TB154475A **Reg. No: ……**

Name: ……

B. A. DEGREE (C.B.C.S.S) EXAMINATION, MARCH 2017
SEMESTER IV – STATISTICS (COMPLEMENTARY COURSE)
ST4CS02B - STATISTICAL TOOLS
(For Sociology)

Time: Three Hours **Maximum Marks: 80**

Use of scientific calculators and statistical tables permitted

PART A

I. Answer all questions. Each question carries 1 mark.

1. Write an advantage of Spearman's rank correlation coefficient.
2. Write the regression equation of y on x.
3. What is a random experiment?
4. Write the two necessary conditions to be satisfied by a pdf.
5. Define null hypothesis.
6. What is significance level?

(6x1=6)

PART B

II. Answer any seven questions. Each question carries 2 marks.

7. State two properties of correlation coefficient.
8. What is regression?
9. Write classical definition of probability.
10. What is addition theorem for two events.
11. For two events A and B how will you express the event 'exactly one of the two events occurs'?
12. Define continuous random variable.
13. Define distribution function of a random variable. How do you obtain the probability density function from the distribution function of a continuous random variable?
14. Write down the pdf of a Normal distribution. Give a practical example of a situation in which this distribution arises?
15. Define Type I and Type II errors.
16. What is Power of a test?

(7x2 =14)

PART C

III. Answer any five questions. Each question carries 6 marks.

17. Explain different methods of studying correlation.
18. If $\sum x = 544$, $\sum y = 552$, $\sum xy = 37560$, $\sum x^2 = 37028$, $\sum y^2 = 38132$, n=8, obtain the line of regression of y on x and estimate y when x is 68.

19. The random variable X has the following pdf.

X	0	1	2
f(x)	k	2k	3k

Find k, P(X<2) and P(0<X<2).

20. For a binomial distribution, mean = 2, variance = 3/2. Write down its pdf.
21. A pair of unbiased dice are thrown. Find the probabilities that (i) the sum is 6 (ii) the sum is 5 or less.
22. A card is drawn from each of two well shuffled pack of cards. Find the probability that at least one of them is an ace.
23. Explain the test procedure for testing the equality of means of two normal populations?
24. Distinguish between critical region and acceptance region.

(5x6 =30)

PART D

IV. Answer any two questions. Each question carries 15 marks.

25. The two regression lines obtained in a correlation analysis are $8x - 10y + 66 = 0$, $40x - 18y = 214$. Find the mean values of x and y and the correlation coefficient.
26. A bag contains 8 red balls and 5 white balls. Two successive drawings of 3 balls are made with replacement. Find the probability that the first drawing will give 3 white balls and second 3 red balls.
27. A test of 100 youths and 200 adults showed that 42 of the youths and 50 of the adults were poor drivers. Use the data to test the claim that youth percentage of poor drivers is larger than the adult percentage. ($\alpha = 0.05$)
28. The mean weight of a sample of 100 students was 50 kgs with SD 3 kgs. Is it reasonable to accept the claim that the mean weight of all students is 51 kgs? ($\alpha = 0.05$)

(2x15 =30)