**DPT 4th Semester**

**Course Title: Exercise Physiology Instructor: Ahmed Hayat**

**Student Name: ID:**

**Final Term Assignment Marks: 50**

***NOTE: Mention your name and roll number on the assignments.***

1. If you lifted a 10-kilogram (Kg) weight upward over the distance of 2 meters (m), the work performed would be ? Calculate Work.
2. Enlist basic principles of the training.
3. Describe preload and afterload in simple words.
4. What are the factors increasing stroke volume.
5. *Differentiate between isometric, isotonic and isokinetic exercises.*

Name Maryam Khalid

Id No 14954

**Question no 1**

**Data:**

Force: mass× kg =10kg × 9.8m/s 2 =98N

Distance = d =2m

Work =?

**FORMULA:**

Then from the equation for work,

W=F × d

W =98 × 2

W = 196 J Ans

AND 2ND METHOD:

*Data:*

M=10kg

S= 2m w =?

Solve:

W=PE

PE =mgh

W=mgh

W=10×1o×2

W=200j kgm/s2=j

**Q UESTION NO : 2**

* **Basic principles of the training:**
* Train to improve an athlete’s performance, specificity, overload, rest, adaption and reversibility.
* **Principles of the training:**

1. **Overload :**

* Over load leads to training gains.
* It’s the higher the level of the condition the greater overload is required.
* Varying frequency, duration, and intensity so we can apply overload.

* It is related to health fitness 3-4 x per week.
* The greater aerobic component of the event, the more frequent from the training
* The non endurance athlete’s frequency is 3x per week.
* Mostly the endurance athlete’s frequency is 4x 6 per week.
* It is the dangerous of the under training, its loss of the motivation, poor or no improvement.

**INTENSITY:**

* Training how much hard should be training.

Intensity is the measurement by the heart rate, repetition max...RM subjective measured of the feelings.

**DURATION:**

* The time of the stimulation and the length of the time variation.

Fitness increase, duration needs to increase and if you are wish to improve.

**SPECIFICITY:**

* What you get and what you train.
* You should the train of the: energy system and muscles group. ADAPTATION:
* The body will adapt in the response to:
* Frequency of training.
* Intensity of training.
* Duration of training
* Specify of the training.
* Adaption leads to occur early on training’s the time is progresses to gains and made tend to become smaller this is known as the low of the diminishing returns.
* Physiological adaption.. increase the lung volume, increase the heart volume, and the more slow twitch muscle fibres,increase blood volume and increase the no of RBC,s.

**REVERSIBILITY:**

* It is the longer of the buildup, the slower the loss. The loss of the improvement when training is decreased or stopped.
* That effect can be reversed when athletes resume training.

**QUESTION NO: 3**

* **PRELOAD:**
* Preload is the initial s of the stretching of the cardiac myocytes (muscle cells its prior contraction. The relating of the ventricular filling.
* Contractility is the intrinsic strength of the cardiac muscle independent to the preload , but a changing in preload will be affected the force of contraction.
* Preload is known as left Ventricle end diastolic pressure (LVEDP).

**EXAMPLE:**

* Person remembers this by using an analogy of a balloon blow into the balloon and it is stretch and the more air in blow, it is the greater stretch.
* AFTERLOAD:
* After Load is the force and load against which the heart contraction to ejection of the blood.
* After load is the load to the heart must pump against.

**EXAMPLE:**

* If you thinking about the balloon analogy, after load is represented by the knot at the end of the balloon. To get the ear out, the balloon must to working against the knot.
* After Load its goes down when aortic pressure and systemic vascular resistance is the decreased through the vasodilatation.

**QUESTIO NO: 4**

* **FACTORS INCREASING STROKE VOLUME :**

**STROKE VOLUME (SV):**

* SV is the volume of the blood pumped from the left ventricle per beat. Sv calculating the measurement of the t ventricle volumes from an echocardiogram and subtracting the volume of the blood in the ventricle at the end of a beat called end –systolic volume from the volume of blood just prior to the beat called end-diastolic volume..

SV=EDV-ESV

**FACTORS INCREASING STROKE VOLUME:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | Increase stroke volume | |  | | End- diastolic Volume ( period)  resistance | Inc contractility | Decrease Total peripheral (after load) | |  |  |  | | Inc Plasma volume |  |  | | Inc filling time and venous return |  |  | | Inc Ventricular volume |  |  | |

**Preload:**

* SV is intrinsically controlled by preload the percent to which the ventricles are stretched prior to contracting. An increase in the volume or speed of the venous return will increase preload and through the frank –starling low of the heart, it will increase the SV and decreased the venous return has the opposite effect, causing a reduction in stroke volume.

**AFTERLOAD:**

* Elevated after load is commonly measured as the aortic pressure during systole, decrease stroke volume. Though not usually affecting stroke volume in the healthy individuals, increase afterload will hinder the ventricles in ejecting blood, causing decreased SV increased afterload found in aortic stenosis and arterial hypertension.

**QUESTION NO 5:**

**DIFFERENCE:**

**ISOMETRIC EXERCISE :**

* Isometric means the same length, muscles size do not get longer or shorter by bending a joint.
* Isometric Exercise o type of low-impact exercise that which involves straining yourmuscles withoutmoving and banding your joints.

**EXAMPLE:** A holding your body in a plank position and you stay at the top of a push up without bending your elbows.

* Isometric Exercise is the good for maintaining your strength and stability.
* Isometric Exercise is recommended for those people who are recovering from an injury..
* Isometric Exercise help in lower blood pressure as well.

**ISOTONIC EXERCISE:**

* Isotonic exercise means same tension so that the weight on your muscles the same.
* Isotonic exercise is involved putting a constant amount of weight or tension on the muscles while moving your joints through a full range of the motion.

**EXAMPLE:** Is bench-pressing, as the amount of weight says the same and your joints bend and straighten all the way.

* Isotonic exercise can help strengthen and build muscles to that you can move through all types of motion with greater ease.
* Isotonic exercise is useful to those people who at risk of our diagnosed with diabetes.
* It can improve blood sugar regulation.

**ISOKINETIC EXERCISE:**

* Isokinetic means same speed, and your muscle is contracting at the same speed throughout the workout.
* Isokinetic exercise a type of workout that involves specile machine and is nit used by average person.
* Mostly used to train athletes’ to improve their running or throwing by the better the speed at which they can move their limb/body or weight.
* Isokinetic exercise is known as kinetic dynamometer, keep your muscles moving a consistent speed.
* Isokinetic exercise also is used to assess the muscle function of athletes or person with specific injuries.