

MODEL SAMPLE PAPER

PHYSICAL EDUCATION (048) CLASS 12 SESSION 2021-22

TERM 2

ANSWERS

1. Benefits of bhujangasana (any two)
 - It puts the abdominal muscles and shoulders to work, increasing the circulation of the blood and oxygen in those regions, which in turn raises the body temperature and boosts the body's metabolism to levels that are beneficial at controlling diabetes.
 - It fights acidity, indigestion and constipation, and helps the practitioner lose weight.
 - It enhances the function of the liver, kidney, pancreas and gall bladder.
 - It strengthens the arms and shoulders.
2. Maximum strength is the ability of a muscle to overcome resistance of maximum intensity of stimulus in a single contraction. Applying this strength demands an efficient neuromuscular coordination. Examples include strength used in weightlifting, discus throw, hammer throw, and shot put, wherein heavy resistance has to be dealt with. In sports like long jump and high jump, in which the take-off has to be powerful, maximum strength is required for a short period.
3. **Cardinal Traits:** Cardinal traits are dominant traits. They are the most visible traits of an individual, shaping her/his personality and driving her/his actions. A person with greed and envy as a cardinal trait will try to obtain what she/he wants at any cost, and she/he is not likely to run out of wants.
Neuroticism: Neurotics are emotionally unstable; they are irritable, nervous, anxious, quick to worry even over the smallest matters, and often fall into depression. Due to this, they also become victims of substance abuse and many die at a young age. Those low on this trait are more stable emotionally and do not experience mood swings.
4. **ADHD:** Attention Deficit Hyperactivity Disorder
ODD: Oppositional Defiant Disorder
5. Changes happening in the cardio-respiratory system due to exercising (any four)
 - i. **Increase in the Size of Heart:** The mass and volume of heart increase with consistent exercise; its walls thicken and become stronger, while the left ventricle also expands in size, allowing more blood to flow through the body.
 - ii. **Decrease in Resting Heart Rate:** A significant decrease in resting heart rate occurs after

exercising consistently. If an individual with initial resting heart rate of 72 beats/min is subjected to a 10 weeks training programme, we can expect a reduction of about 10 beats/min by the end of it. A training session leaves the heart rate elevated before slowly returning to a resting rate. After a long period of regular sessions, the heart is able to return to a resting rate quickly.

- iii. **Stroke Volume Increases at Rest:** During moderate and hard exercises, stroke volume increases. In individuals not trained physically, it ranges from 50–70 mL/beat, in trained persons 70–90 mL/beat, and in experienced top endurance athletes it ranges from 90–110 mL/beat.
 - iv. **Increase in Cardiac Output:** The amount of blood (in litres) pumped by the heart in one minute is called cardiac output. It is expressed as L/minute. The product of stroke volume and heart rate gives us cardiac output. During vigorous activity, the heart rate and stroke volume increase, resulting in subsequent increase in cardiac output. It is directly proportional to the intensity of the exercise. Resting cardiac output averages about 5 L/min; this can go up to 20–40 L/min during intense exercise.
 - v. **Increased Blood Flow:** Blood flow increases following training sessions. The skeletal muscles receive greater blood supply because they require more O₂ during exercise. This reaction is set in motion by the body through increasing the number of capillaries and opening the existing ones wider. In this way, the efficiency of blood redistribution is increased. Therefore, blood flow in the body increases with exercise.
6. In isokinetic exercises, the muscles contract with maximum force through every point in the range of motion. They involve specific muscle contractions that can only be executed with the use of specialised complex equipment called dynamometers. The resistance throughout the movement of the muscles remains the same. Isokinetic exercises are considered the best method for improving explosive strength and strength endurance.
7. Symptoms of ODD (any two)
- A short temper characterised by tantrums.
 - Tendency to argue, fight and disobey rules.
 - A liking to annoy people
 - Tendency to blame others and show open hostility without provocation

Causes of ODD (any two)

- **Genetics:** ODD can be inherited. It can also be developed in children with family members suffering from psychological disorders like personality disorders, mood disorders, anxiety disorders, etc.
- **Neurology:** Presence of abnormal amounts of neurotransmitters in the brains has been linked to ODD. Due to this chemical anomaly, the different areas of individual's brain are unable to communicate properly.
- **Environment:** Environmental factors, such as an unhappy home in which there is animosity and violence among the members, social isolation outside of the home, poverty, general lack of discipline in one's surroundings, neglectful parents, etc. are

also known for exacerbating aggressive behavioural symptoms.

8. Abrasion is a superficial injury to the skin when something rubs against it. It does not penetrate deeper than the epidermal layer of the skin. Friction between skin and hard or rough surfaces leads to an abrasion. The region where bones are closer to the skin gets easily damaged, such as elbows, knees and lower arms.

Management of Abrasion

- The first step is to wash the injured area with cold water, followed by application of an antiseptic.
- In case of a serious abrasion, light dressing should be done to speed-up the process of recovery.
- Anti-tetanus injection should be given. Painkillers may also be given if the patient experiences severe pain.

