

PARUL UNIVERSITY
FACULTY OF ARTS
B.A Winter 2018 – 19 Examination

Semester: 3
Subject Code: 15101202
Subject Name: Statistical Methods in Economics

Date: 01/12/2018
Time: 10: 30 am to 1:00 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Do as directed.**(08)****A. Multiple choice type questions. (Each of 0.5 mark)**

1. By De Morgan's law $P(A \cup B)' =$ _____
a) $P(A \cap B)'$ b) $P(A' \cup B)'$ c) $P(A' \cap B')$ d) $P(A).P(B)$
2. For Mesokurtic curve of the distribution, β_2 is
a) Zero b) <3 c) >3 d) 3
3. $p(\text{the sun rises in the west}) = ?$
a) 1 b) 0 c) 0.5 d) 0.25
4. When b_{xy} is positive, then b_{yx} will be:
a) Positive b) Negative c) One d) Zero
5. The mean of the data 3,4,6,7 is:
a) 5 b) 4 c) 3 d) 6
6. In binomial distribution $np = 5$ and $npq = 4$ then $q =$ _____
a) $4/5$ b) 2 c) 1.5 d) 2.5
7. If $E(x) = 1.5$ then $E(2x - 3) = ?$
a) 0 b) 3 c) 1.5 d) 2.5
8. Total number of students in batch A is _____ (Batch A = 90² Total 100 in class)
a) 23 b) 25 c) 21 d) 20
9. The coefficient of correlation lies between _____
a) 0 to 1 b) -1 to 1 c) -1 to 0 d) none of these
10. If A and B are two independent sets then $P(A \cap B) =$ _____
a) $P(A).P(B)$ b) $P(A)+P(B)$ c) $P(A.B)$ d) none of these.
11. The perfect negative correlation is
a) $r = 1$ b) $r = -1$ c) $r = 0$ d) 0.5
12. The mode of the data: 3,2,3,4,3,5,2,5,2,4,5 is _____
a) 3 (b) 5 c) 2,3,5 (d) 3,5
13. If both variables X and Y increase or decrease simultaneously, then the coefficient of correlation will be:
a) Positive b) Negative c) One d) Zero
14. Which of the following is not the method of graphical representation ?
(a) Bar graph (b) pie chart (c) line graph (d) central tendency.
15. The median of any given data is 4 and Mean is 2 then Mode is _____.
a) 8 b) 4 c) 10 d) 12
16. If Mean < Median < Mode then distribution is
a) negatively skewed b) positively skewed c) Skewed d) none of these

B. Terms/ Short notes/ Case study/ Charts/ Graphs/ Tables, etc. (Each of 01 mark)**(07)**

1. Write the sample space for three coins tossed
2. If $\text{cov}(x,y)=0.6$ and $\text{s.d}(x) = 0.2$ and $\text{s.d}(y) = 5$ then find r .
3. Write the formula for Mode for grouped data.
4. Define regression line Y on X.
5. The probability of getting king card from well shuffled 52 playing cards.

6. Define Binomial distribution.
7. Write the types of the graph.

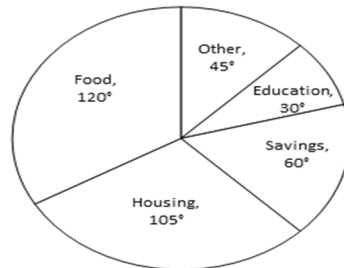
Q.2 Answer the following.

- A. If 10% screws are defective, find the probability that out of 5 screws chosen at random, (i) None is defective (ii) one is defective. (04)
B. Find the Mean for the following data (04)

X	1	2	3	4	5
F	10	15	12	13	8

- C. The pie graph represents distribution of the expenditure of income (Rs. 50000) of a (04)

Person:



- (a) How much income is invested in food and housing?
(b) How much income is spent in education and how much is savings?

OR

- C. Find the mode (04)

Class	0-5	5-10	10-15	15-20
F	14	10	16	8

Q.3 Answer the following.

- A. Find the correlation coefficient between demand (x) and Production (y) (05)

X	10	30	40	50	70
Y	9	6	5	3	2

- B. If A and B are two events such that $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{4}$ and $P(A \cap B) = \frac{1}{12}$. Find (i) $P(A/B)$ (ii) $P(B/A)$ (iii) $P(B/A')$ (iv) $P(A \cap B')$ (v) $P(A \cup B)$ (05)

- C. A card is selected from a pack of 52 playing cards. Find the probability that the selected card is (a) a king card (b) a red card (c) a face card (d) a spade card (e) with number between 2 and 7 (not including 2 and 7). (05)

OR

- C. For a given data set x and y, State which is more variable. (05)

X	7	4	3	5	1
y	2	10	1	3	6

Q.4 Answer the following.

- A. The following data has been obtained for rainfall received and the output in the farm due to the rains: (06)

	Rainfall (cm)	Output (quintals)
Mean	30	50
SD	5	10
Correlation coefficient	0.8	

- (a) Find the two regression coefficients b_{xy} and b_{yx} .

- (b) Find the two regression lines.
- (c) Find the likely production corresponding to the rainfall of 40 cm.

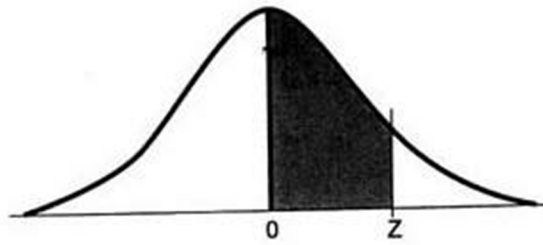
B. Compute spearman's rank correlation for the following observation : (06)

Candidate	1	2	3	4	5	6	7	8
Judge X	20	22	28	23	30	30	23	24
Judge Y	28	24	24	25	26	27	32	30

C. 4 coins are tossed simultaneously, what is the probability of getting (1) 2 heads (2) at least 2 heads (3) at most 2 heads? (06)

OR

C. If the weights of 300 students are normally distributed with a mean of 68kg and a s.d of 3kg , how many students have weights (i) greater than 72kg? (ii) less than or equal to 64kg? (iii) between 65kg and 71 kg inclusive? (06)



This table presents the area between the mean and the Z score . When $Z=1.96$, the shaded area is 0.4750.

Areas Under the Standard Normal Curve

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990
3.1	.4990	.4991	.4991	.4991	.4992	.4992	.4992	.4992	.4993	.4993
3.2	.4993	.4993	.4994	.4994	.4994	.4994	.4994	.4995	.4995	.4995
3.3	.4995	.4995	.4995	.4996	.4996	.4996	.4996	.4996	.4996	.4997
3.4	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4998
3.6	.4998	.4998	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.9	.5000									

Source: Adapted by permission from *Statistical Methods* by George W. Snedecor and William G. Cochran, sixth edition © 1967 by The Iowa State University Press, Ames, Iowa, p. 548.