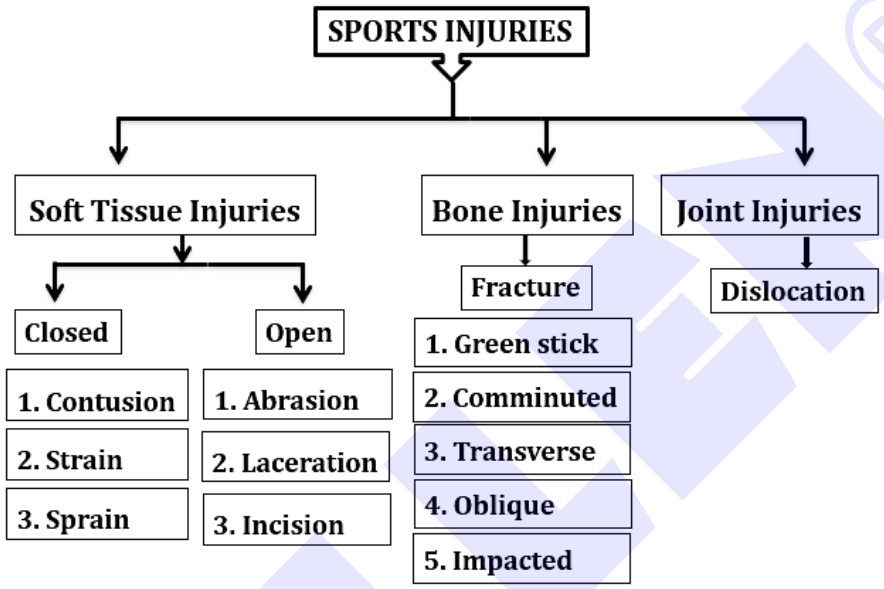
PHYSICAL EDUCATION

SECTION–A

Que.	1	2	3	4	5	6	7	8	9
Ans.	d	b	b	b	c	c	d	d	b
Que.	10	11	12	13	14	15	16	17	18
Ans.	d	b	c	c	a	b	d	c	b

SECTION–B

19.



20. Cardiorespiratory factor

The Cardiorespiratory system is combination of respiratory and cardiovascular systems which jointly work to transport oxygen to the cells and support metabolism by delivering nutrients, which provide energy to neuromuscular system and neuroendocrine system. During exercise, the demand for energy increases and to meet the demand, oxygen is required in appropriate volume to achieve the same. Demand of energy depends on intensity, duration, and type of activity. To match the same, the respiratory system -- pulmonary ventilation, external respiration, and internal respiration work together. The cardiovascular response to exercise is directly proportional to the demands of the skeletal muscles for Oxygen. Maximal oxygen consumption (VO2 Max), Blood pressure, blood volume, oxygen diffusion and extraction, muscle and arterial blood flow etc. simultaneously increase as per activity.

21. The word personality is derived from the Latin word 'Persona', which means 'Mask'. The mask was worn by the various actors in dramas in the days of ancient Greek civilization.

According to **Burgess**, "Personality is the integration of all habits which determine the role and status of the person in society".

Four way or functions used by people

(1) Feeling (2) Thinking (3) Sensing (4) Intuitive

22. Load and adaptation have a relationship of cause and effect. This relationship however is governed by certain rules which are explained below:

(1) The adaptation processes are set in motion only when the load is optimum. For achieving adaptation, the load must have certain minimum of intensity and volume. If the load is less than the adaptation processes are not started and if the load is too much, then recovery processes are delayed considerably.

(2) The adaptation if the result of proper cycle of load and recovery. Without proper and adequate recovery, the adaptation will not take place.

(3) The adaptation takes place faster in case of beginners. But it takes a longer time in case of advanced sportsmen. High level sports men take several weeks or even months to achieve an adaptation.

(4) The adaptation to load not only result in improvement of performance capacity but it also leads to increase in the load tolerance ability.

(5) Load given to a sportsman only once does not lead to any adaptation. A stable adaptation and increase in performance are achieved only when the load is given regularly for several days or weeks.

