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ENTRANCE EXAMINATION - 2026**PhD: Health Sciences: Optometry and Vision Sciences**

Instructions

1. All examination rules and regulations of the University of Hyderabad must be strictly followed.
 2. The question paper consists of 70 questions carrying a total of 70 marks, divided into two parts.
Part A: Research Methodology 35 Questions – 35 marks
Part B: Optometry & Vision Sciences 35 MCQ– 35 marks
 3. Candidates must answer all questions in the OMR answer sheet only, as per the instructions provided.
 4. Candidates must write their Hall Ticket Number clearly in the space provided on the OMR answer sheet.
 5. Candidates must hand over the OMR answer sheet to the invigilator at the end of the examination.
 6. There will be no negative marking.
 7. The duration of the written test is **2 hours**.
 8. Non-programmable calculators may be used.
 9. No additional sheets will be provided. Rough work may be done in the question paper itself or in the space provided at the end of the booklet.
 10. This question paper consists of 16 pages, inclusive of the cover page.
 11. Candidates are allowed to carry this question paper after completion of the examination.
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PART-A

1. A major terminology change in the Declaration of Helsinki 2024 is the use of the term
 - A. Experimental subjects
 - B. Research objects
 - C. Human participants
 - D. Biological cases
2. A researcher plans a clinical trial in a low-resource community but does not intend to provide any post-trial benefit to that community. Which ethical concern is most relevant?
 - A. Lack of laboratory calibration
 - B. Exploitation and unfair distribution of benefits
 - C. Poor statistical modelling
 - D. Excessive use of placebo
3. In AI-based health research, “explainability” refers to:
 - A. The ability of AI to produce colourful graphs
 - B. The ability to understand, interpret, or justify how an AI system reaches its output
 - C. The ability to remove human decision-making
 - D. The ability to publish data openly without restriction
4. Human accountability in AI-assisted writing means:
 - A. The AI tool is responsible for all errors
 - B. The journal editor is responsible for all errors
 - C. The author remains responsible for accuracy, originality, interpretation, and ethical compliance
 - D. The software company becomes co-author
5. In a particular company, a study stated that - “As a result of employee training program, there will be a significant decrease in employee absenteeism.” The above statement is:
 - A. One tailed hypothesis
 - B. Two tailed hypothesis
 - C. Null hypothesis
 - D. None of the above

6. The trend in mortality from tuberculosis in England showed a steady fall in years 1855 – 1965 but thereafter a gradual rise in the incidence of this disease was reported. This type of time trend or fluctuation in disease occurrence is termed as:
- A. Epidemic trend
 - B. Cyclical trend
 - C. Seasonal trend
 - D. Secular trend
7. The number of deceased due to Covid-19 is expressed as a percentage of total deceased in a village, then it is:
- A. Frequency
 - B. Rate
 - C. Ratio
 - D. Proportion
8. A person sees a woman making a driving error and concludes that women are terrible drivers. This is an example of:
- A. Conclusion validity
 - B. Exception fallacy
 - C. Construct validity
 - D. Ecological fallacy
9. In an experimental design, the dependent variable is:
- A. The one that is not manipulated and in which any changes are observed
 - B. The one that is manipulated in order to observe any effects on the other
 - C. A measure of the extent to which personal values affect research
 - D. An ambiguous concept whose meaning depends on how it is defined
10. If a researcher is studying the effect of using laptops in his classroom to ascertain their merit and worth, he is likely conducting which type of research?
- A. Basic
 - B. Applied
 - C. Experimental
 - D. Evaluation

11. Hypothesis cannot be stated in

- A. Declarative terms
- B. Null and question forms terms
- C. General terms
- D. Directional terms

12. In an experimental design, the dependent variable is

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13. Three groups of subjects were followed over the course of five years to compare treatments for sideroblastic anaemia. The most appropriate statistical analysis to determine the quantitative serologic differences resulting from these treatments is:

- A. Regression analysis
- B. F test (ANOVA)
- C. Chi-square test
- D. T test

14. The birth weights in a hospital are to be presented in a graph. This is best done by a

- A. Bar diagram
- B. Pie chart
- C. Histogram
- D. Pictogram

15. An analysis of the race of patients who visit an emergency room reveals that 40% are white, 25% are black, 20% are Native American, and 15% are Asian. These data would best be depicted graphically with :

