**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, November 2022**

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|  | **3BC5164** | Roll No. | Total Printed Pages: 2 |
| **3BC5164** |  |
| BCA III Year V-Semester (Main/Back) End Semester Examination, November 2022  **(DS)** | |
| **BCD05104 : Multivariate Statistical Analysis** | | | |

# Max. Time: **3** Hours. Max. Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **1.----------------------------------------------** **2.-----------------------------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | What is Binomial Distribution? Explain with the help of an example. | **(6)** | **Remembering** |
|  |  |  |  |  |
|  | **(b)** | Let’s suppose that the probability of a random person voting a political party A is 0.1. What is the probability that if 4 people are selected at random then 2 or more than two people will vote for political party B.? | **(6)** | **Applying** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.2** | **(a)** | What is Normal Distribution? Explain with the help of an example. | **(6)** | **Understanding** |
|  |  |  |  |  |
|  | **(b)** | Write the formula for the PDF of the Normal Distribution. Plot the formula for mean = 7.5, standard deviation = 0.5 | **(6)** | **Remembering** |
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|  |  | **UNIT-II (CO2)** |  |  |
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| **Q.3** | **(a)** | What effect does reducing and increasing the value of the parameters, mean and standard deviation of the Gaussian distribution have? Explain. | **(6)** | **Analysing** |
|  |  |  |  |  |
|  | **(b)** | What effect does the Covariance Matrix have on the shape of the Multivariate Normal Distribution when the Covariance matrix is having:  1. Positive Covariances with equal Variances.  2. Negative Covariances with Unequal Variances.  3. Zero Covariances with Unequal Covariances.. | **(6)** | **Applying** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.4** | **(a)** | Write the whole formula for the PDF of the Multivariate Normal Distribution. Explain it’s parameters. | **(6)** | **Remembering and Understanding** |
|  |  |  |  |  |
|  | **(b)** | What is the relationship between Covariance Matrix and Pearson Correlation Matrix? Explain. | **(6)** | **Remembering** |
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|  |  | **UNIT-III (CO3)** |  |  |
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| **Q.5** | **(a)** | What is Hypothesis Testing? Explain. | **(6)** | **Applying** |
|  |  |  |  |  |
|  | **(b)** | What are the steps involved in Hypothesis Testing? Explain. | **(6)** | **Evaluating** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.6** | **(a)** | What is ANNOVA? Explain. | **(6)** | **Applying** |
|  |  |  |  |  |
|  | **(b)** | What are the steps involved in ANNOVA? Explain. | **(6)** | **Evaluating** |
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|  |  | **UNIT-IV (CO4)** |  |  |
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| **Q.7** | **(a)** | Explain the difference between One Way and Two Way ANNOVA. | **(6)** | **Applying** |
|  |  |  |  |  |
|  | **(b)** | Explain two types of Variances involved in ANNOVA:   1. Within Group Variance 2. Between Group Variance | **(6)** | **Applying** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.8** |  | Explain ANNOVA as a Hypothesis Test. | **(12)** | **Understanding** |
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|  |  | **UNIT V (CO5)** |  |  |
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| **Q.9** | **(a)** | Explain the formula of F-Statistic used in performing ANNOVA. | **(6)** | **Applying** |
|  |  |  |  |  |
|  | **(b)** | Draw the table for One Way ANNOVA and Explain it with the help of an example. | **(6)** | **Understanding** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.10** |  | Draw the table for Two Way ANNOVA and Explain it with the help of an example. | **(12)** | **Evaluating** |