(6) Adaptation achieved through load is not permanents. If the training is stopped then the organism adapts itself to the lower level of demands. The stability of an adaptation is more if it has been achieved gradually and steadily.

(Any two points to be explained)

23. Functions of Balanced diet: -

(1) Sufficient energy is given by balanced diet.

(2) It helps individual to grow and develop to optimum level.

(3) Proper functioning of organs is done by balanced diet.

(4) It helps to repair or replace the worn-out tissue.

(5) Balanced diet improves the defense system of body.

(6) It helps to improve the overall health status.

(7) Balanced diet improves metabolism.

(8) Prevents deficiency diseases and maintains body weight thus overall efficiency of individual improves. (Any four)

OR

The purpose of all the tests of Rikli and Jones Test are:

(1) Chair Stand Test for Lower Body Strength

(2) Arm Curl Test for Upper Body Strength

(3) Chair Sit and Reach Test for Lower Body Flexibility

(4) Back Scratch Test for Upper Body Flexibility

(5) Eight Foot Up and Go Test for Agility

(6) Six Minute Walk Test for Aerobic Endurance (Any four)

SECTION–C

24. **Health Run:** The purpose of health run is to raise the standard of health and make people aware about the importance of health. These are the steps to organize a health run in school.

(1) Constitute/Institute various committees with HOS/Principal as organizing head of the event.

(2) HOD physical Education will be responsible for the entire programme.

(3) Wide publicity to be given regarding the event to all the stake holders of the school.

(4) Marking the course of the run.

(5) Local govt. and civic authorities to be informed for permission.

(6) Police to be informed for security purposes.

(7) Have first aid and water facilities in the venue.

(8) Arrange for incentives and certificates to all participants. (Any 3 points)

25. Following strategies should be taken into consideration to make physical activities accessible for the children with special needs:

(1) Medical check-up

(2) Physical activities must be based on interests of children

(3) Equipment related to physical activities should be according to the needs of children

(4) Specific environment should be provided

(5) A variety of different instructional strategies should be used

(6) Rules should be modified according to the needs of children with disabilities

(7) Children's previous experience must be taken into consideration

(8) Advance information about activity should be communicated clearly

(9) Space should be approachable for people having physical disability

(10) During initial stage activities should be simple and the activity should be based on a single action.

(11) Children's previous experience must be taken into consideration

26. **Pre competition:** Liquid food can be digested much quicker and absorbed faster. E.g. Fluids like milkshakes, yogurt/curd, vegetable soups etc.

During competition: Energy drinks help maintain blood volume, regulate body temperature, and allow muscle contraction. It helps in replacing fluids lost in sweat. During the competition, fluids help in maintaining muscle glycogen and blood sugar level

Post competition: Protein drinks, Yogurt, fruit juices and water should be taken. It helps in preparing worn out tissues. It is restoring fluids and Electrolytes lost in sweat and help in refueling the muscle and liver glycogen

27. The big five factors of personality are the five main domains which define human personality and account for individual differences. This model offered by Paul Costa and Robert McCrae. The five personality traits also known as the Five Factor Model of Personality and sometimes referred as OCEAN. The five domains or traits represented by the acronym OCEAN are Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.

Openness: Persons who like to learn new things, new concepts and enjoy new experiences usually remain on the top in openness. Openness includes traits like being imaginative, insightful, and having a variety of interests. People who are high in this trait tend to be more adventurous and creative.

Openness Trait behavior	Curious, Imaginative, Intellectual, Creative, Open to trying new things, focused on tackling new challenges, Thinks about abstract concepts

(Any one trait)

28. **Physiological Factors Determining Endurance**

(1) **Aerobic Capacity:** To perform an activity continuously, energy is required by the muscles which can be supplied in the presence of oxygen. Therefore, the ability of the organism to maintain the adequate supply of oxygen to the working muscles (i.e. aerobic capacity) for energy liberation is important for endurance performance. The aerobic capacity depends on the following factors:

(a) Oxygen Intake (b) Oxygen Uptake

(c) Oxygen Transport (d) Energy Reserves

(2) **Lactic Acid Tolerance:** The ability to tolerate the higher concentration of lactic acid is a significant factor in determining anaerobic capacity. The lactic acid tolerance is important for activities. It can be improved through training. It can help in improving endurance performance.

