Total No. of Questions – [3]

Total No. of Printed Pages: 2

G.R. No.	

PAPER CODE	U223-25 (ES/E)

May 2023 (ENDSEM) EXAM

S.Y (IT) (AY 2022-23 SEMESTER - II)

COURSE NAME: PROBABILITY AND STATISTICS

COURSE CODE: ES22201IT

(Pattern -2020)

Time: [1Hr] [Max. Marks: 30]

(*) Instructions to candidates:

1) **Use of scientific calculator is allowed**
2) **Use suitable data where ever required**
3) **All questions are compulsory**

Question No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Justify central limit theorem with example	[4]	[4]	[4]
	b) An electrical firm manufactures light bulbs that have a length of life that is approximately normally distributed, with mean equal to 800 hours and a standard deviation of 40 hours. Find the probability that a random sample of 16 bulbs will have an average life of less than 775 hours. (Solve using central limit theorem)	[6]	[4]	[3]
	OR			
	c) Let S={1,3,7,9}. Find the probability distribution of the sample mean for random sample of size 2 drawn with replacement and without replacement	[6]	[4]	[3]
Q.2	a) Differentiate between type I and type II sampling errors with an example	[4]	[5]	[4]
	b) Let's say you want to know if gender has anything to do with political party preference. You poll 440 voters in a simple random sample to find out which political party they prefer. The results of the survey are shown in the table below: (Solve using Chi square test)	[6]	[5]	[4]

Marking Scheme:

Total No. of Questions – [3] Total No. of Printed Pages:

G.R. No.	

PAPER CODE	U223-251 (ESE)

May 2023 (ENDSEM) EXAM

S.Y INFORMATION TECHNOLOGY (SEMESTER - II)

COURSE NAME: Probability and Statistics

COURSE CODE: ES22201IT

(Pattern -2020)

Time: [1Hr] [Max. Marks: 30]

(*) Instructions to candidates:

1) **Use of scientific calculator is allowed**
2) **Use suitable data where ever required**
3) **All questions are compulsory**

Question No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Justify central limit theorem with example Theorem Statement 1 M Explanation 2 M Example 1 M	[4]	[4]	[4]
	b) An electrical firm manufactures light bulbs that have a length of life that is approximately normally distributed, with mean equal to 800 hours and a standard deviation of 40 hours. Find the probability that a random sample of 16 bulbs will have an average life of less than 775 hours. (Solve using central limit theorem) Using data 1 M Central limit theorem equation 2 M Calculating Z value 1 M Finding 2 value from table 2 M	[6]	[4]	[3]
	OR			
	c) Let S={1,3,7,9}. Find the probability distribution of the sample mean for random sample of size 2 drawn with replacement and without replacement Probability Distribution with replacement 3 M Probability Distribution without replacement 3 M	[6]	[4]	[3]

Q.2	a) Differentiate between type I and type II sampling errors with an example 4 differences 4 M	**[4]**	[5]
	b) Let's say you want to know if gender has anything to do with political party preference. You poll 440 voters in a simple random sample to find out which political party they prefer. The results of the survey are shown in the table below: (Solve using Chi square test) Calculating value of Chi square 3 M Z value from table 2 M Making Conclusion 1 M	**[6]**	[5]
	OR		
	c)The times required by three workers to perform an assembly-line task were recorded on five randomly selected occasions. Here are the times, to the nearest minute. Execute using one way ANNOVA test Finding value of MS between 2 M Finding sum of squares of Deviation 2 M Finding Z Ratio 2 M	**[6]**	[6]
Q.3	a) Differentiate between linear and nonlinear regression? 4 differences 4 M	**[4]**	[6]
	b)The grades of the class of 9 students on a midterm report(X) and on final examination (Y) are as follows: a)Estimate linear regression line b) Estimate final examination grade of a student who received a grade of 85 on midterm report. Finding the value of b 2 M Finding the value of a 1 M Finding equation of line 1 M Finding grading of a student whose grade is 85 2 M	**[6]**	[6]

		Republican	Democrat	Independent	Total				
Male	100	70	30	200					
Female	140	60	20	220					
Total	240	130	50	440					

Hank	Josef	Susan
8	8	10
10	9	9
9	9	10
11	8	11
10	10	9

x	77	50	71	72	81	94	96	99	67
y	82	66	78	34	47	85	99	99	68

	OR			
	c) A small study is conducted involving 17 infants to investigate the association between gestational age at birth, measured in weeks, and birth weight, measured in grams. Calculate Pearson Coefficient between them Finding value of x mean 1 M Finding the value of Y mean 1 M Finding standard deviation 2 M Finding r*	**[6]**	[6]	[4]

Infant id	Age	Weight
1	37.5	4000
2	34.2	3500
3	34.3	4800
4	31.2	3500
5	32.2	3000
6	31.2	4200
7	33.2	4000
8	33.2	3200
9	31.2	3500
10	34.2	3600

Notes:

[BT LEVELS: 1: REMEMBER 2: UNDERSTAND 3: APPLY 4: ANALYZE 5: EVALUATE 6: CREATE]