MANIPAL UNIVERSITY

SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – DECEMBER 2011

SUBJECT: PATHOLOGY AND MICROBIOLOGY
(NEW REGULATION)

Monday, December 12, 2011

Time: 10:00-13:00 Hrs.   Max. Marks: 80

✍ ANSWER SECTION 'A' AND SECTION 'B' IN TWO SEPARATE ANSWER BOOKS.

✍ Answer ALL the questions. Draw diagrams wherever appropriate:

SECTION – A : PATHOLOGY : 40 MARKS

1. Define oedema. Describe the pathogenesis of renal and cardiac oedema.

(1+3½+3½ = 8 marks)

2. Define necrosis. Describe the different types of necrosis with examples.

(1+6 = 7 marks)

3. Write short notes on:

3A. Fate of thrombus

3B. Cellular events in acute inflammation

3C. Hemophilia

3D. Causes and spread of tumors

3E. Leprosy

(5×5 = 25 marks)

SECTION – B : MICROBIOLOGY : 40 MARKS

4. With the help of a diagram, explain the structure of a bacterial cell.

(8 marks)

5. Classify hypersensitivity. Explain in detail the mechanism of anaphylaxis.

(2+5 = 7 marks)

6. Write short notes on:

6A. Robert Koch

6B. Bacterial growth curve

6C. Hot air oven

6D. Routes of spread of nosocomial infections

6E. Chlamydial eye infection

(5×5 = 25 marks)

MANIPAL UNIVERSITY

SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – DECEMBER 2011

SUBJECT: OPTOMETRIC AND DISPENSING OPTICS
(NEW REGULATION)

Tuesday, December 13, 2011

Time: 10:00-13:00 Hrs.   Max. Marks: 80

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1. **Answer the following:**

1A. What should be the normal pantoscopic tilt required for single vision prescriptions?

1B. Arrange these lens materials in order, from the material with the lowest specific gravity to the material with the highest specific gravity.
   i)   Crown glass
   ii) Polycarbonate
   iii) CR-39
   iv) PMMA

1C. The larger the frame difference, the _____ the lens shape.
   i)   Rounder
   ii) More Squared off
   iii) Narrower
   iv) Deeper

1D. Calculate the prismatic effect exerted at a point 5mm above the geometrical centers of the cylinder +3.00DC*90.

1E. Find the reflection factor for glass of refractive index 1.523 in air assuming normal incidence.

1F. What is the refractive index of CR-39 lens material?

1G. As the width of the near portion of a Progressive addition lens increases,
   i)   Peripheral distortion decreases
   ii) Add power increases
   iii) Distance power must be cut back
   iv) Peripheral distortion increases
   v)   Both i) and ii) are correct

1H. What is the decentration required to produce 6^{Δ}BD on the right eye by a -7.00DS lens?

1I. True or False? Mirror coating provides good protection from sunlight if combined with a tint, but allows more UV and IR than a nonmirror-coated lens of equal transmission.

1J. Transpose the prescription into one of its alternate forms:
   +10.25DC*105 / -5.50DC*15

(1×10 = 10 marks)

2. **Answer any TEN:**

2A. Find the focal length of a single lens which will replace the following pairs of crossed cylinders:
   i)   +4.50DS/-1.75DC*180
   ii) -2.75DS/-1.75DC*90
   iii) -1.75DS/+2.50DC*60
   iv) +1.75DS/-2.50DC*60

2B. Write a briefly on the following:
   i) Glass cements
   ii) Allyl Diglycol Carbonate

2C. Write briefly on the following:
   i) Semi-rimless mounting
   ii) Numont mounting
   iii) Half eyes
   iv) Combination Frames
   v) Nylon Cord Frames

2D. Define Catoptric surface power and Ghost images. Name three conditions under which ghost images may cause the spectacle wearer difficulty.

2E. A prescription is as follows:
   OD -2.50DS
   OS +2.00DS/-5.00DC*30
   If the reading portions are 10mm below and 3mm in each from the distance optical centers, what are the vertical and horizontal prismatic imbalances for each eye at the reading level?

2F. Write short notes on Polycarbonate lenses.

2G. The Bifocal lens -5.00DS Add +2.00D is made up with an invisible solid 22mm segment the top of which is 3mm below the distance optical center. The segment is inset 2mm. Find the jump exerted by the segment and the vertical and horizontal prismatic effects at a point 8mm below and 4mm in from the distance optical center.

2H. Find the front and back vertex powers of the following system of thin co-axial lenses:
   F_1= +9.00D and F_2= +12.00D, and the separation between them is 10cm.

2I. With the help of a neat figure explain the refraction of light rays through a Convex Spherical and Plano-concave lens.

2J. Write briefly on the following lens defects and also mention one lens inspection technique to identify this defect:
   i) Rounding
   ii) Color
   iii) Strain
   iv) Scratch

2K. Write on the Destructive interference and Amplitude condition principles of Anti-reflection.

2L. Derive an expression for the effective power of a prism for near vision.

(5×10 = 50 marks)

3. **Answer the following:**

3A. i) Explain the principle of a rotary prism device and show that the resultant effect can be expressed in terms of the sum of the component prisms and the angle through which each prism is rotated.

   ii) A rotary prism consisting of two 12$^{\triangle}$ is mounted before an eye and the prisms rotated through 20^0 from the zero position. What is the prismatic effect obtained before the eye? How can a resultant effect of 16$^{\triangle}$ be obtained?