(3) **Movement Economy:** The economical movements are significant for endurance performance. Correct movement is a good technique in endurance sports so, we can save energy.

(4) **Muscle Composition:** There are two basic muscle fibres slow and fast. The slow twitch fibres are best used for aerobic or endurance activities. They produce small levels of force for long periods of time and that is why, they are better suited for endurance activities. The percentages of these fibres are regulated genetically.

OR

Osteoporosis: It refers to the decreased bone material contents. It is a skeletal disorder. A reduction in bone mass may cause fracture. In fact, low oestrogen levels and poor nutrition especially low calcium intake can lead to osteoporosis which is one of the significant triads of female athlete.

Various factors which usually lead to osteoporosis among women athletes are stated below:

(1) Insufficient calcium in diet. The main cause of osteoporosis is intake of insufficient amount of calcium in diet. In fact, 100mg calcium should be taken in daily diet by a women athlete. In addition to calcium, vitamin 'D' should also take because it is essential for absorbing calcium in our body.

(2) Amenorrhea. Women suffering from menstrual dysfunction or amenorrhea for more than six months are likely to face osteoporosis because the secretion of the hormone called 'estrogen' is decreased in those women. This hormone is necessary for absorption of calcium in our body. If calcium is not absorbed in our body, there will be less amount of calcium in our body which may lead to osteoporosis.

(3) Eating disorders. Eating disorders like anorexia and bulimia etc. may also cause osteoporosis because there can be less amount of calcium intake.

(4) Bad eating habits. Various research studies indicate that intake of caffeine, alcohol; tobacco or smoking etc. may also lead to osteoporosis.

SECTION–D

29. (a) 21 matches

(b) $= \frac{N(N-1)}{2}$

(c) Mr. Burger

(d) Round robin league or 'Burger System'

30. (a) 1924

(b) 1949

(c) 55dB or greater

(d) 2001

31. (a) Lower

(b) Larger

(c) Lower the centre of gravity

(d) Three planes and axis

OR

Greater stability

SECTION–E

32. Asanas which cure Back pain and Arthritis are:

Back Pain and Arthritis	
Tadasana	Bhujangasana
Urdhawahastootansana	Gomukhasana
Ardh-Chakrasana	Bhadrasana
Ushtrasana	Makarasana
Vakrasana	Nadi-shodhanapranayam
Sarala Maysyendrsana	

(Any four from above list)

Procedure of Gomukhasana

Sit down on the ground with the legs stretched forward. Now fold the left leg the knee and sit on the left foot. Fold the right leg and keep the right thigh on the left thigh with the help of your hands. Now lift your buttocks and bring the heels of both feet together so that they should touch each other. Now fold your left arm behind your back over the shoulder. Fold the right arm behind the back under the right shoulder. After that bend, your fingers of both the hands and clasp each other. At this time, your head and back should be erect. Then repeat the same in reverse position.

Benefits of Gomukhasana

(1) It makes the leg muscles strong and elastic.
(2) It helps in keeping the shoulder joints healthy, flexible, and strong.
(3) it improves the function of lungs.
(4) The regular practice of this asana helps in the treatment of sciatica.
(5) It improves the function of kidneys by stimulating it thus helps the individuals who suffer from diabetes.
(6) It also reduces stress and anxiety.
(7) It helps in staying tough and strong.
(8) It helps in treating sexual ailments.

Stick Diagram of Gomukhasana

33. It is a cardiovascular fitness test and called aerobic fitness test. It was developed by Brouha and others in 1943. It is used to measure the cardiovascular fitness or aerobic fitness by checking the recovery rate. The test was originally designed for young men of college age.

Purpose: To determine aerobic fitness.

Objective: To perform step test continuously without break for 5 minutes or until exhausted.

Equipment's required: Bench or wooden block 20 inches (50.8 cm) in height; stopwatch; metronome or cadence tape.

