Reg. No.										

MANIPAL UNIVERSITY

FIRST SEMESTER BACHELOR OF CLINICAL OPTOMETRY DEGREE EXAMINATION – JANUARY 2012

SUBJECT: GENERAL ANATOMY

(NEW REGULATION)

Monday, January 02, 2012

Time: 10.00 – 11.30 Hrs. Max. Marks: 40

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1. Name the components (parts) of urinary system. Describe the relations and blood supply of right and left kidneys. Add a note on the microscopic structure (histology) of the kidney.

(2+4+1+3 = 10 marks)

2. **Write short notes on:**

2A. Classification of Epithelium

2B. Vertebral column

2C. Paranasal air sinuses

2D. Tongue

2E. Prostate gland

2F. Internal capsule

(5×6 = 30 marks)

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MANIPAL UNIVERSITY

FIRST SEMESTER BACHELOR OF CLINICAL OPTOMETRY DEGREE EXAMINATION – JANUARY 2012

SUBJECT: OCULAR ANATOMY

(NEW REGULATION)

Wednesday, January 04, 2012

Time: 10.00 – 11.30 Hrs. Max. Marks: 40

✍ **Draw diagrams wherever necessary.**

1. **Answer the following:**

1A. Lacrimal gland is situated in _____ bone of the orbit.

1B. Angular artery is branch of _____ artery; which is a branch of _____ artery.

1C. Hassall-Henle bodies are the periodic thickening of _____ layer of cornea.

1D. Crystalline lens is derived from _____ at the time of ocular development.

1E. The thickness of the lipid layer is _____ μm.

(1×5 = 5 marks)

2. **Write short notes on:**

2A. Paranasal air sinuses

2B. Attachment of tear film to the cornea

2C. Branches and supply locations of Oculomotor nerve

2D. Sphincter muscle and dilator muscle of Iris

2E. Retinal bipolar cells

(2×5 = 10 marks)

3. **Answer any THREE of the following:**

3A. Write a note on Blood supply and Nerve supply of eye lids.

3B. Describe on structure of crystalline lens and its function.

3C. Explain the parts of conjunctiva with appropriate diagram.

3D. Describe the parts, layers and blood supply of Ciliary body.

(5×3 = 15 marks)

4. **Essay:**

Describe in detail about the origin, course, insertion, blood supply, nerve supply and action of extra ocular muscles.

(10 marks)

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MANIPAL UNIVERSITY

FIRST SEMESTER BACHELOR OF CLINICAL OPTOMETRY DEGREE EXAMINATION – JANUARY 2012

SUBJECT: PHYSICAL OPTICS (BOP 105) (NEW REGULATION)

Friday, January 06, 2012

Time: 10.00 – 11.30 Hrs. Max. Marks: 40

1. State whether the following statements are **TRUE** or **FALSE** (any **FIVE**) and justify your answer.

1A. All motions in which the force acting on a body is proportional to the displacement, are simple harmonic by nature.

1B. The circular fringes in Michelson interferometer are the fringes of equal thickness whereas the Newton's rings are fringes of equal inclination.

1C. Gas lasers are more monochromatic than solid state lasers.

1D. Only the transverse waves can undergo polarization.

1E. In the case of diffraction at a single slit, the fringes will become narrower when blue light is replaced by yellow light.

1F. Rayleigh scattering occurs when the scattering particles are of size much smaller than the wavelength of incident light.

(2×5 = 10 marks)

2. Answer any **THREE** of the following:

2A. Explain the construction and working of Brodhum Photometer.

2B. Explain Rayleigh's criterion for optical resolution with intensity distribution graph. Obtain expressions for dispersive and resolving power of a diffraction grating.

2C. Sketch the schematic graph of a travelling electromagnetic wave showing the electric and magnetic vectors. With necessary diagrams explain the phenomenon of double refraction and the law of Malus.

2D. Obtain the expression for intensity due to double slit interference and hence arrive at the conditions for maxima and minima. Draw the intensity pattern for double slit interference.

