For Each Of The Following Questions, Choose The Best Answer:

1. Tonic contraction of lower esophageal sphincter is due to:
   a. Cholinergic vagal fiber activity
   b. GIP
   c. Purinergic vagal fiber activity
   d. Cholecystokinin

2. Actions of gastric inhibitory peptide include all of the following, except:
   a. Decreased gastric acid secretion
   b. Increased insulin secretion
   c. Decreased gastrin release
   d. Increased gastric emptying

3. Chewing:
   a. Is partly voluntary and partly involuntary
   b. Is entirely an involuntary act
   c. Inhibits salivary secretion
   d. Inhibits smell sensation

4. Urobilinogen:
   a. Is excreted mainly in urine
   b. Is formed in the reticuloendothelial system
   c. Is excreted mainly in stool
   d. Is formed from unconjugated bilirubin by the action of intestinal bacteria

5. The sphincter of Oddi is relaxed by:
   a. Sympathetic stimulation
   b. Vagal stimulation
   c. Bile salts
   d. Estrogen
6. Migrating motor complex:
   a. Is myogenic
   b. Helps duodenogastric reflux
   c. Is normal colonic contraction
   d. Prevents migration of colonic bacteria into the ileum

7. Defecation:
   a. Cannot be initiated voluntarily
   b. Involves reflex relaxation of the external anal sphincter
   c. Involves reflex contraction of the external anal sphincter
   d. Is initiated by distention of the sigmoid colon with feces

8. Vomiting:
   a. Is due to stimulation of vomiting center in the midbrain
   b. Can be induced by drugs
   c. Occurs by strong contraction of the stomach wall
   d. Does not occur as a conditioned reflex

9. About fecal continence:
   a. The resting anal pressure is greater than rectal pressure
   b. 80% of resting anal pressure is due to the tone of the external anal sphincter
   c. Tone of the puborectalis muscle is not a mechanism of fecal continence
   d. Anal canal mucosa is not sensitive to temperature

10. Which of the following contractions of small intestine is not due to local axon reflex?
    a. Rhythmic segmentation
    b. Normal peristaltic contraction
    c. Migrating motor complex (MMC)
    d. Peristaltic rush

11. About receptor potential, all of the following are untrue except:
    a. It is conducted electrotonically.
    b. It has an absolute refractory period.
    c. Its amplitude has no role in determination in frequency of discharge from the receptors.
d. Its amplitude is fixed regardless the strength of the stimulus.

12. **Regarding the coding of the stimulus intensity:**
   a. The amplitude of receptors potential plays no role.
   b. Determined by the rate of discharge from the receptors.
   c. Could be determined from the type of receptors.
   d. The modality of the stimulus usually determines its strength.

13. **Regarding cutaneous thermoreceptors:**
   a. Warm receptors are abundant when compared with cold receptors.
   b. They detect the absolute temperature of the skin.
   c. They measure the thermal gradient between skin and atmosphere.
   d. They transmit their signal through dorsal column of spinal cord.

14. **Reaction to pain includes all the following, except:**
   a. Increased heart rate.
   b. Depression.
   c. Withdrawal reflexes.
   d. Depressed transmission of pain impulses along sensory pain fibers.

15. **Transmitters in pain control system include all the following, except:**
   a. Serotonin.
   b. Acetylcholine.
   c. Encephalin.
   d. Norepinephrine.

16. **The extrapyramidal pathways to skeletal muscles:**
   a. Are important for posture and fixation
   b. Are required for discrete movements of the hands
   c. Are interrupted when the pyramids are cut
   d. Have no connections with the reticular formation

17. **About hyperalgesia:**
   a. It occurs only in association with cutaneous pain.
   b. Primary hyperalgesia is due to a lesion in the C.N.S.
   c. Secondary hyperalgesia occurs in an inflamed skin area.
   d. The pain threshold is lowered in primary hyperalgesia.
18. A lesion in the somatic sensory area I causes loss of all the following, except:
   a. Pain sensation
   b. Vibration sense
   c. Stereognosis
   d. Position sense

19. A reflex arc includes:
   a. At least two sets of sequential neurons.
   b. At least two sequential sets of central synapses.
   c. At least two types of sensory receptors.
   d. At least two types of efferent neurons.

