Rajiv Gandhi University of Health Sciences, Karnataka

I year B.Sc. Optometry Degree Examination – 22-Jul-2021

Time: 3 Hours **Max. Marks: 80 Marks**

Physical and Principles of Lighting, Geometric Optics
Section A: Physical and Principles of Lighting (40 Marks)
(Revised Scheme – 3)
Q.P. Code : 3105

Your answers should be specific to the questions asked
Draw neat labeled diagrams wherever necessary

(Note : Both QP Codes 3105 and 3106 are to be answered within total duration of 3 hours)

LONG ESSAYS (Answer Any Two) **2 x 10 = 20 Marks**

1. Explain the theory of interference fringes.
2. Explain the Fresnel's theory of rectilinear propagation of light
3. Explain the method of production and detection of plane, circular and elliptically polarised light

SHORT ESSAYS (Answer Any Two) **2 x 5 = 10 Marks**

4. Obtain the expression for Total energy of a vibrating particle exhibiting SHM.
5. The diameter of the n^{th} dark ring in Newton's ring changes from 0.3 cm to 0.26 cm as a liquid is introduced between lens and glass plate. Find the Refractive Index of the liquid.
6. What are Polariods? Explain their uses.

SHORT ANSWERS **5 x 2 = 10 Marks**

7. What is photo electric effect?
8. What are the differences between emission and absorption spectra?
9. State Lambert's Cosine law.
10. Define resolving power of a grating.
11. State Brewster's law.

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I year B.Sc. Optometry Degree Examination – 22-Jul-2021

Time: 3 Hours **Max. Marks: 80 Marks**

Physical and Principles of Lighting, Geometric Optics
Section B: Geometric Optics (40 Marks)
(Revised Scheme – 3)
Q.P. Code : 3106

Your answers should be specific to the questions asked
Draw neat labeled diagrams wherever necessary

(Note : Both QP Codes 3105 and 3106 are to be answered within total duration of 3 hours)

LONG ESSAYS (Answer Any Two) **2 x 10 = 20 Marks**

1. Derive lens maker's formula and hence an expression for focal length of two lenses kept in contact.
2. What are spherical aberration and coma? How can they be eliminated?
3. What is the principle of a laser? Describe the construction and action of a Ruby laser.

SHORT ESSAYS (Answer Any Two) **2 x 5 = 10 Marks**

4. Draw the image formation by concave mirror when the object is positioned at (a) centre of curvature and (b) between focal point and centre of curvature
5. How do you determine the focal length of convex lens by the UV method
6. Two thin convex lenses having focal length 5cm and 2cm are separated by a distance 3cm. Find the equivalent power and the positions of principal points

SHORT ANSWERS **5 x 2 = 10 Marks**

7. What are Cardinal points of a thick lens?
8. State the conditions for total internal reflection?
9. Define Focal points of a convex lens.
10. Define Dispersive power of a prism and write the expression.
11. What is Depth of field?

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I Year B.Sc. Optometry Degree Examination – 16-July-2021

Time: Three Hours **Max. Marks: 100 Marks**

BASIC BIOCHEMISTRY AND NUTRITION (RS-4)
Q.P. CODE: 3340

Your answers should be specific to the questions asked
Draw neat, labeled diagrams wherever necessary

LONG ESSAYS (Second Question Choice) **2 x 10 = 20 Marks**

1. Explain the various steps involved in Citric acid cycle, mentioning the enzymes, coenzymes/cofactors and inhibitors involved in this process. Add a note on the energy yield on oxidation of one molecule of glucose.
2. What are water-soluble vitamins? Explain the sources, functions, RDA, digestion and absorption and deficiency manifestation of Vitamin B1

   Or

   Define Glycosaminoglycans. Write the structure, distribution and functions of any three Glycosaminoglycans.

SHORT ESSAYS (Question No 5 & 10 choice) **10 x 5 = 50 Marks**

3. Digestion and absorption of lipids.
4. Explain disorders associated with PEM.
5. Discuss sources and functions of Vitamin D

   Or

   Discuss deficiency of Vitamin B2
6. Specific dynamic action of food.
7. What are phospholipids? Explain their importance.
8. List the plasma proteins and write any three functions.
9. Draw neat labelled diagram of tRNA.
10. What is post translational modification? Mention any four post-translational modifications.

    Or

    Low Birth weight.
11. What is Ketosis? Write the steps of ketone body formation.
12. How is pH of blood maintained by renal mechanism?

