



PHYSIOLOGY
FINAL TEST
BANK 020

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BASED BY SHEETS

Dr Faisal material (SHEET 10 → SHEET 12)

Type of neurotransmitters, Sensory receptors, Adaptation.

1. Pain receptors in the skin are typically classified as which of the following?

- A) Encapsulated nerve endings
- B) A single class of morphologically specialized receptors
- C) The same type of receptor that detects position sense
- D) Free nerve endings

Answer:D

2. Which of the following best describes an expanded tip) tactile receptor found in the dermis of hairy skin that is specialized to detect continuously applied touch sensation?

- A) Free nerve endings
- B) Merkel disc
- C) Pacinian corpuscle
- D) Ruffini endings

Answer: B

3. Which of the following is best described as an elongated, encapsulated receptor found in the dermal pegs of glabrous skin that is especially abundant on lips and fingertips?

- A) Merkel disc
- B) Free nerve endings
- C) Meissner corpuscle
- D) Ruffini endings

Answer: C

4. Which of the following best describes the concept of specificity in sensory nerve fibers that transmit only one modality of sensation?

- A) Frequency coding principle
- B) Concept of specific nerve energy
- C) Singularity principle
- D) Labeled line principle

Answer: D

5. Which of the following is an encapsulated receptor found deep in the skin throughout the body, as well as in fascial layers, where it detects indentation of the skin (pressure) and movement across the surface (vibration)?

- A) Pacinian corpuscle
- B) Meissner's corpuscle
- C) Free nerve endings
- D) Ruffini endings

Answer: A

6. The excitatory or inhibitory action of a neurotransmitter is determined by which of the following?

- A) The function of its postsynaptic receptor
- B) Its molecular composition
- C) The shape of the synaptic vesicle in which it is contained
- D) The distance between the pre- and postsynaptic A) membranes

Answer: A

7. Which type of cholinergic receptor is found at synapses between preganglionic and postganglionic neurons of the sympathetic system?

- A) Muscarinic
- B) Nicotinic
- C) Alpha
- D) Beta-1
- E) Beta-2

Answer: B

8. Which substance activates adrenergic alpha and beta receptors equally well?

- A) Acetylcholine
- B) Norepinephrine
- C) Epinephrine
- D) Serotonin
- E) Dopamine

Answer: C

9. In which type of receptor, does the receptor potential fall below threshold, even as the stimulus continues?

- A) phasic
- B) tonic

Answer: A

10. A wide variety of neurotransmitters have been identified in the cell bodies and afferent synaptic terminals in the basal ganglia. A deficiency of which transmitter is typically associated with Parkinson's disease?

- A) Norepinephrine
- B) Dopamine
- C) Serotonin
- D) GABA
- E) Substance P

Answer: B

11. What's wrong about acetyl choline:

- A) in skeletal muscles it causes contraction
- B) in heart it causes relaxation
- C) it affects mood

ANSWER: C

12. Muscarinic receptors activate by :

- A) ACH
- B) dopamine
- C) glutamate

ANSWER A

13. All of the following describes muscarinic poisoning except:

- A) Dilation of pupil
- B) sweating
- C) hyper-salivation
- D) vomiting and diarrhea
- E) decreased heart rate

Although sweat glands is stimulated by sympathetic neurons but it is stimulated by ACH,So, it has muscarinic receptor.

ANSWER: A

14.All the followings with regard to beta adrenergic receptors are true EXCEPT:

- A) They are present in the heart
- B) They are blocked by atropin
- C) Their stimulation increases heart rate
- D) Their stimulation increases the air flow to the lung
- E) They are stimulated by a neurotransmitter released by sympathetic nervous system

Answer: b

15. Which of the following receptors do not exhibit adaptation:

- A. pain receptors
- A) pressure receptors
- B) touch receptors
- C) smell receptors

Answer: a

16.One of the following are false about phasic receptor:

- A) quickly adapt
- B) on -off receptor
- C) exhibit none or all principle
- D) All of the above
- E) None of the above

