C 83442 (Pages : 2) Name.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2020

(CCSS)

Applied Plant Science

BOT 2C 15—ENVIRONMENTAL BIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer any *two* questions in not more than 500 words :

1 Describe the different approaches of biodiversity conservation.

2 Give an account on the structure and function of estuarine ecosystem. How is it different from fresh water ecosystem ?

3 Write an essay on the causes and consequences of global climate change.

(2 × 10 = 20 marks)

Part B

II. Answer any *eight* questions in not more than 250 words :

4 Give a short account on the major terrestrial biomes.

5 Write the major causes of water pollution.

6 Explain thermal profile of atmosphere.

7 Explain the concept of habitat and niche.

8 Write an account on the Koppan climate classification.

9 Explain the process of formation and development of soil.

10 Elaborate the role of people's participation in global environmental issues.

11 Give a brief account on the different types of ecological successions.

12 Explain the composition and characteristic features of atmospheric strata.

13 Write the characteristic features of a population.

(8 × 5 = 40 marks)

Turn over

Part C

III. Answer any *ten* questions in not more than *five sentences* :

14 Define density of the population.

15 What is acid rain ?

16 What is hottest hotspot of biodiversity ? Write an example from Kerala.

17 Explain the concept of climax in ecological succession.

18 Explain soil horizon.

19 What is interdemic extinctions ?

20 What is the difference between National park and Biosphere reserve ?

21 What is desertification ?

22 What is Oceanic oscillations ?

23 Differentiate climate and weather.

24 Define density of the population.

25 Differentiate edges and ecotones ?

(10 × 2 = 20 marks)

C 83441 (Pages : 2) Name.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2020

(CCSS)

Applied Plant Science

BOT 2C 13—PLANT MORPHOGENESIS, EMBRYOGENESIS AND PLANT BIOTECHNOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer any *two* questions in not more than 500 words. Each question carries 10 marks :

1 Briefly explain the techniques and applications of tissue culture.

2 Describe the procedure of *Agrobacterium* mediated gene transfer and discuss its merits and applications.

3 Describe the development of endosperm and discuss the types of endosperms in Angiosperms.

(2 × 10 = 20 marks)

Part B

II. Answer any *eight* questions in not more than 250 words. Each question carries 5 marks :

4 Describe the role of different growth regulators in plant tissue culture.

5 Describe the significance of somatic embryogenesis in plant morphogenesis.

6 Distinguish between direct and indirect organogenesis ?

7 Describe the structure of microsporangium in Angiosperms.

8 Write a note on polyembryony.

9 Describe different types of fertilization based on pollen tube entry.

10 Describe the development of shoot apical meristem in Embryogenesis.

11 Write short note on metabolic engineering.

12 Describe the genetic aspects of floral organogenesis in *Arabidopsis*.

13 What are the factors influencing anther culture ?

(8 × 5 = 40 marks)

Part C

III. Answer any *ten* questions in not more than *five sentences*. Each question carries 2 marks :

14 Write a note on cybrid.

15 Distinguish between nuclear and cellular type of endosperm.

16 What do you mean by double fertilization ?

17 What are the functions of endosperm ?

18 Name two genes involved in root organogenesis.

19 What are plasmid vectors ?

20 What is the advantage of suspension culture ?

21 List out two applications of triploids.

22 What are plantibodies ? Give example.

23 What do you mean by somatic hybridization ?

24 What is electroporation ?

25 Distinguish between apospory and diplospory.

(10 × 2 = 20 marks)

C 83440 **(Pages : 2)** **Name**.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2020

(CCSS)

Applied Plant Science

BOT 2C 11—BIOCHEMISTRY, BIOPHYSICS AND IMMUNOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer any *two* questions in not more than 500 words :

1 Describe the principle, function and applications of Electrophoresis.

2 Illustrate and explain the structure and classes of antibodies.

3 Explain structure, function and classification of enzymes.

(2 × 10 = 20 marks)

