



CUET PG MPT/Master in Respiratory Theory (MRT) (SCQP21)

Time Allowed : 1 hour 45 minutes	Maximum Marks : 300	Total questions : 75
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General Instructions

Read the following instructions very carefully and strictly follow them:

- (i) This question paper comprises 75 questions. All questions are compulsory.
- (ii) Each question carries 04 (four) marks.
- (iii) For each correct response, candidate will get 04 (four) marks.
- (iv) For each incorrect response, 01 (one) mark will be deducted from the total score.
- (v) Un-answered/un-attempted response will be given no marks.
- (vi) To answer a question, the candidate needs to choose one option as correct option.
- (vii) However, after the process of Challenges of the Answer Key, in case there are multiple correct options or change in key, only those candidates who have attempted it correctly as per the revised Final Answer Key will be awarded marks.
- (viii) In case a Question is dropped due to some technical error, full marks shall be given to all the candidates irrespective of the fact who have attempted it or not

1: The musculocutaneous nerve does not supply

- (1) Coracobrachialis
- (2) Pectoralis Minor
- (3) Long head of biceps
- (4) Short head of biceps brachii

Correct Answer: (2) Pectoralis Minor

Solution:

The musculocutaneous nerve originates from the lateral cord of the brachial plexus and primarily supplies muscles in the anterior compartment of the arm:

- **Coracobrachialis:** Initiates shoulder flexion.
- **Biceps brachii (both heads):** Flexes the elbow and supinates the forearm.
- **Brachialis:** A primary elbow flexor.

However, the pectoralis minor is supplied by the medial and lateral pectoral nerves, not the musculocutaneous nerve.

Quick Tip

The musculocutaneous nerve is confined to the anterior compartment of the arm. Remember: pectoralis minor is related to the chest region and supplied by pectoral nerves, not the musculocutaneous nerve.

2: Superior oblique (an extraocular muscle) is supplied by which cranial nerve?

- (1) Trochlear
- (2) Abducens
- (3) Facial
- (4) Oculomotor

Correct Answer: (1) Trochlear

Solution:

The superior oblique muscle is unique because it is:

- Innervated by the trochlear nerve (cranial nerve IV).
- Responsible for depressing and intorting the eyeball (rotating it inward).

The trochlear nerve is the only cranial nerve that exits dorsally from the brainstem and crosses to supply the contralateral muscle. Other extraocular muscles are supplied by the oculomotor nerve (CN III) and abducens nerve (CN VI).

Quick Tip

Remember "SO4" for Superior Oblique and Trochlear Nerve (CN IV). Its distinct function—depression and inward rotation—sets it apart from other extraocular muscles.

3: Superior Gluteal Nerve supplies the following muscle

- (1) Gluteus maximus
- (2) Gemellus inferior
- (3) Obturator internus
- (4) Tensor fascia lata

Correct Answer: (4) Tensor fascia lata

Solution:

The superior gluteal nerve originates from the sacral plexus (L4-S1) and supplies:

- **Gluteus medius:** Hip abduction and medial rotation.
- **Gluteus minimus:** Similar function as the gluteus medius.
- **Tensor fascia lata:** Stabilizes the pelvis and knee during walking.

The gluteus maximus is supplied by the inferior gluteal nerve, and the gemellus inferior and obturator internus are innervated by the nerve to obturator internus.

Quick Tip

The superior gluteal nerve stabilizes the pelvis through the gluteus medius, minimus, and tensor fascia lata. Remember: Tensor fascia lata works in tandem with gluteus medius for smooth walking.

4: Aplastic anemia is due to

- (1) Disorder of red bone marrow
- (2) Iron deficiency
- (3) Vitamin B12 deficiency
- (4) Folic acid deficiency

Correct Answer: (1) Disorder of red bone marrow

Solution:

Aplastic anemia is characterized by the bone marrow's failure to produce adequate blood cells, resulting in:

- Reduced red blood cells (anemia).
- Low white blood cells (increased infection risk).
- Low platelets (bleeding tendency).

Common causes include radiation, toxic exposure, autoimmune conditions, or infections like hepatitis. Unlike nutrient deficiencies (iron, B12, folate), aplastic anemia affects all blood cell lines (pancytopenia).

Quick Tip

Aplastic anemia impacts all blood cell types, not just red cells. Link "aplastic" with "absent cell production" for easy recall.

5: Fick principle is used as a

- (1) Method of measurement of vital capacity
- (2) Method of measurement of tidal volume
- (3) Method of measurement of cardiac output
- (4) Method of measurement of blood volume

Correct Answer: (3) Method of measurement of cardiac output

Solution:

The Fick principle calculates cardiac output by using oxygen consumption and the difference in oxygen content between arterial and venous blood:

$$\text{Cardiac Output} = \frac{\text{Oxygen Consumption}}{\text{Arterial Oxygen Content} - \text{Venous Oxygen Content}}$$

Key steps:

- Measure oxygen consumption through respiratory analysis.
- Determine arterial and venous oxygen content using blood samples.
- Calculate the ratio to determine cardiac output, which reflects the heart's pumping efficiency.

Quick Tip

The Fick principle uses oxygen balance to estimate cardiac output. Think of it as measuring the heart's "oxygen delivery efficiency."

6: The correct formula for the alveolar ventilation is

- (1) (Tidal Volume + Dead Space) x Respiratory Rate
- (2) (Tidal Volume - Dead Space) x Respiratory Rate
- (3) (Tidal Volume + Dead Space) / Respiratory Rate
- (4) (Tidal Volume - Dead Space) / Respiratory Rate

Correct Answer: (2) (Tidal Volume - Dead Space) x Respiratory Rate

Solution:

Alveolar ventilation calculates the effective air volume reaching the alveoli for gas exchange.

Formula:

$$\text{Alveolar Ventilation} = (\text{Tidal Volume} - \text{Dead Space}) \times \text{Respiratory Rate}$$

Steps:

- Subtract anatomical dead space (air not used in exchange) from tidal volume.
- Multiply by the respiratory rate to get ventilation per minute.

Quick Tip

Subtract dead space to isolate the usable air volume in alveolar ventilation. This ensures accurate assessment of respiratory efficiency.

7: The protection furnished by society to its members through a series of public measures against social and economic distresses is called as

- (1) Social welfare
- (2) Social security
- (3) Social work
- (4) Social reform

Correct Answer: (2) Social security

Solution:

Social security refers to the measures taken by society to provide protection to individuals against social and economic distress. It encompasses unemployment benefits, disability payments, and pensions. On the other hand, social welfare focuses on overall well-being, while social work refers to professional activities for improving social conditions, and social reform involves changes to improve societal structures.

Quick Tip

Social security provides financial support to individuals during hardships like unemployment or injury. It is essential for maintaining social stability.

8: Which of the following is the major effect of "Vrikshasana" pose in Yoga?

- (1) Gives a sense of balance
- (2) Strengthens upper limb muscles
- (3) Improves flexibility of the trunk
- (4) Improves breathing

Correct Answer: (1) Gives a sense of balance

Solution:

Vrikshasana, or the tree pose, involves standing on one leg while the other foot is placed on the inner thigh or calf. The major benefit of this posture is improving balance and stability by strengthening the lower body and engaging core muscles. While it helps in flexibility, balance is the most prominent benefit.

Quick Tip

To improve balance in Vrikshasana, focus on steadying your gaze and breathing. Engage your core muscles to prevent wobbling.

9: According to Piaget's stages of cognitive growth, 'emergence of language' is the major hallmark of:

- (1) Sensorimotor stage
- (2) Preoperational stage
- (3) Concrete operational stage
- (4) Formal operational stage

Correct Answer: (2) Preoperational stage

Solution:

Piaget's preoperational stage, which occurs from approximately 2 to 7 years, is characterized by the emergence of language and symbolic thought. During this stage, children begin using

words and images to represent objects, and their thinking becomes more intuitive, although still limited by egocentrism.

Quick Tip

The preoperational stage marks the beginning of language development. Think of it as the stage where children start to "talk about" their thoughts.

10: The action of biceps brachii muscle on the elbow joint is an example of which class/order of lever?

- (1) First class/order of lever with mechanical advantage
- (2) First class/order of lever with mechanical disadvantage
- (3) Second class/order of lever
- (4) Third class/order of lever

Correct Answer: (4) Third class/order of lever

Solution:

The biceps brachii acts as a third-class lever on the elbow joint. In a third-class lever, the effort is applied between the fulcrum (elbow) and the load (weight in the hand). This configuration allows for a greater range of motion but sacrifices mechanical advantage.

Quick Tip

Third-class levers are common in the human body, particularly in the arms, where speed and range of motion are prioritized over force.

