

## **PHYSICAL EDUCATION**

Subject: Physical Education

Semester: 4th

Paper No. & Title: 401

Test, Measurement and Evaluation in Physical Education

Lecture No. & Title: 1

Harvard Step Test

### **TEST**

#### **Harvard Step Test**

#### **INTRODUCTION**

This test was developed by Lucien Brouha and his associates in 1943. A very simple and promising field test of human beings by using easily available and inexpensive equipment. Originally, the test was developed on 220 college men by administering it simultaneously on small groups of students. This is probably the most common test of cardiovascular endurance used in India and also all over the world.

#### **PURPOSE**

To measure cardio vascular endurance.

#### **EQUIPMENT**

A stopwatch, 20-inch high bench, metronome or tape recorder (optional), stethoscope (optional).

#### **TEST ADMINISTRATION**

During the test, The metronome is set to a speed of 120 beats per minute. depending upon the availability of 20-inch high bench area and pulse count testers, subjects asked to start the stepping up and down exercise in consonance with the sounds of metronome and by starting the stopwatch at the signal 'go'. if the metronome is not available, then the tester should do enough rehearsal of counting the pace up-up-down-down, 30 times a minute. The subject is given instructions that on the command 'up' or the first sound of the metronome, he/she should place one foot on the bench, on the second command 'up' or the second sound of the metronome, he/she should place both feet fully on the bench with the body erect straightening the legs and back.

Immediately after reaching the erect posture, he/she should step down one foot at a time as the tester gives command 'down-down'(Third and fourth sounds of the metronome).The subject is instructed to repeat the stepping up and down exercise in the above manner for five minutes at the pace of 30 steps per minute. The subject is also asked to take off and step-down with the same foot each time. The tester starts the stopwatch simultaneously with the first take off by the subject and stops the watch after exactly five minutes by giving the 'stop' signal to the subjects who immediately sit down on the bench. In case, any subject stops the exercise or slows down the pace of the exercise due to fatigue or exhaustion, his or her duration of exercise performed at the correct pace is noted(in seconds)and is asked to stop and sit down. Exactly one minute after stopping the exercise, the tester starts counting the pulse rate and records the same for the duration from 1 to 1.5,2 to 2.5 and 3 to 3.5 minutes.

## SCORING

The pulse of all the 3 half minute counts recoded are added together and a fitness index is calculated by the following formula:

$$\text{Fitness Index(F.I.)} = \frac{\text{Duration of exercise period in seconds} \times 100}{2 \times \text{sum of three pulse counts after exercise}}$$

In case the subject is unable to do the step exercise for full five minutes, Brouha had recommended a direct scoring scheme

Duration of exercise(at correct pace)	Score
Less than 2 minutes	25
From 2.00 to 3.00 minutes	38
From 3.01 to 3.50 minutes	48
From 3.51 to 4.00 minutes	52
From 4.01 to 4.50 minutes	55
More than 4.50 minutes	59

Given below, which was irrespective of the after exercise pulse counts:

Fitness Index Score	Fitness Condition
Up to 54	Poor condition
Between 55-64	Low average
Between 65-79	High average

Between 80-89	Good
90 and above	Excellent

Modifications for its use on college women:

**Clarke (1943)** made the following modifications college women:

1. The height of the bench= 18".
2. Duration of exercise=4 minutes.
3. The rest of the test procedure including the evaluation standards used are the same as those for modified test for college men.