Written Questions L1,2

1. *Enumerate properties of receptor ?*
2. *Def muller law ?*
3. *Def receptor (generator) potential ?*
4. *Enumerate properties of receptor potential ?*
5. *Def weber feschner law ?*
6. *Effect and mechanism of increased intensity of stimulus on rate of discharge from receptor ?*
7. *Def recruitment of receptor ?*
8. *Def adaptation of receptor ?*
9. *Compare () rapidly and slowly adapting receptors ?*
10. *Def neural coding of sensation ?*
11. *Describe : modality , intensity and locality discrimination ?*

Formative MCQ

1. Which of the following represent basis of transduction of sensory stimulus into nerve impulse: *a) change in permeability of receptor membrane* *b) generation of action potential* *c) Inactivation of G protein mediated response* *d) protein synthesis* *e) activation of cell membrane enzyme with increased intracellular Ca*	***A***
2. A generator potential: *a) Always leads to an action potential.* *b) Increases in amplitude as a more intense stimulus is applied.* *c) Is unchanged when a given stimulus is applied repeatedly over time.* *d) Is an all or none phenomenon.*	***B***
3. Depolarization of receptor: *a) Called action potential* *b) Obey all or none* *c) Is graded* *d) Caused by ca inflow* *e) Lead usually to single action potential*	***C***
4. Adaptation is rapid in: *a) Pain* *b) Touch* *c) Cold* *d) Hot* *e) Muscle spindle*	***B***

5. Modality of sensation encoded by: *a) Type of receptor activated* *b) Frequency of action potential* *c) Rate of receptor adaptation* *d) Method used to transduce stimulus at receptor* *e) Area of CC stimulated*	***A***
6. Discrimination of locality of sensation depends on the: *a) Rate of discharge along the afferent nerve.* *b) Projection from the cortex.* *c) Presence of specific pathway for each sensation.* *d) Weber-Fechner's law.* *e) Number of receptors*	***B***
7. Which receptors are absent in the viscera: *a) Nociceptors* *b) Cold receptors* *c) Warm receptors* *d) Proprioceptors* *e) Touch receptors*	***D***
8. Which of the following best describes modality discriminalion: *a) Frequency coding principle.* *b) High threshold receptors to adequate stimulus.* *c) Rate of receptor adaptation.* *d) Labeled line principle* *e) Strength of stimulus internity.*	***D***

9. Regarding receptors adaptation: *a) A decrease in response when the stimulus decreased.* *b) A decrease in response in spite of constant stimulation.* *c) Pain receptors are rapidly adapting,* *d) Arterial baroreceptors are rapidly adapting.* *e) Touch receptors are slowly adapting*	***B***
10. Stimulation of receptors leads to: *a) Action potential.* *b) Complete depolarization.* *c) Partial depolarization.* *d) Non specific response* *e) All or NONE pressure.*	**C**
11. Depolarization of a receptor: *a) is called action potential* *b) obeys all of none law,* *c) is graded* *d) is caused by Ca++ inflow.* *e) leads usually to single action potential along the afferent neuron.*	**C**
12. Transduction describes: *a) the transmission of signals across synapses by neurotransmitter* *b) the transmission of nerve impulses to cortex* *c) the translation of the stimulus into a code of action potentials.* *d) the generation of conscious mental states from nerve impulse.*	**C**

13. Adaptation to a sensory stimulus produces: a) *A diminished sensation when other types of sensory stimuli are withdrawn.* b) *A more intense sensation when a given stimulus is applied repeatedly.* c) *A sensation localized to the hand when the nerves of the brachial plexus are stimulated.* d) *A diminished sensation when a given stimulus is applied repeatedly over time (constantly).* e) *A decreased firing rate in the sensory nerve from the receptor when one's sensation is directed to another matter.*	***D***
14. The slowly adapting receptors: a) *Include the pacinian corpuscles.* b) *Are also called rate or movement receptors.* c) *React strongly while a change is actually occurring.* d) *Transmit impulses only during the first few seconds after stimulation* e) *Keep the brain constantly aware of the stimulus.*	***E***
15. The receptor potential: a) *Does not obey all or none law.* b) *Can not be summated.* c) *Has a duration greater than 2 sec.* d) *Results from an increase in the membrane permeability of the receptor to* Ca++. e) *Its amplitude is inversely proportional to the intensity of the stimulus.*	***A***
16. A receptor potential is an example of: a) *A frequency-coded signal.* b) *A spatially coded signal.* c) *A temporally coded signal.*	***D***

