

Reg. No.

MANIPAL UNIVERSITY

SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – JUNE 2009

SUBJECT: PATHOLOGY AND MICROBIOLOGY

Monday, June 01, 2009

Time: 10:00-13:00 Hrs.

Max. Marks: 80

- ✍ **ANSWER SECTION 'A' AND SECTION 'B' IN TWO SEPARATE ANSWER BOOKS.**
✍ **Answer ALL the questions.**

SECTION – A : PATHOLOGY : 40 MARKS

1. Define shock. What are the different types of shock? Describe the pathogenesis of septic shock.
(1+3+4 = 8 marks)
2. Define necrosis. Describe the different types of necrosis with examples.
(2+5 = 7 marks)
3. Write short notes on:
 - 3A. Nutritional anemias
 - 3B. Fate of a thrombus
 - 3C. Classification and clinical features of acute myeloid leukemia
 - 3D. Phagocytosis
 - 3E. AIDS.(5×5 = 25 marks)

SECTION – B : MICROBIOLOGY : 40 MARKS

4. What is transposition? Explain the process of gene transfer that occurs with the help of a bacteriophage and denote its significance.
(2+4+2 = 8 marks)
5. Classify viruses with suitable examples. Draw and describe the structure of an enveloped virus.
(3+4 = 7 marks)
6. Write short notes on the following:
 - 6A. Bacterial growth curve.
 - 6B. Anaphylaxis.
 - 6C. Nosocomial infections with emphasis on MRSA.
 - 6D. Mycotic keratitis.
 - 6E. Blepharitis.(5×5 = 25 marks)



MANIPAL UNIVERSITY

SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – JUNE 2009

SUBJECT: PHARMACOLOGY

Tuesday, June 02, 2009

Time: 10:00-11:30 Hrs.

Max. Marks: 40

1. Mention two drugs for each of the following conditions:
- Allergic conjunctivitis
 - Trachoma
 - Ocular candidiasis
 - Dry eye
 - Toxoplasmosis.
- (1×5 = 5 marks)
2. Write briefly on:
- Preanesthetic medications.
 - Ocular route of drug administration.
 - Ocular analgesics.
 - Wetting agents.
 - Morphine.
- (3×5 = 15 marks)
3. Define the following terms:
- Local anesthetic.
 - Hypnotic.
 - Ocular hypertension.
 - Pharmacokinetics.
 - Styptic.
- (1×5 = 5 marks)
- 4A. Write briefly on requirements of an ideal ocular preparation.
- 4B. Mention three different groups of antihypertensive drugs with an example for each.
- (2+3 = 5 marks)
- 5A. Define mydriasis.
- 5B. List two drugs each which cause passive mydriasis and active mydriasis.
- 5C. Enumerate two uses of mydriatics.
- (1+2+1 = 4 marks)
6. Explain the pharmacological basis for the following:
- Pilocarpine in glaucoma.
 - Ethanol in methanol poisoning.
 - Ketamine is contraindicated in ocular surgery.
- (2×3 = 6 marks)



MANIPAL UNIVERSITY
SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – JUNE 2009
SUBJECT: OPTOMETRIC AND DISPENSING OPTICS

Wednesday, June 03, 2009

Time: 10:00-13:00 Hrs.

Max. Marks: 80

1. Answer the Following:

- 1A. Transpose the prescription into one of its alternate forms:
 - +2.50DS/+2.00DC*80
- 1B. What is the power of a lens having its focal length at +27cm?
- 1C. What are the Constringence and Density values of Dense Barium Crown?
- 1D. Define Interpupillary Distance.
- 1E. Convert 4° into prism diopters.
- 1F. What are Hydrophobic coatings?
- 1G. Given one use of Sports shape design of Ophthalmic lenses.
- 1H. How is chromatic aberration eliminated in a recumbent prism?
- 1I. Give the range of Ultra-Violet radiations.
- 1J. Calculate the jump exerted by the following lens:
 - -2.00D; Add +1.00D, 50 Segment

(1×10 = 10 marks)

2. Answer any TEN:

- 2A. Which spectacle tools, calibrated for glass of refractive index 1.523 are necessary to produce a +12.50DS in plano-convex form in a plastics material whose refractive index is 1.49?
- 2B. With the help of a neat figure prove that the optic center must be dropped 1mm for every 2 degrees of Pantoscopic tilt, if the optic axis is to continue to pass through the center of rotation.
- 2C. Name five disadvantages of glasses over plastics.
- 2D. Write in detail about manufacture of glass by Individual Batch Method.
- 2E. What are Ghost images? Describe each type of Ghost image.
- 2F. Describe a prism with the help of a neat diagram and explain the procedure used to detect prism in spectacle.
- 2G. Show that the semi-angular field of view, Φ , produced by a thin lens of power F and diameter 2y mounted 25mm in front of the center of rotation of an eye can be found from:

$$\tan \Phi = y(40-F) / 1000$$
- 2H. Write short notes on Polarizing filters.
- 2I. Name the common design problems of Progressive Addition Lens. What are the basic patient's visual characteristics and requirements that need to be assessed once the patient is motivated for Progressive Addition Lens?

