Hall Ticket Number:

Code No. : 13614

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (IT: CBCS) III-Semester Main Examinations, December-2018
Probability and Statistics

Time: **3 hours**   Max. Marks: **60**

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

Q. No	Stem of the Question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	If two dice are thrown, what is the probability that the sum is greater than 8?	2	3	1	1
2.	A card is drawn from a well-shuffled pack of playing cards. What is the probability that it is either a spade or Ace?	2	4	1	1
3.	Define Probability Density function.	2	1	2	1
4.	Define discrete and continuous random variable.	2	1	2	1
5.	Explain briefly Type-I and Type-II errors.	2	1	3	1
6.	Define single Tail and Two Tailed test	2	1	3	1
7.	State the Assumption for single sample mean (t-test)	2	1	4	1
8.	State the test statistics for equality of two variances.	2	1	4	1
9.	Find the correlation coefficient for the following observations	2	3	5	1
10.	Define angle between two regression lines and state its limitations.	2	2	5	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	State and prove Baye's theorem	4	1	1	1
b)	The contents of urns I, II and III are as follows	4	4	1	1
12. a)	Find the Mean, Variance and Third moment of $f(x) = e^{-x}$, $0 \le x \le \infty$	4	2	2	1
b)	Derive variance of Poisson distribution.	4	3	2	1
13. a)	The means of two single large samples of 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of standard deviation 2.5 inches?	4	4	3	2
b)	Define Null Hypothesis, Alternate Hypothesis, Level of significance and Critical region.	4	2	3	1
14. a)	A random sample of 10 boys had the following I.Q's 70, 120, 110, 101, 88, 83, 95, 98, 107, and 100. Do these data support the assumption of population Mean I.Q of 100?	4	3	4	2

Question 9 table:

x:	5	4	3	2	1
y:	1	2	3	4	5

Question 11 b) table:

Urn I:	1 white 2 Block and 3 Red balls
Urn II:	2 white 1 Block and 1 Red balls
Urn III:	4 white 5 Block and 3 Red balls

One urn is chosen at random two balls drawn, they happen to be white and red. What is the probability that they come from urn I, II or III.

		M	L	CO	PO
b)	The following figures show the distribution of digits in numbers chosen at random from the telephone directory. Test whether the digits may be taken to occur equally frequently in the directory.	4	4	4	2

Digits: 0, 01, 02, 03, 04, 05, 06, 07, 08, 09

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

15. a) Obtain the Regression lines x on y and y on x for the following data. — 4 2 5 1

x:	1	3	5	7	9	11
y:	2	4	8	12	14	16

b) Find the correlation coefficient, Means of the following Regression lines — 4 2 5 1
$3x + 12y = 19, \ 3y + 9x = 46$

16. a) If 'X' is normal variate with mean 30 and standard deviation '5'. Find — 4 3 2 1
$(i) P(26 \le X \le 40) \ (ii) P(X \ge 45)$

b) State and prove law of addition theorem for two events. — 4 2 1 1

17. Answer any *two* of the following:

a) A coin was tossed 400 times and the head turned up 216 times. Test the hypothesis that the coin is unbiased at 5% level of significance. — 4 3 3 2

b) Explain briefly significant differences between small sample tests and large sample tests. — 4 2 4 1

c) If p is the pull required to lift the weight(w) by means of a pulley block, find a linear law of the form $p = a + bw$, connecting p and w using the following data: — 4 3 5 1

w : 50   70   100   120
p : 12   15   21   25

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	52.5
2	Knowledge on application and analysis (Level-3 & 4)	47.5
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	0

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