d) *An amplitude-coded signal.* e) *Rapidly propagating potential*	
17. Sensory systems code for the following attributes of stimulus: a) *Modality, location, intensity and duration.* b) *Threshold, receptive field, adaptation and discrimination.* c) *Touch, taste, hearing and smell.* d) *Threshold, laterality, sensation and duration.* e) *Sensitization, discrimination, energy and projection.*	***A***
18. Which of the following statements concerning the mechanoreceptive receptor potential is true? a) *A decrease in stimulus energy results in an increase in receptor potential.* b) *When receptor potential rises above a 0.5 mv action potentials will appear in the neuron attached the receptor.* c) *Number of action potentials generated in the neuron attached to the receptor is inversely proportional to receptor potential.* d) *The maximal amplitude of receptor potential recorded about 100 mv.* e) *Can be easily blocked by application procaine Hd.*	***D***

Other MCQ

1. As the receptor potential rises higher above threshold, which of the following best characterizes the new frequency of action potentials? a) *Decrease.* b) *Increase.* c) *Remain unchanged.* d) *Increase only when the receptor potential increases to twice the level of threshold.* e) *Increase only when the receptor potential increases above 100 mv.*	***B***

2. Receptor potential: *a) Is a state of partial depolarization of the receptor.* *b) Is not graded.* *c) Is not summated.* *d) Is caused by increased permeability to K+.* *e) Its duration = 1.5 m.sec.*	***A***
3. The receptor potential: *a) Does not obey all or none law.* *b) Can not be summated.* *c) Has a duration greater than 2 sec.* *d) Results from ↑ in the membrane permeability of the receptor to Ca.* *e) Its amplitude is inversely proportional to the intensity of the stimulus.*	***A***
4. It is correct to say that: *a) pain receptors are rapidly adapting.* *b) receptor potential is caused mainly by Ca++ inflow.* *c) receptor potential obeys all or non-law.* *d) temperature receptors are slowly adapting.* *e) receptor potential is longer than action potential in duration.*	***E***
5. Adaptation of receptors: *a) is a decrease in response in spite of constant stimulation.* *b) is a decrease in response when the stimulus decreased.* *c) is rapid in pain receptors.* *d) is slow in temperature receptors.* *e) is moderate in touch receptors*	***A***

6. Stimulation of receptors leads to: *a) action potential.* *b) partial depolarization.* *c) complete depolarization.* *d) non specific response.* *e) all or non response.*	***B***
7. The receptor potential: *a) does not obey all or none law.* *b) can not be summated.* *c) has a duration greater than 2 sec.* *d) results from an increase in the membrane permeability of the receptor to Ca++.* *e) its amplitude is inversely proportional to the intensity of the stimulus.*	***A***
8. 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*	***D***
9. Weber – Fechner law is related to: *A. Modality discrimination* *B. Unit receptor field* *C. Intensity discrimination* *D. Two point discrimination*	***C***

