

**2020/TDC (CBCS)/ODD/SEM/
STSSEC-301T (H/P)/116**

(2)

**TDC (CBCS) Odd Semester Exam., 2020
held in March, 2021**

STATISTICS

(3rd Semester)

Course No. : STSSEC-301T

Full Marks : 50

Pass Marks : 20

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Honours students will answer Group—A and
Pass students will answer Group—B

GROUP—A

(For Honours Students)

Course No. : STSSEC-301T (H)

(Statistical Data Analysis using R)

SECTION—A

Answer any *fifteen* of the following questions :

1×15=15

1. Why is R useful?
2. What is an open source software?

10-21/88

(Turn Over)

3. How can we assign a variable in R?
4. What is the use of the command 'length ()'?
5. What is the use of the command 'sample ()'?
6. What is R-command for bar diagram?
7. Write the command for box plot.
8. Write the command to alter name of axes in R.
9. Write the package name for simple linear regression.
10. Write the operator that is used for multiplication in R.
11. Write the command for a line diagram in R.
12. Write the command for a 2 2 matrix with some elements.
13. Write the command for drawing a sample with replacement.
14. Write the command for predicting a linear model.
15. What is the use of normal probability plot?
16. What is data cleaning?

10-21/88

(Continued)

(3)

17. What is the use of the function 'scan'?
18. What is the use of '\$' in R?
19. Which function will give us all the names of variables in a data set?
20. State the uses of 'summary' in R.
21. Write the command for plotting frequency polygon in R.
22. Write the command for drawing exponential random numbers.
23. Write R command for *t*-test.
24. What is the significance of transpose in R?
25. What is *P*-value?
26. What is the use of 'subset' function in R?
27. Write the command for drawing a 95% CI.
28. How can we arrange the values in a variable in increasing/decreasing order?
29. Write the command for finding maximum value in a data set.

(4)

SECTION—B

Answer any *five* of the following questions : 2×5=10

30. What are data types in R?
31. Write some advantages and disadvantages of R.
32. What is a scatter plot? How do we plot it in R?
33. Write the codes for computing correlation and regression in R.
34. Write a note on Q-Q plot. How do we plot it in R?
35. Write the codes for generating 1000 random numbers from an $N(2.5, 2)$ distribution.
36. How can we remove missing observation in R? Write the appropriate code.
37. How can we replace (2, 2)th element of a 3 × 3 data matrix in R?
38. Write the command for *t*-test for single mean and its underlying null hypothesis.
39. How can you draw your conclusion of a hypothesis testing based on *p*-value?

SECTION—C

Answer any *five* of the following questions : 5×5=25

- 40.** Considering X be a data vector of dimension $(n - 1)$, write the commands for computing—
- mean of $X_{n - 1}$;
 - median of $X_{n - 1}$;
 - mode of $X_{n - 1}$;
 - SD of $X_{n - 1}$;
 - CV of $X_{n - 1}$.
- 41.** Considering X and Y be two data vectors of same dimension, how can we do scatter plot in R? Write all possible conclusions that may be taken regarding correlation from that plot.
- 42.** How can we install packages in R with all dependencies?
- 43.** How can we plot line of best fit in a scatter plot in R?
- 44.** Write the command for generating 100 random numbers from the following distributions :
- $N(0, 1)$
 - $N(2, 2.5)$
 - Poisson (2)
 - Uniform distribution
 - Binomial distribution with $p = 1/2$

- 45.** The following data provides the number of fishes that one caught in a trap. Write the commands by considering that the data have been drawn from a binomial distribution :

<i>Fish trap</i>	0	1	2	3	4	5	6	7	8
<i>Frequency</i>	1	2	11	20	29	23	10	3	1

- 46.** How can we load data files in R from disk of computer?
- 47.** How can we export a data file from R and save it in a specified location in disk of a computer? Write appropriate code and various file extensions in which we may save the file.
- 48.** Write the procedure for generating 20 random numbers from $N(2, 1.5)$ distribution and perform one sample t -test in R, specifying alt. hypothesis. What will be its d.f.?
- 49.** Write the procedure for one sample z -test by generating a random sample of size 57 from a normal distribution with some mean and SD = 1.

(7)

GROUP—B

(For Pass Students)

Course No. : STSSEC-301T (P)

(**Statistical Computing using C**)

SECTION—A

Answer any *fifteen* of the following questions :

1×15=15

1. What are the four basic data types in C programming?
2. Write one disadvantage of C programming.
3. What is the key word used to create an enumerated data type?
4. State the range of integer constant.
5. What is the rule for constructing a string constant?
6. How many characters should be there to construct a character constant?
7. Define 'scanf' function in C.
8. How many key words are available in C programme?

10-21/88

(Turn Over)

(8)

9. Write the C expression of the function

$a \ b \ c \ d$

10. What are the commonly used input/output functions used in C language?
11. Write two standard key words used in C language.
12. Why is 'continue' statement used in C programming?
13. Write the syntax of 'if' statement.
14. What is the syntax of 'while' loop?
15. What is the purpose of 'break' statement used in C?
16. Define 'exit' function.
17. Define 'unary' operator used in C language.
18. Name the types of 'loops' used in C language.
19. Write the syntax of 'return' statement in C.
20. Define 'function' declaration.
21. What is the function of 'function prototype' in C?

10-21/88

(Continued)

(9)

22. Define 'array' in C.
23. State the classification of arrays in C language.
24. Define 'function definition' in C.
25. Define 'Student's *t*-statistic'.
26. What is 'static' variable in C language?
27. Define 'null hypothesis'.
28. Define 'equal operator' used in C.
29. What is 'user-defined' function?
30. Define SE of a statistic.

SECTION—B

Answer any *five* of the following questions : $2 \times 5 = 10$

31. State the rules for constructing an integer constant in C.
32. State some features of C programming.
33. Define local and global variables.
34. Write a programme to find the sum of two numbers.

(10)

35. Define 'if-else' statement, mentioning its system.
36. Explain with example, how 'break' statement can be used to exit a loop.
37. Define 'function-prototype' in C.
38. Define 'multidimensional' array in C language.
39. What is the difference between 'break' and 'continue' statements?
40. Write a programme in C to obtain the arithmetic mean (AM) of two numbers.

SECTION—C

Answer any *five* of the following questions : $5 \times 5 = 25$

41. Explain basic structure of C programming.
42. Explain the different constants used in C language.
43. Write a note on arithmetic operator in C programming.
44. Explain input and output functions in C programming.

45. Draw the flowchart of (a) while loop and (b) do-while loop.
46. Write a programme that finds all the prime numbers between 2 and 1000 using nested loops.
47. Write a programme in C to obtain the addition of two 3 3 matrices.
48. What do you mean by one-dimensional array? How do you declare such an array in C?
49. Write a C programme to perform the Student's t -test for testing the null hypothesis $H_0: \mu = \mu_0$ (specified) against $H_1: \mu \neq \mu_0$ based on an array of observations to be provided by the user.
50. If two sides of a triangle are of length a and b and the angle between these two sides is θ , then write a C programme to compute the area of the triangle.
