

Manual for Physical Efficiency Tests

SAVITRIBAI PHULE PUNE UNIVERSITY



PHYSICAL EDUCATION EXAMINATION SCHEME

For First Year Students of all Faculties



Manual for Physical Efficiency Test

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VICE-CHANCELLOR'S MESSAGE



It gives me immense pleasure to learn from the faculty of Physical Education that in response to the Government's resolution regarding the policy for the sports 2012, the experts in the field of Physical Education have taken noteworthy effort to prepare the manual for the Physical Efficiency Test for the University. It is truly said that, the Youths in every walk of life are under stress. They have incredible muscles to make the revolutionary changes in the society.

We are living in the era of materialism. Naturally everyone is losing their Physical strength to face the challenges of the daily life. In this background, it is the appreciable initiative taken by the experts of the University to make the first year admitted students to undergo the physical exercises to improve their productivity. I believe that, this productivity in turn definitely extends its help in improving the productivity and the economy of the Nation.

I, hereby appeal to the fraternity of Physical Education, to implement the policy in the first instance and engage the students admitted to their colleges to undergo the plans and program designed under this scheme. I agree that every scheme/ policy always has its pros and cons; this newly coined scheme is not exception to it. It is also open for any alteration in future. I wish good luck to all the College Directors of Physical Education and Sports for the successful implementation of the scheme and to prepare the Youths (backbone of the society) to enhance the muscular power.

(Dr. Wasudeo Gade)

Vice-Chancellor

FOREWORD



Dear Colleagues,

You might have been aware of the Government policy for sports 2012. The same issue was also discussed in the forum of the Advisory Board. It is expected by the Government resolution to improve the physical efficiency of the youths that are admitted to higher and technical education in the state of Maharashtra, should undergo the physical training programs for enhancement of the physical efficiency. It is also observed by the Government officials that the Universities in the state of Maharashtra do not have such sort of prescribed programs or those which are having, are inconsistent with the present requirements. Hence, they have appealed to the universities to frame such programs to develop the physical efficiency of the youth.

In response to the same, the Faculty of Physical Education has formulated a committee of the experts in this field. They have been shouldered with the responsibility to design appropriate program for the enhancement of physical efficiency. It was a challenge before them considering the available infrastructure and equipments, other assisted support and the various commitments of the College Direction of Physical Education and Sports in the Colleges.

I believe that, in the very initial efforts the committee has done their very best in preparing the required physical efficiency improvement program for the admitted youths in the colleges. They have also tried their level best to provide all the necessary supporting documents along with the norms that will surely be supportive to conduct the said program. I am confident in my colleagues that, they will surely extend their fullest cooperation to fulfill the expectations of the university and the Government also giving respect to the appeal made by the Hon'ble Vice-Chancellor of this University.

Dr. Deepak Mane
Dean,
Faculty of Physical Education

PREFACE

This manual consists of detailed information of the test to be administered along with the norms and marking system. The section 'A' and Section 'B' are defined in the table and accordingly the description of the tests is encrypted. The scores achieved by the students can be easily converted with the help of the tables provided for the respective tests. The expert committee has taken the utmost care to provide the standard norms of the test selected for the drive. It is expected that the selected tests will surely come up to the expectations in enhancing the physical efficiency of the youths undergoing the tests.

*** All the figures, matter, norms, units, information used and appeared in the manual are subject to availability of the prints of the respective sources. This manual do not contain any individual opinion of the members of the Editorial Board**

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BADMINTON

Lockhart and McPherson Badminton Skill Test

Lockhart and McPherson Badminton Skill Test: The test was constructed on fifty college women. The reliability coefficient (test retest method) was 0.90 and the validity coefficient ranged from 0.60 to 0.70

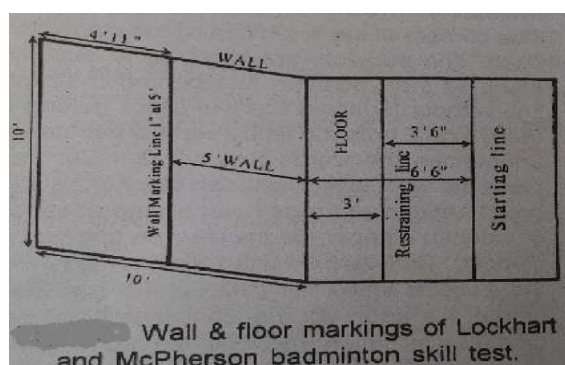
Equipment: Unobstructed ten feet high and ten feet wide wall, badminton racket, new indoor shuttlecocks, a stopwatch, a few score sheets, marking chalk and a tape.

Test Dimension: A restraining line is drawn at a distance of 3' from the base of the wall and a starting line parallel to the restraining line is drawn at a distance of 3 feet 6 inches from the restraining line that is at a distance of 6 feet 6 inches from the base of the wall. A horizontal net line (one inch wide) is marked on the wall at a height of 5 feet from the floor in figure.

Test Administration: The player (examinee) is asked to stand behind the starting line with a racket in one hand and shuttlecock in the other. On the signal 'go' the player is required to serve legally against the wall on or above the net line continuously for 30 seconds from the area between the starting line and the restraining line. In case, the player is not able to volley the shuttlecock continuously for 30 seconds and misses the shuttlecock, he is allowed to restart with another legal service from behind the starting line (Mathews 1973; Eckert, 1974, Bosco and Gustafson, 1983; Clarke and Clarke, 1987). Each examinee is allowed three trails with short intervals of 30 seconds in between the trails.

Scoring: The total number of legal hits made on or above the net line in all the three 30 seconds trials is the score of the examinee in the skill test. The scoring may be converted into T-scale as per standard statistical procedure.

It may be noted that although, the test was originally constructed on college women but Mathews (1973) reported that the test is equally satisfactory for college men.



Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008), Pp. 391-392

Lockhart and McPherson Test

Scoring	Marking
Within 30 Seconds number of hits	Each Hit - 1 mark each

GYMNASTICS, MALLAKHAMB AND ROPE MALLAKHAMB

Vertical Arm Pull Test

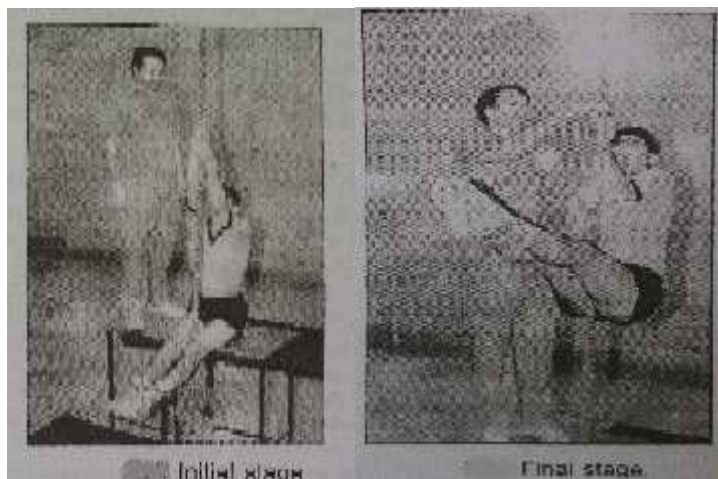
Vertical Arm Pull Test (Distance): This test is used to measure the power of arms and shoulder girdles and is quite indicative of one's potential in gymnastics, Malkhamb Rope Malkhamb and Pole Vault. The test is considered suitable only for boys aged fourteen and above.

Equipment: A climbing rope, a tape measure, marking tape and a bench.

Test Administration: The following instructions are given to a group of five to ten subjects, explaining the same with the help of a practical demonstration by a trained helper. The subjects are informed that each one of them will be required to dress in shorts and light shirt without shoes. The subject is asked to assume a sitting position on a bench of 15 inches high from the floor and to grasp the rope as high as possible without lifting the buttocks from the bench. The dominant hand or preferred hand is to be placed just above the other hand. The tester then wraps the marking tape around the rope just above the upper hand of the subject in the figure. The subject is now asked to pull as hard as possible without touching the floor, so as to reach as high as possible to grasp the rope. The subject is required to keep grasping the rope at the highest level until the tester can place a piece of marking tape above the upper hand of the examinees. Each subject is given three trials in addition to any trial where the feet touch the floor during the pull. Before the subject starts the second trial, the tester should encourage the examinee by asking to beat his first distance pulled; before the third trial the tester is supposed to inform the subject.

Scoring: The test measures the distance between the lower marking tape and the upper marking tape from the lower edge of the lower tape to lower edge of the upper tape for each pull. The maximum distance out of the three pull trials given to a subject, provides the score of this test.

Comments: This is a quite simple and practical test of measuring power of the upper extremities and shoulder girdle.



Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008), Pp.304-305

Vertical Arm Pull Test

Sr. No	Performance in cms	Performance Level	Marks
01	73.0 – 76.8 cms	Advanced	20
02	66.7 – 72.4 cms	Advanced Intermediate	16
03	48.9 – 66.0 cms	Intermediate	12
04	39.4 – 48.3 cms	Advanced beginners	08
05	0.0 – 38.7 cms	Beginners	04

Courtesy: Barry L. Johnson and Jack K. Nelson , “ Practical Measurements for Evaluation in Physical Education” Surjeet Publications, (1982) : P. 206

Flexed Arm Hang

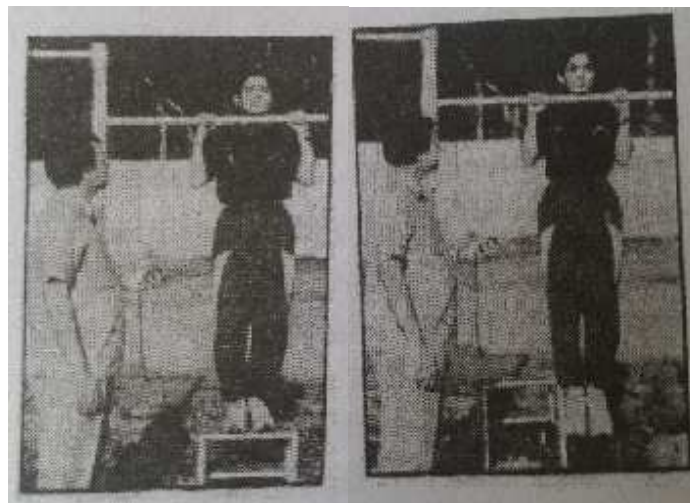
Flexed Arm Hang: This test is used to measure, the isometric endurance of the arm and shoulder girdle muscles responsible for flexed-arm hang position. This test is meant for children of ten years and above but most commonly this test is used for girls.

Equipment: A stopwatch and horizontal bar, preferably 1.5” in diameter at a height where the tallest subject does not touch the ground in flexed arm hang position.

Test Administration: First of all the height of the bar is adjusted so that it is approximately equal to the subject's standing height. The subject is asked to grip the bar using the overhand grasp. With the assistance of two helpers, one in front and one in back of the subject, the subject's body is raised off the floor to a position where the chin is above the bar without touching it. Alternatively, as shown in the figure, a bench of 15" to 18" is used to help the subject to take chin up position. Once a correct position is taken, the stool is removed from below the feet. Both the elbows are flexed and the chest comes close to the bar during the test. The subject holds the position for the maximum duration of time without any support.

