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|  | **ENGINEERING MATHEMATICS IV**  **(AAS0402) UNIT-II** | | **SESSION: 2022-23** |
| **CLASS/SEM: (CSE)- IV(EVEN)** |
| Assignment Given Date: 04/05/23 Assignment Submission Date: 8/05/22 | | Maximum Points: 40 | |
| Weightage in University Exam: 34 Marks | |
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Note: Write solution of each question in clear handwriting.

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| Sample I | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 24 | 26 | 27 |  | |
| Sample II | 19 | 22 | 23 | 25 | 26 | 28 | 29 | 30 | 31 | 32 | 35 | 36 |

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| Q.  N. | Question Statement | Pts | CO | BLOOM’S KNOWLEDGE LEVEL |
| 1 | A random sample of 100 students gave a mean weight of 58 kg with S.D. of 4 kg. Test the hypothesis that mean weight of the population is 60kg. (Take 𝛼 = 0.05 ) | 5 | 2 | K5 |
| 2 | 10 students are selected at random from a college and their marks in Hindi are found to be as follows:  71, 72, 73,75,76,77,78,79,79,80. In the light of the marks, test whether the average marks in Hindi of the college are 75.  (Take 𝛼 = 0.05 ) | 5 | 2 | K5 |
| 3 | The height of 6 randomly chosen soldiers in inches is  76, 70,68,69,69 and 68. Those of 6 randomly chosen sailors are 68, 64,65,69,72 and 64. Test whether the soldiers are on the average taller than sailors. (Take 𝛼 = 0.05 ) | 10 | 2 | K5 |
| 4 | The random samples were drawn from two normal populations and the following results were obtained.  Obtain estimates of the variances of populations and test whether the two populations have the same variances. (Take 𝛼 = 0.05 ) | 10 | 2 | K5 |
| 5 | A sample analysis of examination results of 500 students it was found that 220 students have failed, 170 have secured a third class, 90 have secured a second class and the rest, a first class. Do these figures support the general belief that above categories are in the ratio 4:3:2:1 respectively? (Test at 5 % level of significance) | 10 | 2 | K3, K5 |

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| 6 | A sample of 400 students of under graduate and 400 students of post graduate classes was taken to know their opinion about autonomous colleges.290 of the under graduate and 310 of the post graduate students favored the autonomous status. Present these facts in the form of a table and test at 5% level that the opinion regarding autonomous status of colleges is independent of the level of classes of students. | 10 | 2 | K5 |
| 7 | To test the effectiveness of inoculation against cholera, the following table was obtained:  Use Chi-Square test to defend or refute the statement that the inoculation prevents attack from cholera. If the tabulated value is 3.841 at 5% level. | 10 | 2 | K2, K5 |
| 8 | The following figures relate to the production in kg of three varieties I, II, III of wheat shown in 12 plots:  **Variety I:** 14 16 18  **Variety II:** 14 13 15 22  **Variety III:** 18 16 19 19 20  Is there any significant difference in the production of three varieties?  Given the tabulated value of 𝐹 for 𝑣1 = 2 and 𝑣2 = 9 at 5% level of significance is 4.26. | 10 | 2 | K5 |
| 9 | Three varieties of coal were analyzed by four chemists and the ash contents in the varieties was found as  **Varieties Chemists**  I II III IV  A 8 5 5 7  B 7 6 4 4  C 3 6 5 4  Discuss the significance of difference between (a) Chemist (b) varieties of coal in respect of ash content. | 10 | 2 | K5 |
| 10 | An inspection of 10 samples of size 100 each from 10 lots reveal the following number of defectives: 16,18,11,18,21,10,20,18,17,21. Do these indicate that the quality characteristics inspected is under statistical control. | 10 | 2 | K5 |

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|  | Attacked | Not attacked | Total |
| Inoculated | 30 | 160 | 190 |
| Not inoculated | 140 | 460 | 600 |
| Total | 170 | 620 | 790 |

**Answer:**

**1.** 𝒁 = 𝟓, 𝑯𝟎 **is accepted**

**2.** 𝒕 = 𝟏. 𝟎𝟓𝟒 **,** 𝑯𝟎 **is accepted**

**3.** 𝒕 = 𝟏. 𝟔𝟔, 𝑯𝟎 **is accepted**

1. 𝑭 = 𝟏. 𝟗𝟑𝟓**; Not Significant**
2. **No**

**6.** 𝝌𝟐 = 𝟐. 𝟔𝟔**,** 𝑯𝟎 **is accepted**

1. 𝑯𝟎 **is Rejected**
2. **Not Significant**

**9.** 𝑭𝑹 = 𝟏. 𝟐𝟏, 𝑭𝑪 = 𝟎. 𝟒𝟑𝟗, 𝑯𝟎 **is accepted**

1. **Process is in under statistical control**