Register Number

Part III — FOUNDATION SCIENCE

(Common to Medical Laboratory Assistant, Nursing Course, Hospital Housekeeping, Ophthalmic Technician, Physiotherapy and Dental Hygienist)

(English Version)

Time Allowed : 3 Hours]

[Maximum Marks : 150

Note : Each Section carries 75 marks.

Instructions : i) Answer the questions in *two* Subjects *only* in the Foundation Science, leaving out the Subject chosen under related Subjects.

ii) Candidates should answer the *two* Subjects in *separate* answer-books indicating the name of the Subject.

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SECTION – A
(CHEMISTRY)
(Marks : 75)

I. Answer any *four* of the following :

$4 \times 5 = 20$

1. Define the following :

a) solubility

b) solubility curves.

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2. What is meant by dialysis ? Explain.

3. What are the differences between physical adsorption and chemic adsorption ?

4. Write short notes on types of carbohydrates.

5. What is meant by sulpha drugs ? Mention the names of any six sulph drugs.

II. Answer any *three* of the following :

$3 \times 9 = 2$

6. What is meant by osmosis ? Explain the determination of osmotic pressur by Berkley-Hartley method.

7. How are colloids prepared by condensation method ?

8. a) How is diethyl ether prepared by Williamson's synthesis ?

   b) How are the following compounds prepared from diethyl ether ?

      i) Diethyl peroxide

      ii) Oxonium salt

      iii) Perchlorodiethyl ether.

9. Explain optical isomerism with example.

10. How are the following compounds prepared ?

    a)   DDT

    b)   Phthalic acid

    c)   Aspirin.

III. Answer any *two* questions of the following : $2 \times 14 = 28$

11. Explain the following :

    a)   Fractional distillation.   5

    b)   Explain acid, base and neutral solutions on the basis of pH.   3

    c)   Explain buffer action with an example.   6

12. a)   Describe the structure of glucose.   8

    b)   How is $CHCl_3$ prepared ? **Explain any two chemical properties of**

        $CHCl_3$.   6

13. How are the following compounds prepared from phenol ?

    a)   Benzene

    b)   Aniline

    c)   Picric acid

    d)   Quinone

    e)   Phenolphthalein.   **2 + 3 + 3 + 3 + 3**

14. a)   How are Vitamins classified ?

    b)   Tabulate all the names of the Vitamins and their sources, works deficiency diseases.

SECTION - B
(PHYSICS)
(Marks : 75)

I.   Answer any *four* of the following questions : $4 \times 5 =$

1.   Define total internal reflection. What are the conditions for total intern reflection ?

2.   State and prove Brewster's law.

3.   Define the terms 'magnetic permeability' and 'magnetic susceptibility'.

4.   State the laws of photo-electric emission.

5.   The disintegration constant λ of a Radioactive element is 0.00231 per day Calculate its half-life and mean life.

6. What are the common defects of a human eye ? How can these defects be rectified ?

7. State Ohm's law and describe an experiment to verify it.

8. What are canal rays ? Write the properties of canal rays.

9. Explain Rutherford's α-particle scattering experiment and discuss its results.

10. Describe the construction and working of an astronomical telescope with a neat diagram.

III. Answer any *two* of the following questions : $2 \times 14 = 28$

11. What is diffraction grating ? Describe an experiment to determine the wavelength of light using a plane transmission grating.

12. Describe the principle, construction and working of an A.C generator.

13. Define dispersive power of a prism. Derive an expression for the dispersive power of a prism.

14. How are X-rays produced in a Coolidge tube ? Write any four properties of X-rays.

SECTION - C

(ZOOLOGY)

(Marks : 75)

I. Answer any *four* of the following questions in not more than 5 lines each :

$4 \times 5 = 20$

1. Give a short note on Chemical Mutagenic agents.

2. Define Parthenogenesis. What are its uses ?

3. Give an account of the valves of Human heart.

4. Draw a neat labelled diagram of L.S. of human kidney.

5. Write five characters of cleavage.

II. Answer any *three* of the following questions in not more than 15 lines each :

$3 \times 9 = 27$

6. Describe the various phases involved in chemical evolution.

7. Describe Mendel's law of independent assortment with Dihybrid cross experiment.

8. What are the functions of hormones secreted by Adrenal Medulla ?

9. Explain the role of Eugenics in the welfare of human race.

10. Describe Hen's egg with a neat diagram.

III. Answer any *two* of the following questions in not more than 25 lines each :

$$2 \times 14 = 28$$

11. Explain the processes of Spermatogenesis and Oogenesis in frog.

12. Describe the Palaeontological evidences of Evolution.

13. Describe the mechanism of urine formation. Draw a labelled diagram of nephron.

14. Explain *Rh*-factor.

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