Part B

II. Answer any *eight* questions in not more than 250 words :

4 Explain beta oxidation of fatty acids.

5 Give an account of different types of RNA.

6 Explain the classification of amino acids.

7 Write an account on primary immune response.

8 Write a note on Atomic force microscopy and scanning tunnelling microscopy.

9 Explain structure and function of leg haemoglobin.

10 Write about sources of different types of vitamins.

11 Explain cell mediated immunity.

12 Write an account on monoclonal antibodies.

13 Explain gluconeogenesis.

(8 × 5 = 40 marks)

Part C

III. Answer any *ten* questions in not more than *five* sentences :

14 What is complement fixation ?

15 Differentiate multi enzymes and isozymes.

16 Write about Z DNA.

17 What are the functions of different phyto hormones ?

18 Write a note on buffers.

19 Write about uses of ELISA.

20 Explain immune electrophoresis.

21 Write about major reactions of reducing sugars.

22 Write a note on hyper sensitivity.

23 What are super antigens ?

24 Explain principles of thermodynamics.

25 Write about omega fatty acids.

(10 × 2 = 20 marks)

C 83439 (Pages : 2) Name.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2020

(CCSS)

Applied Plant Science

BOT 2C 09—PLANT PHYSIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer any *two* questions in not more than 500 words. Each question carries 10 marks :

1 Write an account on the various types of biotic and abiotic stress conditions. Add a note on the biochemical responses to stress and explain how plants overcome stress.

2 Give a diagrammatic representation of the Krebs cycle, specifying the enzymes involved in each step and the number of ATP produced.

3 Describe the process of primary and secondary cell wall formation in plants.

(2 × 10 = 20 marks)

Part B

II. Answer any *eight* questions in not more than 250 words. Each question carries 5 marks :

4 Describe the sequence of events during fruit ripening.

5 Explain the different mechanisms of metabolite transport through cellular channels.

6 Illustrate and describe the electron transport chain.

7 Explain the conversion of a fertilized ovule into a fruit.

8 What is the difference between short-day, long-day and day-neutral plants ? Explain with examples.

9 Discuss the conversion of a vegetative meristem into a floral meristem during floral initiation.

10 Illustrate and explain the ultrastructure of the chloroplast.

11 Explain the process of photorespiration.

12 What are the different types of signals ? Elaborate on the properties of five signal receptors.

13 Highlight the role of Ca++ and Calmodulin as secondary messengers in signal transduction.

(8 × 5 = 40 marks)

Part C

III. Answer any *ten* questions in not more than *five sentences*. Each question carries 2 marks :

14 Distinguish between CAM and VAM.

15 What are the intermediate compounds produced during glycolysis ?

16 Explain how the stomata facilitate gaseous exchange in plants.

17 What are plasmodesmata ?

18 What is the ABC model of flower development ?

19 What are photoreceptors ?

20 What is the death hormone ?

21 What are the different types of abiotic stress the plants are exposed to ?

22 What are heavy metals ?

23 What is the difference between qualitative and quantitative trait loci ?

24 Compare differentiation and de-differentiation.

25 What is the role of aquaporins in imbibition ?

(10 × 2 = 20 marks)

C 3936 (Pages : 2) Name.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 2C 15—ENVIRONMENTAL BIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer any *two* questions in not more than 500 words. Each question carries 10 marks :

1 What are the major hotspots of biodiversity in the world ? Explain major threats to biodiversity.

2 Briefly explain the causes and consequences of soil pollution. Writes its control measures.

3 Write an essay on the impact of global climate change.

(2 × 10 = 20 marks)

Part B

II. Answer any *eight* questions in not more than 250 words. Each question carries 5 marks :

4 Write short note on different soil types in India.

5 Briefly explain different biodiversity management approaches.

6 Explain age structured population.

7 Write a short note on the species interactions.

8 Give an account on the various types of ecological succession.

9 Explain the concept of habitat and niche.

10 Elaborate community structure and attributes.

11 Explain mineral cycling.

12 What are the different factors regulate the population growth.

13 Explain the composition and character of different atmospheric strata.

(8 × 5 = 40 marks)