- A. Venn diagram
- B. Cumulative frequency graph
- C. Histogram
- D. Pie chart

16. In study carried out in the hospital ward, every 10th admitted patient was included in the sample, which sampling procedure is this:
- A. Random sampling
 - B. Stratified sampling
 - C. Convenient sampling
 - D. Systematic sampling
17. If six families were surveyed and the numbers of children per family were found to be 2, 3, 4, 4, 5, 6, find the mean number of children per family
- A. 2
 - B. 3.5
 - C. 4
 - D. 6
18. If $Z=52$ and $L=24$, then what is the value of EGG:
- A. 19
 - B. 38
 - C. 57
 - D. 76
19. India's first indigenous COVID-19 vaccine was prepared by
- A. Dr. Reddy's lab
 - B. Serum Institute of India
 - C. Bharat Biotech
 - D. Ranbaxy Labs
20. Which of the following rule listed below states that DNA from any cell of all organisms should have a 1:1 ratio of pyrimidine and purine bases and, more specifically, the amount of guanine is equal to cytosine and the amount of adenine is equal to thymine.
- A. Mendel's
 - B. Chargaff's
 - C. Shapiro-Wilk'
 - D. Miescher's
21. Which amongst them is not a leap year?
- A. 1966
 - B. 176
 - C. 1996
 - D. 1916

22. All of the following are important criteria when making causal inferences except:
- A. Consistency with existing knowledge
 - B. Dose-response relationship
 - C. Strength of association
 - D. Predictive value
23. All of the following variables are classified as nominal, except:
- A. Sex
 - B. Body weight (obese/not obese)
 - C. Education (high school degree/no degree)
 - D. Education (highest year of schooling)
24. The stages of a cancer is recorded using the symbols 0, I, II, III, IV. We say that the scale used is:
- A. Alphanumeric
 - B. Numerical
 - C. Ordinal
 - D. Nominal
25. If on a group of 500 patients, for a risk factor we calculated a Relative Risk $RR = 12.5$, the possibility of developing the disease being investigated is:
- A. Very high when exposed to the factor
 - B. Very small when exposed to the factor
 - C. The same in the case of exposure in the case of non-exposure
 - D. Lower in the exposed than in the unexposed, RR being less than 100
26. Which of the following statement is true about evidence-based medicine?
- A. Does not involved health economic assessment
 - B. Is restricted to randomized placebo-controlled trials.
 - C. Is used to cut down waiting list
 - D. Relies only on objective measurement of disease outcomes

27. The value of the correlation co-efficient between 2 variables lie between:

- A. 0 and α
- B. $-\alpha$ and $+\alpha$
- C. 0 and 1
- D. -1 and 1

28. Student's 't' test is a statistical method to test the significance of:

- A. One mean of a sample
- B. Difference between two means
- C. Correlation between variables
- D. Coefficient of variation

29. While performing a chi-square test, the data must be:

- A. In raw form as scores
- B. In percentage form
- C. In proportions form
- D. In ratio form

30. In general, screening should be undertaken for diseases with the following feature(s):

- A. Diseases with a low prevalence in identifiable subgroups of the population
- B. Diseases for which case-fatality are low
- C. Diseases with a natural history that can be altered by medical intervention
- D. Diseases that are readily diagnosed and for which treatment efficacy has been shown to be equivocal in evidence from a number of clinical trials

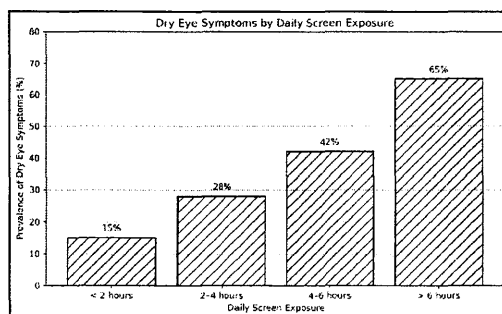
31. The extent to which a specific health care treatment, service, procedure, program, or other intervention does what it is intended to do when used in a community-dwelling population is termed its:

- A. Efficacy
- B. Effectiveness
- C. Effect modification
- D. Efficiency

32. The limit of an orthokeratology procedure is reached when:

- A. The cornea is changed to a hyperbolic shape
- B. The cornea is changed to a prolate shape
- C. The cornea is changed to an oblate shape
- D. The cornea is changed to a spherical shape

33. The following graph shows the prevalence of dry eye symptoms among individuals with different daily screen exposure durations:



- A. The prevalence of dry eye symptoms increases as daily screen exposure decreases.
- B. There is no relationship between screen exposure and dry eye symptoms.
- C. The prevalence of dry eye symptoms increases as daily screen exposure increases.
- D. All are True
34. According to *2019 WHO-world report on vision* what is the reported prevalence of myopia in high-income countries of the Asia-Pacific region?
- A. 54.4%
- B. 54.3%
- C. 53.2%
- D. 53.4%
35. The FDA-approved strength of VIZZ in 2025 launched eye drops for presbyopic correction is:

