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Code No. : 13612 S

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (IT: CBCS) III-Semester Supplementary Examinations, June-2019**

**Probability and Statistics**

Time: 3 hours

Max. Marks: 60

Note: Answer ALL questions in Part-A and any FIVE from Part-B

**Part-A (10 × 2 = 20 Marks)**

1. If two dice are thrown, what is the probability that the sum is 7?
2. Define conditional Probability.
3. A card is drawn from well shuffled pack of cards. What is the probability that it is either Queen or King.
4. Define probability distribution function for continuous random variable.
5. Define type-I and type-II error.
6. Define testing of hypothesis.
7. State the test statistics for  $\chi^2$  (Chi - square) test.
8. State the test statistics for single sample mean (t-test).
9. State the principle of least squares.
10. Find the means from the given regression lines are  $4x - 2y = 1, 3x - 6y = 0$ .

**Part-B (5 × 8 = 40 Marks)**

*(All Sub-questions carry equal marks)*

11. a) State and prove Baye's theorem  
b) State and prove addition theorem of probability.
12. a) A random variable X has the following probability function:

<b>X:</b>	0	1	2	3	4	5	6
<b>P(X):</b>	k	3k	5k	7k	9k	11k	13k

Find  $P(X < 4), P(X \geq 5), P(3 < X \leq 6)$ .

- b) If 'X' is a normal variate with mean 20 S.D is '3'. Find (i) $P(20 \leq X \leq 15)$  (ii) $P(X \geq 20)$ .
13. a) A Random samples drawn from two countries gave the following data relating to the heights of adult mean.

	Country A	Country B
Mean Height (in inch)	67.42	67.25
S.D (inches)	2.58	2.50
Number in samples	1000	1200

Is the difference between the Mean significant?

- b) Define Null Hypothesis, Alternate Hypothesis, Level of significance and Critical region.

14. a) A certain stimulus administered to each of 12 patients, resulted in the following increase of blood pressure 5, 2, 8, -1, 3, 0, -2, 1, 5, 0, 4 and 6, can it be concluded that the stimulus will, in general, be accompanied by an increase in blood pressure?
- b) The following figures show the distribution of digits in numbers chosen at random from the telephone directory.

<b>Digits:</b>	0	01	02	03	04	05	06	07	08	09
<b>Frequency:</b>	1026	1107	997	966	1075	933	1107	972	964	853

Test whether the digits may be taken to occur equally frequently in the directory.

15. a) Fit a straight line to the following data using method of least squares.

<b>X:</b>	1	2	3	4	5	6	7	8	9
<b>Y:</b>	9	8	10	12	11	13	14	16	15

- b) The following results were obtained in the analysis of data as category X and Y

	X	Y
Average	9.2	16.5
S.D	2.1	4.2

Correlation coefficient is 0.84 and Construct the two regression lines X on Y and Y on X.

16. a) State and prove multiplication theorem of probability.
- b) Find the Mean and Variance of  $f(x) = e^{-x}$ ,  $0 \leq x \leq \infty$

17. Answer any *two* of the following:

- a) Write the significant differences between small sample and large sample test.
- b) State the test statistics for  $F - test$  and write the properties of  $F - test$ .
- c) Find the correlation coefficient for the following data

<b>X:</b>	1	4	7	9	11
<b>Y:</b>	5	8	12	14	16

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