

**PARUL UNIVERSITY**  
**FACULTY OF ARTS**  
**B.Arts Summer 2017 – 18 Examination**

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

Date: 31/05/2018  
Time: 10:30am to 1:00pm  
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.A. Select the correct option.****(08)**

1. Which of the following is the correct relation between  $r$ ,  $b_{xx}$  and  $b_{yx}$ ?  
 (a)  $r = b_{xy}b_{yx}$       (b)  $r^2 = b_{xy}b_{yx}$       (c)  $r = \frac{b_{yx}}{b_{xy}}$       (d)  $r = \frac{b_{xy}}{b_{yx}}$
2. Median of the following data is \_\_\_\_\_  
 10,12,15,12,18,19,18,20,12,17,18,14,12,16,12  
 (a) 15      (b) 18      (c) 14      (d) 12
3. For a normal distribution,  $z = \frac{x-\sigma}{\mu}$   
 (a)  $\frac{x-\sigma}{\mu}$       (b)  $x - \frac{\sigma}{\mu}$       (c)  $\frac{x-\mu}{\sigma}$       (d)  $x - \frac{\mu}{\sigma}$
4. For a binomial distribution, mean = \_\_\_\_\_.  
 (a)  $n$       (b)  $p$       (c)  $nq$       (d)  $np$
5.  $p(S) =$  \_\_\_\_\_.  
 (a) 1      (b) 0      (c) -1      (d) 0.5
6. For the following data, frequency of 4 is \_\_\_\_\_.  
 2,3,2,3,4,3,4,5,4,5,6,5,6,7,5,8,9,10,5  
 (a) 5      (b) 3      (c) 4      (d) 2
7. If  $r = 0$  then the correlation is known as \_\_\_\_\_.  
 (a) no correlation      (b) zero correlation      (c) negative correlation      (d) positive correlation
8. Normal distribution is a distribution for \_\_\_\_\_ variable.  
 (a) no      (b) continuous      (c) any      (d) discrete
9. For a normal distribution,  $P(Z \geq 0) =$  \_\_\_\_\_.  
 (a) 0      (b) 0.5      (c) 1      (d) -1
10. Class length of the class 30 – 45 is \_\_\_\_\_.  
 (a) 20      (b) 15      (c) 7.5      (d) 35
11. If  $p(A) = 1$  then  $p(A')$  = \_\_\_\_\_.  
 (a) 0.5      (b) 1.5      (c) 0      (d) 1
12. Equation of line of regression of  $x$  on  $y$  is \_\_\_\_\_.  
 (a)  $y = \bar{y} + b_{yx}(x - \bar{x})$       (c)  $y = \bar{y} + b_{xy}(x - \bar{x})$   
 (b)  $x = \bar{x} + b_{xy}(y - \bar{y})$       (d)  $x = \bar{x} + b_{yx}(y - \bar{y})$
13. The rank correlation coefficient lies between \_\_\_\_\_.  
 (a) -1 and 1      (b) -1 and 0      (c) 0 and 1      (d)  $-\infty$  and  $\infty$
14. Mid-point of the class 0 – 30 is \_\_\_\_\_.  
 (a) 00      (b) 15      (c) 7.5      (d) 30
15. If  $n(S) = 12$ ,  $n(A) = 8$  then  $p(A) =$  \_\_\_\_\_.  
 (a)  $\frac{3}{2}$       (b)  $\frac{1}{6}$       (c) 6      (d)  $\frac{2}{3}$
16.  $p(A \cap B) = p(A) + p(B) -$  \_\_\_\_\_.  
 (a)  $p(A')$       (b)  $p(A \cup B)'$       (c)  $p(A \cup B)$       (d)  $p(B')$

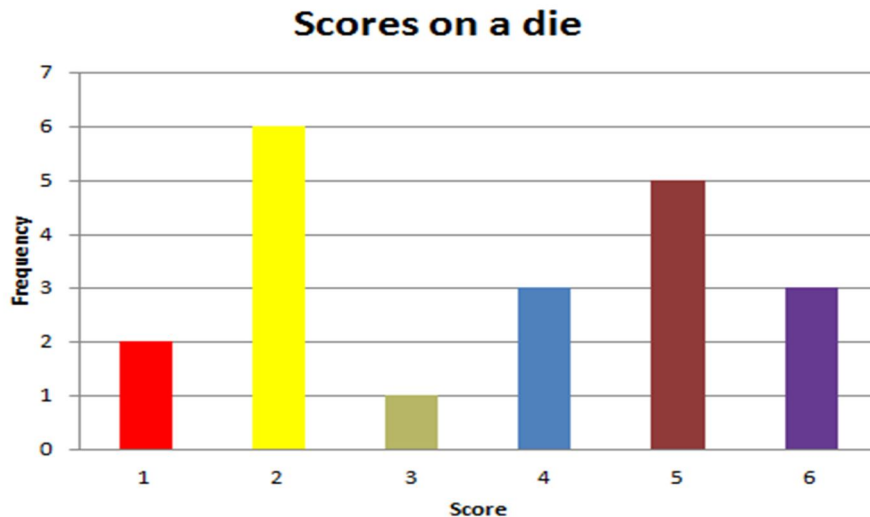
**Q.1.B. Answer the following.****(07)**

