

**Q.P. Code :32312**

**[Time: 2:30 Hours]**

**[ Marks:75]**

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.

2. Figures to the right indicate full marks.

3. Draw neat labeled diagram wherever necessary.

- Q.1 (a) State two applications of the following: **(any one)** 02
- Immunofluorescence
  - Radioimmunoassay (RIA)
- (b) Give one example of the following: **(any one)** 01
- Incomplete antibody
  - Insoluble antigen
- (c) Answer the following: **(any two)** 12
- Give an account of working of Fluorescence-activated cell sorter and give any two of its applications.
  - Outline the general features of antigen-antibody reaction.
  - Explain indirect and sandwich ELISA.
  - Describe direct and indirect Coomb's test
- Q.2 (a) Name the following: **(any three)** 03
- Any one hormone produced by *Zona glomerulosa*
  - Disorder associated with hypothyroidism in children.
  - Hormone associated with Addison's disease.
  - Predominant hormone in the luteal phase of menstrual cycle.
  - Transport protein for thyroid hormone.
  - An example of a C-18 steroid hormone of the gonads.
- (b) Answer the following: **(any two)** 12
- Menstrual cycle is a good example of coordination among hormonal functions-Elaborate.
  - Discuss the physiological and any three biochemical functions of DHT
  - Describe the effects of thyroid hormones on metabolism
  - Give an account of the biochemical functions of cortisol.
- Q.3 (a) Identify the pathway to which the following enzymes belong: **(any three)** 03
- Acetoacetate decarboxylase
  - Enoyl ACP reductase
  - Glycerol 3 – phosphate dehydrogenase
  - PS decarboxylase
  - HMG CoA synthase
  - Isopentenylpyrophosphate isomerase

**P.T.O.**

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(b) Attempt the following questions: **(any two)**

12

- (i) Schematically represent the reactions of fatty acid biosynthesis
- (ii) Describe the reactions for biosynthesis of Triacylglycerol from DHAP.
- (iii) Write the flow-sheet for conversion of activated isoprene to cholesterol.
- (iv) Describe the cellular strategies for attaching phospholipid head group.

Q.4(a) Do as directed: **(any three)**

03

- (i) Define positron emission.
- (ii) Give an example of source of radiation in electron microscope.
- (iii) State True/false: Thermocouples are used as detectors in spectrofluorimeters.
- (iv) Fill in the blank: \_\_\_\_\_ is the commonly used unit for radioactivity.
- (v) Choose the correct option: \_\_\_\_\_ stained specimens are observed in confocal microscope (Fluorescent/azo dye).
- (vi) State true/false: Infrared spectrophotometry can be used to study protein conformation.

(b) Attempt the following: **(any two)**

12

- (i) Describe the process of image formation in confocal microscopy.
- (ii) Discuss the working of liquid scintillation counter.
- (iii) What are basic components of spectrofluorimeter? Briefly discuss its working.
- (iv) Justify: Radioactive isotopes have a wide range of applications in biological science.

Q.5 Write short notes on: **(any three)**

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- (a) Regulation of fatty acid synthesis
- (b) Role of  $\beta$  Hydroxybutyrate as a fuel
- (c) Specimen preparation in TEM.
- (d) Disorders associated with deficiency of calcitriol
- (e) Mechanism of action of group I hormones
- (f) Immunoprecipitation