Date:...../...../20.....

M□T□W□T□F□S□

lecture = 14

Revie Questions

(1)

a)

$$av(2) = \frac{s_2 - s_1}{t_2 - t_1} = \frac{21.4 - 21.1}{2 - 1}$$

$$= 0.3$$

b) $$a(v(3) = \frac{s_3 - s_1}{t_3 - t_1} = \frac{11.9 - 21.1}{2}$$

=

c)

$t = 3s$

$s(t) = 11.9$

$\Delta t = 2$

$t - \Delta t = 1$

$s(t - \Delta t) =$ [illegible] $s(1) = 21.1$

$\Delta s = -$

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(2)

a) $\frac{dQ}{dt} = -0.0004Q$

$Q_0 = 200.$

$P = P_{old} + \Delta P.$

$Q = Q_{old} + \Delta Q$

$Q = 200 + \Delta Q$

$\Delta Q = -0.0004 (Q)$

$Q = 200 - 0.0004 (Q - \Delta t)$

b) $t_{new} = t_{old} + \Delta t.$

$t_{old} = t_{new} - \Delta t.$

$= 9.0 - 0.5 = 8.5.$

c) $Q(t - \Delta t) = 199.32.$

$Qt = 199.28.$

$\Delta Q = ?$

$Q_{new} = Q_{old} + \Delta t.$

$\Delta t = 199.28 - 199.32$

$= -0.04.$

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"Q.No 5"

$$Q(t) = Q_0 (e^{-rt})$$

$$\frac{Q_0}{2} = Q_0 e^{-rt}$$

$$\frac{1}{2} = e^{-rt}$$

Decay rate = $\frac{0.042787}{100}$

$$= 0.00042787$$

$$\frac{1}{2} = e^{-(0.00042787(t))}$$

$$\frac{\ln}{2} = \ln\left(e^{-(0.00042787(t))}\right)$$

$$-0.693147180t = -0.0042787(t)$$

$$t = \frac{0.693147180}{0.0042787}$$

$$t = 1619.9 \text{ years}$$

$$\boxed{t \approx 1620 \text{ years}}$$

Infinity Notes

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Review Question 2

Data :-

$\Delta t = 0.1$

$t - \Delta t = \leq 1000$

$M = 1000$

$r = 105\% \Rightarrow 1.05$

$P_0 = 20$

Sol :-

(a)

$$\Delta P = r \Delta t (1 - P/M) \times P$$

$$= r \Delta t \left(1 - \frac{P}{M}\right) \times P$$

$$= (1.05)(0.1)\left(1 - \frac{P}{1000}\right) P$$

(b)

$M = 1000$ is the Max Population

(c)

$P(5) = 600$

$P(5.1) = ?$

$$\Delta P = (1.05)(0.1)\left(1 - \frac{600}{1000}\right)(600$$

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$\Delta P = 25.2$

$P = P_{old} + \Delta P$

$= 600 + 25.2$

$= 625.2$ individuals

↩

Quick Review Question 8

(a)

c - Greater

(b)

A - 13 s

(C)

B - 21 s

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Model 4.1

Review Question 2

B = BTS

This is because all other parameters are same and death proportionality constant of WTS is greater, which will result in more deaths of WTS.

Model 4.2

Review Question 2

(A)

Δy, because its BIR is dependent on its own population and population of Δx

r.h.s - r₂ h ⇒ refrence eq

(B)

Δy = (0.01 * (x)(t - Δt) * y(t - Δt)

D = 0.01

(C)

$\Delta x = (2 * x(t-\Delta t)$ ~~- 0.02~~

$A = 2$

(D)

$\Delta y = -1.06 * y(t-\Delta t)) * \Delta t$

$F = 1.06$

(E)

$\Delta x = -0.02 * y(t-\Delta t) * x(t-\Delta t)) * \Delta t$

$C = -0.02$

(F)

Pridators = 15

(G)

Prey = 100

~~Quiz~~

Quick Review Question 8 (Picture Phone men him)

a) $K \rightarrow 10$

$N_0 \rightarrow$ initial population.

$\frac{a-10}{1000000} \times 100\%$

$= 0.0001\%$

$\frac{K}{N_0}$ → Har bonds kitne contacts kar raha hai dosere ke saat

b) $b = 0.06\%$

↳ contact se kitna chance hai beemari ho gii

c) $b \times \frac{K}{N_0}$

↳ 1 bonds kitne contact kerta hai aur kitneon men beemari phele gii

$= 0.06 \times 0.0001\%$

$r = 0.00006\%$

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d) SI

$\Rightarrow 5000 \times I$

$= 45 \times 10^9$

e) $r \times Si$

$= \frac{k}{No} \times b \times SI$

rate of getting sick = # of contact with SARS transmition per day.

$\frac{ds}{dt}$ = -rate of getting sick

$S \times I \times r = 45 \times 10^9 \times r$

$= 45 \times 10^9 \times \frac{k \times b}{No}$

$= 45 \times 10^9 \times 0.00006\ \%$

$r \times SI = 2700$

rate of getting sick

$\frac{ds}{dt} \Rightarrow$ rate of getting sick

$\frac{ds}{dt} = -$ rate of getting sick

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Q. No 7

(a)

$$P = \frac{1}{5} = 0.5$$

P here is the rate of people going from exposed to infections.

(b)

P E

(c)

PE

(D)

$$10 \times \frac{1}{100} = 0.1$$

$$\mu = \frac{1}{0.1} \Rightarrow 10 \text{ days}$$

(e)

$$\mu = \frac{1}{16} = 0.0625$$

(f)

μ So

Infinity Notes