Answer: E

17. One of the following are false about B receptor?

- A) They found in the heart
- B) they increased the heart rate
- C) they stimulated by ACH
- D) they increase the amount of the air in bronchioles

ANSWER: C

18. In the back the two-points discrimination is larger than on the fingertips because?

- A) The excitability of the receptors from back is greater
- B) The cortical space specified for sensory reception from the back is smaller
- C) The receptive field in the back is smaller
- D) The density of receptors in the back is greater
- E) The discharge rate from the afferents from the back is greater

ANSWER B

19. Which type of neuronal pool circuits is important in well localized sharp sensation:

- A) Convergence of neurons
- B) Reverberatory circuits
- C) Divergence of neurons
- D) Lateral inhibitory circuits
- E) Parallel circuits

ANSWER D

20. Local anesthetic drugs like curare take effect by which of the following mechanisms:

- A) Blocking nicotinic acetylcholine receptors at the synapse
- B) Inhibiting the action of acetylcholinesterase in the synapse
- C) Internal block of axonal voltagegated sodium channels
- D) Blocking neurotransmitter uptake by axonal terminals
- E) Inhibiting the propagation of the action potential through autonomic neurons

Answer: a

Dr Ebaa material (SHEET 13 → SHEET 17)

Signal transduction, extracellular regulators, hormones and their effects.

21. Prolonged changes in neuronal activity are usually achieved through the activation of which of the following?

- A) Voltage-gated chloride channels
- B) Transmitter-gated sodium channels
- C) G-protein-coupled channels
- D) Voltage-gated potassium channels

Answer: C

22. cholesterol enters the cell by:

- A) SIMPLE DIFFUSION
- B) Active transport
- C) Facilitated diffusion
- D) Secondary active transport

Answer: A

23. Some cells secrete chemicals into the extracellular fluid that act on cells in the same tissue. Which of the following refers to this type of regulation?

- A) Neural
- B) Endocrine
- C) Neuroendocrine
- D) Paracrine
- E) Autocrine

Answer: D

24. What activates adenylyl cyclase?

- A) epinephrine binding to it
- B) an activated G protein
- C) cAMP
- D) a protein kinase

Answer: B

25. Signal amplification is most often achieved by:

- A) an enzyme cascade
- B) binding of multiple signals
- C) branching pathways
- D) action of adenylyl cyclase

Answer: A

26. If we want to inhibit the secretion of Ca we inhibit:

`` phospholipase C

27. G proteins are a family of proteins involved in transmitting chemical signals originating from outside a cell into the inside of the cell. G proteins function as molecular switches. The three stages of cell signaling are:

- A) paracrine, local, and synaptic
- B) reception, transduction, and response
- C) transcription, translation, and folding
- D) alpha, beta, and gamma

Answer: B

28. Each of the following numbered processes are involved in signal transduction pathways:

-I. Response -II. Amplification - III. Reception -IV. Transduction

Which of the following represents the sequence of events in a typical signal transduction pathway?

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

Answer: D

29. A signal molecule that binds to a plasma-membrane protein is a :

- A) ligand
- B) second messenger
- C) protein kinase
- D) receptor protein

Answer: A

30. What determines whether a signal molecule binds on the surface or enters the cell?

- A) size
- B) polarity
- C) ability to cross the membrane
- D) all of these are correct

Answer: D

31. Protein kinases activate other relay proteins by adding a(n) ____ to them.

- A) phosphate
- B) ATP molecule
- C) cAMP
- D) GTP

Answer: A

32. Alpha1 -Adrenergic receptors are coupled to which Enzyme-Product:

- A) Adenylyl Cyclase-cAMP
- B) Guanylyl Cyclase-cGMP
- C) Phospholipase c-DAG (diacylglycerol),IP3 (inositol triphosphate)
- D) Phospholipase A-arachidonic acid

Answer: c

33. Adenylyl cyclase is used in a G-protein pathway to

- A) cause ATP to form cAMP
- B) add a phosphate to a kinase
- C) remove a phosphate from a kinase
- D) attract a ligand

Answer: A

34. cAMP and calcium are examples of:

- A) hormones
- B) ligands
- C) enzymes
- D) secondary messengers

Answer: D

35. Consider this pathway: epinephrine --> receptor --> cAMP --> protein kinase --> transcription factors.

-Identify the secondary messenger.