As soon as the subject attains the flexed arm free hand position, the stopwatch is started and it is stopped as soon as anyone of the following conditions is noticed: (a) The subject's head tilts backwards for keeping the chin above the bar. (b) The subject's chin touches the bar. (c) the subject's chin comes below the level of the bar.

Scoring: The duration in seconds for which the subject holds the flexed arm hang position correctly, is the score of the test.



Flex arm Hang

Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008), Pp. 268-269

Flex Arm Hang

Sr. No.	Percentile	Performance in Seconds	Marking
1	100 th	73	20
2	95 th	34	19
3	90 th	28	18
4	85 th	22	17
5	80 th	19	16
7	75 th	17	15
8	70 th	14	14
9	65 th	12	13
10	60 th	10	12
11	55 th	09	11
12	50 th	08	10
13	45 th	07	09
14	40 th	06	08
15	35 th	05	07
16	30 th	04	06
17	25 th	03	05
18	20 th	02	04
19	15 th	02	03
20	10 th	01	02

Courtesy : Barry L. Johnson and Jack K. Nelson , “ Practical Measurements for Evaluation in Physical Education” Surjeet Publications, (1982) : P. 123

JUDO & WRESTLING

Push-Ups / Modified Push-Ups

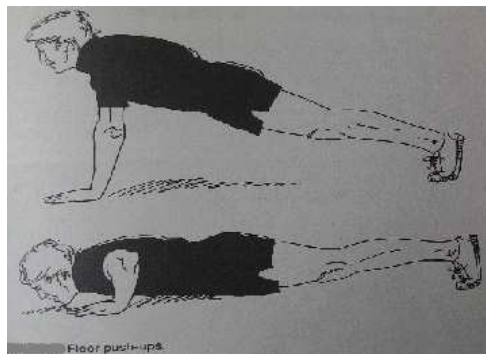
Measurement Objectives: To measure the dynamic muscular endurance of the arms and shoulder girdle.

Test Qualities: Content validity is accepted. No reliability coefficient for floor push-ups was found but reliability is undoubtedly high if no endurance training occurs between the test and retest. Reliability of modified push-ups is 0.93

Test Applications: Male, junior high through college (floor push-ups). Female, junior high through college (modified push-ups)

Equipment and Materials: A floor mat

Procedure: Floor push-ups – performer takes a front-leaning ready position with arms and legs straight. He then lowers the body until the chest touches the mat and pushes up to the straight arm position. The exercise is continued as many times as possible without a rest as shown in the figure.



Modified Push-ups: Performer's takes a front-leaning ready position with body weight supported by fully extended arms and knees bent at right angle. Performer lowers her body to the mat and pushes back to straight arm position. The exercise is continued as many times as possible without a rest as shown in the figure.

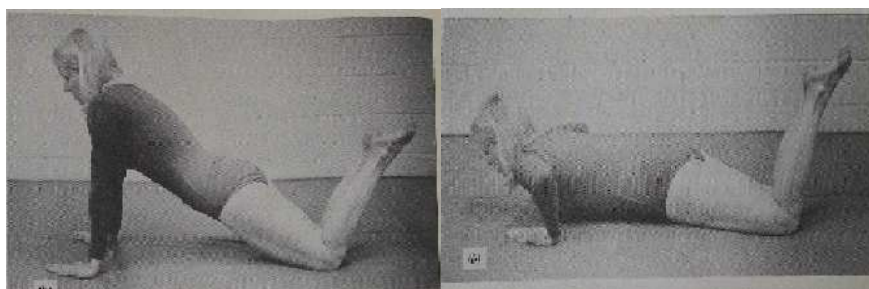
Note: There are several variations in terms of administrative procedures, fingertip push-ups and modified bench push-ups, for instance. Consistency must prevail when testing.

Scoring: Floor push-ups – score is the number of correct push-ups continuously executed. When body pikes or sags, chest does not touch mat, or arms do not fully extend, that trial does not count. If performer stops to rest, the test should be considered completed. As a helpful technique in determining correctness of the push-

up, the tester or partner can place his hand on the mat under the performer's chest. If the chest is lowered enough, it will touch the hand of the tester.

Modified push-ups – Score is the number of correct push-ups continuously executed. If performer stops to rest, the test should be considered terminated. If the body sags, chest does not touch mat or arms are not fully extended, the trial does not count.

Norms available in Johnson and Nelson (1979, 1972)



Modified Push-Ups (repetitions)

Scores Men Under 30 Years	Scale Points	Scores Men over 30 years
60	100	50
58	95	48
56	90	46
54	85	44
53	80	43
50	75	40
48	70	38
46	65	36
44	60	34
42	55	32
40	50	30
38	45	28
36	40	26
34	35	24
32	30	22
30	25	20
28	20	18

Courtesy: Barry L. Johnson, Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, Surjeet Publications (1982), Pp 129-130

Raw Score Norms of Modified Push-Ups (Repetitions)

Raw Scores	Performance Level
31- and above	Advanced
25-30	Advanced Intermediate
13-24	Intermediate
7-12	Advance Beginners
0-6	Beginners

Courtesy: Barry L. Johnson, Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, Surjeet Publications (1982), Pp 129-130

Courtesy: D. Allen Phillips and James E. Hornak, Measurement and Evaluation in Physical Education, John Wiley & Sons, Inc. (1979), Pp. 231-232

Push-Ups (Men) (number of pushups)

Scores Men Under 30 Years	Scale Points	Marks
60	100	20
58	95	19
56	90	18
54	85	17
53	80	16
50	75	15
48	70	14
46	65	13
44	60	12
42	55	11
40	50	10
38	45	09
36	40	08
34	35	07
32	30	06
30	25	05
28	20	04

Courtesy: Barry L. Johnson, Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, Surjeet Publications (1982), Pp 129-130

Raw Score Norms of Modified Push-Ups (women) (number of pushups)

Raw Scores	Performance Level	Marks
31- and above	Advanced	20
25-30	Advanced Intermediate	16
13-24	Intermediate	12
7-12	Advance Beginners	08
0-6	Beginners	04

Courtesy: Barry L. Johnson, Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, Surjeet Publications (1982), Pp 129-130

Twelve minutes Run and Walk Test (Cooper's Test)

Measurement Objective: To measure cardio-respiratory endurance.

Test Qualities: Validity is 0.90 when correlated with treadmill measurements of oxygen consumption and aerobic capacity. Reliability is 0.94 with test-retest method.

Test Applications: Male and female, junior high through college. Also applicable for adult men and women

Equipment and Materials: Stopwatch or clock with sweep second hand, whistle or starter's pistol, track, football field, or some running area marked so that distance traveled in 12 minutes can be calculated easily.

Procedure: Performers assemble behind starting line. At the starting signal, they run or walk as far as possible within the 12 minute time limit. An experienced pacer should accompany performers around the running area during the actual test. Performers should have experienced some practice in pacing. At the signal to stop, performers should remain where they finished long enough for test administrators to record the distance covered. Ample time should be given for stretching and warm-up as well as post-test cool down.

Scoring: score is distance in miles covered in 12 minutes. Distance in yards is converted to miles (1760 yards = 1 mile)

Norms: Norms for males and female aged 13 to 19 and 20 to 29 are presented in the table given below. Norms for additional ages are available in Cooper (1977). Norms for fifth-through eighth-grade boys and girls are available in Clarke (1976).

(1 mile = 1.609 kms)

Male		Fitness Class	Female	
13-19	20-29		13-19	20-29
0-1.29 miles	0-1.22 miles	Very poor	0.99 miles	0.95 miles
1.3-1.37	1.22-1.31	poor	1.0-1.18	0.96-1.11
1.38-1.56	1.32-1.49	fair	1.19-1.29	1.12-1.22
1.57-1.72	1.50-1.64	good	1.30-1.43	1.23-1.34
1.73-1.86	1.65-1.76	excellent	1.44-1.51	1.35-1.45
1.87 & above	1.77 & above	superior	1.52 & above	1.46 & above

Courtesy: The Aerobics Way by Kenneth H. Cooper, M. D. , M. P. H. copyright (c) 1977 Kenneth H. Cooper, inc., New York, New York 100017. Reprinted by permission

SWIMMING

Jackson et al., 12 minute swim test

Swimming is a most prepared and most recommended exercise for adopting to lead lifetime active lifestyle for earning fitness benefits. Hence, skill testing work has been considered quite unimportant for such a general and essential category of physical activity for all. However, Jackson et al., 1979 twelve minute swimming test has been described below:

This test is used to measure swimming endurance with the help of crawl stroke method.

Equipment: Any waterproof timing device / stopwatch, score sheet, lane dividers and floor making tape.

Test Area: Swimming pool of at least 25 meters long and 25' in width

Test Administration: Before allowing the examinee for the test, it is assured that all the examinees have done warming up from 5 to 10 minutes in the swimming pool. It is also assured that all the swimmers have previous experience of crawl stroke and have practiced in pacing the stroke efficiency. An individual lane is assigned to each examinee. The length of the pool is divided into 5 yards distance by marking on both the sides of the pool. The subjects are instructed to start the crawl stroke with a push off from the side of the pool. An assistant is assigned to each examinee to count the number of laps and the distance of the last part of the lap. At the signal 'ready?' get, set 'go!' the tester starts the stopwatch and the examinees push off the start crawl stroke swimming for twelve minutes. On the completion of 12 minutes the tester announces the stop signal when all the assistants note down the record yardage closest to the swimmers hand along with number of full laps, the respective examinee has completed. The swimmers are requested to continue swimming at a leisurely pace for another 2/3 minutes for cooling down their all out efforts.

Scoring: The distance covered by crawl stroke (full lapse + yardage of the last lap) is the score of the test.

Validity and Reliability: The validity coefficient of 0.89 has been reported for this test through a criterion measure. Very high reliability coefficient 0.99 for college men and 0.98 for test-retest administration on college men and women (Fried, 1983)

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Manual for Physical Efficiency Test

Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008), Pp. 394-395

Sr. No.	Total distance covered in prescribed time in Mtrs	Marks
1	800	20
2	780	19
3	760	18
4	740	17
5	720	16
6	700	15
7	680	14
8	660	13
9	640	12
10	620	11
11	600	10
12	580	09
13	560	08
14	540	07
15	520	06
16	500	05
17	480	04
18	460	03
19	440	02
20	420	01

TABLE TENNIS

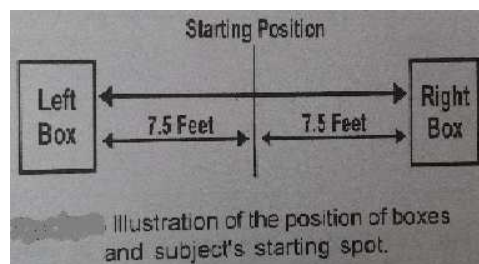
Eye-hand Coordination Test (Ball transfer)

This test, as evident from its name, is used to test the coordination between eyes and hands. The test is satisfactory for both boys and girls aged 4 years and above.

Equipment: Two large boxes or containers (capable of holding more than 5 balls of 10 inches diameter each) and a stopwatch.

