

CLASS NOTES

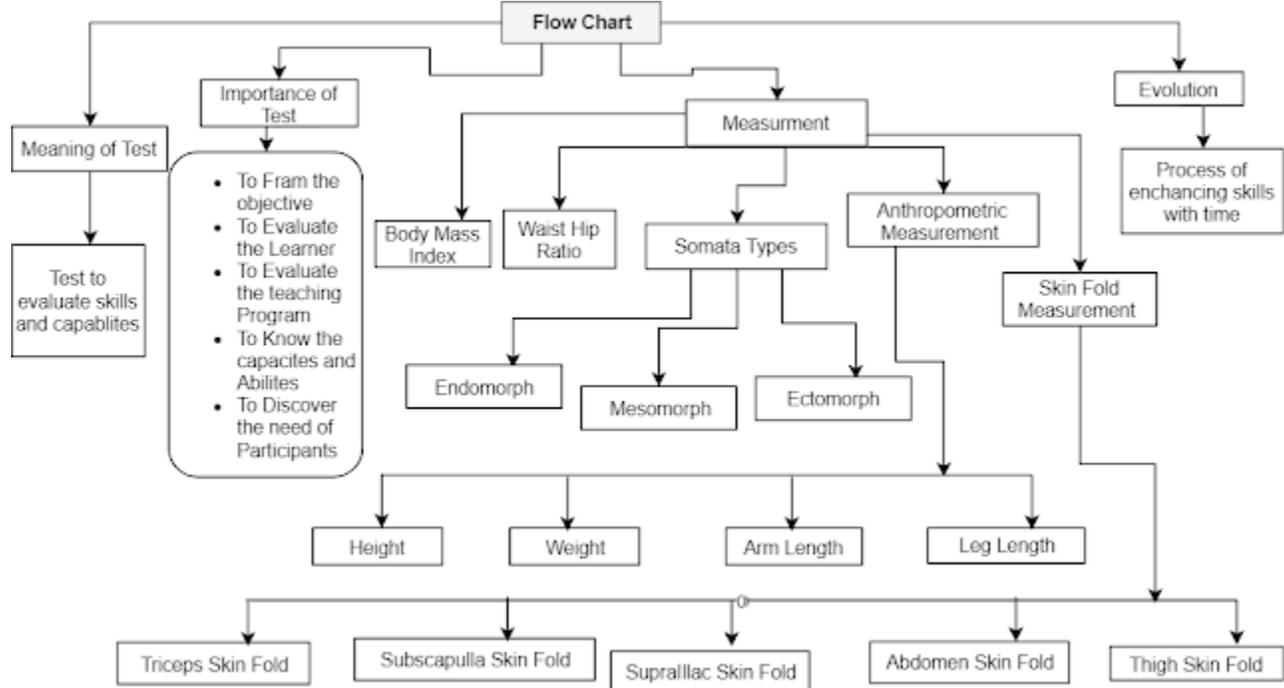
Class: 11

Topic: CHAPTER-7

Subject: PHYSICAL EDUCATION

TEST, MEASUREMENT AND EVALUATION

FLOW CHART OF TEST MEASUREMENT AND EVALUATION



7.1 Test “A test is a tool which is used to evaluate the skill, knowledge, capitulates or aptitudes of an individual or a group.”

OR

“A Test is a tool which is used to evaluate the quality, performance and reliability of the task completed by a person.”

7.2 Measurement: “Measurement is a collection of data and information about certain skill or level of fitness of an individual by using test and relevant techniques.”

OR

“Measurement is about the collection of data about performance or task completed by a sports person by using a test.”

OR

“Measurement refers to the process of administrating a test to obtain quantitative data.”

7.3 Evaluation

“It is a systematic determination of a subject’s merit, worth and significance, using criteria governed by a set of standards.”

OR

“It is the process of education that involves collection of data from the products which can be used for comparison with the preconceived criteria to make judgement.”

7.4 Importance of Test, Measurement and Evaluation in Sports

- μ To frame the objectives.
- μ To help the selection of player.
- μ To help the evaluate the learners.
- μ To evaluate the teaching programme.
- μ To know the capacities and abilities of players.
- μ To study the need of the participants.
- μ Help to conduct the research.
- μ Help to Achieve Aims and Objectives.
- μ Help to prepare norms and standards.
- μ Help to predict in advance the performance potentials of player.
- μ To help the individual game classification of player.

