



## Central Board of Secondary Education, Delhi

### SAMPLE QUESTION PAPER CLASS-XII (2023-2024)

#### PHYSICAL EDUCATION (048)

**Time Allowed: 3hrs**

**Max. Marks:70**

#### GENERAL INSTRUCTIONS:

- 1) The question paper consists of 5 sections and 34 Questions.
- 2) Section A consists of question 1-18 carrying 1 mark each and is multiple choice questions. All questions are compulsory.
- 3) Sections B consist of questions 19-23 carrying 2 marks each and are very short answer types and should not exceed 60-90 words. There is internal choice available.
- 4) Sections C consist of Question 24-28 carrying 3 marks each and are short answer types and should not exceed 100-150 words. There is internal choice available
- 5) Sections D consist of Question 29-31 carrying 4 marks each and are case studies. There is internal choice available.
- 6) Section E consists of Question 32-34 carrying 5 marks each and are short answer types and should not exceed 200-300 words. There is internal choice available.

## SECTION – A

1 mark each

Q1. Identify the Asana:



- (a) Pawanmuktasana (b) Sukhasana  
(c) Chakrasana (d) Gomukhasana

Q2. Reactive Aggression is also called \_\_\_\_\_

- (a) Instrumental Aggression (b) Hostile Aggression  
(c) Assertive Aggression (d) Both (a) and (b)

Q3. The Friction force acts in a/an \_\_\_\_\_ direction to the direction of motion of an object.

- (a) Opposite (b) Same (c) Downwards (d) Diagonal

Q4. The irregular tear-like wounds caused by some blunt trauma \_\_\_\_\_

- (a) Laceration (b) Contusion (c) Abrasion (d) Incision

Q5. Given below are two statements, one of which is labelled as Assertion (A) and the other is labeled as Reason (R)

**Assertion (A):** For improvement of performance in long distance running, continuous training is effective

**Reason (R):** Continuous method of training improves basic endurance

Which one of the following statements is correct?

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A)  
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A)  
(c) (A) is true, but (R) is false  
(d) (A) is false, but (R) is true

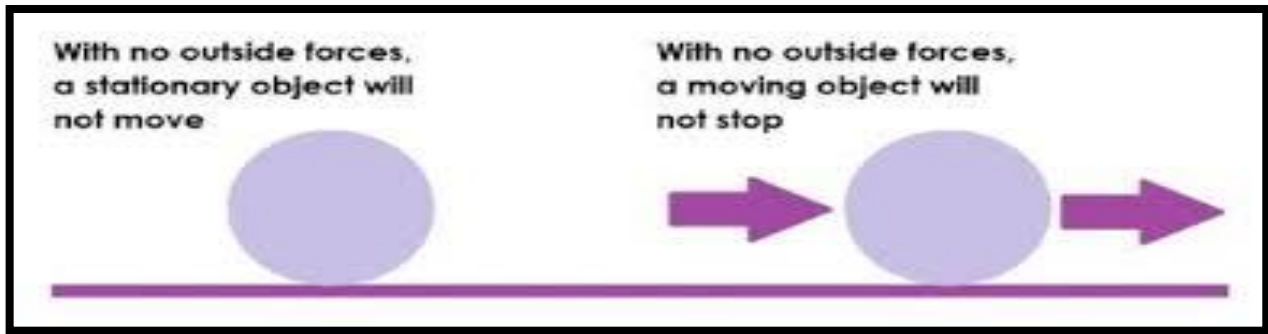
Q6. What do you mean by iso and metric?

- (a) Iso means constant and metric means length  
(b) Iso means change and metric means size  
(c) Iso means constant and metric means velocity  
(d) Iso means size and metric means constant

**Q7. It is the amount of blood pumped out by each side of the heart (actually each ventricle) in 1 minute\_\_\_\_\_**

- a) Blood pressure      (b) Cardiac Output      (c) Blood volume      (d) Both (a) and (b)

**Q8. Identify the given below**



- (a) First Law of Motion  
(b) Second Law of Motion  
(c) Third Law of Motion  
(d) Law of Effects

**Q9. Match List – I with List – II and select the correct answer from the code given below:**

LIST - I		LIST - II	
1	Extraversion	i)	Enthusiasm
2	Conscientiousness	ii)	Responsible
3	Agreeableness	iii)	Compassionate behavior
4	Neuroticism	iv)	Emotional Stability

Code				
	i	ii	iii	iv
(a)	1	2	3	4
(b)	4	3	2	1
(c)	3	4	2	1
(d)	2	3	4	1

**Q10. Given below are two statements, one of which is labelled as Assertion (A) and the other is labeled as Reason (R)**

**Assertion:** Scurvy is caused due to the deficiency of Vitamin C.

**Reason:** The disease sets in when the diet does not include fresh vegetables and fruits for a long time.

Which one of the following statements is correct?