11: The paralysis of the dorsiflexors of the foot will result in the affected extremity and there could be during the swing phase of gait

- (1) Functional shortening; increased knee and hip flexion
- (2) Functional lengthening; increased knee and hip flexion
- (3) Functional shortening; decreased knee and hip flexion
- (4) Functional lengthening; decreased knee and hip flexion

Correct Answer: (2) Functional lengthening; increased knee and hip flexion

Solution:

Paralysis of the dorsiflexors causes the foot to drop during the swing phase of gait (foot slap). To compensate, the body increases knee and hip flexion to avoid the dragging foot. This results in a functional lengthening of the affected extremity.

Quick Tip

In cases of dorsiflexor paralysis, the body compensates by increasing knee and hip flexion to clear the foot off the ground.

12: The superior zygapophyseal facet in a typical lumbar vertebra faces and the inferior zygapophyseal facet faces their orientation limits

- (1) Posteromedially; anterolaterally; lateral flexion and rotation
- (2) Anterolaterally; anteromedially; lateral flexion and rotation
- (3) Anteromedially; posterolaterally; lateral flexion and rotation
- (4) Posteromedially; anterolaterally; flexion and extension

Correct Answer: (1) Posteromedially; anterolaterally; lateral flexion and rotation

Solution:

In the lumbar region, the superior zygapophyseal facet faces posteromedially, while the inferior facet faces anterolaterally. This orientation primarily limits lateral flexion and rotation, providing stability and restricting excessive movement.

Quick Tip

The lumbar spine's facet orientation limits rotation and lateral flexion, providing stability for weight-bearing and preventing excess motion.

13: Which of the following does not cause oedema?

- (1) Decreased plasma oncotic pressure

- (2) Decreased capillary permeability
- (3) Lymphatic obstruction
- (4) Increased capillary hydrostatic pressure

Correct Answer: (2) Decreased capillary permeability

Solution:

Oedema can be caused by:

- **Decreased plasma oncotic pressure:** Reduced albumin leads to fluid accumulation in tissues.
- **Increased capillary hydrostatic pressure:** Increased pressure forces fluid into interstitial spaces.
- **Lymphatic obstruction:** Fluid accumulation due to impaired drainage.

Decreased capillary permeability does not cause oedema; instead, it limits fluid movement from the blood into the tissues.

Quick Tip

Oedema is typically caused by factors that increase capillary pressure or decrease protein levels in the blood. Decreased permeability helps limit fluid leakage.

14: Which of the following is the most important rate-limiting enzyme of the glycolysis pathway?

- (1) Phosphohexose isomerase
- (2) Phosphofructokinase
- (3) Aldolase
- (4) Glyceraldehyde-3-phosphate dehydrogenase

Correct Answer: (2) Phosphofructokinase

Solution:

Phosphofructokinase (PFK) is the rate-limiting enzyme in glycolysis. It catalyzes the conversion of fructose-6-phosphate to fructose-1,6-bisphosphate. PFK activity is tightly regulated by various factors, including ATP and AMP levels.

Quick Tip

PFK is a key regulator in glycolysis. When energy is low (AMP high), PFK is activated, promoting glycolysis to generate ATP.

15: Which of the following is considered an essential component of a rehabilitation program to reduce the risk of musculoskeletal injury or re-injury during activities that involve high intensity deceleration and quick changes of direction?

- (1) Isokinetic training
- (2) Eccentric training
- (3) Concentric training
- (4) Isoinertial training

Correct Answer: (2) Eccentric training

Solution:

Eccentric training focuses on lengthening the muscle under tension, which is essential for controlling deceleration and preventing injury. This type of training strengthens muscles during high-intensity activities, like rapid directional changes, reducing the risk of musculoskeletal injuries.

Quick Tip

Eccentric training is crucial for improving muscle resilience during activities involving sudden stops or changes in direction, such as running or jumping.

16: The corrective exercise for diastasis recti is

- (1) Head lift in supine position with patient gently approximating the rectus muscle inferiorly with the crossed arms

- (2) Head lift in supine position with patient gently approximating the rectus muscle towards midline with the crossed arms and doing straight leg raising with abducted lower extremities
- (3) Head lift in hook lying position with patient gently approximating the rectus muscle towards midline with the crossed arms
- (4) Repeated abdominal crunches in supine lying

Correct Answer: (3) Head lift in hook lying position with patient gently approximating the rectus muscle towards midline with the crossed arms

Solution:

Diastasis recti refers to the separation of the rectus abdominis muscles along the midline of the body. Corrective exercises aim to bring the muscles back together. The head lift in the hook-lying position engages the rectus muscle and assists in approximation without straining the abdominal wall, which is key in preventing further separation. Other options, such as straight leg raises and abdominal crunches, may exert too much force on the abdominal wall.

Quick Tip

For diastasis recti correction, focus on exercises that gently engage the rectus muscle towards the midline, avoiding excessive strain on the abdomen.

17: The medial glide to the subtalar joint of the foot is used to increase

- (1) Eversion
- (2) Inversion
- (3) Dorsiflexion only
- (4) Plantarflexion only

Correct Answer: (2) Inversion

Solution:

The subtalar joint is involved in foot inversion and eversion. A medial glide of the subtalar joint increases inversion, which is the movement where the sole of the foot turns towards the

midline of the body. This is critical in restoring proper foot alignment and function, especially in conditions affecting the subtalar joint.

Quick Tip

Medial glide at the subtalar joint facilitates inversion. This is important for conditions like flat feet where more inversion is required.

18: Monophasic sinusoidal currents introduced by Pierre Bernard are called as

- (1) HVPGS (High Voltage Pulse Galvanic Stimulation)
- (2) Galvanic current
- (3) Faradic current
- (4) Diadynamic current

Correct Answer: (4) Diadynamic current

Solution:

Monophasic sinusoidal currents, developed by Pierre Bernard, are referred to as diadynamic currents. These currents are typically used in electrotherapy for their ability to provide therapeutic benefits, such as muscle stimulation and pain relief. They are distinct from galvanic, faradic, and HVPGS currents.

Quick Tip

Diadynamic currents are used for muscle stimulation in therapeutic settings, providing relief in cases of muscle spasms and pain.

19: During the application of cold packs, the skin temperature is usually around

- (1) Below 0°C
- (2) 0°C
- (3) 5-10°C
- (4) 16-18°C

Correct Answer: (3) 5-10°C

Solution:

Cold packs are typically applied to reduce inflammation and numb the area. The skin temperature during the application of cold packs usually ranges between 5-10°C, which is sufficient to induce vasoconstriction and decrease pain without causing frostbite.

Quick Tip

For effective cryotherapy, maintain skin temperature within 5-10°C to avoid tissue damage while ensuring therapeutic benefits like reduced swelling.

20: In Ultraviolet Radiation (UVR) therapy, E3 is

- (1) 2.5 times E1
- (2) 5 times E1
- (3) 10 times E1
- (4) 12 times E1

Correct Answer: (2) 5 times E1

Solution:

In UVR therapy, the dosage of ultraviolet radiation is often measured in terms of erythemal dose (E1, E2, E3, etc.). E3 corresponds to five times the erythemal dose (E1), which is used in therapeutic applications for conditions like psoriasis or wound healing.

Quick Tip

In UVR therapy, remember that E3 is 5 times E1. This helps gauge the intensity and therapeutic range for various skin conditions.

21: Pressure is generally used to hasten scar maturation and to minimize scar hypertrophy during healing of burns. But it may not be required in the case of:

- (1) If wounds heal in less than 10-14 days

- (2) If the scar is less than 6 months old
- (3) If skin is grafted over the wound area
- (4) If scar is still red and shows evidence of vascularity

Correct Answer: (1) If wounds heal in less than 10-14 days

Solution:

Pressure garments are commonly used in burn rehabilitation to reduce hypertrophic scarring and improve scar maturation. However, if wounds heal in less than 10-14 days, scar formation is minimal, and pressure therapy may not be necessary.

Quick Tip

Pressure garments are most effective in the later stages of healing, especially after 10-14 days, when scar formation begins to stabilize.

22: Recommendation for developing and maintaining cardiovascular fitness in healthy adults is

- (1) 3 days/week for 40 minutes/day at an intensity of 10-11 on the RPE (Rate of Perceived Exertion) Scale
- (2) 3-5 days/week for 20-60 minutes/day at an intensity of 12-16 on the RPE (Rate of Perceived Exertion) Scale
- (3) 5 days/week for 60 minutes/day at an intensity of more than 16 on the RPE (Rate of Perceived Exertion) Scale
- (4) 3 days/week for 20 minutes/day at an intensity of 10-11 on the RPE (Rate of Perceived Exertion) Scale

Correct Answer: (2) 3-5 days/week for 20-60 minutes/day at an intensity of 12-16 on the RPE (Rate of Perceived Exertion) Scale

Solution:

For cardiovascular fitness, the general recommendation is 3-5 days of moderate to vigorous intensity exercise per week. The exercise should last between 20 to 60 minutes, with an

intensity on the RPE scale ranging from 12 to 16.