7.5 a) Body Mass Index

(BMI) BMI of any individual can be calculated with the help of the following formula. Body Mass Index

$(BMI) = \frac{\text{Body weight}}{\text{Height} \times \text{Height}}$

or

$= \frac{\text{Body weight (in Kg)}}{\text{Height (in Metre)} \times \text{Height (in Metre)}}$

Here the weight of the individual's is measured in kilograms and the Height of that individual is taken in meter.

Example 1: Calculate the BMI of a male person whose body weight is 80 kg and his height is 1.60 m.

Also state the category in which he falls?

Solution: Body weight = 80 kg

Height = 1.60 m

$BMI = \frac{\text{Weight (in Kg)}}{\text{Height} \times \text{Height (in Metre)}}$

$= \frac{80}{1.60 \times 1.60} = \frac{80 \times 100}{16 \times 16} = \frac{8000}{256} = \text{answer } 3.125$

He falls obesity type I.

BMI is categorized below:

Category	BMI
Underweight	< 18.5
Normal weight	18.5–24.9
Overweight	25.0–29.9
Obesity class I	30.0–34.9
Obesity class II	35.0–39.9
Obesity class III	> 40.0

7.5(b) Waist Hip Ratio (W.H.R.)

Waist-hip ratio is defined as the measurement of waist circumference divided by Hip circumference.

It is used as a risk factor assessment tool for heart diseases, Hypertension and Type-II diabetes. Excess body fat is considered a risk factor of diseases.

Waste hip ratio (W.H.R.) = $\frac{\text{Waist circumference (in inches)}}{\text{Hip circumference (in inches)}}$

Hips circumference (in inches)

Waist to Hip Circumference Ratio Standards for Men and Women

	Age (years)	Disease Risk Related to Obesity			
		Low	Moderate	High	Very High
MEN	20-29	<0.83	0.83-0.88	0.89-0.94	>0.94
	30-39	<0.84	0.84-0.91	0.92-0.96	>0.96
	40-49	<0.88	0.88-0.95	0.96-1.00	>1.00
	50-59	<0.90	0.90-0.96	0.97-1.02	>1.02
	60-69	<0.91	0.91-0.98	0.99-1.03	>1.03
WOMEN	20-29	<0.71	0.71-0.77	0.78-0.82	>0.82
	30-39	<0.72	0.72-0.78	0.79-0.84	>0.84
	40-49	<0.73	0.73-0.79	0.80-0.87	>0.87
	50-59	<0.74	0.74-0.81	0.82-0.88	>0.88
	60-69	<0.76	0.76-0.83	0.84-0.90	>0.90

(Adapted from Heyward VH, Stolarczyk LM: Applied Body Composition Assessment. Champaign IL, Human Kinetics, 1996, p82.)

Example 2: If an individual (male) waist circumference measurement is 30 inches and hip circumference measurement is 44 inches. Then calculate his waist hip ratio. Also state the category of his health risk.

Solution:

Waist circumference = 30"

Hip circumference = 44"

W.H.R. = Waist circumference/Hips circumference

= 30/40 = 0.68

It means the individual (male) is not at health risk. In case of male if the W.H.R. is more than 1.00, then he is at the health risk.

7.6 Somato Types (Endomorph, Mesomorph, Ectomorph)

Somato types means human body shape and physique type.

According to W.H. Shielding, human beings can be classified into three extreme body types i.e.

1. **Endomorphy:** People with endomorph body structure have rounded physique. Their excessive mass hinders their ability to compete in sports. Suitable games weight lifting and power lifting.
2. **Mesomorphy:** People with mesomorphy body structure have thick bones and muscles with rectangular shaped body. They have larger and broader chest and shoulders can be top sports person in any sport.
3. **Ectomorphy:** These realism people because their muscles and limbs are elongated. They have flat chest and have less muscle mass. They have less strength but dominate endurance sports.

7.8 Measurement of Health-Related Fitness

Health related fitness is related with the development and maintenance of fitness components that can increase the level of health through prevention and remedies of various diseases. Health related fitness enhance one's ability to function efficiently and maintain a healthy life-style.

In this way, it can be said that health related fitness is very significant for all the individuals through our life. There are following components of health-related fitness.

