D 70361 (Pages : 3) Name.....

Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(CUCBCSS—UG)

Statistics

STS 5B 06—STATISTICAL COMPUTING

Time : Three Hours Maximum : 80 Marks

Section A

Answer all the **ten** *questions in* **one word.**
Each question carries 1 *mark.*

1. What is the output of the R-command, seq (10, 25, by = 3) ;
2. How you simulate 50 standard normal random variables and put in y.
3. If p-value is 0.3051 is an output, what will be your inference ?
4. Write down the R-command to draw a boxplot.
5. If A and B are matrices of same order, what will give A*B ?
6. Write down the R-command to find the combination $10C_2$.
7. Write down the R-command to find P (X = 5), for X follows binomial with parameters n = 10 and p = 0.25.
8. Write down R-command to find correlation co-efficient.
9. Write down R-command to carryout one way ANOVA.
10. Write down the R-command for difference of Proportion.

(10 × 1 = 10 marks)

Section B

Answer all the **seven** *questions in* **one sentence.**
Each question carries 2 *marks.*

11. What are the advantages of R ?
12. What do you mean by packages in R ?
13. What is the use of Shapiro.test () ?
14. Give the set of R-commands to draw a simple random sample of size 15 from a population of 50 observations.

Turn over

25. Different methods of data input in R. (6 Marks)
26. Write R commands. (6 Marks)
27. Explain test of equality of variances in R. (6 Marks)
28. Goodness of fit and R command. (6 Marks)

15. Write down R-command to find the variance of data vector x.

16. Describe the output of the R-command , B<-barplot(c(15,22,35,12));B;

17. Explain importance of p-value given by R.

(7 × 2 = 14 marks)

Section C

Answer any **three** *out of five questions in* **a paragraph.**
Each question carries 4 *marks.*

18. Explain the graphical method to checking normality of data. What is the R-command for plotting the same ?

19. Distinguish between the functions qnorm() and rnorm().

20. Explain the utility of data.frame() and scan() functions.

21. Describe the procedure for import a data file from MS-Excel to R.

22. If Y follows a Poisson distribution with mean 1.3, write a R-program to obtain a table of Poisson probabilities.

(3 × 4 = 12 marks)

Section D

Answer any **four** *out of six questions.*
Each question carries 6 *marks.*

23. Explain the method of fitting linear regression mode. How do you test significance of the model ? Write down the R command for this.

24. Briefly describe history of development of R.

25. Explain some methods of data input in R.

26. Write down R command to determine correlation coefficient, regression lines X on Y and Y on X for the following data :

X	:	34	37	36	32	32	36	35	34	29	35
Y	:	37	37	34	34	33	40	39	37	36	35

27. Describe the program to test the equality of variances in R.

28. Explain goodness of test. Write down the R command to test.

(4 × 6 = 24 marks)

Section E

Answer any two questions.
Each question carries 10 marks.

29. Explain the following :

    (a) Lists in R programming.

    (b) Data frames in R programming.

    (c) Work space in R programming.

    (d) Scripts in R programming.

30. Write down the R command for :

    (a) Simulate 100 sample observations from the normal distribution with mean 50 and standard deviation 4.

    (b) Find mean and variance of generated sample

    (c) Drawing the Q-Q plot of the generated sample.

    (d) Test whether the mean of the population is 50.

    (e) Constructing 99% confidence intervals for the population mean.

31. Suppose that the number of screws produced by a sophisticated machine per day has a poisson distribution with mean 2. What is the probability that out of total production of the day, there is ?

    (a) No defective screw.

    (b) Exactly 2 defective screw.

    (c) Atleast one defective screw.

    (d) Atmost two defective screws.

32. Explain the procedure for constructing confidence intervals for the difference of means of two normal populations. Specify the underlying assumptions and methods to check them. Write down the R command to implement these.

(2 × 10 = 20 marks)

24. History of development of R. (6 Marks)
25. Different methods of data input in R. (6 Marks)
26. Write R commands. (6 Marks)
27. Explain test of equality of variances in R. (6 Marks)
28. Goodness of fit and R command. (6 Marks)

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ANSWER KEY

SECTION A

1. [1]10 13 16 19 22 25
2. x<-rnorm(50,0,1);
3. p-value=0.3051>α(0.05). so we accept the null hypothesis.
4. boxplot(x,main="",xlab="",ylab="");
5. A%*%B;
6. choose(10,2);
7. dbinom(5,10,0.25);
8. pearson correlation coefficient, cor(x,y);
   spearman rank correlation coefficient, cor(x,y,method="spearman");
9. oneway.test(values~ind,data=d,var.equal=T);
10. prop.test(x,n,alt="");

SECTION B

11. Advantages of R. (2 Marks)
12. Packages in R (2Marks)
13. Uses of shapiro.test() (2Marks)
14. SRSWOR-sample(50,15);
    SRSWR-sample(50,15,replace=T); (1 Mark each)
15. v<-var(x);variance<-(n-1)*v/n; (2 Marks)
16. Describe the output. (2 Marks)
17. Importance of p-value. (2 Marks)

SECTION C

18. Explain hist(),boxplot(),qqplot(). (4 Marks)
19. Explain qnorm() and rnorm(). (2 Marks each)
20. Uses of data.frame() and scan(). (2 Marks each)
21. explain the procedure. (4 Marks)
22. x<-0:100;dpois(x,1.3); (4 Marks)

SECTION D

23. Explain method of fitting linear regression model. (6 Marks)
24. History of development of R. (6 Marks)
25. Different methods of data input in R. (6 Marks)
26. Write R commands. (6 Marks)
27. Explain test of equality of variances in R. (6 Marks)
28. Goodness of fit and R command. (6 Marks)

SECTION E

29. 2.5 Marks each.
30. 2.5 Marks each.