

MTHE-C-1 Mathematical Modelling

કુલ સમય :- : ૩૦ મીનીટ

કુલ પ્રશ્નો : ૩૫

વિદ્યાર્થીએ ટીક કરવાના પ્રશ્નો : ૧૮

નોંધ : વિદ્યાર્થીએ માત્ર ૧૮ પ્રશ્નો જ ટીક કરવાના રહેશે. જો વધારે ટીક કરેલ હશે તો પ્રથમ ૧૮ પ્રશ્નો જ ગણતરીમાં લેવામાં આવશે.

- If the comparison is not satisfactory, we modify either _____ or search for another structure for the mathematical modelling.
A. Idealization assumption B. Simple assumption C. Only assumption D. None of these
- Mathematical model may be
A. Linear or non-linear B. Static or dynamic C. Both A and B D. None of these
- Which of the following is the formula for population growth model?
A. $x(t) = x(0)e^{(b-d)t}$ B. $x(t) = x(0)e^{(b)t}$ C. $x(t) = x(0)e^{(b+d)t}$ D. $x(t) = x(0)e^{(b-t)d}$
- Population growth model based on migration is applicable to growth of population of
A. Bacteria B. Micro-organism C. Malignant cell D. All of above
- Suppose that the population of certain country's growth and an annual 2% if the current population is 30, 00,000. What will be the population is 10 years?
A. 3.7642×10^6 B. 3.6642×10^6 C. 3.6642×10^5 D. 3.5042×10^6
- What is the formula of the logistic law of population growth?
A. $\frac{x}{(a-bx)} = \frac{x(0)}{a-bx(0)} \cdot e^{at}$ B. $\frac{x}{(a-bx)} = \frac{x(0)}{a-bx(0)} \cdot e^{at}$ C. $\frac{x}{(a-b)} = \frac{x(0)}{a-bx(0)} \cdot e^{at}$ D. None of these
- Which of the following is phase of model building?
A. Formulation phase B. Design phase C. Evaluation phase D. All of above
- Mathematical Model is representation of certain feature of
A. Physical phenomena B. Process C. Object D. All of above
- After a long time the velocity of the free falling body is _____ $\frac{g}{\alpha}$.
A. Constant B. Half C. Double D. None of these
- Those people who are suffering from diseases are called _____ people.
A. Infective B. Susceptible C. Carrier D. Immune
- Those people who are not present suffering from diseases but they may be infective is called _____ people.
A. Infective B. Susceptible C. Carrier D. Immune
- Those people do not have diseases and never becomes infective is called _____ people.
A. Infective B. Susceptible C. Carrier D. Immune
- In SI model people are categories in how many categories?
A. 1 B. 2 C. 3 D. 4
- In which model a susceptible people can become infected and then they become susceptible?
A. SI B. ISI C. SIS D. None of these
- In which model, only carrier can spread the diseases?
A. SI B. SIS C. ISI D. Simple epidemic model with carrier
- The species getting killed by other species is called
A. Pre B. Predictor C. Both A and B D. None of these
- The Prey predictor model is also called
A. Circle B. Catastrophic C. Trajectory D. None of these
- The competition model is also called
A. Circle B. Catastrophic C. Trajectory D. None of these
- Which formula used for prey-predictor model?
A. $\left(\frac{y}{y_0}\right)^a \cdot \left(\frac{x}{x_0}\right)^p = e^{q(x-x_0)} + e^{b(y-y_0)}$ B. $\left(\frac{y}{y_0}\right)^a \cdot \left(\frac{x}{x_0}\right)^p = e^{q(x-x_0)} \cdot e^{b(y-y_0)}$
C. $\left(\frac{y}{y_0}\right)^a \cdot \left(\frac{x}{x_0}\right)^p = e^{q(x-x_0)} - e^{b(y-y_0)}$ D. $\left(\frac{y}{y_0}\right)^a + \left(\frac{x}{x_0}\right)^p = e^{q(x-x_0)} \cdot e^{b(y-y_0)}$
- Which following formula is used for SIS model?
A. $S(t) = \frac{(N+1)(\beta N - \gamma)e^{-\alpha t} - \gamma}{\beta + (N\beta - \gamma)e^{-\alpha t}}$ B. $S(t) = \frac{(N+1)(\beta N + \gamma)e^{-\alpha t} + \gamma}{\beta + (N\beta - \gamma)e^{-\alpha t}}$
C. $S(t) = \frac{(N+1)(\beta N - \gamma)e^{-\alpha t} + \gamma}{\beta + (N\beta - \gamma)e^{-\alpha t}}$ D. None of these