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (c) (A) is true, but (R) is false
- (d) (A) is false, but (R) is true

**Q11. One gram of carbohydrate contains \_\_\_\_\_ Calories**

- (a) 2
- (b) 3
- (c) 4
- (d) 5

**Q12. Which gland is associated with Diabetes?**

- (a) Endocrine glands
- (b) Pituitary
- (c) Pancreas
- (d) Hypothalamus

**Q13. What is the formula to determine number of matches in League fixture for even number of teams?**

- (a)  $N+1/2$
- (b)  $N-1/2$
- (c)  $N(N-1)/2$
- (d)  $N(N+1)/2$

**Q14.** Mr. Gopi, Physical Education Teacher of a reputed CBSE school has decided to conduct an Inter School Kabaddi tournament in his school premises after proper drawing of fixtures. He consulted the Management and the Principal to conduct the Tournament of Inter School Kabaddi pattern but the Physical Education Teacher was not aware of Inter School Kabaddi Tournament. So he discussed with the National Kabaddi Referee Association.

**Which of the following is the best method to organize this kind of tournament?**

- (a) Knock out
- (b) League
- (c) Ladder
- (d) Pyramid

**Q15.** School management needs to recognize the essential place of physical activity in the education of children with special needs.

**Which of these is not one of the results of physical activities in children with special needs?**

- (a) Improvement in confidence
- (b) Improvement in endurance
- (c) Increase in depression
- (d) Better hand-eye coordination

**Q16. If the menstruation cycle does not begin at puberty, the condition is called \_\_\_\_\_**

- (a) Primary Amenorrhea (b) Secondary amenorrhea  
(c) Oligomenorrhea (d) Dysmenorrhea

**Q17. Senior Citizen Fitness Test the range of age group is \_\_\_\_\_**

- (a) 60-94 (b) 55-79 (c) 65-95 (d) 50-90

**Q18. Kyphosis is also known as \_\_\_\_\_**

- (a) Hallow Back (b) Hunch Back  
(c) Curve Back (d) both (a) and

### (SECTION - B)

Q19. Point out physiological factor for strength. [4X0.5=2]

Q20. Write short note on Goal setting [1+1=2]

Q21. Explain Isokinetic exercise with suitable examples [1+1=2]

Q22. Write a key point on cardio respiratory factors determining fitness. [1+1=2]

Q23. Explain the procedure and scoring of 600meter run/walk [1+1=2]  
OR

Explain the importance of fluid intake during a competition. [1+1=2]

### (SECTION - C)

Q24. Explain any three strategies to Make Physical Activities Accessible for CWSN [1+1+1=3]

Q25. What are the benefits of Non-Nutritive foods? [1+1+1=3]

Q26. What should be the role of technical and marketing committee while organizing the event? [1.5+1.5=3]

Q27. Differentiate between Introvert and Extrovert personality? [1+1+1=3]

Q28. Define Fracture and explain any four types of fracture [1+2=3]

