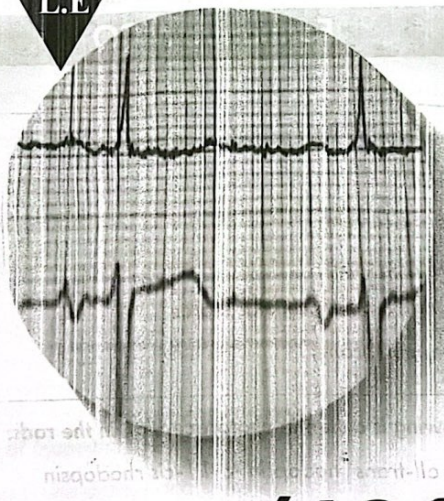
Level 2

Sem 4

MCQ Physio

CNS

6 L.E



Lecture (13&14)

DR.M M

Written Q

1. Enumerate function of outer pigmented layer ?
2. Compare () rodes and cones ?
3. Compare () macula lutea and optic disc ?
4. Why fovea centralis is the area of acute vision ?
5. Enumerate changes that occur in dark and light adaptation ?
6. Def retinal adapation ?
7. Enumerate function of ganglion cell , LGB , 1ry visual area ?
8. Mention mechanism of color vision ?
9. Enumerate requirement and advantages of binocular vision ?
10. Compare () photopic and scotopic vision ?

Formative MCQ

1. Activation of transducin by light activates an enzyme which: a) Hydrolyzes cGMP b) Increases the dark current c) Activates adenylyl cyclase d) Releases calcium from intracellular stores e) Depolarizes the membrane	**A**
2. Which of the following is a step in photoreception in the rods: a) Light converts all-trans rhodopsin to 11-cis rhodopsin b) Metarhodopsin II activates transducin c) Cyclic guanosine monophosphate (cGMP) levels increase d) Rods depolarize e) Release of neurotransmitter increases	**B**

3. Which one of the reactions in the retinal rods is caused directly by the absorption of light energy? a) Dissociation of scotopsin and metarhodopsin b) Decomposition of scotopsin c) Transformation of 11-cis retinal to all-trans retinal d) Transformation of metarhodopsin to lumirhodopsin e) Transformation of vitamin A to retinene	C
4. When light strikes the eye there is an increase in: a) The activity of the transducin b) The amount of transmitter released from the photoreceptors c) The concentration of 11- cis retinal within the photoreceptors d) The concentration of calcium within the photoreceptors e) The activity of guanylyl cyclase	A
5. Given these areas of the retina: **1. macula lutea** **2. fovea centralis** **3. optic disc** **4. periphery of the retina** **Choose the arrangement that lists the areas according to the density of cones, starting with the area that has the highest density of cones.** a) 1,2,3,4 b) 1,3,2,4 c) 2,1,4,3 d) 2,4,1,3 e) 3,4,1,2.	C
6. One of advantages of binocular vision is: a) Help the eye to see fine details and color of the objects. b) Prevent spherical and chromatic aberrations. c) Correct the minor defects in the visual field of one eye by the other eye. d) Increase the field of vision vertically from 160 to 200 degrees. e) Increase the acuity of vision.	C

7. A requirement of binocular vision is: a) Corneal dehydration. b) High intraocular pressure. c) Intact neuromuscular apparatus of the eye. d) Intact secondary visual area (area 19). e) Absence of overlap between the visual fields of the two eyes.	**C**
8. The fovea centralis: a) is the area of least acute vision. b) Is specialized for dark vision. c) Has the lowest threshold of excitation in the retina. d) Contain only cones.	**D**
9. The retinal adaptation in dim light is: a) a primary function of the cones. b) Normally completed in 2 – 3 minute. c) Entirely due to regeneration of Rhodopsin. d) Accompanied with decreased retinal sensitivity.	**C**
10. Cones are: a) Present mainly in the peripheral parts of the retina. b) Responsible for colour vision. c) Associated with a lower visual acuity than rods. d) Connecting to bipolar cells with great convergence than rods.	**B**
11. Rhodopsin: a) In the photosensitive pigment present in the cones. b) Is responsible for light adaptation. c) Is bleached in the dark. d) Is decreased in Vit A deficiency.	**D**