- A) epinephrine
- B) G protein-coupled receptor
- C) adenylyl cyclase
- D) cAMP

Answer: D

36. Which of the following hormones has intracellular receptors

- A) Glucagon
- B) Follicle Stimulating Hormone
- C) Growth Hormone
- D) Estradiol
- E) ACTH (adrenocorticotrophic hormone)

Answer: d

37. What is an organic compound that is made by glands in the body (pituitary, thyroid, etc) that is used in long distance communication between cells?

- A) Hormones
- B) Neurotransmitters
- C) Synapse
- D) Carbohydrates

Answer: A

38. Which of the following can activate a protein by transferring a phosphate group to it?

- A) cAMP
- B) G Protein
- C) protein kinase
- D) protein phosphatase

Answer: C

39. What do second messengers do?

- A) transport a signal through the lipid bilayer
- B) relay a signal from the outside to the inside of the cell
- C) relay message from the inside of the membrane throughout the cytoplasm
- D) dampen the message

Answer: C

40. What determines whether a cell is a target cell for a particular signal molecule?

- A) phosphorylation cascade
- B) cAMP
- C) signal receptors
- D) phosphatase

Answer: C

41. Location of cellular receptor proteins depends mainly on:

- A) Chemical class of hormone
- B) Function of hormone
- C) Site of release
- D) Type of cell
- E) Half life of hormone

Answer: A

42. All of the following are derivatives of Tyrosine EXCEPT:

- A) Epinephrine
- B) Dopamine
- C) Thyroxine
- D) Thyroid stimulating hormone
- E) Norepinephrine

Answer: d

43. insulin receptor is an example of:

- A) Ionotropic receptors
- B) Metabotropic receptors
- C) G Protein Coupled Receptor (GPCR)
- D) Receptor Tyrosine kinase
- E) Voltage gated channel

Answer: d

44. Which of the following hormones has nuclear receptors that are typically associated with acid receptors (RXR):

- A) Insulin
- B) Leptin
- C) T₃(triiodothyronine)
- D) Testosterone
- E) Dopamine

Answer: c

45. All of the following are mechanisms of turning GPCR signal EXCEPT:

- A) G_α hydrolyzes GTP
- B) cAMP-induced Phosphodiesterases activation
- C) β-Arrestin-induced endocytosis of GPCR
- D) Activation of phospholipase
- E) Activation of phosphatases

Answer: d

46. Epinephrine may have the following second messenger/s:

- A) cAMP
- B) Ca⁺⁺
- C) IP₃
- D) DAG
- E) All the above mentioned are correct

Answer: e

47. Which of the following is rarely bound to plasma proteins in blood:

- A) Testosterone
- B) Insulin
- C) Cortisol
- D) Thyroxine
- E) Estrogen

Answer: b

48. Leptin hormone induces its effect mainly through:

- A) PKA-CREB pathway
- B) JAK-STAT pathway
- C) Ca⁺⁺-Calmodulin pathway
- D) Adenylyl cyclase-cAMP pathway
- E) Guanylyl cyclase-cGMP pathway

Answer: b

49. Clearance of a hormone is high if :

- A) The half-life is high
- B) The percentage of the hormone bound to plasma proteins is low
- C) The hormone is inactive
- D) The hormone is lipophilic
- E) The hormone is a preprohormone

Answer: b

Dr. MOHAMMED KHATATBEH (SHEET 18 → SHEET 21)
AUTONOMIC NERVOUS SYSTEM, BODY FLUIDS.

50. Which of the following is the approximate extracellular fluid volume of a normal individual? (male)

- A) 5% of body mass
- B) 10% of body mass
- C) 20% of body mass
- D) 40% of body mass
- E) 60% of body mass

Answer: C

51. As the axons of motor neurons leave the spinal cord and course peripherally to skeletal muscle, they must pass through which structure?

