Q.No.	DAY - 71
444	**Example 10.27** The growth of a population is proportional to the number present. If the population of a colony doubles in 50 years, in how many years will the population become triple?
445	**Example 10.28** A radioactive isotope has an initial mass 200mg, which two years later is 50mg. Find the expression for the amount of the isotope remaining at any time. What is its half-life? (half-life means the time taken for the radioactivity of a specified isotope to fall to half its original value).
446	**Example 10.29** In a murder investigation, a corpse was found by a detective at exactly 8 p.m. Being alert, the detective also measured the body temperature and found it to be $70°F$. Two hours later, the detective measured the body temperature again and found it to be $60°F$. If the room temperature is $50°F$, and assuming that the body temperature of the person before death was $98.6°F$, at what time did the murder occur? $\left[\log(2.43) = 0.88789; \quad \log(0.5) = -0.69315\right]$
447	**Example 10.30** A tank contains 1000 litres of water in which 100 grams of salt is dissolved. Brine (*Brine is a high-concentration solution of salt* *(usually sodium chloride) in water*) runs in a rate of 10 litres per minute, and each litre contains 5grams of dissolved salt. The mixture of the tank is kept uniform by stirring. Brine runs out at 10 litres per minute. Find the amount of salt at any time t.

448	**EXERCISE 10.8** 2. Find the population of a city at any time t, given that the rate of increase of population is proportional to the population at that instant and that in a period of 40 years the population increased from 3,00,000 to 4,00,000.
449	3. The equation of electromotive force for an electric circuit containing resistance and self- inductance is $E = Ri + L\dfrac{di}{dt}$, where E is the electromotive force is given to the circuit, R the resistance and L, the coefficient of induction. Find the current i at time t when $E = 0$.