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NPTEL

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Courses » Virtual Reality Engineering

Announcements

Course

Ask a Question

Progress

Unit 6 - Week 4

Course outline

How to access the portal

Week 0 - Self Assessment

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Week 4

- Three interpretations of light
- Refraction
- Simple lenses
- Diopters
- Imaging properties of lenses
- Lens aberrations
- Optical system of eyes
- Photoreceptors
- Sufficient resolution for VR
- Light intensity
- Eye movements
- Eye movements, contd
- Eye movement issues for VR
- Neuroscience of vision

Week 4 - Assignment 4 a

The due date for submitting this assignment has passed. **Due on 2018-02-21, 23:59 IST.**

Submitted assignment

Questions on light & Optics

1) 1 point

What is the refraction angle of light in water, where the incident angle is 22° , from air? The speed of light in water is given as 2.25×10^8 m/s. (refractive index of air = 1)

(Hint: Snell's law)

- 12.36
- 11.23
- 14.9
- 26.34

No, the answer is incorrect.

Score: 0

Accepted Answers:

14.9

2) The distance between focal point and optical centre is called 1 point

- Converging length
- Optical distance
- Mean optical distance
- Focal length

No, the answer is incorrect.

Score: 0

Accepted Answers:

Focal length

3) Which of the following statements are correct for the plane mirror image? 1 point

- i. Virtual image is of same size as object
 - ii. Virtual image is bigger in size than object
 - iii. Virtual image undergoes little inversion
 - iv. Virtual image will not undergo any inversion
- ii only
 - i and iii only
 - ii and iii only
 - none of the above

No, the answer is incorrect.

Score: 0

Quiz : Week 4 - Assignment 4 a

Week 4 Feedback

Week 5

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Week 12

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Accepted Answers:
i and iii only

4) What is the speed of light in crown glass with refractive index 1.52? **1 point**

- 1.56x10⁵ km/s
- 1.97x10⁵ km/s
- 2.99x10⁵ km/s
- 1.38x10⁵ km/s

No, the answer is incorrect.

Score: 0

Accepted Answers:
1.97x10⁵ km/s

5) Find the distance at which the image is formed when the light from the object passes through the convex lens, with focal length of 15cm, placed at a distance of 25 cm from the object. **1 point**

- 33.2 cm
- 37.5 cm
- 45.1 cm
- 36.4 cm

No, the answer is incorrect.

Score: 0

Accepted Answers:
37.5 cm

6) The refractive index and radius of curvatures of lens are given as 1.5, 30 cm and -35 cm respectively. Find the focal length of the lens. **1 point**

(Hint: lensmaker's equation)

- 35.6 cm
- 13.2 cm
- 32.3 cm
- 42.4 cm

No, the answer is incorrect.

Score: 0

Accepted Answers:
32.3 cm

7) Calculate the refractive power of the lens described in question 6. **1 point**

- 3.809
- 3.095
- 4.087
- 2.988

No, the answer is incorrect.

Score: 0

Accepted Answers:
3.095

8) Pick the correct answer(s). (more than one may be correct) **1 point**

- i. Pincushion distortion is one type of optical distortion.
- ii. If the field of view is wider, then the optical distortion will be of no effect.
- iii. Barrel distortion can be applied to overcome the pincushion distortion of HMD lens.
- iv. Spherical aberrations can be reduced by using aspherical lenses.

- i and ii only
- iii only
- i, iii and iv only

ii and iii only

No, the answer is incorrect.

Score: 0

Accepted Answers:

i, iii and iv only

9) For converging lens, the rays which are parallel to the optic axis fail to converge to the same point, the effect is due to the, **1 point**

- Oblique astigmatism
- Chromatic aberration
- Barrel distortion
- Spherical aberration

No, the answer is incorrect.

Score: 0

Accepted Answers:

Spherical aberration

10) Which structure of the eye is responsible for primary focussing? **1 point**

- Pupil
- lens
- Cornea
- Iris

No, the answer is incorrect.

Score: 0

Accepted Answers:

Cornea

11) The part of the eye which is responsible for highest visual acuity, **1 point**

- Macula
- Retina
- Fovea centralis
- Optic disc

No, the answer is incorrect.

Score: 0

Accepted Answers:

Fovea centralis

12) Pick the right answer(s). (more than one may be correct) **1 point**

- i. Myopia may be corrected by a diverging lens
- ii. Hypermetropia may be corrected by a diverging lens
- iii. Lens is the chief refractive element of the eye
- iv. Cornea is the chief refractive element of the eye.

- i and iii only
- i and iv only
- iii only
- i, iii and iv only

No, the answer is incorrect.

Score: 0

Accepted Answers:

i and iv only

13) Pick the correct answer(s). (more than one may be correct) **1 point**

- a. The pressure within the eye is maintained by the secretion of the aqueous humour.
- b. The pressure within the eye is about 1.5 mm Hg (0.2 kPa).

- ii only

- both i and ii
- i only
- neither i nor ii

No, the answer is incorrect.

Score: 0

Accepted Answers:

i only

14 What is the total power of eye's optical system (in dioptres and in focal length) ?

1 point

- 59.52 D or 16.8 mm
- 45.54 D or 21.9 mm
- 56.34 D or 17.7 mm
- 35.62 D or 28.0 mm

No, the answer is incorrect.

Score: 0

Accepted Answers:

59.52 D or 16.8 mm

15 Which lobe of human brain is responsible for vision?

1 point

- Occipital lobe
- Frontal lobe
- Parietal lobe
- Temporal lobe

No, the answer is incorrect.

Score: 0

Accepted Answers:

Occipital lobe

16 The slower and minute movements that help the eye align with the target and avoid perceptual fading, the concept is called

1 point

- Fixation
- Saccade
- Microsaccade
- Eye tracking

No, the answer is incorrect.

Score: 0

Accepted Answers:

Fixation

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