Ø Question # 1

The sequence of deposit is 8, 24, 72, ……..

Here $a_1 = 8$ $r = \frac{24}{8} = \frac{72}{24} = 3$, $n = 5$

Since $S_n = \frac{a_1(r^n - 1)}{r - 1}$ $\Rightarrow$ $S_5 = \frac{8(3^5 - 1)}{3 - 1} = \frac{8(243 - 1)}{2} = 4(242) = 968$

Thus he has to deposited Rs. 968 up to the fifth year.

Ø Question # 2

Here $a_1 = 8$, $r = 2$, $S_n = 32760$, $n = ?$, $a_n = ?$

Since $S_n = \frac{a_1(r^n - 1)}{r - 1}$

$\Rightarrow 32760 = \frac{8(2^n - 1)}{2 - 1}$ $\Rightarrow 32760 = \frac{8(2^n - 1)}{1}$ $\Rightarrow 32760 = 8(2^n - 1)$

$\Rightarrow 4095 = (2^n - 1)$ $\Rightarrow 4095 + 1 = 2^n$ $\Rightarrow 4096 = 2^n$

$\Rightarrow (2)^{12} = 2^n$ $\Rightarrow 12 = n$

Now $a_{12} = a_1 r^{11}$ $\Rightarrow a_{12} = (8)(2)^{11} = (8)(2048) = 16384$

Hence the last instalment is Rs. 16384.

Ø Question # 3

Here $a_1 = 62500$, $n = 4$, $r = 1 + \frac{4}{100} = 1 + 0.04 = 1.04$

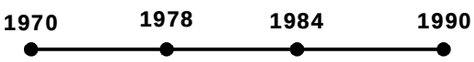
Since $a_n = a_1 r^{n-1}$ $\Rightarrow$ $a_4 = (62500)(1.04)^{4-1} = (62500)(1.04)^3$

$= (62500)(1.1249) = 70304$

Thus the population after 3 years is 70304.

Ø Question # 4

Let the enrolment in 1970 is a_1



also $a_n = 6000$, $r = 2$, $n = 4$

Since $a_n = a_1 r^{n-1}$

$\Rightarrow 6000 = a_1(2)^{4-1}$ $\Rightarrow 6000 = a_1(2)^3$ $\Rightarrow 6000 = a_1(8)$

$\Rightarrow \frac{6000}{4} = a_1 \Rightarrow a_1 = 750$

Thus the enrolment was 750.

Ø Question # 5

The colony of bacteria in the start = $a_1 = A$

Then $r = 2$, $n = 2n + 1$

Since $a_n = a_1 r^{n-1}$ $\Rightarrow$ $a_{2n+1} = (A)(2)^{2n+1-1} = A(2)^{2n}$

Thus bacteria after n hours will be $A(2)^n$.

Ø Question # 6

Here $a_1 = \frac{3}{2}$, $r = \frac{1}{2}$

So the series is $\frac{3}{2} + \frac{3}{4} + \frac{3}{8} + ...$

Which is infinite geometric series

Now $S = \frac{a_1}{1 - r} = \frac{3/2}{1 - 1/2} = \frac{3/2}{1/2} = 3$ Answer