Test Administration: The tester after giving a demonstration, asks a subject to stand in the middle of two boxes lying at a distance of 15 feet from each other as shown in the figure. Five or more ordinary playground balls of 10" diameter are put in the box lying on the left hand side of the subject. The tester gives the commands Ready, Steady, Go! At the word 'go' the tester switches on the stopwatch while the subject runs to the right box, puts the ball in the box, runs back to the left box to take another ball for putting in the right box and repeats the process till the last ball is put in the right box. As soon as the subject puts the last ball in the right box, the tester stops the stopwatch to record the time taken by the subject to transfer all the five or more (upto 10 balls, if the tester wants to, measure coordination, agility and speed simultaneously).

Scoring: The subject is given two trials after a slow practice trail. The best timing is the score of the test. However, a variety of scoring has been used by the testers depending upon the variety of ways the ball transfer skill has been tested by the physical educators and coaches. For instance, different teachers have used different size and number of balls and different manners in which the subject is required to deposit the ball (tossing from a specified distance, toss it over a barrier, bounce it in the box, just simple placing). Accordingly, scoring has been, correct number of balls transferred (during distance tossing), number of complete correct trials out of given number of trials of the time taken to perform the specified job.



Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008), P. 334

- **Table Tennis : Test for Administration – (Maximum 20 Marks)**

Eye hand Co-Ordination Test (Ball Transfer)

Scoring	Marking
Per ball transfer	2 marks each

TENNIS

Dyer's Tennis Skill Test

Dyer's Tennis Skill Test: This test is used to measure tennis skill ability. It was developed in 1935 by J. T. Dyer on 736 women tennis players of 19 colleges.

Equipment: A stopwatch, a backboard, tennis balls, racket and a measuring tape.

Description of Test Administration: The backboard of 10 feet X 15 feet or a wall of 15 feet wide and 10 feet high may be used. A horizontal line, 3 inch in width is marked at a height of 3 feet from the floor which acts as tennis net. Another line is marked on the floor at a distance of 5 feet from the base of the wall that is restraining line. After giving a demonstration to the subjects through a trained helper, the tester asks the subject to stand behind the restraining line with a racket in his/her one hand and two balls in the other hand. Extra balls are also provided in a box of 9”X12”X3” lying on the floor near the restraining line at a distance as convenient to the subject. After asking the subject to be ready, the tester gives the signal 'start' and starts the stopwatch, the subject drops the ball to the floor and plays it against the wall as rapidly as possible aiming to hit the wall above the 3 feet high net line for a maximum number of times. After 30 seconds, the tester gives the 'stop' signal and stops the stopwatch. The subject stops volleying the ball. Each subject is given three trials. The tester needs three helpers, one for counting the number of ball hitting the wall, one for collecting the balls and one for checking the violations made at the restraining line.

Scoring: Each time the ball strikes the wall on or above the net line before the end of 30 seconds, scores one point. The sum of points achieved in all three trials, gives the final score.

Comments: This test has been revised a number of times (Dyer, 1938; Scott and French, 1959; Hewitt, 1966) with respect to the distance of restraining line and the length of time of volleying.

Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008). Pp. 395-396

- **Tennis : Test for Administration – (Maximum 20 Marks)**
Dyer's Tennis Test

Scoring	Marking
Within 30 Seconds number of hits	Each Hit - 1 mark each

WEIGHT LIFTING & POWER LIFTING

Sit-ups, Push-ups, Standing Broad Jump

Push-Ups / Modified Push-Ups

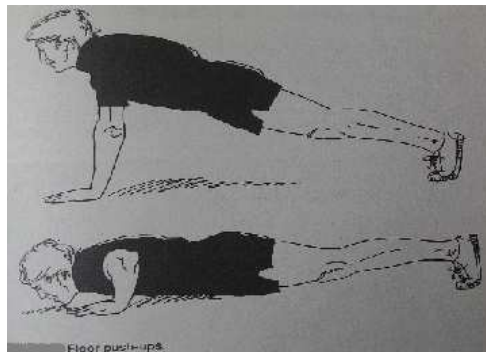
Measurement Objectives: To measure the dynamic muscular endurance of the arms and shoulder girdle.

Test Qualities: Content validity is accepted. No reliability coefficient for floor push-ups was found but reliability is undoubtedly high if no endurance training occurs between the test and retest. Reliability of modified push-ups is 0.93

Test Applications: Male, junior high through college (floor push-ups). Female, junior high through college (modified push-ups)

Equipment and Materials: A floor mat

Procedure: Floor push-ups – performer takes a front-leaning ready position with arms and legs straight. He then lowers the body until the chest touches the mat and pushes up to the straight arm position. The exercise is continued as many times as possible without a rest as shown in the figure.



Modified Push-ups: Performer's takes a front-leaning ready position with body weight supported by fully extended arms and knees bent at right angle. Performer lowers her body to the mat and pushes back to straight arm position. The exercise is continued as many times as possible without a rest as shown in the figure.

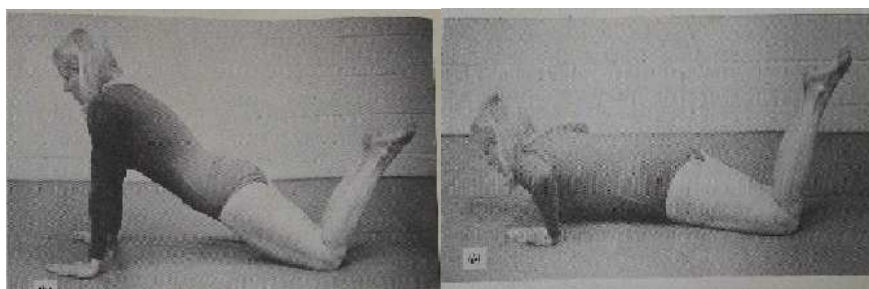
Note: There are several variations in terms of administrative procedures, fingertip push-ups and modified bench push-ups, for instance. Consistency must prevail when testing.

Scoring: Floor push-ups – score is the number of correct push-ups continuously executed. When body pikes or sags, chest does not touch mat, or arms do not fully extend, that trial does not count. If performer stops to rest, the test should be considered completed. As a helpful technique in determining correctness of the push-

up, the tester or partner can place his hand on the mat under the performer's chest. If the chest is lowered enough, it will touch the hand of the tester.

Modified push-ups – score is the number of correct push-ups continuously executed. If performer stops to rest, the test should be considered terminated. If the body sags, chest does not touch mat or arms are not fully extended, the trial does not count.

Norms available in Johnson and Nelson (1979,1972)



Modified Push-Ups (repetitions)

Scores Men Under 30 Years	Scale Points	Scores Men over 30 years
60	100	50
58	95	48
56	90	46
54	85	44
53	80	43
50	75	40
48	70	38
46	65	36
44	60	34
42	55	32
40	50	30
38	45	28
36	40	26
34	35	24
32	30	22
30	25	20
28	20	18

Courtesy: Barry L. Johnson, Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, Surjeet Publications (1982), Pp 129-130

Raw Score Norms of Modified Push-Ups (Repetitions)

Raw Scores	Performance Level
31- and above	Advanced
25-30	Advanced Intermediate
13-24	Intermediate
7-12	Advance Beginners
0-6	Beginners

Courtesy: Barry L. Johnson, Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, Surjeet Publications (1982), Pp 129-130

Courtesy: D. Allen Phillips and James E. Hornak, Measurement and Evaluation in Physical Education, John Wiley & Sons, Inc. (1979), Pp. 231-232

Push-Ups (Men) (number of pushups)

Scores Men Under 30 Years	Scale Points	Marks
60	100	20
58	95	19
56	90	18
54	85	17
53	80	16
50	75	15
48	70	14
46	65	13
44	60	12
42	55	11
40	50	10
38	45	09
36	40	08
34	35	07
32	30	06
30	25	05
28	20	04

Courtesy: Barry L. Johnson, Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, Surjeet Publications (1982), Pp 129-130

Raw Score Norms of Modified Push-Ups (women) (number of pushups)

Raw Scores	Performance Level	Marks
31- and above	Advanced	20
25-30	Advanced Intermediate	16
13-24	Intermediate	12
7-12	Advance Beginners	08
0-6	Beginners	04

Courtesy: Barry L. Johnson, Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, Surjeet Publications (1982), Pp 129-130

Sit-Ups (Bent Knees)

Objectives: To measure the endurance of the abdominal muscles.

Age: Ages ten through college.

Sex: Satisfactory as a test for both boys and girls.

Reliability: Has been reported as high as 0.94.

Objectivity: An 'r' of 0.98 was found for this test.

Validity: Face validity was accepted for this test.

Equipment And Materials: The only equipment required is a mat and yardstick.

Directions: From a lying position on the back, the performer flexes his knees over the yardstick while sliding his heels as close to his seat as possible. The yardstick should be held tightly under the knees until the performer is instructed to slowly slide this feet forward. At the point where the yardstick drops on the mat, the tester marks the heel line and seat line to indicate how far the feet should remain from the seat during the bent-knee sit-up exercise. The performer should interlace the fingers behind the neck and perform sit-ups alternating a left elbow touch of the inside right knee and right elbow touch of the inside left knee. The exercise should be repeated as many times as possible.

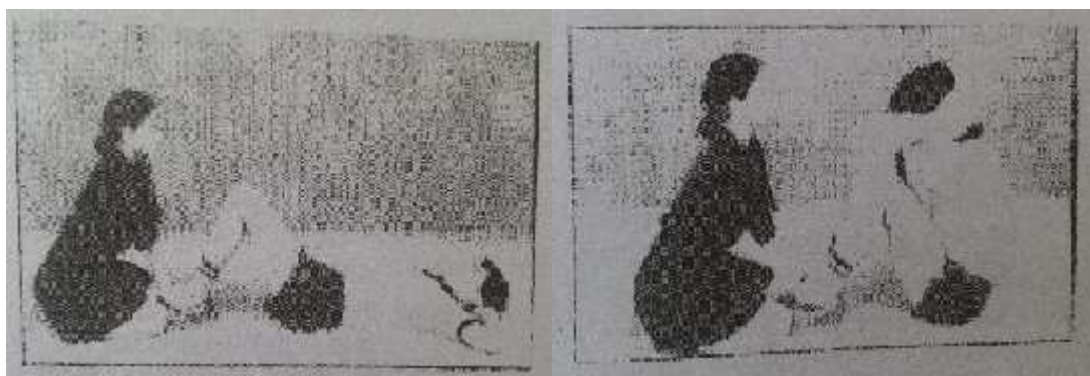
Scoring: The total number of repetition is recorded for the score. However, repetitions should not be counted when fingertips do not maintain contact behind the head, when the knees are not touched, or when the pupil pushes off the floor with the elbow.

Additional Points: (a) The feet should rest flat on the floor and may be separated a few inches. (b) The back of the hands should touch the mat each time before curling

to the sit-up position. (c) Taping the yardstick to the floor for the seat line helps the performer to maintain proper distance between seats 2 feet.

Raw score norms for sit-ups (bent knees):

College Men	Performance level	College Women
66 and above	Advanced	49 and above
53 to 65	Advance intermediate	37 to 48
34 to 52	Intermediate	21 to 36
25 to 33	Advanced beginner	13 to 20
0 to 24	Beginner	0 to 12



Bent Knee Sit-Ups

Courtesy: Practical measurement for evaluation in physical education, Third edition- Barry L. Johnson and Jack K. Nelson, Published by S.S. Chhabra for Surjeet Publication, India 1988 with permission from Burgess Publishing Company U.S.A.; Page number 120, 121, and 122.