3B. Write on the Lens Quality with respect to faults in the material and on the surface of a lens.

(10×2 = 20 marks)

MANIPAL UNIVERSITY

SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – DECEMBER 2011

SUBJECT: VISUAL OPTICS
(NEW REGULATION)

Wednesday, December 14, 2011

Time: 10:00-13:00 Hrs.   Max. Marks: 80

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1.   Fill in the blanks:

1A.   Maximum retinal image size difference that can be tolerated between the two eyes is _____%.

1B.   A rise in the blood sugar level for diabetic may cause _____ shift in refractive error.

1C.   The aim of binocular balancing techniques are to equalize_____.

1D.   In Aphakia, parallel rays brought to focus_____mm behind the cornea.

1E.   _____is the instrument used for measuring the thickness of cornea.

1F.   The basic equation of SRK-II formula is _____.

                                                                    (1×6 = 6 marks)

2.   Answer the following questions:

2A.   What is Fusional convergence? What is the normal fusional convergence amplitude for distance and near?

2B.   Define Anisometropia. What are the classifications of Anisometropia?

2C.   Differentiate between the terms- Latent Hypermetropia and Manifest Hypermetropia.

2D.   List out the components of trial set.

2E.   What do you mean by spherical equivalent? Calculate the spherical equivalent of -2.00DS/-0.50DCX180°.

                                                                    (2×5 = 10 marks)

3.   Answer the following questions:

3A.   Write briefly about treatment of uniocular Aphakia.

3B.   Classify regular astigmatism with one example of each type.

3C.   Write a short note on refractive surgeries done to correct myopia.

3D.   Define the following terms:

    i)   Range and Amplitude of accommodation

    ii)   Accommodative inertia

                                                                    (3×4 = 12 marks)

4. **Short notes (Any SIX):**

4A. Binocular balancing

4B. Worth's 4- dot test

4C. Optical condition in myopia with diagram

4D. Nott Dynamic Retinoscopy

4E. Pseudophakia

4F. Clinical features and treatment modalities of Hypermetropia

4G. Astigmatic fan

$(6 \times 6 = 36 \text{ marks})$

5. What is accommodation? Explain briefly about the theories behind the mechanism of accommodation in humans. What are the ocular changes that take place during accommodation? Enumerate the anomalies of accommodation.

$(1+6+4+5 = 16 \text{ marks})$

MANIPAL UNIVERSITY

SECOND YEAR B.Sc. OPTOMETRY DEGREE EXAMINATION – DECEMBER 2011

SUBJECT: OPTOMETRIC INSTRUMENTS AND CLINICAL EXAMINATION OF VISUAL SYSTEM (NEW REGULATION)

Thursday, December 15, 2011

Time: 10:00-13:00 Hrs.   Max. Marks: 80

✍ **Draw diagrams wherever necessary.**

1. **Fill in the blanks:**

1A. _____ and _____ are the average HVID and VVID.

1B. _____ explained the optical principle of retinoscope in 1878.

1C. _____ will be the near PD at 40cm, if the distant PD is 64mm.

1D. _____ is the slit-lamp illumination technique, in which the light beam directed at the limbus, while the cornea is being observed for scars, edema and opacities.

1E. The micrometer reading of an applanation tonometer is graduated for_____ gm.

1F. _____ is the anterior chamber angle structure posterior to Scleral Spur.

1G. _____ energy is converted to Ultrasound by Piezoelectric crystal.

1H. _____ is the wavelength range of green light that sodium fluorescein emits.

1I. _____ aperture on Direct Ophthalmoscope helps to evaluate fundus through a dilated pupil.

1J. Amsler charts were designed by_____.

(1×10 = 10 marks)

2. **Answer any FIVE questions.**

2A. Explain how slit lamp is used to evaluate the depth of an embedded corneal foreign body.

2B. Why the anterior chamber angle structures are not visible with Slit Lamp?

2C. Match the following:

i)	Aluminium alloy	a)	Prism
ii)	Phoria assessment	b)	Cylindrical lens
iii)	Diopter	c)	Maddox rod
iv)	Power meridian	d)	Trial frame

2D. What are the disadvantages of Keratometer as a corneal topographer?

2E. Write about role of condensing lens in streak retinoscope.

2F. Comment on vanishing designs in pseudoisochromatic plate tests.

(2×5 = 10 marks)

3. **Answer any FOUR questions.**

3A. How a ORBSCAN topographer represents corneal features? Explain.

3B. Describe the methods of visual acuity assessment in infants.

3C. Explain the non-invasive techniques of assessing IOP.

3D. Describe the Immersion technique of A-Scan.

3E. Comment about the field of view and magnification of Indirect Ophthalmoscope. Explain its advantages over direct ophthalmoscope.

(5×4 = 20 marks)

4. **Answer the following:**

4A. Write about the screen dimension, testing procedure and patient preparation for tangent screen tests.

4B. Explain how the ocular history is obtained. Mention at least two possible causes for:
   i)   Binocular diplopia,
   ii)   Sudden loss of vision
   iii)   Blurring of vision with newly prescribed glasses
   iv)   Watering of eye
   v)   Pain in the eye

(10×2 = 20 marks)

5. **Answer any ONE.**

5A. What is Glaucoma? Explain different techniques to assess the angle of anterior chamber in detail.

5B. List out the routine clinical examination procedures performed during an eye examination. Explain the clinical significance of each test in detail.

(20×1 = 20 marks)