Quick Tip

To improve cardiovascular fitness, aim for moderate to vigorous activity, targeting an RPE of 12-16 for 20-60 minutes per session.

23: Which of the following are NOT the age-related physiological changes?

- (1) Loss of motor neurons
- (2) Reduction in size of Fast twitch Type II fibres
- (3) Reduction in size of Slow twitch Type I fibres
- (4) Increase in non-contractile tissue

Correct Answer: (3) Reduction in size of Slow twitch Type I fibres

Solution:

With aging, slow-twitch Type I muscle fibers generally maintain their size or may even increase due to enhanced endurance. However, fast-twitch Type II fibers, responsible for rapid, powerful contractions, tend to decrease in size. Additionally, aging leads to an increase in non-contractile tissue such as collagen.

Quick Tip

Slow-twitch fibers are typically more resistant to aging effects. Focus on exercises that enhance endurance to preserve these fibers.

24: Which of the following is incorrect regarding Boutonniere deformity?

- (1) It occurs due to rupture of the central slip of the extensor mechanism as a result of trauma or inflammation
- (2) There is hyperextension deformity at the PIP joint and flexion deformity at the DIP joint
- (3) Splinting is the first option in closed injuries and in early rheumatoid pathology
- (4) Surgical repair and reconstruction is required in cases of severe and total rupture

Correct Answer: (2) There is hyperextension deformity at the PIP joint and flexion deformity at the DIP joint

Solution:

Boutonniere deformity is characterized by the following:

- **Rupture of the central slip:** The condition occurs when the central slip of the extensor mechanism at the PIP joint ruptures, which may result from trauma or inflammation.
- **Deformity pattern:** The typical deformity is flexion at the PIP joint and hyperextension at the DIP joint, not the other way around.
- **Treatment:** In cases of mild injury or early rheumatoid involvement, splinting is the primary conservative treatment. Severe cases may require surgical intervention.

Quick Tip

In Boutonniere deformity, the classic deformity is flexion at the PIP joint and hyperextension at the DIP joint. Remember, it's the opposite of what might be intuitively expected.

25: In cervical Upper Crossed Syndrome

- (1) Deep neck flexors are strong
- (2) Deep neck flexors, rhomboids, and serratus anterior are weak
- (3) Pectoralis major and minor are weak
- (4) Lower trapezius is strong

Correct Answer: (2) Deep neck flexors, rhomboids, and serratus anterior are weak

Solution:

Cervical Upper Crossed Syndrome is a condition where:

- **Weak muscles:** The deep neck flexors, rhomboids, and serratus anterior are weak, contributing to poor posture and shoulder instability.

- **Tight muscles:** The pectoralis major/minor and upper trapezius/levator scapulae are tight and overactive, leading to forward head posture and rounded shoulders.
- **Corrective focus:** Treatment focuses on strengthening the weak muscles (deep neck flexors, rhomboids) and stretching the overactive muscles (upper traps, pectorals).

Quick Tip

In Upper Crossed Syndrome, strengthening the deep neck flexors and scapular stabilizers, while stretching tight upper traps and pectorals, can help restore posture.

26: The patient is lying prone. The examiner squeezes the calf muscles. The absence of plantarflexion on squeezing calf muscles indicates:

- (1) Ruptured Achilles tendon
- (2) Lateral tibial torsion
- (3) Peroneal tendon dislocation
- (4) Anterior talofibular ligament strain

Correct Answer: (1) Ruptured Achilles tendon

Solution:

The Thompson test is used to assess for an Achilles tendon rupture:

- **Thompson test:** The examiner squeezes the calf while the patient is in a prone position. If the Achilles tendon is intact, plantarflexion should occur.
- **Absence of plantarflexion:** If no plantarflexion is observed, it indicates a rupture of the Achilles tendon, a significant injury that typically requires surgical intervention.

Quick Tip

The Thompson test is the most reliable clinical test for detecting an Achilles tendon rupture. Absence of plantarflexion indicates a positive test.

27: A patient complains of lightheadedness, nausea, and spinning vertigo while lying in bed, turning in bed, and bending over to pick objects from the floor. He also feels off balance while walking. He is most likely to have:

- (1) Benign Paroxysmal Positional Vertigo
- (2) Migraine
- (3) Meniere's Disease
- (4) Vestibular Neuritis

Correct Answer: (1) Benign Paroxysmal Positional Vertigo

Solution:

The patient is likely experiencing Benign Paroxysmal Positional Vertigo (BPPV), which is characterized by:

- **Positional vertigo:** Symptoms are triggered by specific changes in head position, such as bending over or turning in bed.
- **Vertigo and balance issues:** The spinning sensation and balance issues when moving the head are hallmark signs of BPPV.
- **Cause:** BPPV is caused by the displacement of otoliths (tiny calcium crystals) in the inner ear, which disrupt the normal function of the vestibular system.

Quick Tip

BPPV is the most common cause of vertigo related to head movements. It's diagnosed through positional testing and treated with repositioning maneuvers like the Epley maneuver.

28: Cognition is assessed by testing the following

- (A) Fund of knowledge
- (B) Agnosia
- (C) Proverb interpretation
- (D) Two Point Discrimination

Correct Answer: (1) (A) and (C) only

Solution:

Cognition is assessed through tests that evaluate various aspects of cognitive function, such as:

- **Fund of knowledge (A):** This assesses the general knowledge and awareness of the patient, which is a core component of cognitive functioning.
- **Proverb interpretation (C):** This assesses abstract thinking and the ability to interpret metaphors and deeper meanings in language.
- **Agnosia (B):** A condition in which the brain fails to recognize familiar objects, faces, or sounds, which is a specific neuropsychological test, not part of routine cognition assessment.
- **Two Point Discrimination (D):** This test assesses sensory function rather than cognition.

Quick Tip

Cognitive assessments often focus on knowledge, abstract reasoning, and memory, not sensory or perceptual functions like agnosia or two-point discrimination.

29: Obligatory Flexor synergy components, observed in the upper limb, following Stroke are

- (1) Scapular protraction, shoulder adduction, internal rotation, elbow extension, forearm pronation, wrist and finger flexion
- (2) Scapular retraction, shoulder abduction, external rotation, elbow flexion, forearm supination, wrist and finger flexion
- (3) Scapular protraction, shoulder adduction, internal rotation, elbow extension, forearm supination, wrist and finger flexion
- (4) Scapular retraction, shoulder abduction, external rotation, elbow flexion, forearm pronation, wrist and finger extension

Correct Answer: (1) Scapular protraction, shoulder adduction, internal rotation, elbow extension, forearm pronation, wrist and finger flexion

Solution:

In stroke rehabilitation, the flexor synergy pattern is marked by:

- **Scapular protraction, shoulder adduction, internal rotation:** These movements are typical in a flexor synergy.
- **Elbow extension, forearm pronation:** These motions also contribute to the loss of coordinated movement.
- **Wrist and finger flexion:** This completes the flexor pattern, often resulting in a “claw hand” posture.

Quick Tip

The flexor synergy is a pattern of abnormal movement that occurs after a stroke. Understanding this helps in designing rehabilitation strategies to reduce spasticity.

30: The term, 'tic douloureux' is used to indicate the sharp shooting pain on the face, is a result of affection of the following nerve

- (1) Facial nerve
- (2) Trigeminal nerve
- (3) Trochlear nerve
- (4) Glossopharyngeal nerve

Correct Answer: (2) Trigeminal nerve

Solution:

Tic douloureux, also known as Trigeminal Neuralgia, is a condition characterized by sharp, shooting pain in the distribution of the trigeminal nerve. This nerve is responsible for sensation in the face, and its irritation or compression leads to episodes of intense pain.

Quick Tip

Tic douloureux (trigeminal neuralgia) involves the trigeminal nerve. The pain is often described as a sudden, severe, shock-like sensation on the face.

31: Consists of repeated cycles of three ventilatory phases; breathing control, thoracic expansion exercises, and forced expiration technique.

- (1) Functional Breathing Technique
- (2) Passive Cycle of Breathing Technique
- (3) Active Cycle of Breathing Technique
- (4) Manual Hyperinflation Followed by Secretion Clearance

Correct Answer: (3) Active Cycle of Breathing Technique

Solution:

The Active Cycle of Breathing Technique (ACBT) is a therapeutic technique designed to help individuals with chronic respiratory conditions clear secretions and improve lung ventilation. It involves the following steps:

- **Breathing Control:** Focuses on relaxing the body and controlling the breath. This is done in a comfortable position to promote normal breathing.
- **Thoracic Expansion Exercises:** Involves deep breaths to expand the lungs and encourage better air distribution, helping in improving lung volume.
- **Forced Expiration Technique (FET):** The patient forcefully exhales to help clear mucus from the lungs, particularly in the airways.