Raw score norms for sit-ups (bent knees)

College Men	College Women	Performance level	Marks
Repetitions	Repetitions		
66 and above	49 and above	Advanced	20
53 to 65	37 to 48	Advance intermediate	16
34 to 52	21 to 36	Intermediate	12
25 to 33	13 to 20	Advanced beginner	08
0 to 24	0 to 12	Beginner	04

Courtesy: Practical measurement for evaluation in physical education, Third edition- Barry L. Johnson and Jack K. Nelson, Published by S.S. Chhabra for Surjeet Publication, India 1988 with permission from Burgess Publishing Company U.S.A.; Page number 120, 121, and 122.

Standing Vertical Jump (Sergeant Chalk Jump)

Objective: To measure explosive strength of the legs in jumping vertically upward.

Age Level: Satisfactory for ages nine through adulthood.

Sex: Satisfactory for both boys and girls.

Reliability: Has been reported as high as 0.93.

Objectivity: An objectivity coefficient of 0.93 was obtained by Jack Clayton, 1969.

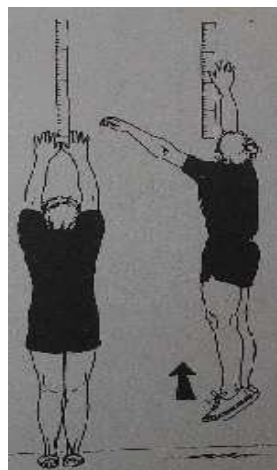
Validity: A validity of 0.78 has been reported with the criterion of a sum of four track and field event scores.

Equipment and Materials: A yardstick, several pieces of chalk, and a smooth wall surface of at least 12 feet from the floor are required.

Directions: The performer should stand with one side towards a wall, heels together, and hold a 1 inch piece of chalk in the hand nearest to the wall. Keeping the heels together, on the floor, he should reach upward as high as possible and make a mark on the wall. The performer then jumps as high as possible and makes another mark at the height of his jump.

Scoring: The number of inches between the reach and the jump marks measured to the nearest half inch is the score. Three to five trials are allowed and the best trial is recorded as the score.

Additional Pointers: (a) A double jump or a 'crow hop' should not be permitted upon take-off. (b) The chalk should not be extended any further than necessary beyond the fingertips to make the standing and jumping marks. (c) The reliability and validity of the test can be slightly improved if the performer practices the jump until it is correctly executed before being tested. (d) Body weight may be included to score in terms of foot-pounds.



***Vertical Jump scoring table**

GENDER AND AGE	100	90	80	70	60	50	40	30	20	10	0
Boys and Girls 9,10,11	16	15	14	12	11	10	9	7	4	2	0
Boys 12,13,14	20	18	17	16	14	13	11	9	5	2	0
Girls 12,13,14	16	15	14	13	12	11	10	8	4	2	0
Boys 15 to 17	25	24	23	21	19	16	12	8	5	2	0
Girls 15 to 17	17	16	15	14	13	11	8	6	3	2	0
Men 18 to 34	26	25	24	23	19	16	13	9	8	2	0
Women 18 to 34	14	13	13	12	10	8	6	4	2	1	0

Reference: Harold T. Friermood, 'Volleyball skill contest for Olympic development' in United States Volleyball Rules and Reference guide of the U.S. Volleyball Association, Berne, Ind.: USVBA printer, 1967, pp 134-135.

Raw scores are located in the chart in accordance with age and sex, and percentile scores are located across the top.

Age	Boys			Girls		
	Satisfactory	Good	Very Good	Satisfactory	Good	Very Good
8	30-32	33-35	36 & above	26-29	30-33	34 & above
9	33-35	36-38	39 & above	29-32	33-36	37 & above
10	36-38	39-41	42 & above	32-35	36-39	40 & above
11	39-41	42-44	45 & above	35-38	39-43	44 & above
12	42-45	46-50	51 & above	39-42	43-47	48 & above
13	44-47	48-53	54 & above	43-46	47-50	51 & above
14 & above	46-50	51-56	57 & above	46-49	50-53	54 & above

Reference: Sports Medicine Centre, Pune

College Men Cms	Performance level	College Women Cms	Marks
66 and above	Advanced	49 and above	20
53 to 65	Advance intermediate	37 to 48	16
34 to 52	Intermediate	21 to 36	12
25 to 33	Advanced beginner	13 to 20	08
0 to 24	Beginner	0 to 12	04

YOGA

Flexibility Test (Sit and Reach)

Test Aim and Purpose: To measure the development of hip and back flexion as well as extension of the hamstring muscles of the legs. The object is to see how far you can extend your fingertips beyond your foot line with the legs straight.

Sports Specificity: (1) Vaulting, diving, and trampoline skills; (2) Straight-arm, straight-leg press to handstand in floor exercises as well as in other gymnastics skills.

Age Level: Ages six through college.

Sex: Satisfactory as a test for both boys and girls.

Reliability: An 'r' of 0.94 was found when the best score of three trials was recorded from separate testing and correlated.

Objectivity: An 'r' of 0.99 was found when the scores from an experienced tester were correlated with scores from an inexperienced tester.

Validity: Face validity was accepted for this test.

Equipment: Flexomeasure case with yard stick and tape.

Directions: (1) Line up the 15 inch mark of the yardstick with a line on the floor and tape the ends of the stick to the floor so that the flexomeasure case (window side) is face down. (2) Sit down and line up your heels with the near edge of the 15 inch mark and slide your seat back beyond the zero end of the yardstick. (3) Have a partner stand and brace his or her toes against your heels. Also, have an assistant on each side to hold your knees in a locked position as you prepare to stretch. (4) With heels not more than 5 inches apart, slowly stretch forward, while pushing the flexomeasure case as far down the stick as possible with the fingertips of both hands. Take your reading at the near edge of the flexomeasure case.

Scoring: The best of three trials measured to the nearest quarter of an inch is your test score.

Sit and Reach Test

Men (in Cms.)	Women (in Cms.)	Level	Marks
23 $\frac{3}{4}$ and above	25 $\frac{3}{4}$ and above	Advanced	20
21 $\frac{1}{4}$ to 23 $\frac{1}{2}$	22 $\frac{1}{2}$ to 25 $\frac{1}{2}$	Advanced Intermediate	16
18 $\frac{3}{4}$ to 21	20 to 22 $\frac{1}{4}$	Intermediate	12
17 to 18 $\frac{1}{2}$	18 to 19 $\frac{3}{4}$	Advanced Beginner	08
Below 16 $\frac{3}{4}$	Below 17 $\frac{3}{4}$	Beginner	04

Savitribai Phule Pune University
Manual for Physical Efficiency Test

Data is based on the scores of 100 college men and 100 college women at Corpus Christi State University, Corpus Christi, TX. 1977.

Age	Boys			Girls		
	Satisfactory	Good	Very Good	Satisfactory	Good	Very Good
8	4 to 6	7 to 9	10 or more	4 to 6	7 to 10	11 or more
9	4 to 7	8 to 10	11 or more	4 to 7	8 to 11	12 or more
10	5 to 8	9 to 11	12 or more	5 to 8	9 to 12	13 or more
11	6 to 9	10 to 12	13 or more	5 to 8	9 to 12	13 or more
12	6 to 9	10 to 13	14 or more	6 to 10	11 to 14	15 or more
13	7 to 10	11 to 14	15 or more	6 to 11	12 to 16	17 or more
14 & above	7 to 10	11 to 14	15 or more	7 to 11	12 to 16	17 or more

Reference: Practical measurement for evaluation in physical education, Third edition- Barry L. Johnson and Jack K. Nelson, Published by S.S. Chhabra for Surjeet Publication, India 1988 with permission from Burgess Publishing Company U.S.A.; Page number 79 and 80.

BASKETBALL

Johnson Basketball Test Battery

Johnson Basketball Test Battery: It is probably the oldest but the most commonly used test and was constructed in 1934 by Johnson during his research work for Master's thesis. This test is a battery of seven test items which includes three items of basic skill and four items of potential basketball ability as described below: (a) Basic Basketball Skill Test Items: (i) Field Goal Speed Test (ii) Basketball Throw for accuracy (iii) Basketball Dribble Test

(a) Johnson Basic Basketball Skill Test Items: To establish validity of the test battery, Johnson divided 180 high school basketball boys into two groups, 'good' and 'poor'. The 'good' group of boys included those basketball players who represented in the school's basketball teams and the 'poor' group of boys included those basketball players who were not selected for representing their school's basketball squad. There were fifty boys in the first group 'good' and 130 in the second group 'poor'. A validity 'coefficient' of 0.88 had been reported between test scores of both 'poor' and 'good' group boys. The reliability and the validity coefficient of the basic test items battery have been reported by Johnson to be 0.93 and 0.84 respectively (Clarke and Clarke, 1987). Brief description of the three items consulting basic basketball skill testing in the Johnson Basketball Battery is given below:

(i) Johnson Field Goal Speed Test: The tester asks the basketball player (examinee) to stand in any position under the basket and is required to make maximum number of baskets in 30 seconds. The number of successful baskets thrown in 30 seconds provides the score for this test. This item measures the ability of the examinee to make successive field goals as quickly as possible under the stress of time.

(ii) Johnson Basketball Throw for Accuracy (Passing Test): This test item measures the shoulder strength and the ability of consistent accurate throws. In this test either a rectangular (Clarke and Clarke, 1987) or a circular archery type target (Kirkendall et al., 1987) is placed on a wall (fig). The examinee, standing at a distance of 40 feet from the target, makes ten trials for hitting the ball in the center of the target. For hitting, the examinee uses either the overhead or the hook pass method.

Position of Examinee, Tester and Recorder: the examinee stands just outside the forty feet line in front of the target. The tester stands 5 to 10 feet inside the 40 feet line on

the right side of the examinee and the recorder stands on the right side of the target about 5 to 7 feet away from the target wall towards the tester (fig).

Scoring: For each hitting in the inner rectangle / circle or its line-three points are awarded; for each hitting in the middle rectangle or circle and its line-two points; and for each pass hitting in the outer circle / rectangle and the line-one point is awarded. The total ten trials, score is used for evaluating basketball passing test item of the battery.