- 2J. Write short notes on Aspherical Lenses.
- 2K. Write briefly about:
- Occupational Progressive Addition Lenses
 - Varilux Physio
 - Varilux Ipeo
- 2L. With the help of neat diagrams explain the principles of:
- Lens thickness calipers
 - Geneva lens measure
- Also mention their uses.

(5×10 = 50 marks)

3. Answer the Following:

- 3A. Write short notes on the following:
- Fresnel's prisms and lenses
 - Recumbent Prisms
- 3B. Derive the formula to find sphero-cylindrical equivalent of obliquely crossed cylinders.

(10×2 = 20 marks)



MANIPAL UNIVERSITY
SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – JUNE 2009
SUBJECT: VISUAL OPTICS

Thursday, June 04, 2009

Time: 10:00-13:00 Hrs.

Max. Marks: 80

1. Fill in the blanks:

- 1A. An equation used to convert grating acuity score to MAR value is _____.
- 1B. In unocular aphakia, there is a difference of _____ % between the two images of both eyes.
- 1C. When the retinoscopy reveals +2.00Dsph/-1.75Dcyl X 180 at working distance of 67cm, the final refraction will be _____.
- 1D. In the recent refractive alteration technique Excimer laser is used, operating at UV light of _____ nm.
- 1E. Ametropia calculated in relation to the first principal plane of the eye gives _____.
- 1F. +2.00DSph/-1.00DCylx10 is an example of _____ type of astigmatism.

(1×6 = 6 marks)

2. Answer the following:

- 2A. Clinically how does physiological myopia differ from pathological myopia?
- 2B. If a patient is a 2.00D of hyperope and has 3.00D of accommodation,
 - i) How much facultative hypermetropia does the patient have?
 - ii) How much absolute hyperopia does the patient have?
- 2C. What are the limits of predictability of IOL power calculation?
- 2D. Explain in brief about mechanism of accommodation.
- 2E. Which of the horizontal disjunctive movement is more highly developed function? Give evidence.

(2×5 = 10 marks)

3. Answer the following questions:

- 3A. What are the treatment modalities available for presbyopia?
- 3B. What is Rowing Ring scotoma? What is the reason for seeing scotoma and what is the solution for this condition?
- 3C. What are the possible causes of inaccurate retinoscopic findings?
- 3D. Write a note on Donders Reduced eye concept.

(3×4 = 12 marks)

4. Write short notes on any SIX of the following:

- 4A. Spasm of accommodation, the eye conditions it is seen in and the treatment.
- 4B. Clinical features of hypermetropia.
- 4C. Disadvantages of aphakia corrected with spectacles.
- 4D. Treatment modalities available for myopia in current optometry practice.
- 4E. Gullstrand's schematic eye.
- 4F. Optical condition of astigmatism.
- 4G. Jacksons crossed cylinder, refining cylindrical power and axis with JCC.
- 4H. Vision in anisometropia.

(6×6 = 36 marks)

5. Write in detail about the optics of Retinoscopy. Explain all the stages of retinoscopy in emmetropia, hypermetropia and myopia with neat diagrams.

(16 marks)



MANIPAL UNIVERSITY

SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – JUNE 2009

SUBJECT: RESEARCH METHODOLOGY AND STATISTICS

Friday, June 05, 2009

Time: 10:00-13:00 Hrs.