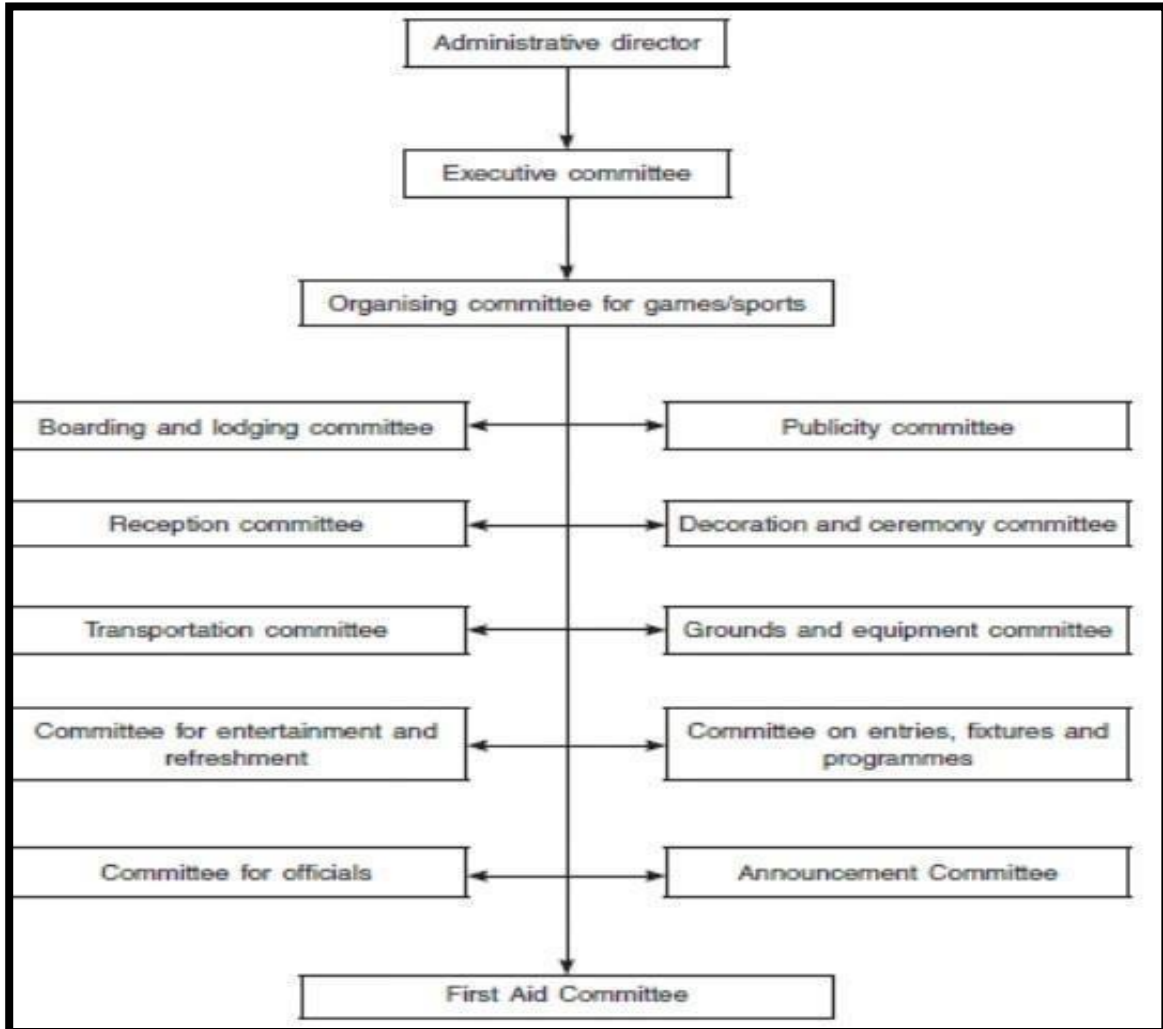
**OR**

Write in brief the corrective measures of Bow Leg, Knock Knee and Flat Foot. [1+1+1=3]

## (SECTION - D)

4 marks each

**Q29. While organizing sports events for the Annual Sports Day, Arjun and Ravi being the captain and vice-captain of sports, formed various committees as shown below.**



**On the basis of above given picture answer the following questions:**

- The members of this committee are responsible for welcoming guests and spectators \_\_\_\_\_
- The Committee responsible for liaison with Print media is the \_\_\_\_\_ Committee.
- Purchase of sports equipment is a work of the \_\_\_\_\_ Committee.
- Publication of rules and regulations should be done \_\_\_\_\_.

**OR**

- To prepare a proper score sheet for record is \_\_\_\_\_ responsibility.