12. Layer 1 of LGB: a) Receives signals from coniocellular ganglion cells. b) Receives signals from parvocellular ganglion cells. c) Receives impulses from retina on the same side. d) Sends signals to primary visual area via parvocellular patnway. e) Is important in detection of shape and motion of the object.	**E**
13. Damage of area 18 causes: a) Complete blindness b) Contralateral homonymous hemianopia c) Bitemporal hemianopia d) Visual agnosia e) Binasal hemianopia	**D**
14. The main function of the rods in the eye is: a) depth perception. b) color vision. c) vision in dim light. d) accommodation for near vision. e) prevention of light reflection inside the eye.	**C**
15. The blind spot of the eye is: a) where more rods than cones are found b) where the macula lutea is located c) where only cones occur d) Where the optic nerve leaves the eye. e) Where more cones than rods are found.	**D**

16. Retinal cells which respond by full depolarization is: a) Amacrine cells b) Horizontal cells c) Photoreceptors d) Ganglion cells e) Bipolar cells.	**D**
17. Concerning dark adaptation: a) the amount of rhodopsin increases. b) the pupils constrict. c) it occurs more rapidly than light adaptation. d) Retinal sensitivity markedly decreases. e) Retinal threshold is increased.	**A**
18. In the retina there are cones that are most sensitive to a particular color. **Given this list of colors:** **1. red** **2. Yellow** **3. Green** **4. blue** **Indicate which colors correspond to specific types of cones.** a) 2,3 b) 3,4 c) 1,2,3 d) 1,3,4 e) 1,2,3,4.	**D**
19. In the retina: a) There are equal numbers of rods and cones. b) The fovea contains rods only. c) Inverted images are formed. d) There are one blood supply via the central retinal artery.	**C**

20. About the ganglion cells of the retina: a) Are only one type. b) Do not respond when light is turned off. c) Their axons form the optic nerve. d) Are inhibited by the amacrine cells.	C
21. The horizontal cells of the retina: all false except: a) Form a lateral connection between photoreceptors & bipolar cells. b) Stimulate rods & cones. c) Directly connect the photoreceptors to the ganglion cells. d) Constitute a lateral excitatory pathway in the retina.	A
22. The fovea centralis: a) Is located at the periphery of the macula lutea. b) Lies where the optic axis meets the retina. c) Lies on the temporal side of the blind spot. d) Contains more rods than cones.	C
23. Match the abnormality in each question with the lettered disease that is most closely associated with it. Each lettered disease is selected once: **1- Hypermetropia** **2- Myopia** **3- Bitemporal hemianopia** **4- Strabismus** **5- Nyctalopia (night blindness)** a) Tumor of the anterior pituitary gland b) Vitamin A deficiency c) Failure of visual images to fall on corresponding points in the retina. d) Long anteroposterior diameter of the eyeball.	1- 2- D 3- A 4- C 5- B

Other MCQ

1. Rods in the retina are: a) more in the central part of the retina. b) better innervated than cones. c) more sensitive to light. d) responsible for color vision. e) present in fovea.	C
2. In dark adaptation: a) the retinal sensitivity is decreased. b) it is associated with papillary constriction. c) the retinal sensitivity is increased. d) it is associated with increased power of lens. e) it is caused by decomposition of rhodopsin pigment.	C
3. Dark adaptation in the eye is mainly due to: a) dilatation of pupil. b) cone adaptation. c) rod adaptation. d) constriction of pupil. e) increase intraocular pressure	C
4. Concerning the retina: a) exposure to light leads to depolarization of photoreceptors only. b) exposure to light leads to depolarization of both photoreceptors and bipolar cells. c) exposure to light leads to depolarization of the bipolar cells only. d) fovea centralis is the least sensitive part of the retina. e) optic disc contains rods only.	C