Procedure : Student will start test at the command "Go" and will step up and down, on and off the wooden block or bench at the rate of 30 steps per minutes for 5 minutes.

Participant is given instructions that on the command 'up' or the first sound of the metronome, he/she should place one foot on the bench; on the second command 'up' or the second sound of the metronome, he/she should place both feet fully on the bench with the body erect straightening the legs and back.

Exactly five minutes of steps, on the signal 'stop', the participant immediately sits down on the bench. If the student is unable to maintain the pace, then she/he is exhausted, and the test is brought to an end before completion of 5min.

The tester will note the duration of the exercise in seconds and use short formula.

Pulse Count : After completion of the test, the student sits down, and the tester takes the hearts beats between 1 to 1½ minutes.

Scoring: Fitness Index score will be determined by applying following equation:

$$\textbf{Fitness index score (Short term)} = \frac{100 \times \text{Duration of the Exercise in Seconds}}{5.5 \times \text{Pulse count of } 1 - 1.5 \text{ min after Exercise}}$$

Advantages:

(1) Minimum equipments are required for conducting this test.

(2) It requires minimal cost.

(3) It is simple to set-up and conduct.

34. **Strength :** Strength is the ability to overcome resistance or to act against resistance.

According to Mathews, "Muscular strength is the force that a muscle or group of muscles can exert against a resistance in one maximum effort.

Methods of Improving Strength – Isometric, Isotonic, Isokinetic

(a) **Isometric Exercises (Static Muscle Contraction) :** These exercises were first introduced by Hettinger and Muller (1953). In this type of exercises, the work or activity is carried out, but the work done is not visible, a group of muscles carry out tension against the other group of muscles.

Examples of exercises: Pressing, pushing the wall, lifting heavy weight, holding the static position etc.

(b) Isotonic Exercises (Dynamic Muscle Contraction) : This type of muscle contraction is also called isotonic or auxo-tonic muscle contraction. These were developed by De Loone (1954). In this type of muscle contraction, the muscle lengthens or shortens. In isotonic exercises, the movement and activity are clearly visible. Movement can be seen directly; muscles tone up and become flexible.

Examples of exercises: Lifting a light weight, Doing exercises with a lightweight, Callisthenic etc.

(c) Isokinetic Exercises : This method was first introduced by J.J.Perrine in 1968. This method involves a special type of muscle contraction called isokinetic contraction. These exercises are a combination of Isotonic and Isometric exercises.

Examples of exercises: Ice-skating, carrying weight, Chin ups, pushing a heavy roller and Rope climbing etc.

OR

Types of Friction: Generally, there are two types of friction

1. **Static Friction:** The opposing force that comes into play when one body tends to move over the surface of another, but the actual motion has not yet started, is called static friction.
2. **Dynamic Friction:** It is the opposing force that comes into play when one body is moving over the surface of another body. It is of two types.
   (a) Sliding Friction: The opposing force that comes into play when one body is sliding over the surface of the other body is called sliding friction. E.g. – ice-skating
   (b) Rolling Friction: The opposing force that comes into play when one body is rolling over the surface of the other body is called rolling friction. E.g. – when a hockey or cricket ball is hit, it rolls on the surface of the ground. It stops after some time due to rolling friction.

Advantages of friction : Friction is usually called a necessary evil. It means that it is essential in games and sports. Without friction, we cannot give a better performance in the field of sports. For example, athletes (racers and jumpers) use spikes and football players use studs to have appropriate friction while they run fast. Without friction they are unable to run fast. Even gymnasts also use lime on their palms to perform on horizontal bar, uneven bars and roman rings to have friction. Even walking may be difficult due to less friction. The weightlifters also use lime on palms before holding the bars in jerk and snatch. In badminton, the players are usually seen to rub their soles of shoes with lime before going to the wooden court. In fact, in sports field, there are a lot of examples where friction is advantageous.

Disadvantages of friction : Friction is disadvantageous in some of the sports and games, such as in cycling, there should not be more friction between road and the tyres of cycle. If there is more friction, there will be more wastage of energy of the rider. The tyres must be fully inflated to reduce the force of friction in cycling. In roller skating, there should be less friction for better performance.