**Q30. During her gymnastics practice, Zoya was finding it difficult to maintain her balance on the balancing beam. Her coach tried to explain to her about basic principles of equilibrium.**



**According to the principles of equilibrium Centre of gravity plays a very important role.**

- (a) The nearer the Center of Gravity to the Center of the base of support the more will be the \_\_\_\_\_.
- (b) The position of the centre of gravity changes depending upon the \_\_\_\_\_.
- (c) The sum of all the vertical and horizontal forces acting on the body must be \_\_\_\_\_.
- (d) Centre of gravity is the average location of an object's \_\_\_\_\_.

**OR**

- (d) When the sum of force acting upon the object and sum of the movement acting upon the body is both equal to zero then the body is said to be in \_\_\_\_\_.

**Q31. School management needs to recognize the essential place of physical activity in the education of children with special needs. In order to develop lifelong habits for fitness and to provide them with many opportunities of socialization, schools need to understand that physical education is not a secondary subject but it is just as important as other skills.**



**On the basis of above given picture answer the following questions:**

- Development of Gross Motor and Fine Motor skills are benefits which are part of \_\_\_\_\_
- Graded activities as strategy for effective inclusive physical education program includes \_\_\_\_\_
- \_\_\_\_\_ for activities should be disturbance free (noise, heat, cold, texture of floor, audience etc.)
- The activities that include running, jumping, hopping, galloping, rolling, leaping and dodging, horizontal jump, slide \_\_\_\_\_

### (SECTION - E)

**Q32.** Discuss the asanas helpful for a person suffering from Hypertension. Write down the procedure and contraindications of Sarala Matsyasana in detail. [2+3=5]

**Q33.** Make a table of test items listed under fitness test by SAI (Age group 9-18 yrs) Explain the Procedure and Scoring of 50 MTS Run and Partial Curl Up [1+2+2=5]

**Q34.** Define Flexibility. Explain its types and any two methods to develop flexibility. [1+2+2=5]

**OR**

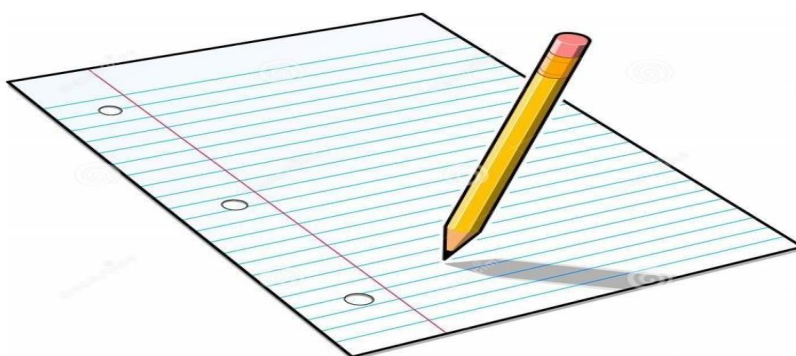
With the help of suitable examples, discuss the application of Newton's Laws of Motion in sports. [3+2=5]





# Central Board of Secondary Education, Delhi

**MARKING SCHEME**  
**SAMPLE QUESTION PAPER**  
**PHYSICAL EDUCATION (048)**  
**CLASS-XII 2023-2024**



Time Allowed: 3hrs

Max. Marks:70

**ANSWER KEY**

Q.NO.	ANSWER	MARKS DISTRIBUTION
<b>(SECTION - A)</b>		
1	(a) Pawanmuktasana	1
2	(b) Hostile Aggression	1
3	(a) Opposite	1
4	(a) Laceration	1
5	(a) Both (A) and (R) are true and (R) is the correct explanation of (A)	1
6	(a) Iso means constant and metric means length	1
7	(b) Cardiac Output	1
8	(b) Second Law of Motion	1
9	(a)	1
10	(b) Both (A) and (R) are true but (R) is not the correct explanation of (A)	1
11	(c) 4	1
12	(c) Pancreas	1
13	(c) $N(N-1)/2$	1
14	(b) League	1
15	(c) Increase in depression	1
16	(a) Primary Amenorrhea	1
17	(a) 60-94	1
18	(b) Hunch Back	1
<b>(SECTION - B)</b>		
19	Strength is the ability of the body to work against resistance and has varied sub-types such as Maximum Strength, Explosive Strength, Strength, Endurance etc. Each has different types of exercise, intensity and duration so physiological factors vary. Different sports require different amount of strength and according to that, mixture of the slow twitch fiber and fast twitch fiber is needed. Generally, in all the strength related sports where sudden burst of energy is required, high percentage of fast twitch fiber is required.	2
20	<ul style="list-style-type: none"> <li>Goal setting is a mental training technique that can be used to increase an individual's commitment towards achieving a specific standard of proficiency on a task within a specified time. It is a process of establishing a level of performance proficiency which should be reached within a prescribed time period is known as goal setting.</li> <li>It has proven effectiveness in enhancing performance and productivity in several contexts, including</li> </ul>	1+1=2