10. A generator potential: *A. always leads to an action potential.* *B. increases in amplitude as a more intense stimulus is applied.* *C. is an all-or-none phenomenon.* *D. is unchanged when a given stimulus is applied repeatedly over time.*	***B***
11. Sensory systems code for the following attributes of a stimulus: *A. modality, location, intensity, and duration* *B. threshold, receptive field, adaptation, and discrimination* *C. touch, taste, hearing, and smell* *D. threshold, laterality, sensation, and duration* *E. sensitization, discrimination, energy, and Projection*	***A***
12. Generator potential: *A. obey all or non low* *B. has ARP* *C. propagated* *D. all of the above.* *E. none of the above.*	***E***
13. Slowly adapting receptors differ from rapidly adapting receptors in: *A. stopping to discharge after a relatively shorter period of constant stimulation* *B. generating receptor potentials as long as stimulus is applied.* *C. detecting the dynamic properties of stimuli* *D. detecting velocity of stimuli*	***B***
14. Gluco-receptors are: *A. Interoceptors* *B. Hypothalamic receptors* *C. Slowly adapting receptors* *D. Chemical receptors* *E. All of the above*	***E***

15. Receptors detect stimulus intensity by: *A. lowering the threshold for receptor stimulation* *B. generating receptor potentials having higher magnitudes* *C. generating nerve impulses transmitted along sensory fibers at higher velocities* *D. enhancing the central effects of sensory Impulses*	***B***
16. The ability to localize the site of stimuli depends upon: *A. the type of the stimulated receptor* *B. connections between receptor and cortex* *C. rate of adaptation of stimulated receptors* *D. the nature of the stimulus*	***B***
17. In sensory receptors: *A. Stimulus energy is converted into a local depolarization.* *B. The generator potential is graded and self-propagating.* *C. A generator potential can be produced by only one form of energy.* *D. The frequency of action potentials generated doubles when the strength of the stimulus doubles.* *E. Serving touch sensation, constant suprathreshold stimulation causes action potentials to be generated at a constant rate.*	***A***
18. In which of the following is the frequency of stimulation not linearly related to the strength of the sensation felt? *A. Sensory area of the cerebral cortex* *B. Specific projection nuclei of the thalamus* *C. Lateral spinothalamic tract* *D. Dorsal horn* *E. Cutaneous receptors*	***E***

19. Most sensory receptors: *a) are stimulated by different types of stimuli* *b) are stimulated only by specific stimuli* *c) posses a high threshold for their specific stimuli* *d) only 'b' and 'c are correct*	***B***
20. A specific stimulus produces a receptor potential by: *a) inhibiting Na+ influx into receptor* *b) inhibiting K+ efflux from receptor* *c) enhancing Na+ influx into receptor* *d) enhancing K+ efflux from receptor*	***C***
21. Receptor potential initiated by an adequate stimulus: *a) develops always at it full magnitudes* *b) undergoes temporal summation only* *c) undergoes spatial summation only* *d) could initiate an action potential*	***D***
22. Once initiated, the receptor potential: *a) spreads to a long distance along the sensory nerve fiber* *b) amplitude is not related to the strength of the stimulus* *c) always generates an action potential from the receptor* *d) stays for a variable period depending on the type of the receptor*	***D***
23. Receptor potential generates: *a) electrotonic current which is transmitted along sensory fibers to the* *b) a nerve impulse at the receptive region of the receptor* *c) a state of hyperpolarization of the receptor membrane* *d) a nerve impulse at the spike initiating region of the receptor*	***D***

24. When stimulated by effective stimulus , sensory receptors: *a) continuously discharge impulses* *b) stop discharging after a short time* *c) produce an initial high rate of impulse discharge followed by decline of this rate* *d) differ in their response : some types discharge continuously, while other types do not respond at all*	***C***
25. Slowly adapting receptors include all the following types except: *a) Golgi tendon organs* *b) warmth receptors* *c) free nerve endings* *d) Meissner corpuscles*	***D***
26. Slowly adapting receptors differ from rapidly adapting receptors in: *a) Stopping to discharge after a relatively longer period of constant stimulation* *b) detecting the dynamic properties of stimuli* *c) detecting velocity of stimuli* *d) generating receptor potentials with different properties*	***D***
27. Rapidly adapting receptors are involved in: *a) initiation of rapid reflex responses* *b) detection of joint movements* *c) regulation of heart rate* *d) only 'a' and 'b' are correct*	***B***