Max. Marks: 80

1. Define:
- a) Crude birth rate b) Crude death rate c) General fertility rate
 d) Age specific fertility rate e) Total fertility rate
- (2×5 = 10 marks)
2. Explain with examples different types of variables in research.
- (10 marks)
- 3A. Explain standard deviation with its merits and demerits.
- 3B. In two series, adults aged 21 years and children 3 months old, following values were obtained for heights. Calculate co-efficient of variation and find out if height is more variable in adults or children?
- | <i>Category</i> | <i>Mean. Height</i> | <i>Standard Deviation</i> |
|-----------------|---------------------|---------------------------|
| Adults | 160cms | 10cms |
| Children | 60cms | 5cms |
- (5+5 = 10 marks)
- 4A. Define epidemiology and write the objectives of epidemiology.
- 4B. The estimated mid-year population for City X in 1990 was 761,335 of which 76,100 were in the age group of 1 – 4 years. During the year, there were 700 attacks of measles in the age group 1-4 years. The total new cases of tuberculosis were 912; the total cases of tuberculosis reported during the year were 23,000. Calculate the following:
- i) Incidence rate for Tuberculosis in the year 1990
 ii) Age specific incidence rate for measles in the age-group 1-4 years
 iii) Prevalence rate for Tuberculosis.
- (4+6 = 10 marks)
5. What is correlation? Explain different types of correlation with the help of scatter diagram.
- (1+4 = 5 marks)
6. Explain stratified random sampling with its merits and demerits.
- (5 marks)
7. It is observed that pulse rate of healthy male adults follow normal distribution with a mean of 75 per minute and a SD of 4 per minute. Find the probability that a randomly selected person have pulse rate
- a) Less than 71 per minute b) Between 67 and 83 per minute
- (5 marks)

8. Write short notes on:
- 8A. Census
 - 8B. Characteristics of a good hypothesis
 - 8C. Population, sample and sampling
 - 8D. Biostatistics and its role in health science

(5×4 = 20 marks)

9. Present the following data on percentage of live births by order of birth using a component bar diagram.

Birth Order	% Live births in	
	1990	1996
1	20	21
2	25	24
3	17	18
4	16	13
5	14	15
6 or more	8	9
Total	100	100

(5 marks)



MANIPAL UNIVERSITY

SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – JUNE 2009

SUBJECT: OPTOMETRIC INSTRUMENTS AND CLINICAL EXAMINATION OF VISUAL SYSTEM

Saturday, June 06, 2009

Time: 10:00-13:00 Hrs.

Max. Marks: 80

✍ **Draw diagrams wherever necessary.**

1. Fill in the blanks.

- 1A. Patient's refractive error has a major role in the magnification produced by a Direct Ophthalmoscope (True / False)
- 1B. The retina between Optic disc and macula is known as _____
- 1C. _____ is the best A-Scan technique to measure the axial length of the eye
- 1D. _____ glaucoma is expected if SHAFFER grading of AC angle shows Gr-I
- 1E. _____ mm is the diameter of area of Applanation
- 1F. _____ is the angle subtended by the 6/18 letter at retina which is kept at 18mtrs away
- 1G. The hypothetical sphere that used to construct the elevation maps in ORBSCAN topography is known as _____
- 1H. An 'against' motion in retinoscopy while using concave mirror can be neutralized by _____ lens
- 1I. Humans can recognize around _____ colors in visual spectrum
- 1J. In _____ systemic disease Blue-Yellow color vision defect is seen

(1×10 = 10 marks)

2. Answer any FIVE questions.

- 2A. Explain Vogt-Koeller illumination principle of slit lamp.
- 2B. Record the principle of non-contact tonometer.
- 2C. What are the factors affecting velocity of Ultrasound?
- 2D. Differentiate between Fundus and Posterior Pole.
- 2E. Define: i) Achromatopsia ii) Deuteranopia
- 2F. What are the clinical uses of Lensometers?

(2×5 = 10 marks)

3. Answer any FOUR questions.

- 3A. What is dynamic Retinoscopy? What are the types of dynamic Retinoscopy practiced in optometry?
- 3B. How is the scoring and interpretation of pseudo isochromatic plate tests and color arrangement tests.
- 3C. Define Scotoma. Differentiate between relative and absolute scotoma.
- 3D. Explain the QUAD map of ORBSCAN with its clinical applications.
- 3E. Write a note on LogMAR visual acuity chart.

(5×4 = 20 marks)

4. Answer the following.

4A. Calculate the letter heights for all levels for the charts mentioned below.

- i) Log MAR chart for 6m long examination room
- ii) Snellen's chart for a 2m long examination room
- iii) N-chart for measuring near visual acuity at 40cm
- iv) Reduced Snellen chart

4B. Write a note on Gonioscopy. Note down the indications for this procedure.

(10×2 = 20 marks)

5. Answer any ONE.

5A. Write an essay on all retinal examination procedures.

5B. Explain tonometer and its clinical procedure under following headings

- i) Significance of IOP measurement
- ii) Various methods of IOP measurements
- iii) Clinical interpretation of measured IOP values
- iv) Explain the instrument you think the best for IOP measurement. Justify your choice.

(20×1 = 20 marks)