Quick Tip

ACBT is effective for improving lung function and clearing mucus in patients with chronic lung diseases like COPD. Always perform the technique in cycles to maximize lung capacity and secretion clearance.

32: Which of the following interventions facilitates the removal of airway secretions collected centrally?

- (1) Incentive spirometry
- (2) Pursed lip breathing
- (3) Suctioning
- (4) Manual percussion

Correct Answer: (3) Suctioning

Solution:

Suctioning is the most direct and effective method for removing airway secretions, especially those collected centrally. This involves the use of a catheter or suction device inserted into the airway to manually remove mucus and other fluids. While techniques like manual percussion help in loosening secretions, they are not as effective as suctioning for direct removal.

Quick Tip

Suctioning is commonly used in intensive care or emergency settings where patients are unable to clear their own airway secretions. It provides immediate relief and improves oxygenation.

33: The age-related decline in the VO_2 max can be offset by:

- (1) Aerobic training
- (2) Meditation
- (3) Relaxation training
- (4) Periodic assessment of respiratory functions

Correct Answer: (1) Aerobic training

Solution:

VO_2 max refers to the maximal oxygen uptake during exercise, and it typically declines with age due to changes in cardiovascular function. However, aerobic training has been shown to

slow down this decline and can even improve VO_2 max in older adults. Aerobic exercises like walking, cycling, or swimming increase heart efficiency and lung capacity, which helps maintain a higher VO_2 max.

Quick Tip

Aerobic training is essential for older adults. It improves cardiovascular efficiency and increases overall stamina, which helps in mitigating the decline in VO_2 max with age.

34: All these are absolute contraindications to exercise testing except:

- (1) Unstable angina
- (2) Pulmonary oedema
- (3) Uncontrolled hypertension
- (4) Resting tachycardia

Correct Answer: (4) Resting tachycardia

Solution:

Absolute contraindications to exercise testing include conditions that pose immediate risks to the patient's health. These include:

- Unstable angina: Ongoing chest pain due to inadequate blood supply to the heart.
- Pulmonary oedema: Fluid accumulation in the lungs, indicating heart failure.
- Uncontrolled hypertension: High blood pressure that cannot be managed or controlled.

While resting tachycardia is a concern, it is not an absolute contraindication unless it is linked with other serious conditions such as arrhythmias.

Quick Tip

Absolute contraindications prevent exercise testing. Ensure proper medical evaluation is done to assess the safety of testing in high-risk individuals.

35: The plyometric training should be kept as brief as possible for maximum effect during:

- (1) Concentric phase
- (2) Eccentric phase
- (3) Countermovement phase
- (4) Amortization phase

Correct Answer: (4) Amortization phase

Solution:

Plyometric training involves rapid muscle contractions, and the amortization phase refers to the brief transition between eccentric (muscle lengthening) and concentric (muscle shortening) phases. The shorter this phase, the more effective the plyometric training becomes, as it maximizes the stretch-shortening cycle and optimizes muscle power and efficiency. A prolonged amortization phase reduces the effectiveness of plyometric exercises.

Quick Tip

To enhance plyometric training, aim to minimize the amortization phase. This will improve muscle power and elasticity, key benefits of plyometric exercises.

36: The following training feature after ACL reconstruction should be avoided:

- (1) Closed chain strengthening of quadriceps between 60 degrees to 90 degrees of knee flexion
- (2) Open chain training of quadriceps between 90 degrees of flexion to 60 degrees of flexion
- (3) Isometric quadriceps exercises
- (4) Exercise on continuous passive motion unit

Correct Answer: (2) Open chain training of quadriceps between 90 degrees of flexion to 60 degrees of flexion

Solution:

After ACL reconstruction, the focus is on protecting the knee joint and promoting recovery. Open chain quadriceps exercises between 90° and 60° flexion should be avoided because they place undue stress on the ACL graft, which is still healing. Closed chain exercises and isometric quadriceps exercises are generally safe in the early stages of rehabilitation.

Quick Tip

Post-ACL surgery, avoid open chain exercises between 90° and 60° of flexion to protect the graft and promote proper healing. Focus on strengthening the quadriceps with safer closed chain exercises.

37: Which of the following techniques involves voluntary muscle contractions by the patient in a precisely controlled direction and intensity against a counterforce applied by the practitioner?

- (1) Rhythmic Initiation
- (2) Muscle Energy Technique
- (3) Neuromuscular Stimulation
- (4) Active Stretching Technique

Correct Answer: (2) Muscle Energy Technique

Solution:

The Muscle Energy Technique (MET) involves the patient performing voluntary muscle contractions against a counterforce provided by the therapist. This technique is used to restore range of motion and reduce muscle tightness, particularly in conditions like joint stiffness or muscle spasm. The therapist applies a resistance to the muscle contraction, which helps stretch the muscle and improve flexibility.

Quick Tip

MET is effective in reducing muscle tightness and improving range of motion. By involving the patient in active muscle contraction, it provides better results than passive stretching.

38: Affective psychotic disorders include which one of the following?

- (1) Delusional disorder
- (2) Bipolar disorders
- (3) Schizophrenia
- (4) Mental retardation

Correct Answer: (2) Bipolar disorders

Solution:

Affective psychotic disorders, also known as mood disorders with psychotic features, include conditions such as bipolar disorder. This disorder is marked by alternating periods of mania and depression, and psychotic features such as delusions or hallucinations can occur during mood extremes. Schizophrenia, while a psychotic disorder, is not considered an affective disorder.

Quick Tip

Bipolar disorder is classified as an affective psychotic disorder. It involves both mood disturbances (mania and depression) and psychotic episodes.

39: Which of the following is a non-modifiable risk factor for the development of COPD?

- (1) Increasing age
- (2) Tobacco smoking
- (3) Exposure to noxious fumes at occupational settings
- (4) Increased use of biomass fuel

Correct Answer: (1) Increasing age

Solution:

COPD (Chronic Obstructive Pulmonary Disease) is a progressive lung disease that is largely preventable. Among the options, the non-modifiable risk factor is increasing age. The following explanations for the other options:

- Tobacco smoking and exposure to noxious fumes at occupational settings are major modifiable risk factors. Reducing smoking and avoiding harmful fumes can help prevent or slow down the progression of COPD.
- Increased use of biomass fuel is also a modifiable risk factor, as switching to cleaner energy sources can reduce exposure to harmful pollutants.

Age increases the risk of developing COPD, but it cannot be modified or prevented.

Quick Tip

Age is a non-modifiable risk factor for COPD. However, lifestyle changes such as quitting smoking and reducing exposure to pollutants can significantly reduce the risk and progression of the disease.

40: Lepra bacilli was detected by

- (1) Hansen
- (2) Ross
- (3) Robert Koch
- (4) Reed

Correct Answer: (1) Hansen

Solution:

Lepra bacilli, the bacteria that cause leprosy, were first identified by Gerhard Armauer Hansen, a Norwegian physician, in 1873. He discovered the bacilli in the tissue samples of leprosy patients, which marked the beginning of microbiological studies of the disease.

Quick Tip

Remember: Hansen is the scientist who discovered Lepra bacilli, a key milestone in the study of leprosy.

41: In the context of outcome measures, it is the degree to which an outcome is measuring what it purports to measure.

- (1) Reliability
- (2) Validity
- (3) Internal consistency
- (4) Responsiveness

Correct Answer: (2) Validity

Solution:

Validity refers to the extent to which an instrument or outcome measure accurately measures what it is intended to measure. It is essential for ensuring that conclusions drawn from a study or assessment are meaningful and relevant.

- Reliability refers to the consistency or repeatability of an instrument, not necessarily its accuracy.
- Internal consistency refers to the degree to which different items on a test measure the same construct.
- Responsiveness indicates how well an outcome measure detects changes over time.

Quick Tip

Validity is about ensuring that the right thing is being measured, so always ensure that your outcome measure aligns with your intended purpose.

42: A therapist categorizes the patients visiting his clinic according to their blood groups- A, B, AB, and O. This is an example of:

- (1) Ordinal level measurement
- (2) Nominal level measurement
- (3) Ratio level measurement
- (4) Interval level measurement

Correct Answer: (2) Nominal level measurement

Solution:

In nominal level measurement, data is categorized into distinct groups or categories without any inherent order. The classification of patients according to blood group (A, B, AB, O) is an example of nominal data since there is no ranking or ordering of the blood groups.

- Ordinal: Data with a meaningful order, but the intervals between categories are not necessarily equal (e.g., rankings).
- Ratio: Data with both an order and an absolute zero (e.g., weight, height).
- Interval: Data with order and equal intervals, but no absolute zero (e.g., temperature in Celsius).

Quick Tip

Nominal data is simply for classification into categories with no order. Blood groups are a classic example of nominal measurement.