9. Advantages of physical activities for CWSN (any two)

- i. Physical activities are a good strategy for imparting motor skills and physical fitness that children with physical or intellectual disabilities might not have due to their condition. They will be able to develop hand-eye coordination, flexibility of the body, muscle strength and endurance, increased bone density and improved cardiovascular performance.
- ii. Physical activities, as we know by now, are also good for mental functions and emotional stability. They uplift the mood, reduce anxiety and provide relief from depression to an extent. The physically active child with disability has an improved self-esteem. She/he gains self-confidence and becomes better at social interactions.
- iii. Physical activities sharpen the mind, allowing the child with disability to have enhanced cognitive skills.

10. The dimensions of personality can be divided into four categories: (any three)

- i. **Physical Dimension:** This includes body size, shape, structure, colour, weight, voice, etc.
- ii. **Mental Dimension:** This dimension is related to mental and intellectual strength and abilities. This includes memory, imagination, reasoning, learning, thinking, etc.
- iii. **Social Dimension:** This includes social ideas, social behaviour, social acceptance, etc.
- iv. **Emotional Dimension:** This is related to emotional stability. It includes happiness, fear, anger, distress, disgust, amusement, etc.

11. Causes of disability (any three)

A few major causes of disabilities are discussed below:

- i. **Genetics:** Anomalies in genes can cause disabilities such as spinal bifida (split spine) and muscular dystrophy, and intellectual disabilities like Down syndrome and Fragile X syndrome. These are inherited at birth. However, diseases and overexposure to radiation may also bring about genetic abnormalities.
- ii. **Poverty:** Many families live below the poverty line and go without two square meals a day. Their living conditions are poor and they do not have access to quality healthcare, safe drinking water, proper sanitation and wholesome nutrition. As such, they fall prey

to many diseases and disabilities and pass them on to their offspring.

- iii. **Accidents:** Accidents are unpredictable external causes that may result in permanent disabilities, such as paralysis of the limbs, amputation and psychosomatic disorders. Those employed at dangerous workplaces, for example, mines, chemical industries, construction business, etc. should take extra care in order to avoid accidents.
 - iv. **Diseases:** If a child is not vaccinated on time, she/he may become susceptible to diseases like polio which can cripple her/him. Infectious diseases acquired during infancy and childhood, or during pregnancy by the infected mother, may result in growth retardation, seizures, congenital toxoplasmosis, etc. Illnesses like diabetes, cancer, arthritis, etc. also result in disabilities.
 - v. **Hormonal Imbalances:** Disturbances in the function of the endocrine glands are also responsible for bringing about disabilities, both physical and mental.
12. There are various causes of sports injuries. Some of them are as follows: (any three)
- i. **Poor Training Methods and Duration:** One of the leading causes of injury is poor training. Unhealthy methods, long period of training sessions without rest lead to injuries during training and competitions. Undertraining is as harmful as overtraining.
 - ii. **Lack of Preparation:** If players do not prepare themselves properly, they are liable to get injured. They are not conditioned to face the challenges and to use the right techniques while performing. Therefore, they get easily hurt if both their body and mind are not prepared well in advance.
 - iii. **Improper Warming-up:** Without a proper warming-up routine, players are likely to injure themselves because their bodies are less flexible in the beginning after a period of inactivity. So, warming-up is absolutely necessary before a training session and competitions.
 - iv. **Lack of Scientific Knowledge:** If athletes do not have a clear understanding about the biology of their bodies and the laws of physics, they will make more mistakes and use wrong techniques. This increases the risk of injuries among them during competitions. Therefore, they should adopt a scientific approach in training and performance to avoid injuries.
 - v. **Lack of Fitness:** If the body as well as mind are not up to the mark, athletes will be more susceptible to injuries. Lack of physical, physiological and psychological fitness obviously makes an athlete vulnerable to various types of sports injuries. Therefore, it is an essential part of any sports to maintain both physical and mental fitness to minimise chances of injuries.

13. Obesity – Vajrasana, Hastasana, Trikonasana

Benefits of Vajrasana

- i. This asana lowers the circulation of blood in the lower legs, diverting it to the abdominal area, where the digestive organs are located.
- ii. Vajrasana helps in case of gas formation in the stomach and stops the formation of

ulcers. It also brings relief from constipation.

Benefits of Hastasana

- i. Hastasana is especially beneficial for those with weight problems since it fully stretches the stomach organs and improves digestion.
- ii. Additionally, it also stretches the armpits and shoulders and boosts circulation throughout the body.

Benefits of Trikonasana

- i. It relieves gastritis, indigestion, flatulence, and acidity. Since it helps burn fat, it is highly recommended for those hoping to lose excess weight.
- ii. It also improves flexibility of the spine and corrects the posture of the shoulders.

14.
 - i. The foundation of interval training is the principle of 'effort and recovery'. Workload is increased by raising workout duration while simultaneously shortening recovery period.
 - ii. Interval training depends on factors like the speed of work, interval of recovery, duration of work, number or repetitions and mode of recovery. These factors are adjusted according to the capacity of the athlete. The advantages that may be gained through this training include improvement of respiratory and circulatory systems, thus enabling the athlete to attain peak performance in a relatively short period of time, increase in intensity of workout during a relatively short period of time, easy monitoring of the athlete's progress, drilling a habit of patience into the athlete, etc.
 - iii. It may also be mentioned that risk of getting injuries is higher in this method, in addition to becoming vulnerable to heart diseases with prolonged use of the method.
15. According to Carl Jung - *"Personality as an attitude refers to a predisposition to behave in a certain manner"*.

