B.Sc (Hons.) Zoology
Part-II, Paper-IV
→ Dr. prabhat Ranjan

"Heart rate"

→ The pressure wave that travels along the arteries following each ventricular systole expands the arterial walls and the expansion is palpable as the pulse.
→ It can be felt by placing fingers over the radial artery at the wrist and also in the neck, temples and ankles.
→ Since each heart beat produces one pulse in the arteries, the pulse rate per minute indicates the HR.
→ As such, the pulse frequency and HR are identical, being 72/min.
→ With advancing age, the arteries become more rigid, and the pulse wave moves faster.
→ HR in rabbit is 200/min (smaller animals have higher metabolic rate, therefore, the rate of heart beat must be faster to supply nutrients and O_2 to the tissue.
→ HR in elephant is 25/min.
→ The difference between systolic pressure (120mm Hg) & diastolic pressure (80mm Hg) which is 40mm Hg is called the pulse pressure.
→ The strength of the pulse is determined by the pulse pressure.
→ The pulse is weak in shock.
→ It is strong during exercise or after the administration of histamine.

Regulation of Heart rate

→ The basic rate of heartbeat is controlled by the activity of SAN.

→ Even when removed from the body and placed into an artificial medium the heart will continue to beat rhythmically, although more slowly.

→ In the body, however, the demands on the blood systems are constantly changing and the heart rate has to be adjusted accordingly.

→ This is achieved by control system, one nervous and the other chemical. This is known as Homeostatic response, whose overall function is to maintain constant conditions within the blood-stream even though conditions around it are constantly changing.

→ The amount of blood flowing from the heart over a given period of time is known as the cardiac output, and depends upon the volume of blood pumped out of the heart at each beat, the stroke volume, and the heart (no. of beats per min.)

[Cardiac output = stroke volume × heart rate.]

→ It is the cardiac output which is the important variable in supplying blood to the body. One way of controlling cardiac output is to control the heart rate.