	employee exercise programs, competitive sport, and industrial organizations, and provides a basis for both increasing a person's SELF-EFFICACY and for instilling a task with intrinsic worth.	
21	These are exercises in which movements can be seen directly. Isotonic exercises result in toned muscles and increased muscle length. These exercises hold much importance when it comes to sports. This method is considered to be the best method to develop strength. Examples of isotonic exercises include running and jumping on the spot, weight training exercises, and calisthenics exercises.	1+1=2
22	<ul style="list-style-type: none"> <li>• <b>Cardiovascular system</b> - It consists of three parts: the heart, blood vessels and blood. Its major function is to deliver oxygen and nutrients, remove CO<sub>2</sub> and other metabolic waste products, to transport hormones and other molecules, to support thermoregulation and control of body fluid balance and lastly to regulate immune function.</li> <li>• <b>Respiratory system</b> - The important parts of the respiratory system are the nose, nasal cavity, pharynx, larynx, trachea, bronchi, and lungs. Air can also enter the respiratory system through the oral cavity. Its major functions include, transporting air to the lungs, exchanging gases (O<sub>2</sub> and CO<sub>2</sub>) between the air and blood, and regulating blood pH.</li> </ul>	1+1=2
23	<ul style="list-style-type: none"> <li>• <b>Procedure:</b> Participants are instructed to run 600 mts. at the fastest possible pace. The participants begin on signal, "ready, start". As they cross the finish line, the elapsed time should be announced to the participants. Walking is permitted but the objective is to cover the distance in the shortest possible time.</li> <li>• <b>Scoring:</b> Time taken for completion (Run or Walk) in min and sec.</li> </ul> <p style="text-align: center;"><b>OR</b></p>	1+1=2
	<ul style="list-style-type: none"> <li>• Dealing with nutritional needs during training is crucial for optimal performance. The main aim during exercise and training should be to maintain water balance, control body temperature, sustain normal blood sugar levels and delay fatigue.</li> <li>• In order to maintain fluid balance and normal body temperature during exercise, water that is lost through sweating during exercise needs to be replaced.</li> </ul>	1+1=2
<b>(SECTION - C)</b>		
24	<ul style="list-style-type: none"> <li>• <b>Communication</b> – Advance information about activity, space, resource person or any change in activity should be communicated clearly. A variety of different instructional strategies such as verbal, visual and peer teaching should be used for performing various types of physical activities so that children get opportunity to participate in physical activity.</li> </ul>	1+1+1=3