1. **Body composition**

2. **Cardiorespiratory endurance.**
3. **Flexibility**
4. **Muscular Endurance**
5. **Muscular strength**
 1. **Body composition:** The body composition means the amount of fat-free body weight. It is well known that a high percentage of body fat in relation to the total body weight is harmful and may lead to be obesity. From the health point of view, the normal percentage of body fat for young men and women should not exceed 15 and 25 percent, respectively. Various methods for measuring body composition can be used by individuals, such as under water weighing, skin fold measurements and anthropometric measurements. It means that for health-related fitness an individual should have ideal body weight and fat percentage.
 2. **Cardiorespiratory endurance:** It is the maximum functional capacity of the cardiorespiratory system to carry on the work or physical activity involving large muscle group over an extended period.
 3. **Flexibility:** It is the range of movements of joints. It is important for all individuals in daily life. It can be classified into passive flexibility and active flexibility. Active flexibility can be further classified into: Static flexibility and dynamic flexibility. Flexibility can be measured with help of sit and reach test.
 4. **Muscular Endurance:** Muscular endurance is the ability of a muscle or group of muscles to repeat muscular contractions against a force or to carry on contraction over a maximum period. It can be measured by the number of sit-ups your can do correctly. It also measured by weight lifting etc.
 5. **Muscular strength:** It is the maximum amount of force that can be exerted by a muscle or muscle group against a resistance during a single contraction. It can be measured by pull-ups, weight lifting and push-ups etc.

Objective Type Questions (1 Marks Each)

**Q.1. Which of the following body type like a pear shape?
(a) Endomorph (b) Mesomorph (c) Ectomorph (d) None of the above
Ans. (a) Endomorph**

**Q.2. Which of the following body type like a round shape?
(a) Endomorph (b) Mesomorph (c) Ectomorph (d) None of the above
Ans. (b) Mesomorph**

**Q.3. Which of the following body type like a slim shape?
(a) Endomorph (b) Mesomorph (c) Ectomorph (d) None of the above
Ans. (c) Ectomorph**

**Q.4. Which of the following body type person good for weight lifting activity?
(a) Endomorph (b) Mesomorph (c) Ectomorph (d) None of the above
Ans. (a) Endomorph**

**Q.5. Which of the following type of people good for adventure activity?
(a) Ectomorph (b) Mesomorph (c) Endomorph (d) None of the above
Ans. (b) Mesomorph**

**Q.6. Which of the following body type of people good for gymnastic activities?
(a) Endomorph (b) Mesomorph (c) Ectomorph (d) None of the above**

Ans. (c) Ectomorph

Q.7. What is the full form of B.M.I.?

(a) Body Management Index (b) Body Mold Index (c) Body Mass Index (d) Body Motivation Index

Ans. (c) Body Mass Index

Q.8. Which one of the following formulas of calculation of BMI?

- (a) Weight of body /Height of body
- (b) Weight of body/ Length of body
- (c) (Length of body)² /Weight of body
- (d) Weight of body/ (Height of body)²

Ans. (d) Weight of body / (Height of body) ²

Q.9. Which of the following formula of calculation waist hip ratio?

- (a) Circumference of waist/ Circumference of hip
- (b) Circumference of hip/ Circumference of waist
- (c) Circumference of waist/ (Circumference of hip)²
- (d) None of the above

Ans: (b) Circumference of hip/ Circumference of waist

Q.10. What is the range of healthy body mass index?

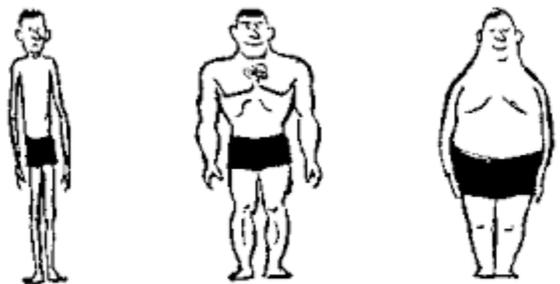
- (a) 20–25 (b) 25–30 (c) 18.5–24.9 (d) 30.0–34.9

Ans. (c) 18.5–24.9

Short Answer Type Questions (3 Marks Each)

Q.1 Explain the procedure of measuring Somato Types in brief.