- A) Posterior column
- B) Posterior root
- C) Ventral white commissure
- D) Posterior horn
- E) Anterior root

Answer: E

52. Which spinal cord level contains the entire population of preganglionic sympathetic neurons?

- A) C5-T1
- B) C3-C5
- C) S2-S4
- D) T1-L3
- E) T6-L1

Answer: D

53. Cells of the adrenal medulla receive synaptic input from which type of neuron?

- A) Preganglionic sympathetic
- B) Postganglionic sympathetic
- C) Preganglionic parasympathetic
- D) Postsynaptic parasympathetic
- E) Presynaptic parasympathetic

Answer: A

54. Preganglionic parasympathetic neurons that contribute to the innervation of the descending colon and rectum are found in which structure?

- A) Superior cervical ganglion
- B) Dorsal motor nucleus of the vagus
- C) Superior mesenteric ganglion
- D) Ciliary ganglion
- E) Spinal cord levels S2 and S3

Answer: E

55. The sweat glands are innervated by which type of fibers?

- A) Cholinergic postganglionic parasympathetic
- B) Cholinergic postganglionic sympathetic
- C) Adrenergic preganglionic parasympathetic
- D) Adrenergic postganglionic sympathetic
- E) Adrenergic preganglionic sympathetic

Answer: B

56. Which of the following actions is/are mediated by β_2 receptors:

- A) increased heart rate
- B) contraction of gastrointestinal sphincters
- C) contraction of vascular smooth muscle,
- D) dilation of airways,
- E) relaxation of bladder wall
- F) MORE THAN ONE IS CORRECT

ANSWER: F

57. The excitatory or inhibitory effect of a postganglionic sympathetic fiber is determined by which feature or structure?

- A) Function of the receptor on the organ itself, to which it binds to
- B) Specific organ innervated
- C) Ganglion where the postganglionic fiber originates
- D) Ganglion containing the preganglionic fiber
- E) Emotional state of the individual

Answer: A

58. A woman who is taking atropine for a gastrointestinal disorder notices that her pupils are dilated. This has occurred because atropine blocks _____ receptors

Answer: **Muscarinic**

59. Which of the following is/are characteristic of the parasympathetic nervous system but not of the sympathetic nervous system:

- A) ganglia in or near target tissues
- B) nicotinic receptors on postganglionic neurons
- C) muscarinic receptors on some target tissues
- D) β_1 receptors on some target tissues
- E) cholinergic preganglionic neurons

Answer: A

60. Nasal, lacrimal, salivary, and gastrointestinal glands are stimulated by which substance?

- A) Acetylcholine
- B) Norepinephrine
- C) Epinephrine
- D) Serotonin
- E) Dopamine

Answer: A

62. The function of which organ or system is dominated by the sympathetic nervous system?

- A) Systemic blood vessels
- B) Heart
- C) Gastrointestinal gland secretion
- D) Salivary glands
- E) Gastrointestinal motility

Answer: A

63. Which of the following is not controlled by parasympathetic:

- A) GI system
- B) heart rate
- C) gland secretion
- D) vesicular tone

ANSWER D

64. One of the followings does NOT characterize the sympathetic nervous system:

- A) Has short preganglionic and long post ganglionic fibers
- B) Has acetylcholine as transmitter in preganglionic neuron
- C) Is always giving excitatory responses
- D) Is a part of the autonomic nervous system
- E) Promotes responses for fight or flight reaction

Answer: c

65. All the followings may describe the parasympathetic system EXCEPT:

- A) when stimulated it is increasing sweating
- B) It dominates in quiet and relaxed situation
- C) Its postganglionic neurons can also be stimulated by nicotine
- D) When stimulated it causes an increase in intestinal movements
- E) Second neurons release a neurotransmitter that binds to muscarinic receptors