5. Which of the following is correct: a) in Argyll Robertson pupil accommodation reflex is lost and pupillary reflex is intact. b) visual aphasia occurs due to lesion in the cortical area 18 and 19. c) astigmatism occurs because lens elasticity is decreased. d) hypermetropia is corrected by biconcave lenses. e) none of the above is correct.	B
6. During photopic vision : a) Rods are not stimulated b) Colour and details are perceived c) Visual acuity is low d) The eye is adapted to dim light .	C
7. The fovea centralis : a) is the area of least acute vision. b) Is specialized for dark vision. c) Has the lowest thresnold of excitation in the retina d) Contain only cones	D
8. In hypermetropia , All are true except : a) The far point in nearer than normal . b) The image is formed behind the retina. c) Convex lenses correct the condition. d) Presbyopia worsens the condition.	A
9. The fovea centralis : a) Is not used during routine vision. b) is the area of least acute vision. c) Is specialized for dark vision. d) Has the lowest threshold of excitation in the retina, e) Contains the highest concentration of cones.	E

10. When visual stimulus falls on given point in retina for long time : a) The image becomes more clearly founded . b) Adaptation occurs in the visual cortex. c) The discharge rate of the retinal bipolar cells gradually increases. d) pupil constricts. e) The image fades gradually then disappears.	**E**
11. Rhodopsin: a) Is the photo-sensitive pigment present in the cones b) is responsible for light adaptation. c) Is bleached in the dark. d) Maximally absorbs the red and violet part of the spectrum. e) Has a high bleaching sensitivity in the green blue part of spectrum .	**E**
12. Rhodopsin is : a) A purple pigment. b) Least sensitive to blue-green light. c) Most sensitive to red and violet light d) Regenerated when the eyes are closed. e) Increased in vitamin A deficiency	**D**
13. About the rods all the following are true except : a) They comprise about 1/5 of the receptor cells in the fovea. b) Many rods converge on a single optic nerve fibre . c) Their number in night-shift workers is the same as in normal persons. d) They become insensitive in bright light. e) They are concerned with peripheral vision, f) They are responsible for scotopic vision.	**A**

14. The fovea centralis : a) Is the thickest part of the retina b) Contains cones and rods in about an equal proportion c) Contains only rods. d) Contains the largest cones in the retina e) Consists mainly of a thin layer containing long slender cones without an apparent ganglion cell layer.	**E**
15. The myopic person : a) May see clearly by adjusting the lone of his cilicry muscles. b) Cannot see clearly unless he wears suitable negative lenses. c) Becomes worse with the occurrence of presbyopia d) May be improved by use of convex spherical lenses	**B**
16. In refractive media of eye , the highest refractive index is that of: a) Cornea. b) Aqueous humour. c) Crystalline lens d) Vitreous humour.	**C**
17. Accommodation of the lens to focus a near object is due to : a) Increased tension of the suspensory ligament. b) Regain of its resting elasticity so that is becomes more spherical . c) Pulling insertion of the suspensory ligament at the ciliary body backward and downward. d) Pulling on its capsule as a result of ciliary muscle contraction	**B**
18. The sensitivity of rods to incident light : a) Is unrelated to the concentration of rhodopsin b) Decreases as the concentration of rhodopsin increases c) Decreases greatly for a small decrease in the concentration of rhodopsin d) is precisely proportional to the concentration of rhodopsin .	**C**

19. The-ganglion cells in the retina : a) Are inhibited by the amacrine cells b) Are only one type c) Discharge continuously at a rate of about 50 / second even in dark d) Increase their discharge at a constant rate when light is applied to eye e) Are subjected to inhibition by the effect of the horizontal cells	**E**
20. The horizontal cells in the retina : a) Directly connect the photoreceptors to the ganglion cells. b) Constitute a lateral excitatory pathway in the retina . c) Stimulate the rods and cones. d) Inhibit the bipolar cells directly and the ganglion cells indirectly. e) Play no function in colour differentiation and detection of contrast, f) Have direct connections with the amacrine cells .	**D**
21. In myopia : a) The eyeball tends to be longer than the average normal . b) The lens power is weaker than normal in most cases . c) The use of biconvex lenses corrects the error . d) Near vision is more seriously affected than far vision . e) A circular object may appear oval .	**A**
22. The primary visual cortex (area 17): a) Is not essential for the visual sensation . b) is a small area in the limbic lobe. c) Also receives auditory information . d) Perceives visual sensations and localizes them in relation to each other e) Is able to interpret the images completely.	**D**

