(8 M+2 M=10 M)

(b) Estimate the likely demand when the price is Rs.20.

6. Princeton school science teacher claims that students in his section will score higher marks than those in his colleague's section. The mean science score for 60 students in his section is 22.1, and the standard deviation is 4.8. The mean science score for 40 of the colleagues' sections is 18.8, and the standard deviation is 8.1. At $\alpha = 0.05$, can the teacher's claim be supported? **(10 M)**

7. To find out a new serum will arrest leukaemia; 9 mice, all with an advanced stage of disease are selected. Five mice receive the treatment and 4 do not. Survival times, in years from the time of the experiment commenced as follows

Treatment	2.1	5.3	1.4	4.6	0.9
No treatment	1.9	0.5	2.8	3.1	

At 5% level of significance, can the serum be said to be effective? Assume the two populations to be normally distributed with equal variances. (Use t- test for two sample same variance) **(10 M)**

8. An urban community would like to show that the incidence of breast cancer is higher in their area than in a nearby rural area (PCB levels were found to be higher in the soil of the urban community). If it is found that 20 of 200 adult women in the urban community have breast cancer and 10 of 150 adult women in the rural community have breast cancer, can we conclude at the 5% level of significance that breast cancer is more prevalent in the urban community? **(10 M)**

9. Two random samples were drawn from two normal populations and their values are given below:

A	65	66	73	80	82	84	88	90	92		
B	64	66	74	78	82	85	87	92	93	95	97

Test whether the two populations have the same variance at 5% level of significance. **(10 M)**

0. The marks of 8 students of a class in Mathematics, out of 50 is given below:

Students	1	2	3	4	5	6	7	8
Marks	38	42	43	50	48	45	52	50

Test the hypothesis that the variance of the population is 48, assuming the population is normal and mean of the population is unknown.

(10 M)

1. The average numbers of hours students spend studying for classes each day in a high school is given below:

Student	0-2 hrs	2-4 hrs	4-6 hrs
Fresher's	76	143	91
Seniors	147	109	64

Is the average number of hours dependent on the type of student? Use 1% level of significance.

(10 M)

VIT-AP UNIVERSITY	Final Assessment Test – Winter (2024-25) Freshers - May 2025	
	Maximum Marks: 100	Duration: 3 Hours
Course Code: MAT1014	Course Title: Fundamentals of Statistics	School: SAS
Set No: 2	Exam Type : **Closed Book**	Session: FN
Date: 19/05/2025	Slot: A1	

Keeping mobile phone/smart watch, even in 'off' position is treated as exam malpractice

General Instructions if any:

1. **"fx series" - non Programmable calculator are permitted : YES**
2. **Reference tables permitted : YES (Z-table, t-table, F-table and chi-square table)**

Answer any TEN Questions, Each Question Carries 10 Marks (10×10=100 Marks)

1. Following are the marks obtained, out of 100, by two students Ravi and Hashina in 6 tests:

Ravi	48	50	54	46	48	54
Hashina	46	44	43	46	45	46

Find who is more intelligent. **(10 M)**

2. The class has a question bank consisting of 300 easy True/False questions, 200 difficult True/False questions, 500 easy multiple choice questions and 400 difficult multiple choice questions. If a question is selected at random from the question bank, what is the probability that it will be an easy question given that it is a multiple-choice question? **(10 M)**

3. The probability that the patient recovers from a rare blood disease is 0.4. If 15 people are known to have contracted with this disease, what is the probability that (i) at least 10 survive and (ii) from 3 to 8 survive? **(10 M)**

4. Compute the rank correlation coefficient for the following data of the marks obtained by 8 students in the English and Mathematics

Students	1	2	3	4	5	6	7	8
Marks in English	15	20	28	12	40	60	20	80
Marks in Mathematics	40	30	50	30	20	10	30	60

Also state the graphical interpretation. **(10 M)**

5. The price (x) and demand (y) of a particular item of a grocery shop is given below

Price (Rs.)	10	12	13	12	16	15
Amount demanded	40	38	43	45	37	43

(a) Estimate the linear regression line y on x.

12. Three different types of exercise namely aerobic, strength training and yoga for three different groups are selected for a weightless program. Perform a one-way ANOVA to compare the mean of three different groups at 5% level of significance.

Group 1 (Aerobic)	8	10	9	7	6
Group 2 (Strength training)	6	7	5	8	6
Group 3 (Yoga)	4	5	3	6	4

(10 M)

QP MAPPING

No.	E/A/T	Module Number	Marks	BL	CO Mapped	PO Mapped	PEO Mapped	PSO Mapped
Q1	E	1	10	1, 5	1	1	-	-
Q2	T	2	10	2, 5	1	1	-	-
3	E	3	10	2, 3	2,3	1, 2, 3	-	-
4	A	4	10	3, 5	2,4	1, 3	-	-
5	E	4	10	3, 5	2,4	1, 3	-	-
	A	5	10	1, 3, 5	4, 6	1, 3, 6	-	-
	A	5	10	1, 3, 5	4, 6	1, 3, 6	-	-
	E	5	10	1, 3, 5	4, 6	1, 3, 6	-	-
	T	6	10	2, 4, 6	5, 6	1, 2, 6	-	