SHORT ANSWER (Question No 15 & 20 choice) **10 x 3 = 30 Marks**

13. Define Respiratory Quotient and give two significances.
14. List three functions of Calcium.
15. Ocular manifestations of Vitamin A

    Or

    Functions of copper in our body.
16. What is the calorific value of proteins?
17. What is Food pyramid?
18. What are the blood buffers? List the various blood buffer systems in the body.
19. List the therapeutic uses of antioxidants.
20. What is active transport give two examples.

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Or

Draw neat labelled diagram of Mitochondria.

21. What is transamination? Name the two enzymes involved in the reaction.
22. Compare and contrast any three differences between starch and glycogen.

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I Year B.Sc. Optometry Degree Examination - 19-Jul-2021

Time: Three Hours **Max. Marks: 100 Marks**

GENERAL ANATOMY AND GENERAL PHYSIOLOGY (RS-4)
Section A: GENERAL ANATOMY– (50 Marks)
Q.P. CODE: 3341

Your answers should be specific to the questions asked
Draw neat, labeled diagrams wherever necessary
(Note: Both QP Codes 3341 and 3342 are to be answered within total duration of 3 hours)

LONG ESSAYS (First Question Choice) **1 x 10 = 10 Marks**

1. List the parts of circulatory system. Describe in detail Anatomy of Heart.

Or

Name the parts of digestive system. Describe stomach in detail.

SHORT ESSAYS (Question No 5 choice) **5 x 5 = 25 Marks**

2. Right lung.
3. Types of connective tissue.
4. Spleen.
5. Differences between artery and vein.

Or

Microscopic structure of Bone.

6. Female reproductive system.

SHORT ANSWER (Question No. 10 choice) **5 x 3 = 15 Marks**

7. Name Ear ossicles.
8. Draw the structure of Neuron.
9. Name the cranial nerves.
10. Lymphoid tissue.

Or

Name endocrine glands.

11. Fertilization.

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I Year B.Sc. Optometry Degree Examination - 19-Jul-2021

Time: Three Hours **Max. Marks: 100 Marks**

GENERAL ANATOMY AND GENERAL PHYSIOLOGY (RS-4)
Section B: GENERAL PHYSIOLOGY– (50 Marks)
Q.P. CODE: 3342

Your answers should be specific to the questions asked
Draw neat, labeled diagrams wherever necessary
(Note: Both QP Codes 3341 and 3342 are to be answered within total duration of 3 hours)

LONG ESSAYS (First Question Choice) **1 x 10 = 10 Marks**

1. Describe the role of counter mechanism in kidney function.
   Or
   Classify receptors. Explain their properties.

SHORT ESSAYS (Question No 5 choice) **5 x 5 = 25 Marks**

2. Give the source, target organs and actions of Growth Hormone.
3. Micturition reflex.
4. Deglutition.
5. Rh factor and its importance.
   Or
   Explain the mechanism of neuromuscular transmission.
6. Explain oxygen transport from lungs to tissues.

SHORT ANSWER (Question No. 10 choice) **5 x 3 = 15 Marks**

7. List the functions of Hypothalamus.
8. Morphological classification of anaemias.
9. Heart sounds.
10. Rigor mortis.
    Or
    List the functions of placenta.
11. Impedance matching by the middle ear.

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I Year B.Sc. Optometry Degree Examination - 22-Jul-2021

Time: Three Hours **Max. Marks: 100 Marks**

OCULAR ANATOMY, OCULAR PHYSIOLOGY AND OCULAR BIOCHEMISTRY
(REVISED SCHEME – 4)
Q.P. CODE: 3343
(QP contains two pages)

Your answers should be specific to the questions asked
Draw neat, labeled diagrams wherever necessary

LONG ESSAYS (Second Question Choice) **2 x 10 = 20 Marks**

1. Explain the normal and applied anatomy of lacrimal system and tear drainage.
2. Describe the mechanism of formation, circulation and drainage of the aqueous humour.

   Or

   Explain the visual pathway diagrammatically. Write in detail about the course of the visual fibres.

SHORT ESSAYS (Question No 5 & 10 choice) **10 x 5 = 50 Marks**

3. Describe the biochemical composition and functions of vitreous humour.
4. Name the extraocular muscles, their nerve supply and uniocular movements.
5. Short note on visual pigments.