43: Evidence Based Medicine involves:

- (1) Integration of best research evidence with clinical expertise and patient's unique values and circumstances
- (2) Integration of expert opinion with clinical expertise
- (3) Treatment based on research evidence and clinical expertise without any regard for patient's values
- (4) Treatment based on case-control studies

Correct Answer: (1) Integration of best research evidence with clinical expertise and patient's unique values and circumstances

Solution:

Evidence-Based Medicine (EBM) is an approach that combines the best available research evidence, clinical expertise, and patient values to make informed healthcare decisions. It

involves not just scientific data, but also the patient's preferences and values, ensuring a more personalized and holistic approach to treatment.

- Expert opinion alone isn't sufficient for EBM, and case-control studies are one type of evidence, but they don't define the whole approach.

Quick Tip

In EBM, it's crucial to balance research evidence with clinical experience and patient preferences. This approach ensures that treatments are effective and aligned with the patient's individual needs.

44: "Equal distribution to all members of a group" comes under the following Moral Principle:

- (1) Beneficence
- (2) Autonomy
- (3) Justice
- (4) Nonmaleficence

Correct Answer: (3) Justice

Solution:

The moral principle of Justice refers to fairness and equality in the distribution of benefits, resources, and burdens among individuals or groups. In healthcare, it ensures that everyone has equal access to care and that resources are distributed equitably.

- Beneficence: Promotes actions that benefit others.
- Autonomy: Respects the individual's right to make their own decisions.
- Nonmaleficence: Avoids causing harm to others.

Quick Tip

Justice in healthcare is about fairness and ensuring that all individuals receive equitable treatment and resources, especially in areas with limited resources.

45: Progress notes for a patient are written in SOAP (Subjective, Objective findings, Assessment and Plan) Format. Anticipated goals and expected outcomes are included in the:

- (1) Subjective
- (2) Objective findings
- (3) Assessment
- (4) Planning

Correct Answer: (4) Planning

Solution:

In the SOAP format:

- Subjective: Describes the patient's perspective and experience.
- Objective: Includes measurable findings from the examination.
- Assessment: The healthcare provider's analysis and diagnosis.
- Planning: This section outlines the treatment goals, expected outcomes, and the next steps in care.

Anticipated goals and expected outcomes fall under the Planning section because they guide the future course of action in treatment.

Quick Tip

Always include clear, measurable goals in the "Planning" section of SOAP notes. This ensures that care is targeted and progress can be assessed.

46: The correct sequence at the postsynaptic membrane during neuromuscular transmission at neuromuscular junction is:

- (A) Opening of ligand-gated sodium channels
- (B) Binding of Acetylcholine (ACh) with receptor and formation of ACh-receptor complex
- (C) Entry of sodium ions into ECF
- (D) Development of endplate potential

Choose the correct answer from the options given below

- (1) (A), (B), (C), (D)
- (2) (A), (B), (D), (C)
- (3) (B), (A), (C), (D)
- (4) (B), (A), (D), (C)

Correct Answer: (4) (B), (A), (D), (C)

Solution:

Neuromuscular transmission occurs in the following sequence:

- (B): Acetylcholine (Ach) binds to receptors on the postsynaptic membrane, forming the Ach-receptor complex.
- (A): This binding opens ligand-gated sodium channels.
- (D): This results in an influx of sodium ions into the extracellular fluid, creating an endplate potential.
- (C): The endplate potential leads to muscle contraction.

Quick Tip

Understanding the sequence of neuromuscular transmission helps in understanding muscle contractions and potential disorders like myasthenia gravis.

47: On the dorsum of the hand, the correct arrangement of tendons (from lateral to medial) is

- (A) Extensor carpi radialis longus and brevis
- (B) Extensor digitorum
- (C) Extensor pollicis longus
- (D) Extensor digiti minimi

Choose the correct answer from the options given below

- 1.(A), (C), (B), (D)
- 2.(A), (B), (D), (C)

3.(B), (A), (D), (C)

4.(D), (A), (B), (C)

Correct Answer: (1) (A), (C), (B), (D)

Solution:

The arrangement of tendons on the dorsum of the hand, from lateral to medial, is as follows:

1. Extensor carpi radialis longus and brevis – These are the first tendons to appear from the lateral side, responsible for wrist extension and radial deviation.
2. Extensor pollicis longus – Located medially, this tendon extends the thumb.
3. Extensor digitorum – This tendon extends the fingers and is positioned next.
4. Extensor digiti minimi – This tendon is the most medial, responsible for extending the little finger.

Quick Tip

The lateral-to-medial arrangement of tendons on the dorsum of the hand can be memorized with the acronym E for Extensor Carpi Radialis, E for Extensor Pollicis Longus, E for Extensor Digitorum, and E for Extensor Digiti Minimi.

48: If a suitable liquid medium is inoculated with bacterium and incubated, the growth of bacterium follows a definitive course. The sequence of phases of bacterial growth curve is

- (A) Rate of death exceeds rate of reproduction, and the bacterial population decreases due to cell death
- (B) In lag phase, there is an increase in cell size and no increase in cell number. Necessary enzymes and metabolic intermediates are built up for multiplication to proceed
- (C) Cell division slows down and stops due to depletion of nutrients and accumulation of toxic products. There is an equilibrium between dying cells and the newly formed cells
- (D) In log phase, cell numbers increase exponentially or by geometric progression with time

Choose the correct answer from the options given below

1.(A), (C), (D), (B)

2.(A), (B), (D), (C)

3.(B), (A), (D), (C)

4.(D), (B), (C), (A)

Correct Answer: (4) (D), (B), (C), (A)

Solution:

Bacterial growth follows a distinct series of phases:

1. Lag Phase (B): Cells are metabolically active but not dividing. They prepare for multiplication by building necessary enzymes and intermediates.
2. Log Phase (D): This is the phase where bacterial numbers increase exponentially. It is the most rapid growth phase.
3. Stationary Phase (C): Cell division slows due to depletion of nutrients and accumulation of waste products. The rate of cell death equals the rate of cell formation.
4. Death Phase (A): Eventually, the rate of death exceeds reproduction, leading to a decline in the population.

Quick Tip

In bacterial growth, focus on the exponential increase in numbers during the Log Phase as this is where most antimicrobial agents are effective.

49: The correct sequence of 'Ujjayi Pranayama' is

- (A) Close eyes and exhale completely
- (B) Hold the breath for a second or two. Exhale slowly and deeply to empty the lungs
- (C) Sit in Padmasana with arms outstretched and back of wrists resting on knees
- (D) Take a slow deep breath till lungs are completely filled

Choose the correct answer from the options given below

1.(A), (B), (C), (D)

2.(D), (A) (B), (C)

3.(C), (A), (D), (B)

4.(A), (C) (D) (B)

Correct Answer: (3) (C), (A), (D), (B)

Solution:

The correct sequence for performing Ujjayi Pranayama, a yoga breathing technique, is:

1. (C): Sit in a comfortable seated position (e.g., Padmasana), with arms outstretched and the back of wrists resting on the knees.
2. (A): Close your eyes and exhale completely.
3. (D): Take a slow, deep breath, filling the lungs completely.
4. (B): Hold the breath for a moment, then exhale slowly and deeply.

Quick Tip

Ujjayi Pranayama is often called the victorious breath. It is important to control both the inhalation and exhalation to maintain calmness and clarity during the practice.

50: The sequence of vascular events that take place during an acute inflammatory response are

- (A) Persistent progressive vasodilatation involving mainly the arterioles
- (B) Elevated local hydrostatic pressure causing transudation of fluid into the extracellular space
- (C) Slowing of microcirculation causing increased red cell concentration followed by peripheral orientation of leucocytes along the vascular endothelium
- (D) Transient vasoconstriction of arterioles

Choose the correct answer from the options given below

- 1.(A), (C), (D), (B)
- 2.(A), (B), (D), (C)
- 3.(B), (A), (D), (C)
- 4.(D), (A), (B), (C)

Correct Answer: (1) (A), (C), (D), (B)

Solution:

During the acute inflammatory response, the vascular events occur in the following sequence:

1. (D): Initially, there is a transient vasoconstriction of arterioles.
2. (A): This is followed by persistent vasodilatation, particularly in the arterioles, which leads to increased blood flow to the injured site.
3. (C): The microcirculation slows, and red cell concentration increases. Leukocytes start to orient along the vascular endothelium in a process called margination.
4. (B): Elevated hydrostatic pressure leads to the transudation of fluid into the extracellular space, causing swelling and edema.

Quick Tip

During inflammation, vascular changes are crucial for the immune response, allowing for the delivery of immune cells and nutrients to the site of injury.