	<ul style="list-style-type: none"> <li>• <b>Space</b> – For CWSN, space should be approachable for people having physical disability. The area for the physical activity should be limited. Space for activities should be disturbance free (noise, heat, cold, texture of floor, audience etc.) It is always better to start with indoor space.</li> <li>• <b>Equipment</b> - A lack of appropriate equipment, coupled with a lack of professionals trained to support physical activity among children and youth with different ability levels, discourages participation.</li> </ul>	
25	<ul style="list-style-type: none"> <li>• <b>Phytochemicals-</b> Phytochemicals are chemical compounds produced by plants, generally to help them thrive or thwart competitors, predators, or pathogens. The name comes from Greek phyton, meaning 'plant'.</li> <li>• <b>Anthocyanins:</b> Anthocyanins give grapes, blueberries, cranberries, and raspberries their dark color.</li> <li>• <b>Flavonoids or isoflavones:</b> These are found in vegetables, fruits and grains like soybeans, chickpeas and may act a little bit like estrogen.</li> <li>• <b>Artificial Sweeteners:</b> These are synthetic compounds that duplicate the taste of sugar, but contain less energy, and, therefore, are often added to diet foods and beverages.</li> <li>• <b>Preservatives:</b> These are compounds that have the ability to inhibit microbial growth and are often added to food and beverage products to prolong shelf life.</li> <li>• <b>Spices:</b> A spice is a dried seed, fruit, root, bark or vegetable substance primarily used for flavoring, coloring or preserving food.</li> <li>• <b>Coffee:</b> Coffee is a brewed beverage prepared from the roasted or baked seeds of several species of Coffee.</li> </ul>	1+1+1=3
26	<p>This committee covers the technical aspect of the events like requisitions to procure sports equipment, conducting matches on time through selected officials (referees, umpires, judges, timekeepers etc.) for their respective games/sports.</p> <ul style="list-style-type: none"> <li>• <b>Pre-Sports Event/ Tournament:</b> Before the event, it is the job of the Technical Committee to put forward a requisition to purchase equipment, invitation and confirmation from officials to conduct sports event, cleaning and layout of the fields, arrangement of equipment and stationery, preparation of fixtures, rules and regulation of the sports event.</li> <li>• <b>During Sports Event/Tournament:</b> While the tournament is in progress, the Technical Committee is responsible for conducting matches, presence of the jury, cleaning and layout of the fields, collection of score sheets and other related papers from officials,</li> </ul>	1+1+1=3

	preparation of merit list, etc. <ul style="list-style-type: none"><li>• <b>Post Sports Event/ Tournament:</b> After the event is over, the Technical Committee arranges for the cleaning and layout of the fields, maintenance of the field, and placing of all equipment back to store.</li></ul>									
27	<table><tr><th>INTROVERT</th><th>EXTROVERT</th></tr><tr><td>Interested in their own self Reserved</td><td>Highly socialized Broad-minded</td></tr><tr><td>Self-aware and introspective Take pleasure in reading, writing Tend to shy away from public</td><td>Expressive and enjoy centre of attention Meet unknown people easily</td></tr><tr><td>Think before acting</td><td>Action oriented</td></tr></table>	INTROVERT	EXTROVERT	Interested in their own self Reserved	Highly socialized Broad-minded	Self-aware and introspective Take pleasure in reading, writing Tend to shy away from public	Expressive and enjoy centre of attention Meet unknown people easily	Think before acting	Action oriented	1+1+1=3
INTROVERT	EXTROVERT									
Interested in their own self Reserved	Highly socialized Broad-minded									
Self-aware and introspective Take pleasure in reading, writing Tend to shy away from public	Expressive and enjoy centre of attention Meet unknown people easily									
Think before acting	Action oriented									
28	A fracture is a break in a bone. Fractures are caused by a direct impact, such as a fall or a severe tackle. <ul style="list-style-type: none"><li>• Stress fracture</li><li>• Greenstick</li><li>• Comminuted</li><li>• Transverse</li><li>• Oblique</li><li>• Impacted</li></ul> <p style="text-align: center;"><b>OR</b></p>	1+1+1=3								
	<table><tr><td><b>Bow Legs</b></td><td>Use of braces and modified shoes can be along with sufficient intake of balanced diet can prove to be of help. Walking on the inner edge of the feet may also help.</td></tr><tr><td><b>Flat Foot</b></td><td>Exercises like walking, standing or jumping on toes and heels in all four directions, skipping rope, strengthens the muscles of foot which help to develop the arch in the foot. Activities like picking up marbles with toes, writing numbers in the sand with the toes will also help in developing the arch. Yoga asanas like Adhomukhsavasana performed in Surya Namaskar, Vajrasana and other therapeutic massages are also helpful in developing the arch.</td></tr><tr><td><b>Knock Knees</b></td><td>Treatment for Genu valgum largely depends on the cause and severity of the problem. Exercises like horse-riding and keeping the pillow between the knees and standing erect for some times are the best. For most people with Genu valgum, Yoga and exercise can help realign and stabilize the knees. Performing padmasana and gomukhasana regularly can help strengthen muscles of the legs and realign the knees. Strengthening exercises can be simple, such as leg raises while seated or lying down. Using of walking calipers is also a big help at pre-puberty stage.</td></tr></table>	<b>Bow Legs</b>	Use of braces and modified shoes can be along with sufficient intake of balanced diet can prove to be of help. Walking on the inner edge of the feet may also help.	<b>Flat Foot</b>	Exercises like walking, standing or jumping on toes and heels in all four directions, skipping rope, strengthens the muscles of foot which help to develop the arch in the foot. Activities like picking up marbles with toes, writing numbers in the sand with the toes will also help in developing the arch. Yoga asanas like Adhomukhsavasana performed in Surya Namaskar, Vajrasana and other therapeutic massages are also helpful in developing the arch.	<b>Knock Knees</b>	Treatment for Genu valgum largely depends on the cause and severity of the problem. Exercises like horse-riding and keeping the pillow between the knees and standing erect for some times are the best. For most people with Genu valgum, Yoga and exercise can help realign and stabilize the knees. Performing padmasana and gomukhasana regularly can help strengthen muscles of the legs and realign the knees. Strengthening exercises can be simple, such as leg raises while seated or lying down. Using of walking calipers is also a big help at pre-puberty stage.	1+1+1=3		
<b>Bow Legs</b>	Use of braces and modified shoes can be along with sufficient intake of balanced diet can prove to be of help. Walking on the inner edge of the feet may also help.									
<b>Flat Foot</b>	Exercises like walking, standing or jumping on toes and heels in all four directions, skipping rope, strengthens the muscles of foot which help to develop the arch in the foot. Activities like picking up marbles with toes, writing numbers in the sand with the toes will also help in developing the arch. Yoga asanas like Adhomukhsavasana performed in Surya Namaskar, Vajrasana and other therapeutic massages are also helpful in developing the arch.									
<b>Knock Knees</b>	Treatment for Genu valgum largely depends on the cause and severity of the problem. Exercises like horse-riding and keeping the pillow between the knees and standing erect for some times are the best. For most people with Genu valgum, Yoga and exercise can help realign and stabilize the knees. Performing padmasana and gomukhasana regularly can help strengthen muscles of the legs and realign the knees. Strengthening exercises can be simple, such as leg raises while seated or lying down. Using of walking calipers is also a big help at pre-puberty stage.									