- A. Aceclidine 0.14%
- B. Aceclidine 1.44%
- C. Aceclidine 1.04%
- D. Aceclidine 14%

PART-B

36. A rigid gas permeable (RGP) lens with a back optic zone radius (BOZR) of 7.60 mm, and back vertex power (BVP) of -3.00 DSph, corrects a patient's refractive error accurately. We now want to fit this eye with a new lens of the same size, but with a BOZR of 7.70 mm.
What should the BVP of this new lens be?
- A. -2.00 D Sph
 - B. -2.50 D Sph
 - C. -3.00 D Sph
 - D. -3.50 D Sph
37. All of the following are likely to result from an RGP lens exhibiting a steep or tight fit in the periphery and mid-periphery, EXCEPT:
- A. Unstable lens fit
 - B. Inadequate tear exchange
 - C. Compression and indentation of the corneal epithelium
 - D. Tear debris trapped under the lens
38. Lens orientation and stabilisation with prism ballast toric soft lenses is achieved primarily through:
- A. Alignment of the lens edge with the lower lid margin
 - B. Base in and base out prisms
 - C. Prism-induced thickness differences
 - D. Gravitational forces
39. An RGP lens with a BOZR of 7.85 mm and a total diameter of 9.40 mm is placed on an eye. The static fitting evaluation shows a limited central touch zone and excessive fluorescein in the mid-periphery and peripheral zones. You now want to fit this eye with a new lens of the same overall diameter and achieve an alignment fit. Which BOZR would be MOST appropriate for the new lens?
- A. 7.75 mm
 - B. 7.80 mm
 - C. 7.85 mm
 - D. 7.90 mm
40. Reducing the total diameter (TD) of an RGP contact lens could affect all of the following lens parameters or fitting characteristics, EXCEPT:
- A. Centre of gravity
 - B. Back vertex power
 - C. Axial edge lift
 - D. Peripheral curve width

41. Which of the following spectacle prescriptions is MOST likely to result in a successful soft toric lens fit?
- A. $+0.75 / -1.75 \times 180$
 - B. $-1.25 / -1.25 \times 15$
 - C. $-4.75 / -2.25 \times 90$
 - D. $-4.50 / -2.00 \times 45$
42. A patient's right eye has keratometry readings of 7.95 mm along 175° (42.50 D) and 7.76 mm along 85° (43.50 D). Which BOZR would be MOST appropriate when fitting a spherical RGP lens to this eye?
- A. 7.60 mm
 - B. 7.70 mm
 - C. 7.80 mm
 - D. 7.90 mm
43. A toric soft contact lens with a BVP of $-2.25 / -2.50 \times 45$ has its greatest thickness in which meridian?
- A. 45° meridian
 - B. 90° meridian
 - C. 135° meridian
 - D. 180° meridian
44. A patient is wearing a rigid gas permeable trial contact lens with the following parameters: BOZR = 7.75 mm, Total diameter = 9.30 mm, BVP = -6.50 DS. Evaluation of the lens on the eye with fluorescein shows slight central pooling, so you decide to order a new lens of the same diameter i.e. 0.05 mm flatter. What should the BVP of this new lens be?
- A. -6.00 D
 - B. -6.25 D
 - C. -6.75 D
 - D. -7.00 D
45. A patient is wearing an RGP trial lens has a BOZR of 8.00 mm and a BVP of $+8.00$ DS, which accurately compensates for his refractive error. The lens shows an apical touch fluorescein pattern on the patient's eye, so you decide to order a final lens of the same overall diameter, but with a BOZR of 7.90 mm. What should the BVP of this final lens be?
- A. $+7.50$ D
 - B. $+7.75$ D
 - C. $+8.25$ D
 - D. $+8.50$ D

46. Manifest refraction = +3.00 / -1.00 X 180
 Keratometry = 43.00 / 44.00 D
 Base curve = 43.50

What is the final power of the contact lens power?

- A. + 3.50 D
- B. + 3.00 D
- C. + 2.50 D
- D. + 2.00 D

47. Spectacle Rx = -2.00 - 2.50 X 180;
 Keratometry = 42.00 @ 180; 44.00 @ 090
 Diagnostic lens = -3.00, 42.25 (7.99 mm) BCR
 What is the Tear lens power?