Ans. Somatotypes means human body shape, and physique types. Somato types helps the physical education and sports teaches to classify the students for particular sports and games on the basis of physical, mental and practical aspects.



Ectomorph

Mesomorph

Endomorph

The procedure of measuring somatotypes is based on the classification by W.H. SHELDON.

1. **Endomorphy:** Such individuals have short arms and legs and rounded physique. The upper parts of arms and legs are significantly thicker than the lower parts. Their excessive mass hinders their ability to compete in sports.
2. **Mesomorphy:** Such individuals have balanced body compositions and athletic physique. They are able to increase their muscle size quickly and easily and have rectangular shapes body. Their chest and shoulders are broader in comparison to their waist line.

3. Ectomorphy: These individuals are generally slim because their muscles and limbs are elongated. As they have weak constitution of body and usually face difficulties in gaining weight. Their light body constitution makes them suited for aerobic activities like gymnastics.

Q.2 What do you mean by BMI? Write down the scale of BMI.

Ans. BMI is a statistical measurement that let us know whether the person is underweight, normal weight or overweight. BMI is categorized as below –

Category	BMI
Underweight	< 18.5
Normal Weight	18.5-24.9
Overweight	25.0-29.9
Obesity Class I	30.0-34.9
Obesity Class II	35.0-39.9
Obesity Class III	> 40.0

Q.3 Enlist the different health related fitness components. Explain any one component measurement procedure?

Ans. These are the following components of health-related fitness. 1. Body composition 2. Cardio-respiratory Endurance 3. Flexibility 4. Muscular endurance 5. Muscular strength
Measurement of Flexibility: It is the ability to use your joint fully. You are flexible when the muscles are long enough and the joint are free enough to allow movement. People with good flexibility have fewer sore and injured muscles. Stretching before and after activities will improve flexibility. The sit and-reach and the trunk lift are two tests used to measure flexibility.

Long Answer Type Questions (5 Marks Each)

Q.1 Explain any four importance of test, measurement & evaluation in detail?

Ans. The four importance in the physical education field are given below of test, measurement & evaluation:

1. To frame the objectives: Test and Measurement helps in setting the target or goal according to the need and requirement. By adopting the Test and Measurement techniques the physical education teachers get an accurate idea about the progress made by the students.
2. To evaluate the learners: In the field of physical education and sports Test and Measurement helps in collection of data which further helps in evaluating the learners ability separately. It also helps the sports person in enhancing his sports performance.
3. To evaluate teaching programme: Test and Measurement is a scientific tool which helps the teacher to adopt correct methodology upon the sportsman so that desired results may be achieved.
4. To discover the needs and requirements of the participants: Needs of the participants are correctly assessed by the scientific approach of Test and Measurement. It helps in knowing where more emphasis is needed so that target may be achieved.

Q.2 Enlist different of health-related fitness components. Explain any three of them in detail?

Ans. These are the following health related components:

- (i) Body composition
- (ii) Cardio-respiratory endurance
- (iii) Flexibility
- (iv) Muscular endurance
- (v) Muscular strength.

(iii) Flexibility: It is the range of movement of joint. It is important for all individuals in daily life. It can be classified into passive flexibility and active flexibility. Active flexibility can be further classified into static flexibility and dynamic flexibility. Flexibility can be measured with the help of "Sit and Reach Test".

- (iv) **Muscular endurance:** It is the ability of muscle or muscle group to repeat muscular contraction against a force over a maximum period. It can be measured by 'weight lifting' and sit-ups etc.
- (vi) **Muscular strength:** Muscular strength is the maximum amount of force that can be exerted by muscle or muscle group against the resistance during the single contraction. It can be measured by push-ups, heavy weight lifting and pull-ups etc.

Q.3 What is the difference between Endomorph and Mesomorph types of personalities?

Ans.

Endomorph

(i) An individual have short arms and legs.

(ii) An individual have rounded

Physique.

(iii) Under developed muscles

(iv) High fat storage

(v) Pear shaped body

(vi) Less ability to compete in sports

(vii) They are less active.

Mesomorph

(i) An individual have balanced body composition.

(ii) An individual have athletic physique.

(iii) Strong muscles.

(iv) Fat evenly stored all over the body.

(v) Rectangular shaped body.

(vi) Can excel in sports.

(vii) The are capable of doing lot of activities.

CONTENT PREPARED AT HOME COMPLETELY

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