20. Regarding the EPSP
   a. Is an all or none response to a presynaptic potential
   b. Usually associated with a partial increase in excitability
   c. Always initiates an action potential
   d. Mediated through a second messenger gated K⁺ channels

21. The progressive increase in muscle tension due to continuous afferent stimulation is known as:
   a. Irradiation
   b. Recruitment
   c. After discharge
   d. Summation

22. Stretch of an innervated muscle evokes:
   a. Contraction of its spindles.
   b. Contraction of its extrafusal fibers.
   c. Contraction of antagonistic muscles.
   d. Relaxation of synergistic muscles.

23. Temporal summation:
   a. Occurs when a single presynaptic neuron is repetitively stimulated
   b. Occurs when many presynaptic neurons are simultaneously stimulated
   c. Is more important in the CNS than spatial summation
   d. None of the above
24. About the stretch reflex, all of the following is true except:
   a. It is the only monosynaptic reflex in the body.
   b. It is not rapidly fatigued.
   c. Its afferent limb originates in the alpha motor neurons.
   d. Stimulation of the afferent limb causes relaxation of the antagonistic muscles.

25. The gamma efferent motor neurons:
   a. Are four types.
   b. Stimulate the extrafusal muscle fibers only.
   c. Increase the sensitivity of the muscle spindles.
   d. Receive inhibitory impulses from area 4 and the neocerebellum.

26. The withdrawal reflex is initiated by stimulation delivered to which of the following receptors?
   a. Muscle spindles.
   b. Joint capsular receptors
   c. Cutaneous free nerve endings
   d. Golgi tendon organs.

27. Representation of the body in the primary motor area:
   a. Is ipsilateral.
   b. Is upright.
   c. Is disproportionate to the actual anatomical size of the represented region.
   d. All of the above.

28. About premotor area, all of the following are true except:
   a. Occupies a large portion of area 6.
   b. Enhances the primary motor area to commence its activity.
   c. Initiates grasp reflex.
   d. Inhibits muscle tone.

29. In the lengthening (clasp-knife) reaction:
   a. The contracting muscle suddenly relaxes due to over stretch of the muscle.
   b. Stimulation of the Pacinian corpuscles is maximal.
   c. The muscle contracts further as its tendon is elongated
   d. Golgi tendon organs stimulate alpha motor neurons.
30. In Upper Motor Neuron lesion (UMNL):
   a. Paralysis occurs on the same side.
   b. Paralysis is associated with hypotonia.
   c. Paralysis is localized.
   d. Slight wasting of the muscles may occur.

31. Motor apraxia is:
   a. The result of a lesion in area 4
   b. Severe weakness of muscles
   c. Difficulty in articulation of words
   d. Loss of the memory of motor acts

32. The Babiniski's sign:
   a. Always indicates presence of disease.
   b. Occurs in lower motor neuron lesions.
   c. Is positive in pyramidal tract lesion.
   d. Is normally negative in adults under deep anesthesia.

33. A hemisection of the spinal cord (Brown Sequard syndrome) leads to:
   a. Bilateral loss of all sensations below the level of the lesion
   b. Loss of pain & temperature on the opposite side below the level of the lesion
   c. UMNL in the opposite side below the level of the lesion
   d. Loss of fine touch & vibration sense in the same side above the level of the lesion

34. About acute internal capsule lesions, all the following is true, except:
   a. They usually result from thrombosis of the middle cerebral artery
   b. They involve damage of both pyramidal & extra pyramidal cortical fibers
   c. They are associated with spastic paralysis of the muscles on the same side of the lesion
   d. They result in immediate paralysis in the opposite side including the lower half of the face & half of the tongue

35. About LMNL:
   a. Is characterized by loss of voluntary movements and preservation of reflex movements
b. Shows a normal response to electric stimuli in the affected muscles  
c. Causes hypertonia but a normal size of the affected muscles  
d. Is commonly the result of poliomyelitis