(SECTION - D)		
29	a) Logistic Committee b) Marketing Committee c) Finance Committee d) Pre-Event <b>OR</b> d) During Responsibility	1+1+1+1=4
30	a) Stability b) Position of the body c) Zero d) Weight <b>OR</b> d) Equilibrium	1+1+1+1=4
31	a) Physical Benefits b) Simple to Complex c) Space d) Locomotor Activity	1+1+1+1=4
(SECTION - E)		
32	<p><b>Hypertension:</b> Tadasana, Katichakrasana, Uttanpadasana, Ardha Halasana, Sarla Matyasana, Gomukhasana, Uttan Mandukasana, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadi-Shodhanapranayam, Sitlipranayam.</p> <ul style="list-style-type: none"> <li>• <b>Technique</b></li> </ul> <p>Lie flat on the back.</p> <ol style="list-style-type: none"> <li>1. With the support of your hands keep the top of your head on the mat.</li> <li>2. Neck, upper back and shoulders will be lifted from the ground.</li> <li>3. Relax your hands at the side of your body.</li> <li>4. Breathe normally and keep your toes stretched out.</li> <li>5. Hold the position for 30 seconds, then relax.</li> </ol> <ul style="list-style-type: none"> <li>• <b>Breath Awareness</b></li> </ul> <ol style="list-style-type: none"> <li>1. Inhale as you lift the chest and tuck the head.</li> <li>2. Exhale while relaxing the body and bring it to the initial position.</li> <li>3. And get back to normal breathing.</li> </ol>	2+3=5