(6×3 = 18 marks)

3. Answer any **THREE** of the following:

3A. i) In a double slit experiment performed with blue green light of $\lambda = 512$ nm, the slits are 1.2 mm apart and the screen is 5.4 m from the slits. How far apart are the bright fringes as seen on the screen?

ii) If mirror M_1 in Michelson's interferometer is moved through 0.233mm, 792 fringes are counted with a light meter. What is the wavelength of the light used?

3B. A pulsed laser emits photons of wavelength 780 nm with 20 mW average power /pulse. Calculate the number of photons contained in each pulse if the pulse duration is 10 ns. Given: Boltzmann constant = 1.38×10^{-23}J/K, Speed of light in vacuum = 3.00×10^{8}m/s, Planck's constant = 6.63×10^{-34}Js.

3C. i) Calculate the thickness of a half wave plate for light of wavelength 500 nm. Given: $\mu_o = 1.55$ and $\mu_e = 1.45$.

ii) In a diffraction experiment, light of wavelength 633 nm is incident on a narrow slit. The angle between the 1st minimum on one side of the central maximum and the 1st minimum on the other side is 1.97°. Find the width of the slit.

3D. A small source of 100 candle-power is suspended 6 m vertically above a point P on a horizontal surface. Calculate the illumination

i) At a point Q on the surface 8 m from P

ii) At the point P

(4×3 = 12 marks)

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FIRST SEMESTER BACHELOR OF CLINICAL OPTOMETRY DEGREE EXAMINATION – JANUARY 2012

SUBJECT: GEOMETRICAL OPTICS (BOP 107) (NEW REGULATION)

Monday, January 09, 2012

Time: 10.00 – 11.30 Hrs. Max. Marks: 40

1. State whether the following statements are **TRUE** or **FALSE** (any **FIVE**) and justify your answer.

1A. The vergence of a diverging wavefront at a distance of 5 cm from a point source is +20.00D.

1B. Red light moves faster than blue light in water.

1C. If we increase the distance between two converging lens, the equivalent focal length decreases.

1D. Dispersive power of the prism depends on its refracting angle.

1E. Myopia is corrected with converging lens.

1F. The amount by which the lens deviates the incident ray depends only on its focal length.

(2×5 = 10 marks)

2. Answer any **THREE** of the following:

2A. i) State the laws of reflection and show that the minimum length of a mirror that is needed for a person of height H to see his entire reflection is H/2.

ii) Light is incident on a transparent slab. Obtain an expression for lateral shift produced by the slab.

2B. i) A light ray is incident on a prism of angle A and refractive index n. Obtain the expression for the deviation produced by the prism.

ii) Define dispersive power of a prism and obtain the condition for no deviation using two prisms.

2C. i) With the help of a neat diagram derive Gauss' formula for refraction at a single surface.

ii) Obtain the expression for axial magnification for a convex lens.

2D. Derive six cardinal points for an optical system and deduce Newton's formula.

(6×3 = 18 marks)

3. Answer any **THREE** of the following:

3A. i) The light at position A has the vergence of +13.5 D. What is the vergence at position B which is 3 cm upstream from position A?

ii) An object 1.5 cm away is viewed through a 2 diopter prism. By how much will the object appear to be displaced?

3B. A real object is located 50 cm in front of a –4.00 D lens. Is the image real or virtual, larger or smaller, erect or inverted? Use vergence method.

3C. A thick lens has a +5.00 D front surface power and a –3.00 D neutralizing power. What vergence the incident wavefront have in order to get plane waves leaving the back of the lens? Find the primary focal length of the lens.

3D. i) If a concave mirror 60 cm radius of curvature forms a real image twice as far away as the object, what is the object distance?

ii) A coin is placed at the bottom of a pool filled with water (n = 1.33) to a depth of 2.16 meter. Find the apparent depth of the coin below the surface when viewed at normal incidence.

(4×3 = 12 marks)