23. Retinal receptors exhibit all the following properties except : a) All contain sensitive photo-chemical pigments. b) All show continuous damage and reformation of new discs in their outer segments c) All have synaptic bodies that connect them to a subsequent neuronal cell d) All are of one type having same shape and photosensitive pigment e) All contain inner segments that are rich in mitochondria.	D
24. In hypermetropia: a) The objects at Infinity cannot be clearly seen. b) ciliary muscle must contract more strongly than normal even during far vision c) The range of clear vision is greater than normal. d) Correction is obtained by use of converging (convex) lenses .	D
25. When comparing the fovea with the periphery of the retina, which of the following statements is correct? a) The fovea contains an increased proportion of cones b) The fovea contains an increased proportion of ganglion cells c) The fovea contains an increased proportion of horizontal cells d) The fovea contains an increased proportion of rods e) The fovea contains an increased proportion of vasculature	A
26. Light entering eye passes through which retinal layer first? a) Inner nuclear layer b) Outer nuclear layer c) Outer plexiform layer d) Photoreceptor layer e) Retinal ganglion layer	E

27. Ganglion cells attached to photoreceptors located on the temporal portion of the retina project to which of the following structures? a) Contralateral lateral geniculate nucleus b) Ipsilateral lateral geniculcte nucleus c) Ipsilateral medial geniculate nucleus d) Calcarine fissure e) Contralateral medial geniculate nucleus	**B**
28. Which of the following best describes the "blind spot" of the eye? a) Located 5 degrees lateral to the central point of vision b) Exit point of no optic nerve c) Contains Only rods and thus has monochromatic visior d) Contains no blood vessels e) Area where chromatic aberration of the lens is the greatest	**B**
29. When parallel light rays pass through a concave lens, which of the following will occur? a) Rays converge toward each other b) Rays diverge away from each other c) They maintain parallel relationship d) They reflect back in the direction from where they came e) Rays refract to one focal point	**B**
30. Which of the following statements best describes the role of melanin in the pigment layer of the retina? a) Precursor of the light sensitive chemical rhodopsin b) Serves as nutritional component to the rods and cones in the retina c) pigment that prevents the reflection of light inside globe of the eye d) Responsible for maintaining integrity of the canal of Schlemm	**C**

31. Which of following pairs of molecules combine to form rhodopsin ? a) Bathorhodopsin and 11-cis-retinal b) Bathorhodopsin and all-trans-retinal c) Bathornodopsin and scolopsin d) Scolopsin and 11-cis-retinal e) Scolopsin and all-trans-retinal	**D**
32. A deficiency of which vitamin prevents the formation of an adequate quantity of retinal, eventually leading to night blindness ? a) Vitamin A b) Vitamin C c) Vitamin D d) Vitamin E	**A**
33. Under low or reduced light conditions, which of the following chemical compounds is responsible for the inward directed sodium current in the outer segments of the photoreceptors? a) Metarhodopsin II b) Cyclic GMP c) 11-cis retinal d) Cyclic AMP e) 11-trans retinal	**B**
34. Accommodation for far vision (focusing on an object at a distance) requires which of the following processes? a) Constriction of the pupil of the eye b) Dilation of the pupil of the eyes c) An increase in die formation of rhodopsin d) Causing the lens of the eye to have more curvature (making it falter) e) Causing the lens of the eye to have less curvature (making it thinner)	**E**