Rectangular Target Size:

Inner rectangle = 20" X 10"

Middle rectangle = 40" X 25"

Outer rectangle = 60" X 40"

Height of the target = 14"

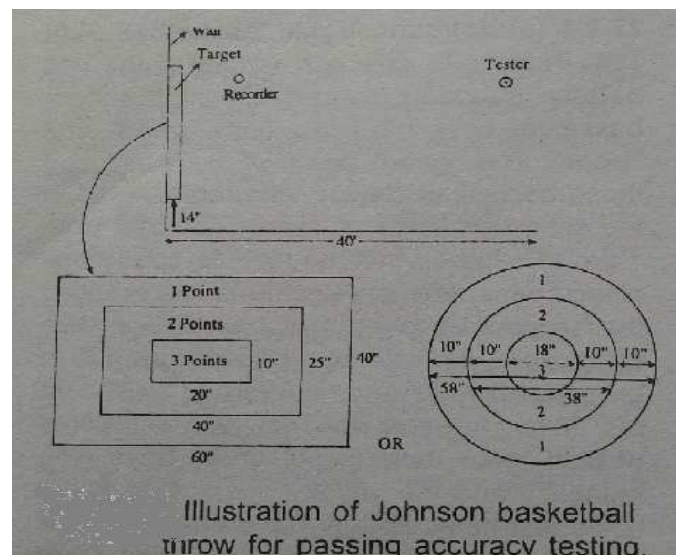
Circular Target Size:

Inner circle = 18" Diameter (9" radius)

Middle circle = 38" Diameter (19" radius)

Outer circle = 58" Diameter (29" radius)

Height of the target = 36"



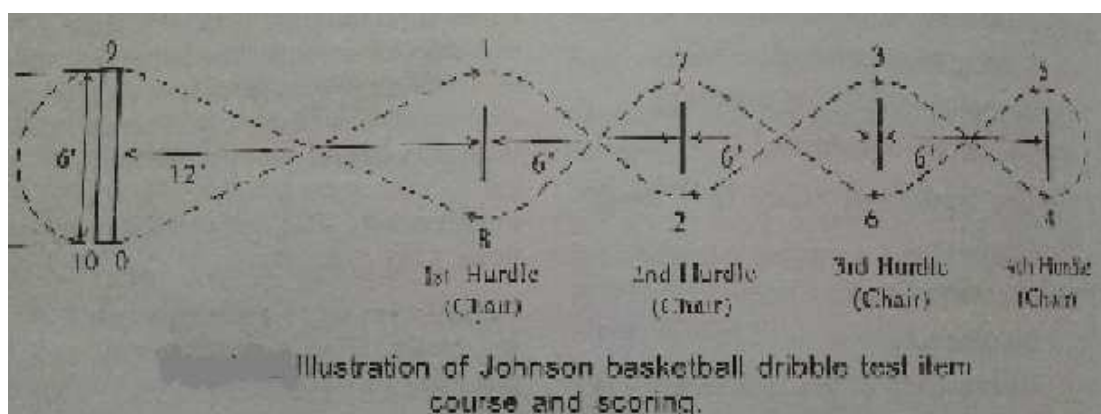
(iii) Johnson Basketball Dribble Test: This test item has been designed with the purpose of measuring ball handling ability and agility level of the examinee.

The examinee is required to cover a maximum distance while dribbling around obstacles in 30 seconds. Four obstacles (chairs or hurdles) are arranged in a straight line at six feet apart. The first obstacle is 12 feet away from the starting line which is 6 feet wide. The subject is asked to begin dribbling from one end of the starting line

and is required to dribble for 30 seconds in a zigzag manner around the turnings at each obstacle point, approaching the first obstacle on the opposite side of the starting point and by turning about at the fourth obstacle as shown in the figure.

Scoring: the score is equal to the number of zones covered in 30 seconds. The scoring pattern is also illustrated in figure. In short, the examinee gets one point on crossing each obstacle. However, two sides of the last obstacle and the starting line mark provide two separate points as they represent the boundaries of two zones each.

The above three Johnson basketball basic skill test items constitute the basketball skill test battery and the three scores added together constitute the Johnson basketball test battery score which may be compared directly among basket baler's score or after converting to 'T' Scores.



Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008), Pp 358-360

- **Basketball : Test for Administration - Johnson's Basketball Test (Maximum 20 Marks)**

Scoring	Marking
3 points	20 Marks
2 points	13 Marks
1 point	07 Marks

FOOTBALL

McDonald Soccer Skill Test

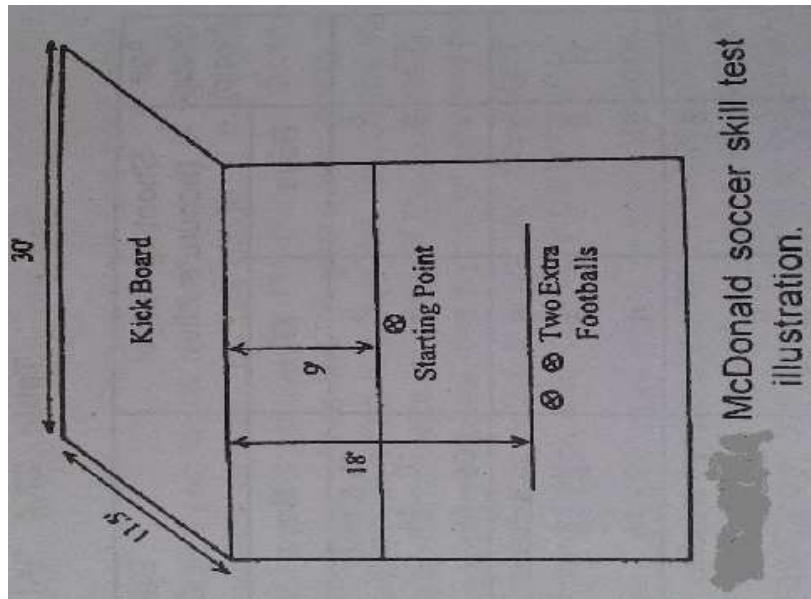
In 1951 during his post graduate study, McDonald constructed the soccer skill test for measuring accurate kicking, ball control and judgment of a moving ball in soccer. The test was constructed on college men and the validity coefficient of the test ranged from 0.63 to 0.94. The author has selected controlled kicking skill as the most fundamental skill element of soccer playing. He conducted the kicking test with a restraining line distance of 9 feet, 15 feet, 21 feet and 30 feet from the kickboard. However, the test with a nine feet restraining distance provided the highest validity coefficient and is in common use of soccer skill testing.

Equipment: A stopwatch, a soccer kickboard, three soccer balls, soccer field and marking powder.

Field Dimensions: The test field is prepared to administer the skill test as shown in figure. An 11.5 feet high and 30 feet wide kick board is used for the test. A horizontal restraining line is marked at a distance of 9 feet from the kickboard. One soccer ball is placed on the 9 feet restraining line. Two extra balls are placed on the 18 feet line as shown in figure.

Test Administration: The subject (examinee) is instructed to make maximum number of kicks in 30 seconds by keeping the ball in his control while using any type of kick and ball control method. On the signal 'Ready?' Go! The timer starts the stopwatch and the subject starts kicking the stationary ball from or behind the restraining line and continues kicking the rebounding ball as rapidly as control permits until the 30 seconds time limit expires (indicated by the timer). In case, the ball fails to rebound sufficiently, the subject has the option either to retrieve the same ball or to take one of the extra balls with the help of either hands or feet, after placing the retrieved or the extra ball on or just behind the 9 feet restraining line, the subject continues kicking the ball again.

Scoring: The subject is given four attempts of 30 seconds each and the final test score is provided by the sum of kicks of the three best trails.



Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008), Pp. 371-372

- **Football : Test for Administration - Mc Donald's Soccer Skill Test (Maximum 20 Marks)**

Scoring	Marking
30 Seconds	1 Mark per hit

HOCKEY

SAI Hockey Skill Test

SAI Hockey Skill Test: The three items of the hockey skill test are:

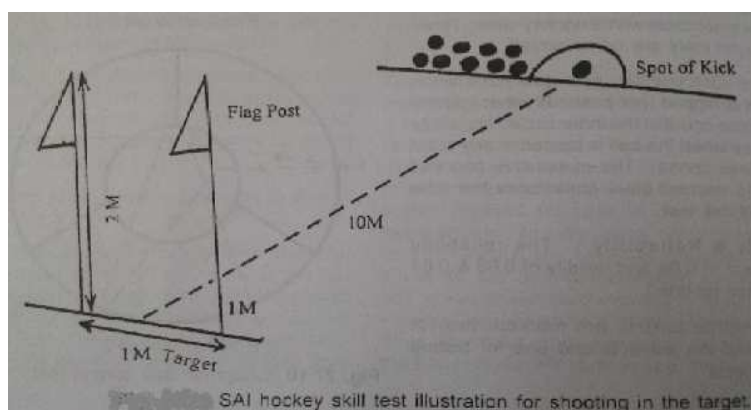
- (i) Shooting in the target (goal)
- (ii) Balancing the ball on the stick
- (iii) Moving with the ball

(i) Shooting in the Target: This test item is aimed at measuring the ball shooting ability of the hockey player.

Equipment: Hockey sticks, hockey cork balls, two flag posts, measuring tapes and marking powder.

Test/ Target Dimensions: A target is formed by pegging two flag posts (each of two meters height) at a distance of one meter from each other. A restraining line at a distance of ten meters from the target is marked on the ground as shown in the figure. Ten balls are placed near the shooting spot on the restraining line. The subject is asked to hit all the ten balls into the target one by one.

Scoring and Evaluation: The number of accurate hits is scored with the help of SAI norms enlisted in the table below.



(ii) Balancing the ball on the stick: this test item is aimed to measure the balancing ability of the hockey player.

Equipment: Hockey stick and cork balls.

Test Procedures: The subject is asked to balance the ball on the blade of the hockey stick continuously for the maximum duration possible. Up to the 11 years age group, the subject allowed placing the ball on the stick with hand while in case of the subject

of 12 years and above, the ball is to be lifted from the ground by the subject with the help of the hockey stick and continue balancing. The subject may move around, if needed to maintain the balance of the longest duration. The moment the ball is placed on the stick or lifted from the ground and brought under control on the stick, a stopwatch is started and the moment the ball falls down from the stick, the stopwatch is stopped and the time is recorded accurate only up to seconds. Two trials may be given.

Scoring and Evaluation: Out of the two trials, the better one, longer duration time is converted to points with the help of SAI norms enlisted in the table below.

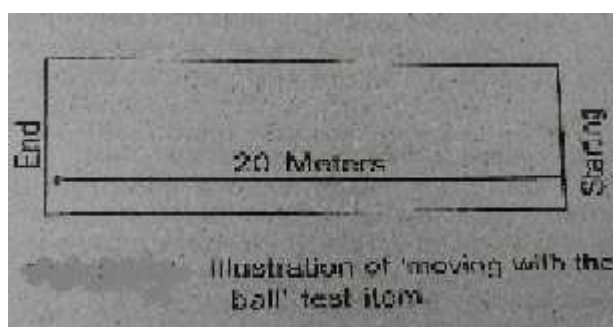
(iii) Moving with the ball: this test item is aimed to measure the ball controlling ability of the hockey player when moving with the ball.

Equipment: A stopwatch, hockey stick, cork balls, tape and marking powder.

Test Dimensions: Two horizontal lines, one called starting line and the other end line, are marked at a distance of 20 meters as shown in the figure.

Test Administration: The subject must stand behind the starting line by holding the hockey stick in both the hands; the hockey ball must be placed on the start line. On the signal, 'Go!' The subject must start moving forward by rolling the ball with the stick without breaking the contact of the blade of the stick on the ball and try to cross the finish line with the ball as early as possible. The forward movement of the ball with the blade of the stick should be rolling movement. A stopwatch is started simultaneously to the signal 'Go' and is stopped as soon as the ball and the subject cross the finish line. Each subject is given two trials and better of the two is considered for evaluation.