36. Angiotensin II:  
a. Is less potent than angiotensin III  
b. Acts as a local vasodilator for RBF  
c. Inhibits Na⁺ reabsorption in PCT  
d. Is a trophic hormone increasing secretion of aldosterone

37. Autoregulation of the RBF and GFR by tubuloglomerular feedback requires which of the following?  
a. Increase in the colloid osmotic pressure of the blood in the glomerular capillaries as blood flow increases  
b. Decrease in the colloid osmotic pressure of the blood in the glomerular capillaries as the filtration fraction increases  
c. Increased release of renin as hydrostatic pressure in the renal artery increases  
d. Signaling from the macula densa to the juxtaglomerular cells

38. Which of the following changes tends to increase GFR?  
a. Increased afferent arteriolar resistance  
b. Increased glomerular capillary filtration coefficient  
c. Increased Bowman’s capsule hydrostatic pressure  
d. Decreased glomerular capillary hydrostatic pressure

39. Which of the following nephron segments is the primary site of Mg²⁺ reabsorption under normal condition?  
a. PCT  
b. DLH  
c. Thick ALH  
d. DCT

40. The renal clearance of a substance:  
a. Is inversely related to its urinary concentration (U)  
b. Is directly related to its plasma concentration (P)  
c. Is inversely related to the rate of urine formation (V)
d. Is expressed in units of volume/unit time

41. **Glucose in the PCT:**
   a. Is reabsorbed by facilitated diffusion at the luminal border
   b. Is reabsorbed by Na\(^+\) independant mechanism
   c. Is reabsorbed by 2ry active transport at the luminal border
   d. Its concentration in the distal part of PCT is similar to that in the plasma

42. **Under the condition of dehydration, which of the following tubular segments will contain the greatest osmolality?**
   a. PCT
   b. DCT
   c. CCD
   d. Thin ALH

43. **The cells of the connecting tubules:**
   a. Reabsorb about 50% of the water filtered by the glomeruli
   b. Secrete hydrogen ions into the tubular lumen
   c. Reabsorb K\(^+\) in exchange for H\(^+\) or Na\(^+\) ions
   d. Determine the final composition of urine

44. **About urea reabsorption, which of the following statements is correct?**
   a. Urea reabsorption in the medullary collecting tubule is less than that in the DCT during anti-diuresis
   b. Thick ALH reabsorbs more urea than the inner medullary collecting tubule during anti-diuresis
   c. Urea reabsorption in the PCT is greater than that in the cortical collecting tubules
   d. Urea permeability is increased in the inner medullary collecting duct during diuresis

45. **The effect of ADH on water excretion could be induced by:**
   a. Inhibition of Na\(^+\) reabsorption
   b. Activation of K\(^+\) secretion
   c. Insertion of aquaporin channels in the luminal membrane
   d. Insertion of Na\(^+\) channels in the luminal membrane
46. Which diuretic causes increased urinary excretion of Na\(^+\), K\(^+\) and decreased excretion of Ca\(^{++}\)?
   a. Diamox
   b. Thiazide
   c. Loop diuretic
   d. Spironolactone

47. A drug which inhibits carbonic anhydrase enzyme decreases:
   a. Bicarbonate formation & reabsorption in the kidney
   b. Urinary loss of K\(^+\) ions
   c. Urine volume
   d. Urine pH

48. In acidosis, most of the H\(^+\) ions secreted by the PCT are associated with which of the following processes?
   a. Excretion of H\(^+\) ions
   b. Excretion of NH\(_4\)^+
   c. Reabsorption of HCO\(_3\)^-
   d. Reabsorption of K\(^+\)

49. Cutting the sympathetic nerves to the urinary bladder may cause:
   a. Difficulty in emptying the bladder
   b. Increase of the tone of internal sphincters of the bladder
   c. Loss of tone of the external sphincter of the bladder
   d. Loss of pain sensation in the bladder

50. Voluntary micturition:
   a. Depends on the integrity of lumbar spinal reflex arc
   b. Is not possible after sensory denervation of the bladder
   c. Is normally accompanied by some reflux of urine into the ureters
   d. Is accompanied by contraction of external urethral sphincter

Good luck