- A. +0.25 / -2.00 x 180
- B. +0.50 / -2.00 X 180
- C. +0.25 / -2.25 X 180
- D. +0.50 / -2.25 X 180

48. Which of the following is the MOST appropriate cleaner for use on a PMMA (acrylic) prosthetic eye?

- A. An antibacterial soap
- B. An alcohol-based rigid contact lens cleaner
- C. A soft lens multi-purpose solution
- D. Dishwashing liquid

49. The following are advantages of preformed scleral lenses, EXCEPT:

- A. Lens parameters are known accurately
- B. Patients can experience a lens before final fitting and ordering
- C. Easy to fit on highly toric corneas
- D. It can be made thinner than molded lenses

50. When fitting a scleral lens, which one of the following would indicate excessive tightness of the scleral zone?

- A. Sectoral bulbar hyperaemia
- B. Blanching of conjunctival blood vessels
- C. Conjunctival chemosis
- D. Iron deposition in the cornea

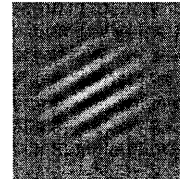
51. Tint fading in a hydrogel contact lens can occur by all of the following processes, EXCEPT:
- A. A reaction between the dye and tear proteins alters the dye density
 - B. Normal wear and tear when a lens is tinted using a reactive dye
 - C. Loss of dye from the contact lens by leaching
 - D. The action of chemicals from lens care products on the tint dye
52. Which one of the following conditions would MOST likely cause corneal hypoaesthesia?
- A. Recurrent corneal erosion
 - B. Herpes simplex keratitis
 - C. Thygeson's superficial punctuate keratitis
 - D. Trichiasis
53. An important exclusion criterion for refractive surgery is:
- A. A large phoria at a distance
 - B. Amblyopia
 - C. Presbyopia
 - D. Forme fruste keratoconus
54. In a population of 10,000 females, if $p = 0.92$ and $q = 0.08$, how many carrier females for color blindness are expected using the Hardy-Weinberg equation?
- A. 0.147
 - B. 14720
 - C. 1,472
 - D. 0.073
55. A video-based autorefractor records at 100 frames per second. The accommodative response begins after 28 frames. What is the latency?
- A. 28 ms
 - B. 280 ms
 - C. 2800 ms
 - D. 0.28 ms

56. A Tungsten light source has chromaticity coordinates $x = 0.20$, $y = 0.30$. Another light source CFL has $x = 0.40$, $y = 0.30$. If they are mixed in a 70:30 ratio, what is the approximate mixed x -coordinate?

- A. 2.60
- B. 0.20
- C. 0.26
- D. 260

57. If the below Gabor patch stimulus is presented which has a spatial frequency of 4 cycles/degree. What is the wavelength of the grating?

- A. $\lambda = 2500^\circ/\text{cycle}$
- B. $\lambda = 250^\circ/\text{cycle}$
- C. $\lambda = 0.25^\circ/\text{cycle}$
- D. $\lambda = 100^\circ/\text{cycle}$



58. A person suddenly notices a bright flashing yellow traffic light before consciously identifying that it is a traffic signal. Which visual process is mainly involved first?

- A. Top-down processing
- B. Bottom-up processing
- C. Memory-based recognition
- D. Language-mediated perception

59. A patient has a nasal corneal reflex displacement of 0.6 mm in Hirschberg test due to angle kappa. What is the approximate value in prism dioptres?

- A. 6Δ
- B. 90Δ
- C. 9Δ
- D. 60Δ

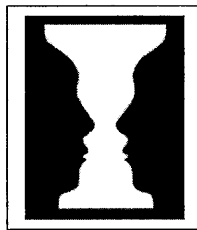
60. A person walks straight for 30 m, turns right and walks 50 m, then turns left and walks 40 m. He is now facing North. A mango tree is located toward the East, and he looks 90° to his right side without moving his head. What is his eye position, and which muscles are mainly responsible?

- A. Levoversion; left lateral rectus and right medial rectus
- B. Dextroversion; right lateral rectus and left medial rectus
- C. Supraversion; both superior recti
- D. Infraversion; both inferior recti

61. Unlike electronic shock circuits that can propagate uncontrolled surges, human retinal circuits remain stable because:

- A. Retinal ganglion cells never generate action potentials
- B. The retina uses direct electrical wiring without chemical mediation
- C. Visual information bypasses the retina and is processed only in the cortex
- D. Photoreceptors and bipolar cells transmit signals mainly through graded potentials, with inhibitory modulation from horizontal and amacrine cells

62. A viewer first sees the central white shape in the image provided below as a vase. After being told to observe the black regions carefully, the viewer begins to see two faces looking at each other. Which visual process best explains this change in perception?