28. Receptors detect stimulus intensity by: *a) lowering the threshold for receptor stimulation* *b) by generating receptor potentials having higher magnitudes* *c) by generating nerve impulses that are transmitted along sensory fibers at higher velocities* *d) by enhancing the central effects of sensory impulses*	***B***
29. Detection of the stimulus modality depend on : *a) the location of the receptors in the body* *b) the magnitude of the stimulus* *c) the anatomical connections between the receptors and specific sensory areas in the cerebral cortex* *d) the magnitude of the receptor potential*	***C***
30. Receptors detect stimulus intensity by: *a) lowering the threshold for stimulating receptors* *b) raising the threshold for stimulating receptors* *c) decreasing the magnitude of receptor potential* *d) raising the magnitude of receptor potential*	***D***
31. The ability to localize the site of stimuli depends upon : *a) the type of the stimulated receptors* *b) connections between the receptor and the sensory cortex* *c) the rate of adaptation of the stimulated receptors* *d) the nature of the stimulus*	***B***
32. The sensory receptors: *a) Have the same structure in all areas of the body* *b) Consist of a nerve cell body* *c) Obey the law of specific nerve energies* *d) Are all free nerve endings* *e) None of the above*	***C***

33. All the following receptors are phasic receptors except: *a) Hair end organs* *b) Pacinian corpuscles* *c) Meissner's corpuscles* *d) Pain free nerve endings*	***D***
34. The sensory receptors: *a) They are specialized structures at the peripheral end of afferent neurons* *b) They detect changes in the surroundings* *c) Then undergo adaptation* *d) They act as transducers* *e) All of the above*	***E***
35. Concerning the adaptation of receptors: *a) It is due to fatigue of the receptors* *b) It is a decline in the rate of firing inspite of constant stimulation* *c) It is due to changes in the receptors which become less responsive to stimuli* *d) It is occurs in all receptors by the same degree* *e) It is accompanied by increase in the receptors potential* *f) The cold receptors adapt more rapidly than the warmth receptors*	***B***
36. Phenomenon of adaptation in sensory receptors is maximal in: *a) Hair end organs* *b) Muscle spindles* *c) Joint capsule receptors* *d) Pacinian receptors* *e) Nociceptors*	***D***

37. The fast (rapid) adapting receptors include: *a) proprioceptors* *b) Pain receptors* *c) Baroreceptors in the carotid sinus* *d) Tactile receptors* *e) Thermoreceptors*	***D***
38. Adequate stimulation of a receptor leads to: *a) Localized hyperpolarization due to increased permeability to K and Cl* *b) Production of a receptor potential which cannot be summated* *c) Repetitive discharge of action potential producing a specific modality of sensation* *d) Production of a receptor potential which obeys the all or none law* *e) Production of a receptor potential which is actively conducted to the first node of Ranvier without a decrease in amplitude*	***C***
39. About generator (receptor) potential all the following is true except: *a) It has longer duration than that of the action (spike) potential* *b) It is a state of partial depolarization due to increased Na permeability* *c) It can be graded* *d) It has a long refractory period*	***D***
40. The Weber - Fechner law states that: *a) Each receptor is most sensitive to a specific form of energy.* *b) The receptors are extremely excitable structures* *c) The receptor obey the all or none law* *d) The rate discharge from receptors directly proportional to the logarithm of the intensity of the stimulus* *e) The receptor potential can be summated*	***D***

41. The muller's law of specific nerve energies state that: *a) The rate of discharge from sensory receptors varies directly with the intensity of the stimulus* *b) A receptor potential can be generated by many kinds of stimuli in any sensory receptor* *c) Stimulation of a receptor , its afferent fiber or the centre where it ends produces the sensation modality to which that receptor is specialized* *d) There are specific stimuli to which receptors are most sensitive* *e) The receptor potential can be graded*	**C**