21. In diffusion of glucose model, maximum level of concentration of a medicine is
 A. $\alpha = \frac{D}{1-e^{-kT/v}}$ B. $\alpha = \frac{D}{1+e^{-kT/v}}$ C. $\alpha = \frac{D}{1-e^{kT/v}}$ D. $\alpha = \frac{Dv}{1-e^{-kT/v}}$
22. The concentration curve is piece-wise continuous and has point of _____ at T, 2T, 3T ...
 A. Constant B. Continuity C. Discontinuity D. None of these
23. The offspring gets the second G from the parent and g from the second parent the probability is $\frac{1}{2} \times \frac{1}{2} =$ _____ and the offspring is H.
 A. $\frac{1}{4}$ B. $\frac{1}{2}$ C. $\frac{1}{8}$ D. None of these
24. If the original population consist of only recessive then after 5th generation. What will be the proposal of dominant and hybrid?
 A. $(\frac{15}{16}, \frac{1}{16})$ B. $(\frac{15}{16}, \frac{5}{16})$ C. $(\frac{15}{16}, \frac{1}{16})$ D. None of these
25. If any population is mated at the random with only dominants successively we find that
 A. The recessive never appear B. The proportion of hybrid
 C. The proportion of dominant D. All of above
26. Under the hypotheses of random mating the proportional of dominant, hybrid, recessive individual remain constant _____ generation onwards.
 A. 1 B. 2 C. 3 D. 4
27. Suppose 50% plants with red flowers, 20% with pink flowers and 30% with white flowers under random processing hypotheses. What will be the percentage in the next of succeed generation?
 A. 36%, 40%, 16% B. 35%, 48%, 16% C. 36%, 48%, 15% D. 36%, 48%, 16%
28. If the original population consist of only recessive then after 10th generation what will be the proportional of the dominant and hybrid?
 A. $\frac{511}{512}, \frac{1}{512}$ B. $\frac{511}{512}, \frac{2}{512}$ C. $\frac{510}{512}, \frac{1}{512}$ D. $\frac{511}{512}, \frac{1}{511}$
29. What is the formula of diffusion of glucose model?
 A. $C(t) = D e^{-\frac{kt}{v}} \cdot \frac{e^{\frac{nkT}{v}} - 1}{\frac{kT}{v} - 1}$ B. $C(t) = D e^{-\frac{kt}{v}} \cdot \frac{e^{\frac{nkT}{v}} + 1}{\frac{kT}{v} - 1}$
 C. $C(t) = D e^{-\frac{kt}{v}} \cdot \frac{e^{\frac{nkT}{v}} - 1}{\frac{kT}{v} + 1}$ D. $C(t) = D e^{-\frac{kt}{v}} \cdot \frac{e^{\frac{nkT}{v}} + 1}{\frac{kT}{v} + 1}$
30. How many types of traffic model?
 A. 1 B. 2 C. 3 D. 4
31. The individual vehicle, individual behavior. The acceleration if a vehicle is measured with respect to velocity of the car difference of velocity between two cars and relation between them is called
 A. Macroscopic model B. Microscopic model C. Both A and B D. None of these
32. Microscopic model sometimes known as
 A. Macroscopic model B. Car model C. Car following model D. Car backward
33. The number of vehicle in a unit length of road is called _____ of a traffic.
 A. Density B. Flow C. Velocity D. Maximum flow
34. Which formula used for find critical density?
 A. $\rho_c = \frac{d\rho_m}{d+v_m\rho_m}$ B. $\rho_c = \frac{d\rho_m}{d-v_m\rho_m}$ C. $\rho_c = \frac{d+\rho_m}{d+v_m\rho_m}$ D. $\rho_c = \frac{d-\rho_m}{d+v_m\rho_m}$
35. Which formula used for finding stopping distance?
 A. $D_s = \frac{5}{18}vT - \frac{25}{648 \times 9.8} \frac{v^2}{k}$ B. $D_s = \frac{5}{18}vT + \frac{25}{648 \times 9.8} \frac{v^2}{k}$
 C. $D_s = \frac{5}{18}vT + \frac{25}{648 \times 9.8} + \frac{v^2}{k}$ D. $D_s = \frac{5}{18}vT + \frac{25}{648 \times 9.8} - \frac{v^2}{k}$