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BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – MBA-2024

Course Name – Advance Statistical Methods

Course Code - MBA40205E

(Semester IV)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

(i) Identify the approach to probability that is based on long-run relative frequency.

- | | |
|--------------|---------------|
| a) Classical | b) Subjective |
| c) Empirical | d) Axiomatic |

(ii) Select the probability approach that assumes all outcomes are equally likely.

- | | |
|---------------|--------------|
| a) Subjective | b) Classical |
| c) Empirical | d) Bayesian |

(iii) Cite the probability approach that relies on personal judgment or belief.

- | | |
|---------------|--------------|
| a) Classical | b) Empirical |
| c) Subjective | d) Relative |

(iv) Identify the value of $P(S)$ for a sample space S .

- | | |
|------|----------------------|
| a) 0 | b) 0.5 |
| c) 1 | d) Depends on events |

(v) Select the major limitation of the Expected Value approach.

- | | |
|------------------------------------|--------------------------------|
| a) Ignores payoffs | b) Ignores probabilities |
| c) Requires accurate probabilities | d) Cannot compare alternatives |

(vi) Select the probability approach that depends on long-run relative frequency.

- | | |
|---------------|--------------|
| a) Classical | b) Empirical |
| c) Subjective | d) Axiomatic |

(vii) Select the correct formula for joint probability of events A and B .

- | | |
|------------------|------------------|
| a) $P(A)+P(B)$ | b) $P(A \cup B)$ |
| c) $P(A \cap B)$ | d) $P(A B)$ |

(viii) Select the condition under which EVPI is zero.

- | | |
|--------------------------------|---------------------------------|
| a) When outcomes are uncertain | b) When probabilities are equal |
|--------------------------------|---------------------------------|

- c) When perfect information has no value d) When regret is maximum
- (ix) Cite the relationship between EVPI and Expected Value with Perfect Information.
- a) $EVPI = EVPI - EMV$ b) $EVPI = EVwPI - EMV$
c) $EVPI = EMV - EVwPI$ d) $EVPI = EMV \times EVwPI$
- (x) Select the decision rule used in marginal analysis.
- a) Choose highest average payoff b) Choose option where marginal benefit $\geq$ marginal cost
c) Choose minimum regret d) Choose maximum loss
- (xi) Select the test statistic used in One-way ANOVA.
- a) t-statistic b) z-statistic
c) χ^2 -statistic d) F-statistic
- (xii) Choose the null hypothesis in One-way ANOVA.
- a) All variances are equal b) All group means are equal
c) At least one mean differs d) Groups are dependent
- (xiii) Select the component of ANOVA that measures random error.
- a) Total variation b) Between-group variation
c) Within-group variation d) Systematic variation
- (xiv) Choose the effect of increasing within-group variance on the F-ratio.
- a) Increases F b) Decreases F
c) No change d) Makes F zero
- (xv) Select the advantage of Two-way ANOVA over One-way ANOVA.
- a) Less computation b) Studies interaction effects
c) Requires fewer samples d) No assumptions

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Illustrate the empirical approach to probability. (3)
3. Explain the subjective approach to probability. (3)
4. Sketch the characteristics of a normal probability distribution. (3)
5. Select the steps involved in building a Multiple Regression Model using Excel. (3)
6. Choose the assumptions required for applying One-way ANOVA in numerical analysis. (3)

OR

Choose how ANOVA supports quality improvement initiatives. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Describe decision-tree analysis. (5)
8. Examine the usefulness of conditional probability. (5)
9. Explain two-way ANOVA. (5)
10. Explain correlation. (5)
11. Differentiate positive and negative correlation. (5)
12. Evaluate the role of significance level. (5)

OR

Explain F-test of equality of variances. (5)
