



BRAINWARE UNIVERSITY

Term End Examination 2023 Programme – M.Sc.(MATH)-2021 Course Name - Mathematical Modelling Course Code - MSCME402 (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

- Choose the correct alternative from the following:
- (i) Let x(t) be the population size at time t. If the birth rate is equal to the death rate, then write the population size
 - a) grows exponentially

b) decays exponentially

c) remains constant

- d) None of these
- (ii) Select the correct option. The model in which every set of variable states is uniquely determined by parameters in the model and by sets of previous states of these variables is termed as
 - a) Deterministic model

b) Probabilistic model

c) Statistic model

- d) Stochastic model
- (iii) Choose the correct option: Consider a transportation problem with 3 supply points and 4 demand points. The number of constraints in the formulation is
 - a) 3
- b) 7
- c) 6
- d) 10
- (iv) Select the correct option. Model rests on neither theory nor observation, but is merely the invocation of expected structure is
 - a) Deductive model

b) Inductive model

c) Floating model

- d) Constant model
- (v) Solve the problem. A body in air at 25°C cools from 100°C to 75°C in 1 minute. What is the temperature of the body at the end of 3 minutes? (Take log(1.5)=0.4)
 - a) 40°C

b) 47.5°C

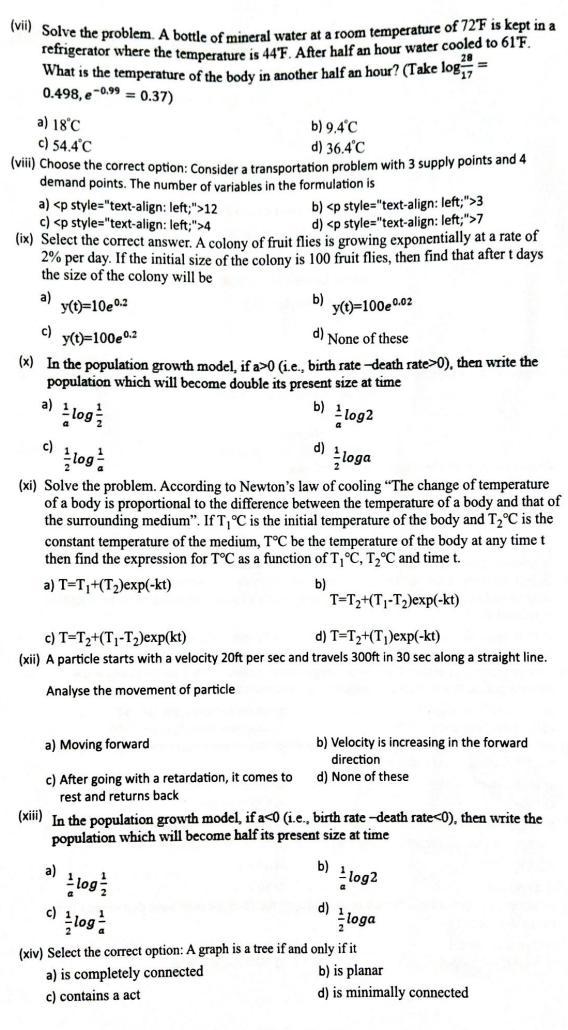
c) 42.5°C

- d) 50°C
- (vi) Select the correct option. Which model follows the changes over time that results from the system activities?
 - a) Dynamic model

b) Static model

c) Analytical model

d) Numerical model



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11. Criticize the mathematical modelling of the motion of a single-stage rocket.	(5)
12. Conclude about the balance of signed graph.	(5)
OR Conclude about the four conditions of structure theorem.	(5)

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