Answer: A

66. Increase in lymph flow leads to:

Answer>> **lower compliance**

67. Increase of what of the following pressures increase lymph flow:

Answer>>> **interstitial fluid colloid osmotic pressure**

68. With regard to measurements of body fluids, which of the followings is TRUE:

- A) Inulin can be used to measure blood volume
- B) $^{22}\text{Na}^+$ radioisotope is used to measure total body fluids
- C) $^{40}\text{K}^+$ radioisotope is used to measuring intracellular fluid volume
- D) ^{125}I -albumin is used to measure intravascular fluids
- E) ^{51}Cr -labeled RBCs can be used for measuring extracellular fluid volume

ANSWER:D

69 . All the followings can lead to hypernatremia with dehydration of cells EXCEPT:

- A) Hypotonic sweating
- B) Deficiency of aldosterone secretion
- C) Deficiency of ADH secretion
- D) Excessive intake of salts
- E) Excessive administration of hypertonic solution

ANSWER B

70. Edema at interstitial fluids can be generated by all the followings EXCEPT:

- A) Increased oncotic pressure in interstitial fluids
- B) Increased albumin concentration in plasma
- C) Increased hydrostatic pressure in capillaries
- D) Decreased lymph flow from interstitial fluids
- E) Increased capillary permeability

ANSWER: B

71. Na⁺ homeostasis is important for controlling all the followings EXCEPT:

- A) Blood volume
- B) Water homeostasis
- C) Oncotic pressure
- C) Extracellular fluid volume
- D) Osmolality

ANSWER C

72. In normal person, plasma is forming about _____ of the total blood volume:

- A) 55%
- B) 95%
- C) 90%
- D) 10%
- E) 40%

ANSWER A

73. High shift of fluids from intracellular to extracellular compartment can take place by:

- A) High release of ADH
- B) Intravenous infusion of normal saline
- C) Consumption of potable (normal) water
- D) Intravenous infusion of hypotonic solution
- E) High release of aldosterone

ANSWER E

Dr. FAISAL (SHEET 22 → SHEET 25)

CARDIAC ACTION POTENTIAL, MICROCIRCULATION.

74. About SA node:

Answer>> **its cell are naturally permeable to Na⁺ ions.**

75. sympathetic effect on heart:

Answer>>> **increases the slope of depolarization.**

76. sympathetic effect on heart:

Answer>> **epinephrine increase permeability to Na⁺**

77. Na voltage gated channel is (close and not capable to open) in:

- A) resting state
- B) hyperpolarization
- C) absolute refractory period
- D) relative refractory period

ANSWER: C

78. If the ventricular Purkinje fibers become the pacemaker of the heart, what is the expected heart rate?

- A) 30/min
- B) 65/min
- C) 75/min
- D) 50/min
- E) 85/min

ANSWER A

79. At phase (2) of an action potential in a ventricular muscle cell which of the following is true?

- A) The chemical gradient for Ca^{++} tends to move this ion inside
- B) The electrochemical gradient for K^+ tends to move this ion inside
- C) Na^+ permeability greatly increases
- D) This phase is responsible for the short refractory period of cardiac action potential
- E) The chemical gradient for K^+ tends to move this ion inside

ANSWER A

80. Which of the following structures will have the slowest rate of conduction of the cardiac action potential?

- A) Atrial muscle
- B) Ventricular muscle
- C) Purkinje fibers
- D) Atrioventricular node
- E) Sinoatrial node

ANSWER D

81. Intracellular calcium homeostasis in cardiac muscle cell is characterized by:

- A) $\text{Na}^+/\text{Ca}^{++}$ exchanger is found in cardiac as well as in skeletal muscle
- B) Mitochondrial $\text{Na}^+/\text{Ca}^{++}$ exchanger works in pathological states
- C) $\text{Na}^+/\text{Ca}^{++}$ exchanger exchanges one sodium for one calcium ions
- D) Ca^{++} pump in the cardiac muscle sarcolemma is low affinity but high capacity pump
- E) Ca^{++} pump of the sarcoplasmic reticulum is not found in the cardiac muscle Cells