	<ul style="list-style-type: none"> <li>• <b>Contraindications</b> People with cervical spondylitis and frozen shoulder should avoid practicing this asana.</li> </ul>	
33	<p>AGE GROUP: 9-18+ YEARS   CLASS 4 to 12 For Class 4 to 12, It is important for students to have an overall physical fitness. The following Components are to be considered in Physical Health and Fitness Profile:</p> <ol style="list-style-type: none"> <li>1. Body Composition (BMI)</li> <li>2. Strength             <ol style="list-style-type: none"> <li>a. Abdominal (Partial Curl-up)</li> <li>b. Muscular Endurance (Push Ups for Boys, Modified Push Ups for Girls)</li> </ol> </li> <li>3. Flexibility (Sit and Reach Test)</li> <li>4. Cardiovascular Endurance (600 Meter Run/Walk)</li> <li>5. Speed (50 mt. Dash)             <ul style="list-style-type: none"> <li>• <b>50 MTR DASH (STANDING START)</b></li> <li>• <b>Procedure:</b> A thorough warm up should be given, including some practice starts and accelerations. Start from a stationary position, with one foot in front of the other. The front foot must be on or behind the starting line. This starting position should be static (dead start). The tester should provide hints for maximizing speed (such as keeping low, driving hard with the arms and legs) and encouraged to continue running hard through the finish line.</li> <li>• <b>Scoring:</b> Time taken for completion</li> <li>• <b>ABDOMINAL (PARTIAL CURL-UP)</b></li> <li>• <b>Procedure:</b> The subject lies on a cushioned, flat, clean surface with knees flexed, usually at 90 degrees, with hands straight on the sides (palms facing downwards) closer to the ground, parallel to the body. The subject raises the trunk in a smooth motion, keeping the arms in position, curling up the desired amount (at least 6 inches above/along the ground towards the parallel strip). The trunk is lowered back to the floor so that the shoulder blades or upper back touch the floor.</li> </ul> </li> </ol>	1+2+2=5

	<ul style="list-style-type: none"> <li>• <b>Scoring:</b> Record the maximum number of Curl ups in a certain time period (30 seconds).</li> </ul>	
34	<p>Flexibility is also known as the range of motion around a joint.</p> <p>Types: (a.) Passive Flexibility: the ability to do movements with greater amplitude and with external help is known as passive flexibility.</p> <p>(b) Active Flexibility: the ability to perform a movement with greater amplitude without external help is called active flexibility.</p> <p>The various methods that can help to improve flexibility are discussed below:</p> <ol style="list-style-type: none"> <li>1. Slow Stretching</li> <li>2. Slow Stretch and Hold</li> <li>3. Ballistic Method</li> <li>4. Proprioceptive Neuro-Muscular Facilitation (PNF) Technique</li> </ol> <p style="text-align: center;"><b>OR</b></p>	1+2+2=5
	<p><b>NEWTON'S FIRST LAW OF MOTION (LAW OF INERTIA)</b></p> <p>According to the first law, a body will remain at rest or continue to move at a constant velocity unless acted upon by an external (resultant) force. Inertia is the resistance of any object to any change in its motion, including a change in direction— objectives to keep moving in a straight line at a constant speed.</p> <p><b>Application in Sports</b></p> <ul style="list-style-type: none"> <li>• A skater gliding on ice will continue gliding with the same speed and in the same direction unless an external force acts upon the skater.</li> <li>• When a ball is thrown and is in mid-air, the only force acting upon it is the force of gravity. If the force of gravity did not exist, the ball would keep traveling at a constant speed until it was affected by an object or another person touched it. If this ball were thrown upwards, it would end up traveling into space.</li> </ul>	3+2=5



### **NEWTON'S SECOND LAW OF MOTION (LAW OF MOMENTUM)**

As per the law, the rate of change of momentum is proportional to the resultant force and takes place in the direction of the resultant force. When a net force acts on an object, the acceleration of the object it produces is directly proportional to the magnitude of the net force, is in the same direction as the net force and inversely proportional to the mass of the object. The more mass the thing has, the more net force has to be used to move it.

#### **Application in Sports**

- As in Shot-put, a player who applies more force and tosses the shot-put at the correct angle has a greater displacement of shot-put, whereas a player who exerts less force has a lesser displacement of shot put.
- In soccer, a team will require more force to kick the ball high and faster. This law of motion is fundamental in soccer, so you can calculate the force needed to give a pass or kick the ball to the net without missing.

### **NEWTON'S THIRD LAW (LAW OF REACTION)**

According to this law, there is an equal and opposite reaction for every action, and this reaction acts with the same Momentum and the opposite velocity for every action. It states that whenever one object exerts a force on a second object, the second object exerts an equal and opposite force on the first object.

#### **Application in Sports**

- In Swimming, a diver needs to push down on the springboard when he/she dives off a diving board. The springboard pushes back the force on you for proper projecting into the air during the performance.