51: The correct order of the Valsalva maneuver is

- (A) Closure of glottis
- (B) Deep inspiration
- (C) Increase in intra-abdominal and intrathoracic pressures
- (D) Contraction of abdominal muscles

Choose the correct answer from the options given below

- 1.(A), (B), (C), (D)
- 2.(A), (B), (D), (C)
- 3.(B), (A), (D), (C)
- 4.(C), (B), (D), (A)

Correct Answer: (2) (A), (B), (D), (C)

Solution:

The Valsalva maneuver involves the following steps:

1. (A): First, the glottis is closed.
2. (B): The person takes a deep inspiration.
3. (D): The abdominal muscles contract, which helps increase intra-abdominal pressure.
4. (C): This increased pressure results in elevated intrathoracic pressure.

Quick Tip

The Valsalva maneuver is often used in clinical settings to assess autonomic function, particularly the response of the cardiovascular system.

52: The sequence of currents in increasing order of frequency will be

- (A) Short wave diathermy
- (B) Long duration interrupted direct current
- (C) Faradic current
- (D) Interferential therapy

Choose the correct answer from the options given below

- 1.(B), (C), (D), (A)
- 2.(C), (A), (D), (B)
- 3.(A), (C) (B) (D)
- 4 (B), (D), (A), (C)

Correct Answer: 3.(A), (C) (B) (D)

Solution:

The frequency of different therapeutic currents increases as follows: 1. Short wave diathermy (A) – Uses frequencies between 1.8 and 30 MHz.

2. Faradic current (C) – This is a low-frequency current, typically between 50 to 100 Hz, used for stimulating muscles.

3. Long duration interrupted direct current (B) – This is a form of direct current with low frequencies.

4. Interferential therapy (D) – This high-frequency therapy involves currents above 1000 Hz and is used for pain management and muscle stimulation.

Quick Tip

To remember the order, think of increasing current frequency as A, C, B, D, starting from the lowest frequency (A) to the highest (D).

53: Respiratory alkalosis is best described by the following sequence of events

- (A) Fall in plasma bicarbonate
- (B) PaCO₂ and H⁺ fall
- (C) Over-ventilation of lungs
- (D) Reduced renal Na⁺/H⁺ exchange

Choose the correct answer from the options given below

- 1. (A) (B) (C) (D)
- 2. (D) (B) (C) (A)
- 3. (B) (A) (D) (C)
- 4 (C) (B) (D) (A)

Correct Answer: 4 (C) (B) (D) (A)

Solution:

The sequence of events in respiratory alkalosis occurs as follows:

- 1. (C): Over-ventilation of the lungs – This leads to excessive expulsion of CO₂ from the body.
- 2. (B): As CO₂ is expelled, PaCO₂ and H⁺ levels fall, causing alkalosis.
- 3. (A): In response to the alkalosis, the plasma bicarbonate decreases as the kidneys compensate.
- 4. (D): Reduced renal Na⁺/H⁺ exchange – The kidneys try to correct the alkalosis by reducing the exchange of sodium for hydrogen ions.

Quick Tip

In respiratory alkalosis, remember the key causes: Over-ventilation (C) leads to a fall in CO₂ (B), which in turn causes bicarbonate reduction (A) and altered renal function (D).

54: The correct sequence of steps during Adson Maneuver (used for diagnosing thoracic outlet syndrome) are

- (A) The patient's head is rotated to face the test shoulder
- (B) The examiner locates the radial pulse
- (C) The patient is instructed to take a deep breath and hold it
- (D) The patient then extends the head while the examiner laterally rotates and extends the patient's shoulder.

Choose the correct answer from the options given below

1. (A) (B) (C) (D)
2. (A) (B) (D) (C)
3. (B) (A) (D) (C)
- 4 (C) (B) (D) (A)

Correct Answer: (2) (A), (B), (D), (C)

Solution:

The Adson Maneuver, used for diagnosing thoracic outlet syndrome, follows these steps: 1.

- (A): The patient's head is rotated towards the test shoulder.
2. (B): The examiner palpates the radial pulse.
3. (D): The patient is asked to extend the head while the examiner laterally rotates and extends the shoulder.
4. (C): The patient takes a deep breath and holds it, which helps to elicit changes in the radial pulse.

Quick Tip

In the Adson Maneuver, the key is the head rotation toward the test shoulder (A), combined with shoulder extension (D) and the deep breath (C), which are essential to stress the thoracic outlet.

55: The steps used in the design of a questionnaire are:

- (A) Piloting the questionnaire i.e. giving it to a few people in order to collect feedback on unclear or insensitive questions.
- (B) Initial draft of the questionnaire

- (C) Second pilot trial to establish if earlier problems have been taken care of followed by remodification and design of final questionnaire
- (D) Modification of the questionnaire using the information collected from the pilot trial

Choose the correct answer from the options given below

1. (A) (B) (C) (D)
2. (A) (B) (D) (C)
3. (B) (A) (D) (C)
- 4 (C) (B) (D) (A)

Correct Answer: (1) (A), (B), (D), (C)

Solution:

- The steps involved in designing a questionnaire are as follows:
1. (B): Initial draft – Begin by drafting the questions based on the objectives of the survey or study.
 2. (A): Piloting – Test the initial draft on a small sample to collect feedback. This helps to identify unclear or biased questions.
 3. (D): Modification – Modify the questionnaire based on the pilot feedback to improve clarity and precision.
 4. (C): Second pilot trial – Conduct a second trial after making the modifications to ensure that the changes have addressed previous issues.

Quick Tip

When designing a questionnaire, focus on the pilot phase. Piloting the questionnaire (A) and then modifying it (D) ensures that you collect reliable data from the final version.

56: Which of the following is correct about the umbilicus?

- (A) Lymph and venous blood flow upwards above the plane of the umbilicus; and downwards below this plane. These do not cross the umbilical plane.
- (B) It is a normal scar in the anterior abdominal wall formed by the remnants of the root of the umbilical cord.
- (C) The skin around the umbilicus is supplied by T4 segment of spinal cord.

(D) It is the meeting point of the four (two lateral, head, and tail) folds of the embryonic plate.

Choose the correct answer from the options given below

1. (A) (B) and (D) only.
2. (A) (B) and (C) only.
3. (A) (B) (C) and (D)
- 4 (B) (C)and (D) only.

Correct Answer: 2. (A), (B), and (C) only

Solution: The correct answer is (B) and (C) only. Here's the explanation:

- (A) is incorrect as the blood flow does not follow the described pattern above and below the umbilical plane.
- (B) is correct. The umbilicus is indeed a scar formed by the remnants of the umbilical cord.
- (C) is correct. The skin around the umbilicus is supplied by the T4 segment of the spinal cord.
- (D) is incorrect. The umbilicus is not the meeting point of the folds of the embryonic plate.

Quick Tip

The umbilicus serves as a scar marking the site where the umbilical cord was attached. It is vital in anatomy for assessing the location of referred pain and dermatomes.

57: Different factors affecting the respiratory centers are

- (A) Impulses from higher centers
- (B) Impulses from baroreceptors
- (C) Impulses from chemoreceptors
- (D) Impulses from proprioceptors

Choose the correct answer from the options given below

1. (A) (B) and (D) only.
2. (A) (B) and (C) only.
3. (A) (B) (C) and (D)
- 4 (B) (C)and (D) only.

Correct Answer: 4. (A), (B), (C), and (D)

Solution: All the listed factors play a role in modulating the respiratory centers:

- (A): Impulses from higher centers, such as the cerebral cortex, affect voluntary control of respiration.
- (B): Baroreceptors detect changes in blood pressure and provide input that adjusts breathing.
- (C): Chemoreceptors monitor the levels of oxygen and carbon dioxide, influencing the rate and depth of breathing.
- (D): Proprioceptors in muscles and joints give feedback on body position and physical activity, adjusting breathing accordingly.

Quick Tip

Respiratory regulation involves complex feedback mechanisms from multiple receptors, ensuring the body maintains homeostasis during varying conditions.

58: The various forms of "Vertical Social Mobility" are

- (A) Upward mobility
- (B) Downward mobility
- (C) Intergenerational social mobility
- (D) Structural mobility

Choose the correct answer from the options given below

1. (A) (B) and (D) only.

2. (A) (B) and (C) only.
3. (A) (B) (C) and (D)
- 4 (B) (C)and (D) only.

Correct Answer: 3. (A), (B), (C), and (D)

Solution: Vertical social mobility refers to the movement of individuals or groups within the social hierarchy. All options represent forms of vertical mobility:

- (A): Upward mobility occurs when an individual or group moves up the social ladder.
- (B): Downward mobility occurs when an individual or group moves down the social ladder.
- (C): Intergenerational social mobility refers to the changes in social position between generations.
- (D): Structural mobility involves shifts due to changes in society, such as economic changes or policy shifts, affecting many individuals simultaneously.

Quick Tip

Vertical social mobility highlights the fluidity of social structures, influenced by both individual actions and structural factors.

59: What is true about the relationship between "Arousal" and "Performance"?