ANSWER B

82. Slow response action potential (pacemaker potential) is characterized by?

- A) During phase 4 the transmembrane potential is closer to Ca^{++} equilibrium
- B) potential rather than to Na^+ equilibrium potential
- C) It has longer plateau phase than fast response potential of ventricular cells
- D) dV/dT (change in voltage per unit change in time) of phase 0 is much slower than ventricular cell potential phase 0
- E) Ca^{++} ions is responsible for phase 2
- F) It has more negative resting membrane potential than ventricular cell potential

ANSWER C

83. Which of the following is NOT caused by Sympathetic stimulation:

- A) Increase in the heart rate
- B) Decrease of the permeability of the sinoatrial node to K^+
- C) Positive inotropic effect
- D) Decrease of the slope of the slow depolarization phase of the pacemaker potential
- E) Increase of the conduction of the atrioventricular phase

ANSWER D

84. Parasympathetic stimulation of the heart leads to:

- A) Negative chronotropic but almost no inotropic action
- B) Negative chronotropic and negative inotropic effect
- C) Negative chronotropic and positive inotropic effect
- D) Positive chronotropic but negative inotropic effect
- E) Positive chronotropic and positive inotropic effect

ANSWER A

85. The sinoatrial (SA) node and atrioventricular (AV) are autorhythmic because:

- A) Their cells are rounded instead of rectangular
- B) Their cells are more permeable to Na^+ at rest
- C) Their cells have a lot of voltage-gated slow Ca^{++} channels
- D) Their cells are non-contractile
- E) Their cells are leaky to anions

ANSWER B

86. A drug that increases the permeability of cardiac cells to Na^+ and Ca^{++} but decreases its permeability to K^+ and Cl^- would cause:

- A) Negative chronotropic and negative inotropic effect on the heart
- B) No effect since the effect of Ca^{++} and Na^+ would be counterbalanced by the effect of Cl^- and K^+
- C) Positive chronotropic and negative inotropic effect on the heart
- D) Positive inotropic and Positive chronotropic effect on the heart
- E) Positive inotropic and negative chronotropic effect on the heart

ANSWER D

87. The cardiac tissue with the slowed auto-rhythmicity is the:

- A) Atrioventricular bundle cells
- B) Sino-atrial node
- C) Purkinje fibers
- D) Bundle branches cell
- E) Atrioventricular node

ANSWER C

88. Which of the following is caused by acetylcholine?

- A) Decreased permeability of the S-A node to potassium ions
- B) Depolarization of the A-V node
- C) Increased permeability of the cardiac muscle to calcium ions
- D) Increased heart rate
- E) Hyperpolarization of the S-A node

ANSWER E

89. A decrease in which one of the following would tend to increase lymph flow:

- A) Hydraulic conductivity of the capillary wall
- B) Capillary hydrostatic pressure
- C) Albumin concentration of the interstitium
- D) Interstitial colloid osmotic pressure
- E) plasma colloid osmotic pressure

ANSWER: E

90. Which of the following changes favor(s) the movement of surrounding interstitial fluid into the capillary lumen (i.e., fluid reabsorption into the capillary):

- A) An increase in the colloid osmotic pressure of the interstitial fluid surrounding the capillary
- B) An increase in the hydrostatic blood pressure in the capillary
- C) An increase in the colloid osmotic (oncotic) pressure of plasma
- D) An decrease in the hydrostatic pressure of the interstitial fluid surrounding the capillary
- E) An increase in the capillary permeability

ANSWER C

91. Listed below are the hydrostatic and oncotic pressure across a muscle capillary wall.

- 1) Mean capillary hydrostatic pressure=30 mmHg
- 2) Plasma colloid osmotic pressure= 25 mmHg
- 3) Interstitial colloid osmotic pressure=10 mmHg
- 4) Interstitial hydrostatic pressure=5 mmHg

What is the net filtration pressure (in mmHg) for fluid movement across the capillary wall?

- A) 25 mmHg
- B) 0 mmHg
- C) 5 mmHg
- D) 15 mmHg
- E) 10 mmHg

ANSWER E