Carl Jung classified personality into three types. They are as follows:

- i. **Introvert:** An introvert is associated with introversion. They are motivated or energised by the internal world of thoughts, feelings and reflections. They focus on the effect the outside world has on them. Introverts prefer their own company to that of others. They do not feel comfortable socialising or being around new people.
 - ii. **Extrovert:** An extrovert is associated with extraversion by the external world of objects and other people. They are just opposite to introverts. They thrive in social settings. They like to be around people and interact with them. Introverts are thought-oriented and extroverts are action-oriented.
 - iii. **Ambivert:** No one is completely introverted or extroverted, and it would be dangerous to become so. An introvert needs to channel the extraversion in her/him to stay connected to the outside world, while an extrovert should do the same with her/his introverted sight to keep in touch with her/his inner self. The persons who possess both the traits of introverts and extroverts are called ambiverts.
16.
 - i. **Aerobic Capacity:** The ability to sustain an activity for a certain length of time using the energy derived from oxygen consumption is one of the crucial factors which determines

endurance. In other words, aerobic capacity is the functional capacity of the body to supply sufficient amount of O₂ to the muscles for the generation of energy.

- ii. **Lactic Acid Tolerance:** This is an efficient predictor of endurance capacity. It is the ability to tolerate the accumulation of lactic acid, especially during activities spanning 40 seconds or more. This accumulation is due to imbalance in formation and removal of lactic acid in the body. Endurance can be improved by enhancing lactic acid tolerance with proper training.
- iii. **Movement Economy:** Saving energy is always advantageous in endurance sports to maintain the level of performance throughout the whole activity. Economical movements minimise energy consumption. For instance, athletes can run for a longer period of time maintaining a given speed if they exhaust less energy. In swimming, precise movements and strokes can conserve 20–30% of energy. Experienced runners land directly under their front knee, i.e. slightly in front of their centre of gravity. This enables them to make precise movements and reduce unnecessary movements.
- iv. **Muscle Composition:** Muscles have two types of fibres, namely, fast-twitch and slow-twitch fibres. Slow-twitch fibres exert a small force and maintain it for a long time. That is why, higher percentage of slow-twitch fibres is ideal for endurance activities such as a marathon race. However, this percentage is determined by genetic factors. Various findings have shown that world-class marathon runners have more than 90% of slow-twitch fibres in their leg muscles.

17. Given below are some definitions of speed by experts:

“Speed is the prerequisite to do motor actions under given conditions (movement task, external force, individual prerequisite) in minimum of time”. – Theiss and Schnabel

“Speed is the capacity of an individual to perform successive movement of the same pattern at a fast rate”. – Johanson and Nelson

It is characterised by maximally quick alteration of contraction and relaxation of muscles. Speed of individuals will vary according to the functioning of their nervous system. The implication of this factor is that it is not as easy to train an athlete in speed as it is to develop her/his strength and endurance.

Speed is determined by: (any three)

- i. The structure of the muscle fibres, as fast-twitch muscle (phasic) fibres dictate the level of speed an individual can achieve. This aspect is hereditary. Hence, athletes of certain races are better sprinters than others.
- ii. The successful coordination between motor and sensory nerves, as speed is produced by swift alteration between contraction and relaxation of the muscles. The nervous system manages this particular activity, hence the motor nerves should have a strong rapport with the sensory nerves.
- iii. The explosive strength of the individual’s muscles. The greater the explosive strength, the greater the speed.
- iv. The flexibility and durability of the muscles; they should be able to execute a wide range of movements.

- v. The amount of energy stores – both the main and supplementary – the individual has as a ready supply of energy during the exercise or competition.
18. Ardha Chakrasana (*'Ardha'* meaning 'half' and *'Chakra'* meaning wheel') is also known as the half wheel pose. In this posture, as the body takes the shape of a half wheel, hence it is called Ardha Chakrasana. It is a warm-up asana which prepares the body for more difficult asanas.



Procedure

1. Stand straight. Now, support the back at the waist with all the fingers together pointing downward or forward.
2. With slow inhalation, bend backwards from lumbar region stretching the neck muscles.
3. Remain in this pose for few seconds with normal breathing.
4. Inhale and slowly come up. Do it for three to four times.

Benefits

- It eases constipation when practised in the morning, which helps in maintaining a proper digestive system.
- It is an important asana for people with excessive fat, especially around the waist.
- It also helps in improving the heart rate. Thus, two common problems of the modern world namely asthma and high blood pressure can be controlled through this asana.
- It makes the spine flexible and strengthens the spinal nerves and the neck muscles. It also improves breathing capacity.

Contraindications

- Do not perform this posture in case of vertigo or a tendency to giddiness.
- Persons with high blood pressure should bend with care.