Scoring and Evaluation: The minimum time taken to reach the end line with the ball is scored with the help of SAI norms enlisted in the table below.



Savitribai Phule Pune University
Manual for Physical Efficiency Test

Age Group (years)	Shooting Target (Accurate hits)		Balancing Ball (seconds)		Moving with the ball (seconds)		Score	Marks
	Boys	Girls	Boys	Girls	Boys	Girls		
10 years	6	5	15 & more	10 & more	4.70 & less	5.99 & less	3	
	5	4	10-14	05-09	4.71-5.99	6.01-6.79	2	
	4	3	05-09	03-05	6.00-7.30	6.80-8.09	1	
11 years	7	6	20 & more	15 & more	4.55 & less	5.34 & less	3	
	6	5	15-19	10-14	4.56-5.89	5.35-6.64	2	
	5	4	10-14	05-09	5.90-7.15	6.65-7.99	1	
12 years	8	7	25 & more	20 & more	4.40 & less	5.19 & less	3	
	7	6	20-24	15-19	4.41-5.69	5.20-6.49	2	
	6	5	15-19	10-14	5.70-7.00	6.50-7.79	1	
13 years	9	8	25 & more	20 & more	4.30 & less	5.10 & less	3	
	8	7	20-24	15-19	4.31-4.39	5.11-5.19	2	
	7	6	15-19	10-14	4.40-5.00	5.20-5.30	1	
14 years	11	10	25 & more	20 & more	4.20 & less	5.00 & less	3	
	10	9	20-24	15-19	4.21-4.29	5.10-5.10	2	
	9	8	15-19	10-14	4.30-4.37	5.11-5.19	1	

Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports Selection, Sports and Spiritual Science Publications, New Delhi (2008), Pp. 369-370

Age Group (years)	Shooting Target (Accurate hits)		Balancing Ball (seconds)		Moving with the ball (seconds)		Score	Marks
	Boys	Girls	Boys	Girls	Boys	Girls		
14 years & above	11	10	25 & more	20 & more	4.20 & less	5.00 & less	3	20
	10	9	20-24	15-19	4.21-4.29	5.10-5.10	2	13
	9	8	15-19	10-14	4.30-4.37	5.11-5.19	1	07

KABADDI AND KHO-KHO
6 X 10 Meters Shuttle Run for Agility

Test Aim: To determine the agility of the subject.

Equipment: Stopwatch, lime powder.

Procedure: The subject stands behind the starting line. On getting a starting signal 'go' he runs faster, goes nearest to the other line and touches it with the one hand turns and comes back to starting line, touches it with hand, turns and repeats it for a total of 5 times and 6th time runs over as fast as possible.

Scoring: The time taken by the performer to complete the course of 6 x 10 meters to the nearest 1/10th of a second is recorded as score of the test. Only one chance is given.

Note: Participants are not allowed to use spikes and the area should be firm and non-slippery.

Age	Boys			Girls		
	Satisfactory	Good	Very Good	Satisfactory	Good	Very Good
8	18.3-17.5	17.4-16.5	16.4 & less	19.3-18.3	18.2-17.2	17.1 & less
9	18.0-17.2	17.1-16.3	16.2 & less	19.0-18.0	17.9-16.9	16.8 & less
10	17.5-16.5	16.4-15.5	15.4 & less	18.5-17.2	17.1-16.2	16.1 & less
11	17.1-16.2	16.1-15.4	15.3 & less	18.0-17.0	16.9-15.0	15.9 & less
12	16.8-16.0	15.9-15.2	15.1 & less	17.2-16.8	16.7-16.3	16.2 & less
13	16.5-15.9	15.8-15.1	15.0 & less	16.8-16.4	16.3-15.9	15.8 & less
14 yrs & above	16.3-15.8	15.7-15.0	14.9 & less	16.4-16.0	15.9-15.5	15.4 & less

Reference: Prospectus of Andhra Pradesh Sports School, Hakim pet, Secunderabad, Page no. 10 and Sports medicine center, Pune.

Age	Boys			Girls		
	Satisfactory	Good	Very Good	Satisfactory	Good	Very Good
14 yrs & above	16.3-15.8	15.7-15.0	14.9 & less	16.4-16.0	15.9-15.5	15.4 & less
Marks	20	13	07	20	13	07

VOLLEYBALL

SAI Volleyball Test

Sports Authority of India is using a three item test for measuring the volleyball skill of 10 to 14 years old children for sporting talent at young age (SAI 1992). The three test items are described below:

- (i) Accuracy of service test item.
- (ii) Wall Volleying test item
- (iii) Medicine ball throw test item

(i) Accuracy of Service Test Item: The purpose of this test item is to measure the ability of exactness of service.

Equipment: A mini volleyball court measuring 6 meters X 12 meters having a net at a height of 2.1 meters to 2.2 meters and 10 mini volleyballs.

Test Administration: The subject is asked to stand in the service zone of the volleyball court and using a mini volleyball, he/she has to serve the ball correctly over the net into the designated half as determined earlier. The examinee is instructed to use the underhand service. He/she is given ten attempts out of which five are to be serviced into the right half of the court and five into the left half of the court.

Scoring: The number of services made correctly in the left and right half court is counted. The number of correct services is then converted into points with the help of the table given below.

(ii) Wall Volleying Test Item: The purpose of this test item is to test the subject's control on volleyball pass.

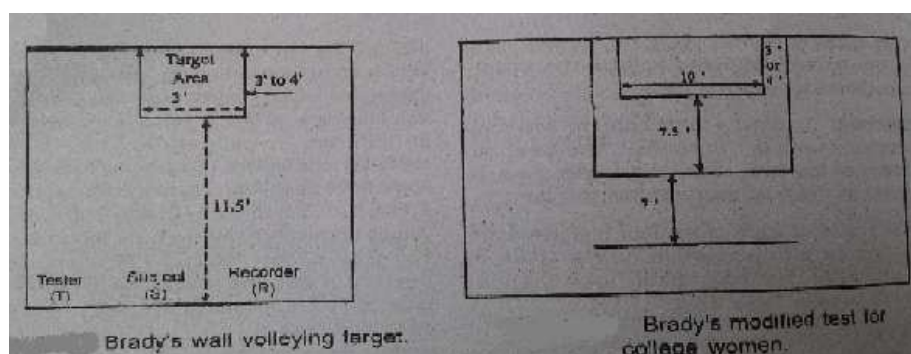
Equipment: A smooth training wall, a good quality marking chalk and a mini volleyball.

Test Administration: A horizontal line at the height of 3 meters from the ground level is drawn on the training wall. A restraining line at a distance of 2.5 meters from the training wall is marked on the floor. The player is required to stand behind the restraining line with a mini volleyball in his or her hand. The player (examinee) has to throw the ball vertically upwards from the standing position and make volley pass on the training wall above three meters high line. He/she is then required to make another

volley pass vertically upwards when the ball rebounds from the wall and sit on the floor and make pass vertically upward over the head from the sitting position and stand-up to make a volley pass against in the same cyclic order till his/her control over the volleyball without any drop. Each subject is given three attempts and the best of the three scores is considered for evaluation.

Scoring: Each subject is given scoring in the form of number of completed successful volleyball cycles in a single attempt till his/her control over the ball. One cycle is constituted by one volley pass and one over head pass that means one pass against the training wall in a standing position and one pass above head from the sitting position.

Evaluation: The number of cycles in the best attempts is converted into evaluation points with the help of SAI norms enlisted in the table below.



(iii) Medicine Ball Throw Test Item: The purpose of this test time is to measure the general throwing ability of the potential volleyball players.

Equipment: Three medicine balls weighing one kilogram each, measuring tape and marking powder.

Test Administration: For conducting the medicine ball throw test item, a field of 20 meters in length is marked in one meter intervals with the marking powder.

The first line on the ground is designated as a throwing line. The subject is instructed to stand behind the throwing line as close as possible without touching the line. Then the subject is asked to throw 1 kilogram medicine ball as far as possible by keeping the ball behind the neck above the shoulder. The throw is to be made without taking any benefit to stop movement.

Scoring: Each subject is given three trials and the best distance is measured for scoring. Scoring is made with the help of SAI norms enlisted in the table below.

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Age Group	Accuracy of Services		Wall Volley Test		Medicine Ball Throw		Points	Marks
	Number of correct services		Number of Cycles		Meters			
	Boys	Girls	Boys	Girls	Boys	Girls		
10 years	7	6	3	1.5	11.00 & more	9.00 & more	3	---
	6	5	2	1.0	9.90-10.90	7.00-8.90	2	---
	5	4	1	0.5	7.00-9.80	5.00-6.90	1	---
11 years	8	7	4	2.0	13.00 & more	10.00 & more	3	---
	7	6	3	1.5	10.00-12.90	8.00-9.90	2	---
	6	5	2	1.0	8.00-9.90	6.00-7.90	1	---
12 years	9	8	5	3.0	15.00 & more	12.00 & more	3	---
	8	7	4	2.0	12.00-14.90	10.00-11.90	2	---
	7	6	3	1.5	9.90-11.90	8.00-9.90	1	---
13 years	10	9	6	4.0	17.00 & more	14.00 & more	3	---
	9	8	5	3.0	15.00-16.90	12.00-13.90	2	---
	8	7	4	2.0	13.00-14.90	11.00-11.90	1	---
14 years & above	10	9	6	4.0	19.00 & more	16.00 & more	3	20
	9	8	5	3.0	17.00-18.90	14.00-15.90	2	13
	8	7	4	2.0	15.00-16.90	12.00-13.90	1	07

Courtesy: D. K. Kansal, Textbook of Applied Measurement Evaluation and Sports

Selection, Sports and Spiritual Science Publications, New Delhi (2008), Pp. 381-382

Age Group	Accuracy of Services		Wall Volley Test		Medicine Ball Throw		Points	Marks
	Number of correct services		Number of Cycles		Meters			
	Boys	Girls	Boys	Girls	Boys	Girls		
14 years & above	10	9	6	4.0	19.00 & more	16.00 & more	3	20
	9	8	5	3.0	17.00-18.90	14.00-15.90	2	13
	8	7	4	2.0	15.00-16.90	12.00-13.90	1	07

PART – B

PART	EVENT	STUDENT	TESTS FOR EVALUATION
Part A	100 m. Run	(Male and Female)	50 yard dash
	400 m. Run	(Male and Female)	
Part B	High Jump or Pole Vault	(Male and Female)	Standing Vertical Jump
	Long Jump	(Male and Female)	
	Triple Jump	(Male and Female)	
Part C	12.5 Km. Cross Country	(Male)	Cooper's Test (12 minutes run and walk test)
	5 Km. Cross Country	(Female)	
	1500 m. Run	(Male)	
Part D	Rope Climbing	(Male)	Medicine Ball put for male and
	Chin Ups/Flex Arm hang	(Male and Female)	Sit Ups test for female
	Sit Ups	(Male and Female)	
	Push Ups and Modified push ups	(Male and Female)	

FIFTY YARD DASH

Objective: To measure speed (acceleration).

Age Level: Ages six through seventeen.

Sex: Satisfactory for both boys and girls.

Reliability: None reported.

Objectivity: None reported.

Validity: Face validity is accepted.