- (A) More the "Arousal", better is the "Performance" on all sorts of tasks
- (B) "Performance" improves with rising "Arousal" only up to an optimal level
- (C) High level of "Arousal" is detrimental for "Performance"
- (D) "Performance" is an inverted U-shaped function of the level of "Arousal"

Choose the correct answer from the options given below

1. (A) (B) and (D) only.
2. (A) (B) and (C) only.
3. (A) (B) (C) and (D)

4 (B) (C) and (D) only.

Correct Answer: 4. (B), (C), and (D) only

Solution: The relationship between arousal and performance follows an inverted U-shaped curve:

- (A): This is incorrect. More arousal doesn't always lead to better performance on all tasks.
- (B): Correct. Performance improves with increasing arousal, but only to an optimal level.
- (C): Correct. Beyond a certain point, high arousal negatively affects performance.
- (D): Correct. The relationship is typically depicted as an inverted U-shaped curve, where both too little and too much arousal impair performance.

Quick Tip

The Yerkes-Dodson law explains that moderate arousal leads to optimal performance, while too little or too much arousal can hinder performance.

60: Translation movements between two adjacent vertebrae include

- (A) Side to side translation in the frontal plane
- (B) Side to side translation in the sagittal plane
- (C) Anterior posterior translation in the sagittal plane
- (D) Anterior posterior translation in the frontal plane

Choose the correct answer from the options given below

1. (B) and (D) only.
2. (A) and (C) only.
3. (A) and (B) only
- 4 (C) and (D) only.

Correct Answer: 3. (A) and (B) only

Solution: The correct translations between adjacent vertebrae are:

- (A): Side-to-side translation in the frontal plane is a common movement between adjacent vertebrae.
- (B): Side-to-side translation in the sagittal plane is also a typical movement.
- (C): Anterior-posterior translation in the sagittal plane is not typical for adjacent vertebrae.
- (D): Anterior-posterior translation in the frontal plane is incorrect.

Quick Tip

Vertebral movements typically occur in the frontal and sagittal planes, affecting flexibility and mobility in the spinal column.

61: How rapidly a muscle can develop maximal tension is determined by:

- (A) Type of muscle fibers in the motor units
- (B) The length of the muscle fibers
- (C) Size of the motor units
- (D) Fiber arrangement

Choose the correct answer from the options given below

1. (A), (B), (D) only.
2. (A), (B), (C) only.
3. (A) (B), (C) and (D)
4. (A) and (B) only.

Correct Answer: (3) (A), (B), (C) and (D)

Solution: The rate at which a muscle develops maximal tension depends on several factors:

- (A): The type of muscle fibers influences the speed at which maximal tension can be developed. Fast-twitch fibers can develop tension more quickly.
- (B): The length of the muscle fibers impacts their ability to generate force. Longer fibers can contract faster.

- (C): The size of the motor units determines how much force can be generated by the muscle.
- (D): The arrangement of muscle fibers (e.g., parallel or pennate) affects the efficiency of force production.

Quick Tip

The combination of muscle fiber type, length, and motor unit size affects how quickly a muscle can develop maximal tension. For optimal strength training, it's important to understand these elements.

62: The extensor mechanism of a finger includes all these except:

- (A) Extensor digitorum tendon
- (B) Straight retinacular ligaments
- (C) Fibers from dorsal and volar interossei
- (D) Ventral aponeurosis

Choose the correct answer from the options given below

1. (C) only.
2. (D)only
3. (B), (C) and (D) only.
4. (B) and (D) only.

Correct Answer: (3) (B), (C) and (D) only

Solution: The extensor mechanism of a finger includes the following components:

- (A): The extensor digitorum tendon is a key part of the extensor mechanism, responsible for finger extension.
- (B): The straight retinacular ligaments are not part of the extensor mechanism; they serve a different role in stabilizing the joints.
- (C): Fibers from the dorsal and volar interossei are involved in finger movements but not in the primary extensor mechanism.

- (D): The ventral aponeurosis is more associated with the flexion mechanism rather than extension.

Quick Tip

The extensor mechanism involves tendons and ligaments that work together to extend the finger. Understanding the role of each structure helps in diagnosing hand injuries.

63: Which of the following is correct about Delayed Onset Muscle Soreness (DOMS)?

- (A) Muscle soreness and aching peaks at 48-72 hours after exercise
- (B) Presence of local edema and warmth
- (C) Muscle soreness and aching begins at 0-2 hours post exercise
- (D) Tenderness with palpation over the muscle belly

Choose the correct answer from the options given below

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D)
4. (B) C) and (D) only.

Correct Answer: (3) (A), (B) and (D) only

Solution: DOMS is characterized by:

- (A): Muscle soreness and aching peak at 48-72 hours after intense physical activity.
- (B): Edema and warmth are common symptoms as part of the inflammation process in the muscle.
- (C): Muscle soreness does not typically begin immediately after exercise but develops over time, starting around 12-24 hours.
- (D): Tenderness with palpation over the muscle belly is another hallmark sign of DOMS.

Quick Tip

DOMS occurs as a result of microscopic damage to muscle fibers during eccentric contractions. It usually peaks 48-72 hours after exercise, and recovery can be aided by light movement and stretching.

64: Which of the following is a characteristic of chi-square test?

- (A) It is a non-parametric test
- (B) It is based on frequencies and not on parameters like mean and standard deviation
- (C) It can be used when individual observations of the sample are dependent
- (D) It can be used for testing hypothesis but is not useful for estimation

Choose the correct answer from the options given below

- 1.(A), (B) and (D) only.
- 2.(A), (B) and (C) only.
- 3.(A), and (D) only.
- 4.(B), (C) and (D) only

Correct Answer: (1) (A), (B) and (D) only

Solution: The chi-square test is characterized by:

- (A): The chi-square test is a non-parametric test, meaning it does not assume a specific distribution for the data.
- (B): It is based on frequencies and not on continuous data parameters such as mean or standard deviation.
- (C): The chi-square test assumes that observations are independent. It is not suitable for dependent observations.
- (D): The chi-square test is used for hypothesis testing and is not used for estimation of population parameters.

Quick Tip

The chi-square test is typically used for categorical data, comparing observed frequencies to expected frequencies. It is not appropriate for continuous data or dependent observations.

65: Which of the following is not a characteristic of the normal distribution curve?

1. It is symmetrical
2. The mean, median, and mode all have the same value
3. The tails of the curve never reach the horizontal axis
4. It descends slowly at first from its central point, but then descends down rapidly as the tails of the curve are reached

Correct Answer: (4) It descends slowly at first from its central point, but then descends down rapidly as the tails of the curve are reached.

Solution: The normal distribution curve has the following characteristics:

- (1): It is symmetrical about the mean, meaning both halves of the curve are mirror images.
- (2): The mean, median, and mode all coincide at the center of the curve.
- (3): The tails of the normal distribution curve never truly reach the horizontal axis, they approach but never touch.
- (4): The curve does not descend rapidly at first. Instead, it descends slowly on both sides of the peak, with the tails tapering off gradually.

Quick Tip

The normal distribution is symmetrical and bell-shaped. Its tails never reach the horizontal axis, and the mean, median, and mode all coincide at the center of the curve.

66: Match List-I with List-II

List-I	List-II
(A). Lateral spinothalamic tract	(I). Pain and temperature from opposite half of the body
(B). Anterior spinothalamic tract	(II). Vibratory sense
(C). Fasciculus Cuneatus	(III). Crude touch and pressure from opposite half of the body
(D). Posterior spinocerebellar tract	(IV). Unconscious proprioception to cerebellum

Choose the correct answer from the options given below:

- 1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
- 2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
- 3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
- 4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (2) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

Solution: Here is the correct match between the ascending tracts and their functions:

- (A): The lateral spinothalamic tract transmits pain and temperature sensation from the opposite side of the body (I).
- (B): The anterior spinothalamic tract carries crude touch and pressure sensations from the opposite side of the body (III).
- (C): The fasciculus cuneatus is responsible for transmitting vibratory sense (II).
- (D): The posterior spinocerebellar tract transmits unconscious proprioception to the cerebellum (IV).

Quick Tip

Each ascending tract in the spinal cord has a specific function, such as carrying pain, temperature, pressure, proprioception, or vibration sensations. Understanding their functions helps in diagnosing sensory pathway disorders.

67: Match List-I with List-II

List-I	List-II
(A). IgG	(I). Mediates type 1 hypersensitivity
(B). IgA	(II). Second most abundant class of Ig
(C). IgM	(III). Only Ig to cross placenta
(D). IgE	(IV). First Ig produced during primary immune response

Choose the correct answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Solution: Here is the correct match:

- (A): IgG is the most abundant immunoglobulin and it mediates type 1 hypersensitivity (I).
- (B): IgA is the second most abundant immunoglobulin in the body (II).
- (C): IgM is the first immunoglobulin produced during the primary immune response (IV).
- (D): IgE is involved in allergic responses and mediates type 1 hypersensitivity (I).