35. Which of the following events occurs in photoreceptors during phototransduction in response to light? a) Phosphodiesterase activity decreases b) Transducin activity decreases c) Hydrolysis of cGMP increases d) Neurotransmitter release increases e) Number of open voltage-gated calcium channels increases	**C**
36. During photoreception, all of the following increase except: a) CGMP phosphodiesterase b) Transducin c) CAMP d) Metarhodopsin II e) Sodium influx into the outer segment of the rod	**E**
37. For the eye to adapt to intense light, which of the following may occur? a) Bipolar cells will continuously transmit signals at the maximum rate possible b) Phytochemicals in both rods and cones will be reduced to retinal and opsins c) The levels of rhodopsin will be very high d) There will be an increase in the size of the pupil e) Vitamin A will convert into retinal	**B**
38. Transmission of visual signals to the primary visual cortex from the retina includes a synapse in which structure? a) Lateral geniculate nucleus b) Medial geniculate nucleus c) Pretectal nucleus d) Superior colliculus e) Suprachiasmatic nucleus	**A**

39. Which of the following statements is correct concerning the elements of the retina ? a) Total number of cones in the retina is much grecter than the total number of rods b) Each individual cone responds to all wave lengths of light c) Photoreceptors activation (rods and cones) results In hyperpolarization of the receptor d) Central fovea contains only rods e) Pigment layer of the retina contains the photoreceptors	C
40. Which of the following neurotransmitters is released by both rods and cones at their synapses with bipolar cells? a) Acetylcholine b) Dopamine c) Glutamate d) Glycine e) Serotonin	C
41. The condition of hyperopia is usually caused by which of the following anomalies of the eye? a) Decreased production of melanin b) Uneven curvature of the cornea c) Eyeball that is shorter than normal d) Eyeball that is longer than normal e) Lens system that is too powerful and focuses object in front of retina	C
42. Of the photoreceptors listed below which one responds to the broadest spectrum of wavelengths of light ? a) Rod receptors b) Creosote receptors c) glue cone receptors d) Red cone receptors	D

43. Which of the following retinal cells have action potentials? a) Amacrine cells b) Bipolar cells c) Ganglion cells d) Horizontal cells e) Photoreceptors	C
44. Visual contrast is enhanced due to lateral inhibition by which retinal cells ? a) Amacrine cells b) Bipolar cells c) Ganglion cells d) Horizontal cells	D
45. Which of the following best describes the underlying basis of the dark current in the outer segment of the photoreceptors? a) Dark current results from the influx of sodium ions via c-AMP dependent sodium channels b) Dark current results from the influx of sodium ions via c-GMP dependent sodium channels c) Dark current results from the efflux of potassium ions via c-MBA dependent potassium channels d) Dark current results from the efflux of sodium ions Via c-CMP dependent sodium channels e) Dark current results from the efflux of sodium ions vic c-AMP dependent sodium channels	B
46. When compared with the cones of the retina, the rods: a) are more sensitive to low-intensity light b) adapt to darkness before the cones c) are most highly concentrated on the foveal d) are primarily involved in color vision	A

47. Which of the following is a step in photoreception in the rods? a) Light converts all-trans rhodopsin to 11-cis rhodopsin b) Metarhodopsin II activates transducin c) Cyclic guanosine monophosphate (cGMP) levels, increase d) Rods depolarize e) Release of neurotransmitter increases	**B**
48. Cutting which structure causes blindness in the temporal fields of the left and right eyes? a) Optic nerve b) Optic chiasma c) Optic tract d) Geniculo-calcarine tract	**B**
49. Which of the following actions occurs when light strikes a photoreceptor cell of the retina? a) Transducin is inhibited b) The photoreceptor depolarizes c) Cyclic guanosine monophosphate (cGMP) levels in the cell decrease d) All-trans rhodopsin is converted to 11-cis rhodopsin e) An excitatory neurotransmitter is released	**C**
50. The fovea of the eye: a) Has the lowest light threshold. b) is the region of highest visual ability. c) contains only rag and green cones. d) contains only rods. e) is situated over the head of the optic nerve.	**B**

51. Which of the following parts of the eye has the greatest concentration of rods? a) Ciliary body b) Iris c) Optic disc d) Fovea e) Parafoveal region	**E**
52. Which of the following is not correctly paired? a) Rhodopsin: retinal and opsin b) Obstruction of the canal of Schlemm: elevated intraocular pressure c) Myopia: convex lenses d) Astigmatism: nonuniform curvature of the cornea e) Inner segments of rods and cones: synthesis of the photosensitive compounds	**C**