- A. Figure-ground organization is influenced by bottom-down processing
- B. The illusion occurs because the eye loses contrast sensitivity
- C. Figure-ground organization is influenced by top-down processing
- D. The optic nerve transmits only one object at a time

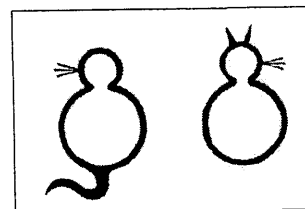
63. An archer named Arjun is aiming at a bird's eye located 50 metres away. The arrow travels at a velocity of 300 m/s. If the human accommodative response available is 2.5 D, what is the accommodative stimulus required to focus on the bird's eye?

- A. 0.02 D
- B. 0.20 D
- C. 2.00 D
- D. 2.50 D

64. Even during steady fixation, the human eye shows microtremors at approximately 70–100 Hz. Their main purpose is to:

- A. Produce smooth pursuit movements for moving targets
- B. Eliminate binocular rivalry
- C. Correct refractive blur in the cornea
- D. Prevent visual fading by maintaining photoreceptor stimulation

65. Locard's principle says that every contact leaves a trace. In human vision, when a person attends to an object and later imagines it, what does this suggest about attention and visual imagery?
- The retina physically stores the object permanently as visuospatial memory
 - Attention can leave cognitive traces that later support visual imagery and recognition
 - Visual imagery is perceptual and helps in attention
 - All are correct
66. A researcher uses eye tracking during an interrogation and finds longer fixation duration on crime-related images. What can be concluded?
- The person is definitely guilty and wanted to do crime
 - The person may have increased attention or recognition toward those images
 - The person is learning to do the crime
 - The person may have increased attention or memory toward those images
67. If tears appear red or blood-stained, the condition is called:
- Heamotearsia
 - Haemotacria
 - Heamatoheria
 - Heamolacria
68. A person is crying while standing under red decorative lights. The tears flowing on the cheek appear reddish, but there is no injury or bleeding. What is the most likely explanation?
- Emotional sadness has produced red-coloured tears
 - The tears are reflecting the red environmental light
 - The retina acting as red filter and providing the color into the tears
 - The lacrimal gland produces heamtotearsin protein during stress as reason
69. In a cat-card stereogram shown below, has the two pictures are usually slightly different so that the patient can:
- Macular perception
 - Detect Contrast
 - Fusion and stereopsis
 - Measure Binocular rivalry



70. A cricket batsman is fixating on a bowler's hand at **20 m** distance. At that moment, the cricket ball is released and is located at **10 m** from the batsman along the same line of sight. Assume the batsman's interpupillary distance is **6.4 cm**. Using the binocular disparity formula: $\delta \approx IPD \left(\frac{1}{Z} - \frac{1}{F} \right)$. What is the binocular disparity produced by the ball, and how will it help the batsman?

- A. 0 radians; the ball lies on the horopter, so no depth signal is produced
- B. 0.0032 radians; the ball is nearer than the fixation point and produces crossed disparity, helping depth estimation
- C. 0.0032 radians; the ball is farther than the fixation point and produces uncrossed disparity
- D. 0.032 radians; the ball is outside the visual field and cannot be detected

University of Hyderabad

Entrance Examinations-2026

Ph.D. Admissions-July-2026

School of Medical Sciences

Course: PhD

Subject: Ph.D. Health Sciences: Optometry and Vision Sciences

Entrance Exam Key [F-24]

Question Number	Answer	Question Number	Answer
1	C ✓	36	B ✓
2	B ✓	37	D ✓
3	B ✓	38	C ✓
4	C ✓	39	A ✓
5	A ✓	40	D ✓
6	D ✓	41	C ✓
7	D ✓	42	D ✓
8	B ✓	43	C ✓
9	A ✓	44	B ✓
10	D ✓	45	D ✓
11	C ✓	46	C ✓
12	A ✓	47	A ✓
13	B ✓	48	A ✓
14	C ✓	49	D ✓
15	D ✓	50	B ✓
16	D ✓	51	A ✓
17	C ✓	52	B ✓
18	B ✓	53	D ✓
19	C ✓	54	C ✓
20	B ✓	55	B ✓
21	A ✓	56	C ✓
22	D ✓	57	C ✓
23	D ✓	58	B ✓
24	C ✓	59	C ✓
25	A ✓	60	B ✓
26	D ✓	61	D ✓
27	D ✓	62	C ✓
28	B ✓	63	A ✓
29	A ✓	64	D ✓
30	C ✓	65	B ✓
31	B ✓	66	B ✓
32	B ✓	67	D ✓
33	C ✓	68	B ✓
34	D ✓	69	C ✓
35	B ✓	70	B ✓



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