

**PARUL UNIVERSITY**  
**FACULTY OF ARTS**  
**B.Arts Summer 2018 – 19 Examination**

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

Date: 03/05/2019  
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 If a dice is rolled then what are the total number of outcomes?  
a) 4    b) 6    c) 5    d) 2
- 2 When  $b_{xy}$  is positive, then  $b_{yx}$  will be:  
a) Positive    b) Negative    c) One    d) Zero
- 3 If  $E(x) = 1.5$  then  $E(2x - 3) = ?$   
a) 0    b) 3    c) 1.5    d) 2.5
- 4 The perfect positive correlation is  
a)  $r = 1$     b)  $r = -1$     c)  $r = 0$     d) 0.5
- 5 The mode of the data: **3,2,3,4,3,3,4,3,3,5** is \_\_\_\_\_  
a) 3    b) 5    c) 2,3,5    d) 3,5
- 6 If both variables X and Y increase with constant ratio, then the coefficient of correlation will be:  
a) Positive    b) Negative    c) One    d) linear
- 7 Which of the following is not the method of graphical representation ?  
(a) Bar graph    (b) pie chart    (c) line graph    (d) central tendency.
- 8 The median of any given data is 4 and Mean is 3 then Mode is \_\_\_\_\_.  
a) 8    b) 6    c) 10    d) 12
- 9 Total number of students in batch A is \_\_\_\_\_ (Batch A = 90<sup>th</sup> Total 100 in class)  
a) 23    b) 25    c) 21    d) 20
- 10 The coefficient of correlation lies between \_\_\_\_\_  
a) 0 to 1    b) -1 to 1    c) -1 to 0    d) none of these
- 11 The mean of the data 1,2,3,4,5 is:  
a) 5    b) 4    c) 3    d) 6
- 12 In binomial distribution  $np = 3$  and  $npq = 2$  then  $q =$  \_\_\_\_\_  
a) 4/5    b) 2    c) 0.6    d) 2.5
- 13 If Mean > Median > Mode then distribution is  
a) negatively skewed    b) positively skewed    c) Skewed    d) none of these
- 14 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.
- 15 By De Morgan's law  $P(A \cap B)' =$  \_\_\_\_\_  
a)  $P(A \cap B)'$     b)  $P(A' \cup B)'$     c)  $P(A' \cup B')$     d)  $P(A).P(B)$
- 16 For Mesokurtic curve of the distribution,  $\beta_2$  is  
a) Zero    b) <3    c) >3    d) 3

**B. Answer the following. (Each of 01 mark)****(07)**

1. Write the types of the graph.
2. Define addition theorem of Probability.
3. Write the formula for Mean for grouped data.
4. For a Poisson distribution, mean = 6.2 and variance = 6.2. (True/False) \_\_\_\_\_
5. The shape of normal distribution curve is \_\_\_\_\_
6. If  $\sigma = 3$  and  $\bar{x} = 5$ , then find CV
7. Write the sample space for two coins tossed

**Q.2 Answer the following.**

A. The two regression coefficients are  $b_{xy} = 0.785$  and  $b_{yx} = 1.1746$ . Find the correlation coefficient between  $x$  and  $y$ . If  $var_x = 25$ , find  $\sigma_y$ . (04)

B. Draw a bar graph for the following data: (04)

Subject	Maths	Physics	Chemistry	Biology	English
Marks obtained out of 100	85	60	35	80	70

C. Find the mode (04)

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

**OR**

C. Find the Mean for the following data (04)

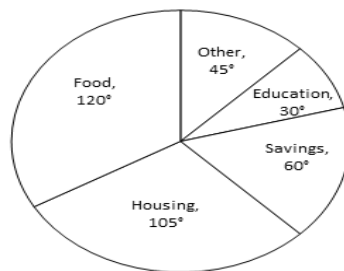
X	1	2	3	4	5
F	10	15	12	13	8

**Q.3 Answer the following.**

A. 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)

B. The pie graph represents distribution of the expenditure of income (Rs. 50000) of a (05)

Person:



(a) How much income is invested in food and housing?

(b) How much income is invested in saving and education?

C. 1. Calculate correlation coefficient for the following data: (05)

X	2	5	6	8
Y	9	5	3	1

Also discuss the correlation between  $x$  and  $y$ .

**OR**

C. Find the correlation coefficient between demand ( $x$ ) and Production ( $y$ ) (05)

X	5	9	13	17	21
Y	12	20	25	33	35

**Q.4 Answer the following.**

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

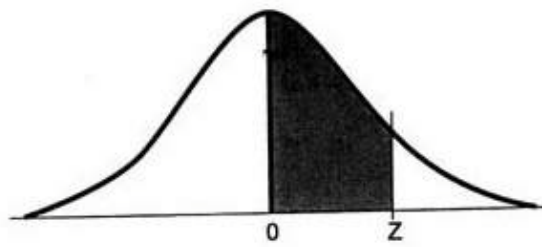
Candidate	1	2	3	4	5	6	7	8
Judge X	20	22	28	23	30	30	23	24
Judge Y	28	24	24	25	26	27	32	30

- B. X is normally distributed and the mean of X is 12 and the Sd is 4. Find out the probability of the following. (i)  $X \geq 20$  (ii)  $X \leq 20$  (iii)  $0 \leq X \leq 12$  (06)

- C. 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 (06)  
(i)  $P(A/B)$  (ii)  $P(B/A)$  (iii)  $P(B/A')$  (iv)  $P(A \cap B')$  (v)  $P(A \cup B)$

**OR**

- C. In a group of 1000 students, there are 650 students who can speak Hindi, 400 students who can speak English and 150 who can speak both Hindi and English. If a student is selected at random, what is the probability that he can speak. (a) At least one of the two language (b) Hindi only (c) English only (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.