   Or

   Describe visual cycle and formation of rhodopsin in details.
6. Explain corneal epithelium repair.
7. Compare the biochemical composition between aqueous humour and vitreous humour.
8. Brief about production of intraocular pressure.
9. Explain the functions, physical and chemical properties of Tear film.
10. Write about retinal function and metabolism.

    Or

    List down the properties of limbus.
11. Anatomy of angle of anterior chamber and maintenance of intraocular pressure.
12. Discuss about metabolic pathways in crystalline lens and its clinical significance.

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SHORT ANSWER (Question No 15 & 20 choice) **10 x 3 = 30 Marks**

13. Dark adaptation time.

14. Optic chiasma.

15. What are metabolic changes seen in aging lens.
    Or
    Factors affecting contrast sensitivity.

16. Explain the action of Orbicularis oculi muscle.

17. List the functions of vitreous humour.

18. Tear film and composition of tears.

19. Write on oxygen supply of cornea.

20. Write about the development of lens.
    Or
    Layers of corneal Epithelium.

21. Composition of sclera.

22. List the test to assess lacrimal excretory function.

Time: Three Hours **Max. Marks: 100 Marks**

PHYSICAL AND PRINCIPLES OF LIGHTING, GEOMETRIC OPTICS
SECTION A – PHYSICAL AND PRINCIPLES OF LIGHTING (50 MARKS)
(REVISED SCHEME – 4)
Q.P. CODE: 3344

Your answers should be specific to the questions asked
Draw neat, labeled diagrams wherever necessary
(Note : Both QP Codes 3344 and 3345 are to be answered within total duration of 3 hours)

LONG ESSAYS (First Question Choice) **1 x 10 = 10 Marks**

1. Obtain an expression for radius of curvature of a plano convex lens by forming Newton's rings using interference.
   Or
   Explain the mathematical treatment of different types of polarized waves.

SHORT ESSAYS (Question No. 5 choice) **5 x 5 = 25 Marks**

2. Obtain an expression for the total energy of a vibrating particle.

3. Explain construction and working of Nicol prism.

4. Calculate the thickness of mica sheet required for making a quarter wave plate for λ =540nm. The indices of refraction for the ordinary and extraordinary rays in mica are 1.58 and 1.59

5. Explain quantum theory of Raman effect.

Or

Explain the laws of photoelectric effect.

6. Obtain an expression for the resolving power of a grating.

SHORT ANSWER (Question No. 10 choice) **5 x 3 = 15 Marks**

7. Write the condition for constructive and destructive interference.
8. Define Rayleigh and Mie scattering.
9. Explain the phenomenon of double refraction.
10. Write the properties of Laser.

Or

What is the need for compensatory glass plate in Michelson interferometer?

11. Explain the principle involved in the propagation of light through an optical fiber.

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I Year B.Sc. Optometry Degree Examination - 26-Jul-2021

Time: Three Hours **Max. Marks: 100 Marks**

PHYSICAL AND PRINCIPLES OF LIGHTING, GEOMETRIC OPTICS
SECTION B – GEOMETRIC OPTICS (50 MARKS)
(REVISED SCHEME – 4)
Q.P. CODE: 3345

Your answers should be specific to the questions asked
Draw neat, labeled diagrams wherever necessary
(Note : Both QP Codes 3344 and 3345 are to be answered within total duration of 3 hours)

LONG ESSAYS (First Question Choice) **1 x 10 = 10 Marks**

1. Explain spherical aberration and chromatic aberration. How are they eliminated?

Or

Obtain the prism formula. Deduce the expression for deviation produced by thin prism.

SHORT ESSAYS (Question No. 5 choice) **5 x 5 = 25 Marks**

2. Obtain an expression for the refractive index of a substance by normal shift method.
3. Obtain the Gauss formula for spherical surfaces.
4. Applications of Optical fiber.
5. What is dispersive power of a prism? Obtain the condition for combination of two thin prisms to produce dispersion without deviation.

Or

Obtain the Einstein's equation for photo electric emission.

6. What are the major defects of the image formed by a convex lens?

SHORT ANSWER (Question No. 10 choice) **5 x 3 = 15 Marks**

7. Define Candela.
8. Write the applications of spherical mirrors.
9. Define Cardinal points of a thick lens.
10. What is the significance of velocity of light?

    Or

    Define dispersive powder of material of a prism.
11. Write about pincushion distortion.

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