40	107	-67	4489	4290
	50	157	-107	11449	7550
	60	202	-152	23104	12120
	70	222	-25	625	15540
	80	230	35	1225	18400

$$\Sigma X = 860$$

$$\Sigma d^2 = 66088$$

$$\sigma = \frac{\Sigma d^2}{n}$$

$$\sigma = \frac{66088}{8}$$

$$= 8261$$

Q.3

A II

P(S) 75% A / 80% B

contradicting percentage

A will contradict = 25%

and B will contradict = 20%

8025%

20%

86.25% percentage contradict



Q.No.								TOTAL
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S. R. / Q.No.

each other in stating the same fact.

7

1



SPPU-14/24

Q.No.							TOTAL
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Sanitary Whole Paper Industries

Z. R./Q.No.

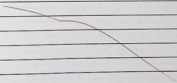
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Q. /Q.No.





Q.No.						TOTAL
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Savitribai Phule Pune University

U. S. Pat. No.





Q.No.

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TOTAL



SPPU-17/24

17

SPPU-17/24

S. /Q.No.



2010年12月11日

	Q.No.						TOTAL
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Swissôtel Plateau Paris Union

U. S. Pat. No.

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Q.No.								
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SPPU-18/24

K./Q.No.



847P-13, 2007, 224

Q.No.						TOTAL
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Savitribai Phule Pune Univ.

2. W./Q.No.

100



Sardar Patel University

Q.No.									
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SPPU- 21/24

21

T. E. / Q. No.



	Q.No.					TOTAL
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Savitribai Phule Pune University

2. W./O.No.

110



Q.No.

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TOTAL



BPPU-23/24

23

Central Board of Secondary Education

K/Q.No.



Q.No.							TOTAL
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S. E. / Q.No.

Rough work

$$\frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2 \times n \sum y^2 - (\sum y)^2}}$$

Kruskal Pearson

$$\text{adjusted } R^2 = 1 - \frac{6 \sum d^2 + m_1(m_1-1) + m_2(m_2-1)}{n(n-1)}$$

$$R^2 = 1 - \frac{6 \sum d^2}{n(n-1)}$$

$$(\bar{x}) = \frac{\sum fx}{F \text{ or } n}$$

arithmetic mean

$$(\bar{x}) = \frac{n}{\sum \frac{1}{x}}$$

$$x \quad y \quad \bar{x} - x \quad x^2$$

$$\sigma = \frac{\sum y^2}{n}$$