Equipment: Two stopwatches or a watch with a split-second timer is needed. A suitable running area to allow the fifty-yard run plus extension for stopping is also required.

Directions: It is advised that two subjects run at the same time. Both start from a standing position. The command to go the starter drops his arm so that the timer at the finish line can start the timing. The subjects run as fast as possible across the finish line.

Scoring: The elapsed time from the starting signal until the runner crosses the finish line is measured to the nearest tenth of a second

Percentile	Sex	Age					
		6	7	8	9	10	11
99 th	Boys	8.3	8.4	7.6	7.5	7.3	7.4
	Girls	9.2	8.6	8.0	7.7	7.7	7.5
90 th	Boys	8.8	8.6	7.9	7.8	7.6	7.7
	Girls	9.4	8.9	8.4	8.0	7.8	7.6
80 th	Boys	9.0	8.8	8.1	8.0	7.	7.9
	Girls	9.7	9.1	8.7	8.2	8.0	7.8
70 th	Boys	9.3	9.1	8.4	8.1	8.0	8.1
	Girls	9.9	9.4	8.9	8.5	8.4	8.0
60 th	Boys	9.4	9.2	8.6	8.3	8.2	8.3
	Girls	10.1	9.5	9.1	8.7	8.6	8.1
50 th	Boys	9.5	9.5	8.7	8.4	8.3	8.4
	Girls	10.2	9.9	9.3	9.0	8.8	8.5
40 th	Boys	9.5	9.7	9.0	8.7	8.5	8.6
	Girls	10.5	10.0	9.5	9.2	9.1	9.0
30 th	Boys	9.9	10.1	9.2	8.9	8.7	8.8
	Girls	10.9	10.2	9.9	9.5	9.4	9.4
20 th	Boys	10.6	10.5	9.7	9.4	9.0	9.4
	Girls	11.5	10.8	10.5	10.0	9.8	9.7
10 th	Boys	12.5	12.3	12.6	11.4	10.5	9.8
	Girls	13.4	14.8	17.5	12.5	11.4	10.8
N	Boys	27	116	126	203	149	50
	Girls	31	101	113	100	82	32

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Percentile	Girls							Percentile	
	10	11	12	13	14	15	16		17
100 th	6.0	6.0	5.9	6.0	6.0	6.4	6.0	6.4	100 th
95 th	7.0	7.0	7.0	7.0	7.0	7.1	7.0	7.1	95 th
90 th	7.3	7.4	7.3	7.3	7.2	7.3	7.3	7.3	90 th
85 th	7.5	7.6	7.5	7.5	7.4	7.5	7.5	7.5	85 th
80 th	7.7	7.7	7.6	7.6	7.5	7.6	7.5	7.6	80 th
75 th	7.9	7.9	7.8	7.7	7.6	7.7	7.7	7.8	75 th
70 th	8.0	8.0	7.9	7.8	7.7	7.8	7.9	7.9	70 th
65 th	8.1	8.0	8.0	7.9	7.8	7.9	8.0	8.0	65 th
60 th	8.2	8.1	8.0	8.0	7.9	8.0	8.0	8.0	60 th
55 th	8.4	8.2	8.1	8.0	8.0	8.0	8.1	8.1	55 th
50 th	8.5	8.4	8.2	8.1	8.0	8.1	8.3	8.2	50 th
45 th	8.6	8.5	8.3	8.2	8.2	8.2	8.4	8.3	45 th
40 th	8.8	8.5	8.4	8.4	8.3	8.3	8.5	8.5	40 th
35 th	8.9	8.6	8.5	8.5	8.5	8.4	8.6	8.6	35 th
30 th	9.0	8.8	8.7	8.6	8.6	8.6	8.8	8.8	30 th
25 th	9.0	9.0	8.9	8.8	8.9	8.8	9.0	9.0	25 th
20 th	9.2	9.0	9.0	9.0	9.0	9.0	9.0	9.0	20 th
15 th	9.4	9.2	9.2	9.2	9.2	9.0	9.2	9.1	15 th
10 th	9.6	9.6	9.5	9.5	9.5	9.5	9.9	9.5	10 th
5 th	10.0	10.0	10.0	10.2	10.4	10.0	10.5	10.4	5 th
0 th	14.0	13.0	13.0	15.7	16.0	18.0	17.0	12.0	0 th

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Percentile	Boys							Percentile	
	10	11	12	13	14	15	16		17
100 th	6.0	6.0	6.0	5.8	5.8	5.6	5.6	5.6	100 th
95 th	7.0	7.0	6.8	6.5	6.3	6.1	6.0	6.0	95 th
90 th	7.1	7.2	7.0	6.7	6.4	6.2	6.1	6.0	90 th
85 th	7.4	7.4	7.0	6.9	6.6	6.4	6.2	6.1	85 th
80 th	7.5	7.5	7.2	7.0	6.7	6.5	6.3	6.2	80 th
75 th	7.6	7.6	7.3	7.0	6.8	6.5	6.3	6.3	75 th
70 th	7.8	7.7	7.5	7.1	6.9	6.6	6.4	6.3	70 th
65 th	8.0	7.8	7.5	7.2	7.0	6.7	6.5	6.4	65 th
60 th	8.0	8.0	7.6	7.3	7.0	6.7	6.5	6.5	60 th
55 th	8.1	8.0	7.8	7.4	7.0	6.8	6.6	6.5	55 th
50 th	8.2	8.0	7.8	7.5	7.1	6.9	6.7	6.6	50 th
45 th	8.3	8.1	7.9	7.5	7.2	7.0	6.7	6.7	45 th
40 th	8.5	8.3	8.0	7.6	7.2	7.0	6.8	6.7	40 th
35 th	8.5	8.4	8.0	7.7	7.3	7.1	6.9	6.8	35 th
30 th	8.7	8.5	8.2	7.9	7.5	7.1	6.9	6.9	30 th
25 th	8.8	8.7	8.3	8.0	7.6	7.2	7.0	7.0	25 th
20 th	9.0	9.0	8.4	8.0	7.8	7.3	7.1	7.0	20 th
15 th	9.1	9.1	8.6	8.2	8.0	7.5	7.2	7.1	15 th
10 th	9.5	9.1	8.9	8.4	8.1	7.7	7.5	7.3	10 th
5 th	10.0	9.5	9.2	8.9	8.6	8.1	7.8	7.7	5 th
0 th	12.0	11.9	12.0	11.1	11.6	12.0	8.6	10.6	0 th

Reference: Practical measurement for evaluation in physical education, Third edition- Barry L. Johnson and Jack K. Nelson, Published by S.S. Chhabra for Surjeet Publication India 1988 with permission from Burgess Publishing Company U.S.A.; Page number 250 and 251.

50 yard dash

Boys 17 yrs and above	Girls 17 yrs and above	Percentile	Marks
Seconds	Seconds		
5.6	6.4	100 th	20
6.0	7.1	95 th	19
6.0	7.3	90 th	18
6.1	7.5	85 th	17
6.2	7.6	80 th	16
6.3	7.8	75 th	15
6.3	7.9	70 th	14
6.4	8.0	65 th	13
6.5	8.0	60 th	12
6.5	8.1	55 th	11
6.6	8.2	50 th	10
6.7	8.3	45 th	09
6.7	8.5	40 th	08
6.8	8.6	35 th	07
6.9	8.8	30 th	06
7.0	9.0	25 th	05
7.0	9.0	20 th	04
7.1	9.1	15 th	03
7.3	9.5	10 th	02
7.7	10.4	5 th	01
10.6	12.0	0 th	00

STANDING VERTICAL JUMP (SARGENT CHALK JUMP)

Objective: To measure explosive strength of the legs in jumping vertically upward.

Age Level: Satisfactory for ages nine through adulthood.

Sex: Satisfactory for both boys and girls.

Reliability: Has been reported as high as 0.93.

Objectivity: An objectivity coefficient of 0.93 was obtained by Jack Clayton, 1969.

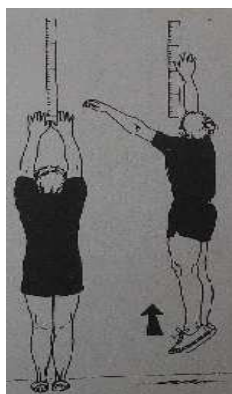
Validity: A validity of 0.78 has been reported with the criterion of a sum of four track and field event scores.

Equipment and Materials: A yardstick, several pieces of chalk, and a smooth wall surface of at least 12 feet from the floor are required.

Directions: The performer should stand with one side towards a wall, heels together, and hold a 1 inch piece of chalk in the hand nearest to the wall. Keeping the heels together, on the floor, he should reach upward as high as possible and make a mark on the wall. The performer then jumps as high as possible and makes another mark at the height of his jump.

Scoring: The number of inches between the reach and the jump marks measured to the nearest half inch is the score. Three to five trials are allowed and the best trial is recorded as the score.

Additional Pointers: (a) A double jump or a 'crow hop' should not be permitted upon take-off. (b) The chalk should not be extended any further than necessary beyond the fingertips to make the standing and jumping marks. (c) The reliability and validity of the test can be slightly improved if the performer practices the jump until it is correctly executed before being tested. (d) Body weight may be included to score in terms of foot-pounds.



***Vertical Jump Scoring Table**

GENDER AND AGE	100	90	80	70	60	50	40	30	20	10	0
Boys and Girls 9,10,11	16	15	14	12	11	10	9	7	4	2	0
Boys 12,13,14	20	18	17	16	14	13	11	9	5	2	0
Girls 12,13,14	16	15	14	13	12	11	10	8	4	2	0
Boys 15 to 17	25	24	23	21	19	16	12	8	5	2	0
Girls 15 to 17	17	16	15	14	13	11	8	6	3	2	0
Men 18 to 34	26	25	24	23	19	16	13	9	8	2	0
Women 18 to 34	14	13	13	12	10	8	6	4	2	1	0

Reference: Harold T. Friermood, 'Volleyball skill contest for Olympic development' in United States Volleyball Rules and Reference guide of the U.S. Volleyball Association, Berne, Ind.: USVBA printer, 1967, pp 134-135.

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Raw scores are located in the chart in accordance with age and sex, and percentile scores are located across the top.

Age	Boys			Girls		
	Satisfactory	Good	Very Good	Satisfactory	Good	Very Good
8	30-32	33-35	36 & above	26-29	30-33	34 & above
9	33-35	36-38	39 & above	29-32	33-36	37 & above
10	36-38	39-41	42 & above	32-35	36-39	40 & above
11	39-41	42-44	45 & above	35-38	39-43	44 & above
12	42-45	46-50	51 & above	39-42	43-47	48 & above
13	44-47	48-53	54 & above	43-46	47-50	51 & above
14	46-50	51-56	57 & above	46-49	50-53	54 & above

Reference: Sports Medicine Centre, Pune

Vertical Jump scoring table (in Cms)

GENDER AND AGE	100	90	80	70	60	50	40	30	20	10
Boys 15 to 17	25	24	23	21	19	16	12	8	5	2
Girls 15 to 17	17	16	15	14	13	11	8	6	3	2
Men 18 to 34	26	25	24	23	19	16	13	9	8	2
Women 18 to 34	14	13	13	12	10	8	6	4	2	1
Marks	20	18	19	14	12	10	08	06	04	02

Reference: Harold T. Friermood, 'Volleyball skill contest for Olympic development' in United States Volleyball Rules and Reference guide of the U.S. Volleyball Association, Berne, Ind.: USVBA printer, 1967, pp 134-135.

