

**GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN**

(Autonomous)

(Affiliated to Andhra University, Visakhapatnam)

IIB.Tech. - II Semester Regular Examinations, April – 2026**PROBABILITY AND STATISTICS**

[Common to CSE, CSE (AI&ML) & INF]

1. All questions carry equal marks
2. Must answer all parts of the question at one place

Time: 3Hrs.**Max Marks: 70****UNIT-I**

1. a. Write briefly about box plot. Construct a histogram for the following data: [2M+5M]

Output (units/worker)	500-509	510-519	520-529	530-539	540-549	550-559	560-569
No. of workers	8	18	23	37	47	26	16

- b. The frequency distribution of weight in grams of mangoes of a given variety is given below. Calculate the mean and the median. [7M]

Weight in grams	410-419	420-429	430-439	440-449	450-459	460-469	470-479
No. of mangoes	14	20	42	54	45	18	7

OR

2. a. Find the standard deviation of intelligence quotient (I.Q) of 68 students of the following data: [7M]

I.Q	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	5	12	15	20	10	4	2

- b. From the following data find out Karl Pearson's coefficient of skewness: [7M]

Measurement	10	11	12	13	14	15
Frequency	2	4	10	8	3	1

UNIT-II

3. a. Two dice are thrown. Let X assign to each point (a,b) in S the maximum of its numbers i.e. $X(a, b) = \text{MAX}(a, b)$. Find the probability distribution. X is a random variable with $X(s) = \{1, 2, 3, 4, 5, 6\}$. Also find the mean and variance of the distribution. [7M]

- b. If a random variable has the probability density function

$$f(x) = k(x^2 - 1), -1 \leq x \leq 3 \quad \text{Find the value of 'k' and } p\left(\frac{1}{2} \leq x \leq \frac{5}{2}\right)$$

$=0, \text{ else where}$ [7M]

OR

4. a. 20% of items produced from a factory are defective. Find the probability that in a sample of 5 chosen at random i) none is defective ii) one is defective [7M]

- b. If the masses of 300 students are normally distributed with mean 68 kgs and standard deviation 3 kgs, how many students have masses

- (i) Greater than 72 kgs
- (ii) Less than or equal to 64 kgs
- (iii) Between 65 and 71 kgs inclusive

[7M]

UNIT-III

5. a. A population consists of six numbers 4, 8, 12, 16, 20, 24. Consider all possible samples of size two which can be drawn without replacement from this population. Find
- The population means.
 - The population Standard deviation.
 - The mean of the sampling distribution of means.
 - The standard deviation of the sampling distribution of means. [7M]
- b. A random sample of size 100 is taken from an infinite population having the mean $\mu = 76$ and the variance $\sigma^2 = 256$. What is the probability that $\bar{x}$ will be between 75 and 78. [7M]

OR

6. a. The pulse rate of 50 yoga practitioners decreased on the average by 20.2 beats/minute with standard deviation 3.5. If $\bar{x} = 20.2$ is used as a point estimate of the true average decrease in pulse rate then what can we assert with 95% confidence about the maximum error E. [7M]
- b. A random sample of 400 items is found to have mean 82 and Standard deviation 18. Find the maximum error of estimation at 95% confidence interval. [7M]

UNIT-IV

7. a. If in a random sample of 600 cars making a right turn at a certain traffic junction 157 drove in to the wrong line, test whether actually 30% of all drivers make this mistake or not at this given junction. Use 0.05 L.O.S. [7M]
- b. A simple sample of heights of 6400 Englishmen has a mean of 67.85 inches and a S.D. of 2.56 inches while a simple sample of heights of 1600 Australian has a mean of 68.55 inches and a S.D. of 2.52 inches. Do the data indicate that the Australians are on the average taller than the Englishmen at 5% level of significance? [7M]

OR

8. a. A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. [7M]
- b. A sample analysis of examination results of 500 students was made. It was found that 220 students has failed, 170 had secured a third class, 90 were placed in second class and 20 got a first class. Do these figures commensurate with the general examination result which is in the ratio of 4: 3: 2: 1 for the various categories respectively. [7M]

UNIT-V

9. a. Fit an equation of the form $y = ab^x$ to the following data: [7M]

x	2	3	4	5	6
y	144	172.8	207.4	248.8	298

- b. Find Karl Pearson's coefficient of correlation from the following data:

Wages	100	101	102	102	100	99	97	98	96	95
Cost of living	98	99	99	97	95	92	95	94	90	91

[7M]

OR

10. a. For a set of values of x and y, the two regression lines are $31x - 37y + 5 = 0$ and $50x - 6y - 612 = 0$. Identify the regression line of y on x and that of x on y. Also obtain the mean values of x and y. [7M]
- b. Using the method of least squares, obtain the regression line of X on Y from the following data:

X	10	12	13	16	17	20	25
Y	10	22	24	27	29	33	37

[7M]