1. If  $A$  and  $B$  are independent events with  $p(A) = 0.5 = p(B)$  then  $p(A \cup B) = ?$
2. If  $A$  and  $B$  are mutually exclusive events with  $p(A) = 0.3$ ,  $p(B) = 0.15$  then  $p(A \cap B) = ?$
3. For normal distribution with  $\mu = 12$ ,  $\sigma = 2$  find  $p(X < 12)$ .
4. Average of the first 10 natural numbers is \_\_\_\_\_.
5. If for a data given  $b_{xy} = -\frac{1}{6}$ ,  $b_{yx} = -\frac{1}{6}$  then  $r =$  \_\_\_\_\_.
6. For binomial distribution with  $n = 3$ ,  $p = \frac{1}{2}$  find  $P(X = 1)$ .

7. If median of the following data is 50 then what is the missing entry?  
10,20,30, \_\_\_\_,50,60,70,80

**Q.2 Answer the following.**

- A. The following bar graph shows the results when a die was thrown a number of times. (04)



- (i) How many times 2 was thrown?  
 (ii) How many times 4 was obtained?  
 (iii) Which number was obtained the maximum times?  
 (iv) In total how many times the die was thrown?
- B. Find correlation coefficient for the price and demand of the commodity. (04)

Price (Rs)	5	7	8	9	10
Demand (qty)	6	6	7	10	10

- C. Consider the following frequency distribution. (04)

Marks	No. of students
0 – 20	3
20 – 40	10
40 – 60	14
60 – 80	16
80 – 100	7

- (i) How many students got marks less than 40?  
 (ii) How many students got marks more than 40?  
 (iii) How many students got marks between 20 to 80?  
 (iv) In total how many students appeared for the test?
- OR**
- C. Find the rank correlation coefficient for following data: (04)

$x$	4	5	1	3	2
$y$	1	5	4	2	3

**Q.3 Answer the following.**

- A. Let  $p(A) = 0.7$ ,  $p(B) = 0.3$  and  $p(A \cup B) = 1$ . (05)  
 Find (i)  $p(A \cap B)$  (ii)  $p(A')$  (iii)  $p(B')$  (iv)  $p(A' \cap B')$  (v)  $p(A' \cup B')$
- B. An unbiased coin is tossed 5 times. Find the probability of getting (i) exactly 4 heads (05)  
 (ii) at least 4 heads (iii) at most 2 heads, using binomial distribution.
- C. The following information is obtained for two variables  $x$  and  $y$ . (05)  
 $n = 8$ ,  $\sum x = 24$ ,  $\sum y = 48$ ,  $b_{xy} = -0.38$ ,  $b_{yx} = -2.41$   
 Find equations of regression lines.

**OR**

- C. Find the mode of the following: (05)

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
$f_i$	5	9	11	13	10	7	2

**Q.4 Answer the following.**

- A. If  $p(A) = p(B) = p(C) = 0.5$ ,  $p(D/A) = 0.4$ ,  $p(D/B) = 0.3$  and  $p(D/C) = 0.1$ . (06)

Find (i)  $p(A/D)$  (ii)  $p(B/D)$

- B. In a normal distribution mean  $\mu = 21.5$  and s.d.  $\sigma = 2.5$ . find the following values: (06)

(i)  $P(x \leq 18)$  (ii)  $P(x \leq 25)$  (iii)  $P(18 \leq x \leq 25)$  (iv)  $P(x \geq 25)$

- C. The following are data regarding the heights (y) and weights (x) of 100 college students: (06)

$\sum x = 15000$ ,  $\sum x^2 = 2272500$ ,  $\sum xy = 1022250$ ,  $\sum y = 6800$ ,  $\sum y^2 = 463025$

Find the coefficient of correlation between height and weight and also the equation of regression of height and weight.

**OR**

- C. Find the mean of the following data: (06)

Class	0-20	20-40	40-60	60-80	80-100
$f_i$	5	8	15	16	6