Quick Tip

IgG crosses the placenta and provides passive immunity to the fetus. IgE is responsible for allergic reactions, while IgM is produced early in immune responses.

68: Match List-I with List-II**List-I****List-II**

- | | |
|-------------------|---|
| (A) Baclofen | (I) Spasticity |
| (B) Diclofenac | (II) Inflammatory pain |
| (C) Gabapentin | (III) Central or peripheral neurogenic pain |
| (D) Amitriptyline | (IV) Depression |

Choose the correct answer from the options given below:

1. (A) - (IV), (B) - (I), (C) - (III), (D) - (II)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)
4. (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

Correct Answer: (2) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Solution: Here is the correct match:

- (A): Baclofen is used to treat spasticity (I).
- (B): Diclofenac is a non-steroidal anti-inflammatory drug (NSAID) used for inflammatory pain (II).
- (C): Gabapentin is used to manage central or peripheral neurogenic pain (III).
- (D): Amitriptyline is primarily used for the treatment of depression (IV).

Quick Tip

Baclofen is used for muscle spasms, while gabapentin helps manage nerve pain. Amitriptyline is an antidepressant also used in neuropathic pain management.

69: Match List-I with List-II

List-I	List-II
(A). Grade I	(I). Large amplitude rhythmic oscillations performed within the range, not reaching the limit
(B). Grade II	(II). Small amplitude rhythmic oscillations performed at the beginning of the range
(C). Grade III	(III). Small amplitude rhythmic oscillations performed at the limit of the available motion
(D). Grade IV	(IV). Large amplitude rhythmic oscillations performed up to the limit of the available motion

Choose the correct answer from the options given below:

1. (A) - (IV), (B) - (I), (C) - (III), (D) - (II)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)
4. (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

Correct Answer: (3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Solution: Here is the correct match:

- (A): Grade I involves small amplitude oscillations within the range, not reaching the limit (I).
- (B): Grade II involves small amplitude oscillations at the beginning of the range (II).
- (C): Grade III involves small amplitude oscillations at the limit of the available motion (III).

- (D): Grade IV involves large amplitude oscillations up to the limit of the available motion (IV).

Quick Tip

Maitland's mobilization grades help classify the intensity and range of motion during manual therapy. Grade I and II are used for pain, while Grade III and IV improve joint range of motion.

70: Match List-I with List-II

List-I	List-II
(A). D1 Flexion Starting position	(I). Shoulder flexion, adduction, external rotation; partial elbow flexion; forearm supination, and wrist and finger flexion
(B). D1 Flexion Ending position	(II). Shoulder flexion, abduction and external rotation; elbow extension; forearm supination; and wrist and finger extension
(C). D2 Flexion Starting position	(III). Shoulder extension, adduction and internal rotation; elbow extension; forearm pronation; and wrist and finger flexion
(D). D2 Flexion Ending position	(IV). Shoulder extension, abduction, and internal rotation; elbow extension; forearm pronation; and wrist and finger extension

Choose the correct answer from the options given below:

1. (A) - (IV), (B) - (I), (C) - (III), (D) - (II)

2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)
4. (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

Correct Answer: (4) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Solution: Here is the correct match:

- (A): D1 Flexion Starting position: Shoulder flexion, adduction, external rotation; partial elbow flexion; forearm supination, wrist and finger flexion (I).
- (B): D1 Flexion Ending position: Shoulder flexion, abduction, external rotation; elbow extension; forearm supination, wrist and finger extension (II).
- (C): D2 Flexion Starting position: Shoulder extension, adduction and internal rotation; elbow extension; forearm pronation; wrist and finger flexion (III).
- (D): D2 Flexion Ending position: Shoulder extension, abduction, and internal rotation; elbow extension; forearm pronation; wrist and finger extension (IV).

Quick Tip

Upper extremity diagonal patterns in PNF focus on the functional movement patterns of the shoulder, elbow, wrist, and fingers. They are used for improving mobility and strength.

71: Match List-I with List-II

List-I	List-II
(A). Aquasonic/Ultrasonic Gel	(I). 72.6%
(B). Distilled water	(II). 59%
(C). Liquid paraffin	(III). 0%
(D). Air	(IV). 19%

Choose the correct answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (1) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Solution: Here is the correct match:

- (A): Aquasonic/Ultrasonic Gel has a transmission rate of 72.6
- (B): Distilled water has a transmission rate of 59
- (C): Liquid paraffin has a transmission rate of 0
- (D): Air has a transmission rate of 19

Quick Tip

For ultrasound therapy, the coupling medium is important as it affects the transmission of sound waves. The best coupling agents (like Aquasonic) offer the highest transmission rates.

72: Match List-I with List-II

List-I	List-II
(A) Conventional (High) TENS	(I) Intensity 50-100 mA, Frequency 50-200 Hz, Pulse duration 150-300 microseconds
(B) Acupuncture-like (Low) TENS	(II) Intensity 30 mA and more, Frequency 2-5 Hz, Pulse duration 150-300 microseconds
(C) Brief Intense TENS	(III) Intensity to patient's tolerance, Frequency 125-250 Hz, Pulse duration 200-250 microseconds
(D) Burst Mode (Pulse trains) TENS	(IV) Intensity 12-30 mA, Frequency 80-120 Hz, Pulse duration 50-80 microseconds

Choose the correct answer from the options given below:

- (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
- (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
- (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
- (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (1) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)

Solution: Here is the correct match:

- (A): Conventional (High) TENS involves higher intensity and frequency for pain relief (IV).
- (B): Acupuncture-like (Low) TENS uses low-frequency stimulation to mimic acupuncture for pain management (II).
- (C): Brief Intense TENS is used for intense pain relief, with high-frequency and intensity (III).

- (D): Burst Mode TENS uses pulse trains at moderate intensity and frequency to provide effective pain relief (I).

Quick Tip

TENS therapy uses different frequencies and pulse durations for varying levels of pain. Conventional TENS is best for acute pain, while acupuncture-like TENS is used for chronic pain.

73: Match List-I with List-II

List-I	List-II
(A) Malignant disease	(I) Polyarteritis nodosa
(B) Infection	(II) Factitious fever
(C) Disease of connective tissue	(III) Hodgkin's disease
(D) Self-induced	(IV) Endocarditis

Choose the correct answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (3) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)

Solution: Here is the correct match:

- (A): Malignant diseases like Hodgkin's lymphoma cause pyrexia (I).
- (B): Infections such as endocarditis cause fever (IV).
- (C): Disease of connective tissue such as polyarteritis nodosa can cause pyrexia (II).
- (D): Self-induced fever is a factitious fever caused by manipulation (III).

Quick Tip

Pyrexia can result from various causes such as infections, malignancy, autoimmune diseases, and self-induced fever. Proper diagnosis of the cause is essential for effective treatment.

74: Match List-I with List-II

List-I	List-II
(A) Posterior sag sign	(I) Meniscus
(B) Lachman-Trillat test	(II) Patellofemoral dysfunction
(C) Apley's test	(III) Posterior Cruciate ligament
(D) Clarke's sign	(IV) Anterior Cruciate ligament

Choose the correct answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Solution: Here is the correct match:

- (A): Posterior sag sign is used to diagnose issues with the posterior cruciate ligament (III).
- (B): Lachman-Trillat test is used to assess the anterior cruciate ligament (IV).
- (C): Apley's test is used to assess the meniscus (I).
- (D): Clarke's sign is used to detect patellofemoral dysfunction (II).

Quick Tip

ACL injuries are assessed using the Lachman test, while PCL injuries are evaluated using the posterior sag sign. Meniscal damage is detected using Apley's test, and patellofemoral dysfunction is assessed with Clarke's sign.

75: Match List I with List II

List-I	List-II
(A) Mallet Finger	(I) Involves Proximal Interphalangeal Joint
(B) Boutonniere Deformity	(II) Involves Distal Interphalangeal Joint
(C) De Quervain's Disease	(III) More Common in Diabetics
(D) Trigger Finger	(IV) Involves abductor pollicis longus

Choose the correct answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (II), (B) - (I), (C) - (IV), (D) - (III)
4. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

Correct Answer: (3) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)

Solution: Here is the correct match:

- (A): Mallet Finger affects the distal interphalangeal joint (II).
- (B): Boutonniere Deformity affects the proximal interphalangeal joint (I).
- (C): De Quervain's disease involves the abductor pollicis longus (IV).
- (D): Trigger Finger is more common in diabetics (III).

Quick Tip

Mallet finger involves the DIP joint, whereas boutonniere deformity affects the PIP joint. De Quervain's disease affects the abductor pollicis longus tendon, and trigger finger is common in diabetics.