Raw scores are located in the chart in accordance with age and sex, and percentile scores are located across the top.

TWELVE MINUTE RUN AND WALK TEST (COOPER'S TEST)

Twelve minute run and walk test (Cooper's Test):

Measurement Objective: To measure cardio-respiratory endurance.

Test Qualities: Validity is 0.90 when correlated with treadmill measurements of oxygen consumption and aerobic capacity. Reliability is 0.94 with test-retest method.

Test Applications: Male and female, junior high through college. Also applicable for adult men and women

Equipment and Materials: Stopwatch or clock with sweep second hand, whistle or starter's pistol, track, football field, or some running area marked so that distance traveled in 12 minutes can be calculated easily.

Procedure: Performers assemble behind starting line. At the starting signal, they run or walk as far as possible within the 12 minute time limit. An experienced pacer should accompany performers around the running area during the actual test. Performers should have experienced some practice in pacing. At the signal to stop, performers should remain where they finished long enough for test administrators to record the distance covered. Ample time should be given for stretching and warm-up as well as post-test cool down.

Scoring: Score is distance in miles covered in 12 minutes. Distance in yards is converted to miles (1760 yards = 1 mile)

Norms: Norms for males and female aged 13 to 19 and 20 to 29 are presented in the table given below. Norms for additional ages are available in Cooper (1977). norms for fifth-through eighth-grade boys and girls are available in Clarke (1976).

Male		Fitness Class	Female	
13-19	20-29		13-19	20-29
0-1.29 miles	0-1.22 miles	Very poor	0.99 miles	0.95 miles
1.3-1.37	1.22-1.31	poor	1.0-1.18	0.96-1.11
1.38-1.56	1.32-1.49	fair	1.19-1.29	1.12-1.22
1.57-1.72	1.50-1.64	good	1.30-1.43	1.23-1.34
1.73-1.86	1.65-1.76	excellent	1.44-1.51	1.35-1.45
1.87 & above	1.77 & above	superior	1.52 & above	1.46 & above

Courtesy: The Aerobics Way by Kenneth H. Cooper, M. D. , M. P. H. copyright (c) 1977 Kenneth H. Cooper, inc., New York, New York 100017. Reprinted by permission

Cooper's Test (12 Minute Run and Walk) (1 mile = 1.609 Kms)

Male		Female		Fitness	Marks
13-19	20-29	13-19	20-29	Class	
0-1.29 miles	0-1.22 miles	0.99 miles	0.95 miles	Very poor	00
1.3-1.37	1.22-1.31	1.0-1.18	0.96-1.11	poor	04
1.38-1.56	1.32-1.49	1.19-1.29	1.12-1.22	fair	08
1.57-1.72	1.50-1.64	1.30-1.43	1.23-1.34	good	12
1.73-1.86	1.65-1.76	1.44-1.51	1.35-1.45	excellent	16
1.87 & above	1.77 & above	1.52 & above	1.46 & above	superior	20

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TWO HAND MEDICINE BALLS PUT (6 LBS) MALE

Objective: To measure the power of the arms and shoulder girdle.

Age Level: Ages twelve through college.

Sex: Satisfactory for boys and girls.

Reliability: An 'r' of 0.81 was found for college girls, while 'r' of 0.84 was found for college boys.

Objectivity: Reported as high as 0.99 as found by Gene Ford, 1969.

Validity: An 'r' of 0.77 was obtained by correlating distance scores with scores computed by power formula. However, angle of release was not figured in the correlation, although it is a definite limiting factor affecting the validity!

Equipment And Materials: A 6 pound medicine ball, marking material (chalk or tape), small rope, chair, and a tape measure are needed for this test.

Directions: From a sitting position in a straight back chair, the performer holds the ball in both hands with the ball drawn back against the chest and just under the chin. He then pushes the ball upward and outward for maximum distance. The rope is placed around the performer's chest and held taut to the rear by a partner in order to eliminate rocking action during the push. The performer's effort should be primarily with the arms.

Scoring: The distance of the best of three trials measure to the nearest foot is recorded as a score. One practice trial may be taken before scoring.

Additional Pointers: (a) Each of three trials should be taken in succession. (b) Distance is measured form the forward edge of the chair to the point of contact of the ball with the floor.

COLLEGE MEN		COLLEGE WOMEN
SCORES	PERFORMANCE LEVEL	SCORES
26 and above	Advance	15 and above
22 to 25	Advance intermediate	13 to 14
14 to 21	Intermediate	8 to 12
10 to 12	Advance beginner	5 to 7
0 to 9	Beginner	0 to 4

Data is based on 100 score secured form physical education classes at Corpus Christi State University, Corpus Christi, TX. 1976.

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Data is based on 65 scores secured from physical education classes at Corpus Christi State University, Corpus Christi, TX. 1976.

Medicine Ball of 1 kg for up to 10 years, 2 kg for 11 years and above

Reference: Sports medicine centre, Pune, India.

Age	Boys			Girls		
	Satisfactory	Good	Very Good	Satisfactory	Good	Very Good
	Marks (07)	Marks (13)	Marks (20)	Marks (07)	Marks (13)	Marks (20)
8 Years	2.26 to 2.50	2.51 to 2.76	2.77 or more	1.80 to 2.13	2.14 to 2.47	2.48 or more
9 years	2.51 to 2.82	2.83 to 3.13	3.14 or more	2.02 to 2.40	2.42 to 2.80	2.81 or more
10 years	2.66 to 3.13	3.14 to 3.59	3.60 or more	2.21 to 2.69	2.70 to 3.18	3.19 or more
11 years	2.50 to 2.96	2.97 to 3.43	3.44 or more	2.41 to 2.84	2.85 to 3.29	3.30 or more
12 years	2.60 to 3.28	3.29 to 3.97	3.98 or more	2.51 to 2.94	2.95 to 3.39	3.40 or more
13 years	3.01 to 3.62	3.63 to 4.23	4.24 or more	2.56 to 3.02	3.03 to 3.49	3.50 or more
14 years & above	3.19 to 3.80	3.81 to 4.41	4.42 or more	2.61 to 3.09	3.10 to 3.59	3.60 or more

Reference: Practical measurement for evaluation in physical education, Third edition- Barry L. Johnson and Jack K. Nelson, Published by S.S. Chhabra for Surjeet Publication, India 1988 with permission from Burgess Publishing Company U.S.A.; Page number 208, 209

Medicine ball of 1 kg for up to 10 years, 2 kg for 11 years and above for Boys

Reference: Sports Medicine Centre, Pune, India.

Age	Boys (Mts)			Girls (Mts)		
	Satisfactory	Good	Very Good	Satisfactory	Good	Very Good
14 years & above	3.19 to 3.80	3.81 to 4.41	4.42 or more	2.61 to 3.09	3.10 to 3.59	3.60 or more
Marks	07	13	20	07	13	20

Reference: Practical measurement for evaluation in physical education, Third edition- Barry L. Johnson and Jack K. Nelson, Published by S.S. Chhabra for Surjeet Publication, India 1988 with permission from Burgess Publishing Company U.S.A.; Page number 208, 209

SIT-UPS (BENT KNEES) FEMALE

Objectives: To measure the endurance of the abdominal muscles.

Age: Ages ten through college.

Sex: Satisfactory as a test for both boys and girls.

Reliability: Has been reported as high as 0.94.

Objectivity: An 'r' of 0.98 was found for this test.

Validity: Face validity was accepted for this test.

Equipment And Materials: The only equipment required is a mat and yardstick.

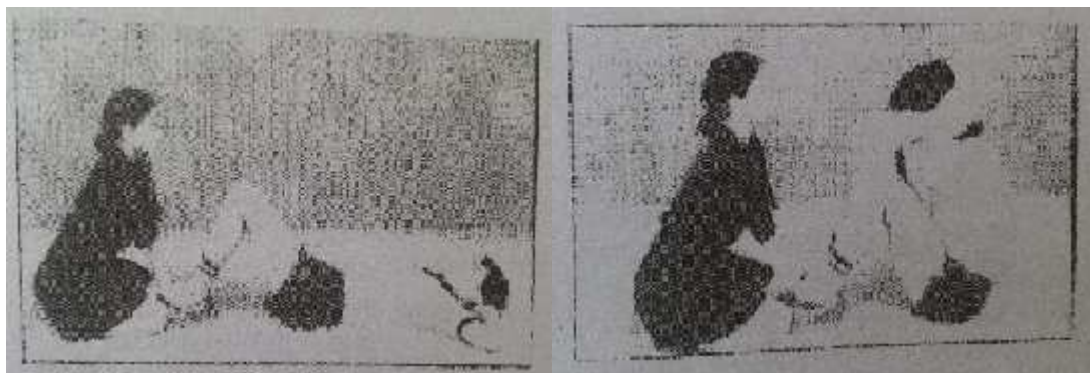
Directions: From a lying position on the back, the performer flexes his knees over the yardstick while sliding his heels as close to his seat as possible. The yardstick should be held tightly under the knees until the performer is instructed to slowly slide this feet forward. At the point where the yardstick drops on the mat, the tester marks the heel line and seat line to indicate how far the feet should remain from the seat during the bent-knee sit-up exercise. The performer should interlace the fingers behind the neck and perform sit-ups alternating a left elbow touch of the inside right knee and right elbow touch of the inside left knee. The exercise should be repeated as many times as possible.

Scoring: The total number of repetition is recorded for the score. However, repetitions should not be counted when fingertips do not maintain contact behind the head, when the knees are not touched, or when the pupil pushes off the floor with the elbow.

Additional Points: (a) The feet should rest flat on the floor and may be separated a few inches. (b) The back of the hands should touch the mat each time before curling to the sit-up position. (c) Taping the yardstick to the floor for the seat line helps the performer to maintain proper distance between seats 2 feet.

Raw score norms for sit-ups (bent knees):

College Men	Performance level	College Women
66 and above	Advanced	49 and above
53 to 65	Advance intermediate	37 to 48
34 to 52	Intermediate	21 to 36
25 to 33	Advanced beginner	13 to 20
0 to 24	Beginner	0 to 12



Bent Knee Sit-Ups

Courtesy: Practical measurement for evaluation in physical education, Third edition- Barry L. Johnson and Jack K. Nelson, Published by S.S. Chhabra for Surjeet Publication, India 1988 with permission from Burgess Publishing Company U.S.A.; Page number 120, 121, and 122.

Raw score norms for sit-ups (bent knees) for Girls (repetitions)

College Men	Performance level	College Women
66 and above	Advanced	49 and above
53 to 65	Advance intermediate	37 to 48
34 to 52	Intermediate	21 to 36
25 to 33	Advanced beginner	13 to 20
0 to 24	Beginner	0 to 12

Courtesy: Practical measurement for evaluation in physical education, Third edition- Barry L. Johnson and Jack K. Nelson, Published by S.S. Chhabra for Surjeet Publication, India 1988 with permission from Burgess Publishing Company U.S.A.; Page number 120, 121, and 122