# THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

## Backlog Arrear Examination, March 2021

**MAT/MAS 2433 / 2554 / CME– BUSINESS STAISTICS**

**Max : 75 Marks** **Time : 3 Hours**

**Answer Any FIVE Questions (5 × 15 = 75 Marks)**

1. (i) Find the mean and median for the following frequency distribution.

| **Class** | 11-15 | 16 -20 | 21 -25 | 26 -30 | 31 -35 | 36 -40 | 41 -45 | 46 -50 | 51 -55 |
|---|---|---|---|---|---|---|---|---|---|
| **frequency** | 8 | 15 | 39 | 47 | 52 | 41 | 28 | 16 | 4 |

(ii) Find the mode from the following frequency distribution.

| **Class** | 1- 9 | 9 -17 | 17 - 25 | 25 - 33 | 33 – 41 | 41 - 49 | 49 - 57 |
|---|---|---|---|---|---|---|---|
| **Frequency** | 20 | 31 | 27 | 15 | 10 | 7 | 8 |

2. The scores of two cricketers A and B in 10 innings are given below. Find who is a better run getter and who is more consistent player

| **A scores $x_i$** | 40 | 25 | 19 | 80 | 38 | 8 | 67 | 121 | 66 | 76 |
|---|---|---|---|---|---|---|---|---|---|---|
| **B scores $y_i$** | 28 | 70 | 31 | 0 | 14 | 111 | 66 | 31 | 25 | 4 |

3. The following data relate to the marks of 10 students in the internal test and the University examination for the maximum of 50 in each.

| **Internal marks** | 25 | 28 | 30 | 32 | 35 | 36 | 38 | 39 | 42 | 45 |
|---|---|---|---|---|---|---|---|---|---|---|
| **University marks** | 20 | 26 | 29 | 30 | 25 | 18 | 26 | 35 | 35 | 46 |

(i) Obtain the two regression equations.

(ii) the most likely internal mark for the university mark of 25.

(iii) the correlation coefficient between university marks and internal marks.

4. (i) Find the rank correlation coefficient between the marks obtained by 10 students in physics and chemistry

| **Physics(x)** | 35 | 56 | 50 | 65 | 44 | 38 | 44 | 50 | 15 | 26 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Chemistry(y)** | 50 | 35 | 70 | 25 | 35 | 58 | 75 | 60 | 55 | 35 |

(ii) The two variables $x$ and $y$ have the regression lines $3x + 2y - 26 = 0$ and $6x + y - 31 = 0$. Find

a) Mean values of x and y
b) Correlation coefficient between x and y
c) The variance of y if variance of x is 25

5. The contents of 3 urns are as follows

| | |
|---|---|
| Urn I | 1 white, 3 red, 2 black balls |
| Urn II | 3 white, 1 red, 1 black balls |
| Urn III | 3 white, 3 red, 3 black balls |

Two balls are chosen from a randomly selected urn. If the balls are 1 white and 1 red ball, what is the probability that they come from Urn I or Urn II.

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6. A group of 10 rats fed on a diet A and another group of 8 rats fed on a different diet B recorded the following increase in weights in gms.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Diet A** | 5 | 6 | 8 | 1 | 12 | 4 | 3 | 9 | 6 | 10 |
| **Diet B** | 2 | 3 | 6 | 8 | 1 | 10 | 2 | 8 | - | - |

Test whether diet A is superior to diet B using t-test.

7. Analyse the variance in the following Latin square

| | | | |
|---|---|---|---|
| B20 | C17 | D25 | A34 |
| A23 | D21 | C15 | B24 |
| D24 | A26 | B21 | C19 |
| C26 | B23 | A27 | D22 |