Turn over

Part C

III. Answer any *ten* questions in not more than five sentences. Each question carries 2 marks :

14 Explain the concept of climax in ecological succession.

15 What are Aquifers ?

16 What is hottest hotspot of bio-diversity ? Write an example.

17 Differentiate endangered and endemic plants.

18 Differentiate climate and weather.

19 Define the density of population.

20 What is Red Data Book ?

21 What is the difference between climate and weather ?

22 Explain two positive species interactions.

23 What is interdemic extinction?

24 What is Oceanic oscillations ?

25 Differentiate fundamental and realized niche.

(10 × 2 = 20 marks)

C 3935 (Pages : 2) Name.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 2C 13—PLANT MORPHOGENESIS, EMBRYOGENESIS AND PLANT BIOTECHNOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer any *two* questions in not more than 500 words :

1 Describe the techniques of androgenesis and discuss the factors that influenced androgenesis.

2 Briefly explain different types of suspension cultures and the methods to assess growth in culture.

3 With the help of suitable drawings describe the process involved in microsporogenesis.

(2 × 10 = 20 marks)

Part B

II. Answer any *eight* questions in not more than 250 words :

4 Describe the mode of sterilization techniques used in plant tissue culture.

5 Describe the different types of endosperm in angiosperms.

6 What are the requirements for pollen germination and pollen tube growth ?

7 What is a bioreactor ? Describe its significance.

8 Describe the different phases of organogenesis.

9 Describe the structure of female gametophyte in angiosperms.

10 How does polyembryony occur in angiosperms ?

11 Describe the floral development in *Antirrhinum*.

12 Describe the biotechnological applications of plant tissue culture.

13 Describe the factors affecting cryopreservation.

(8 × 5 = 40 marks)

Turn over

Part C

III. Answer any *ten* questions in not more than five sentences :

14 What do you mean by somatic embryogenesis ?

15 Distinguish between totipotency and pleuripotency.

16 What is tapetum? List out the different types.

17 What do you mean by microgametogenesis ?

18 What are plantibodies ? Give example.

19 What is RNAi ? List out two applications.

20 Name two plant derived vaccines.

21 Distinguish between autogamy and allogamy.

22 Write a note on molecular farming.

23 Describe the significance of endosperm culture.

24 What do you mean by microinjection ?

25 What is vitrification ?

(10 × 2 = 20 marks)

C 3934 **(Pages : 2)** **Name**.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 2C 11—BIOCHEMISTRY, BIOPHYSICS AND IMMUNOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer any *two* questions in not more than 500 words :

1 Explain the types, principles and applications of chromatography.

2 Describe the structure, functions and classification of proteins.

3 Write an account on primary and secondary immune response.

(2 × 10 = 20 marks)

Part B

II. Answer any *eight* questions in not more than 250 words :

4 Explain Omega and Beta oxidation of fatty acids.

5 Write about structure and functions of enzymes.

6 Explain the production and applications of monoclonal antibodies.

7 Describe TCA cycle and its importance.

8 Explain MHC and antigen presentation.

9 Explain allosteric inhibition with example.

10 Write about biosynthesis of purines.

11 Explain functions and sources of vitamins.

12 Write an account on NMR and X-ray crystallography.

13 Explain cell mediated immunity.

(8 × 5 = 40 marks)

Turn over

Part C

III. Answer any *ten* questions in not more than *five sentences* :

14 What are functional food ?

15 Write a note on HAT medium.

16 Explain Henderson-Hasselbalch equation.

17 Write about artificial sweeteners.

18 Differentiate lymphocytes and lymphokines.

19 Explain the applications of radioisotopes in Biology.

20 What are suicidal inactivators ?

21 Explain ninhydrin reaction.

22 Write about properties of water.

23 What is flow cytometry ? Mention the uses.

24 Write about importance of rubisco enzyme.

25 Explain substrate level phosphorylation.

(10 × 2 = 20 marks)

C 3933 (Pages : 2) Name.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Applied Plant Science

BOT 2C 09— PLANT PHYSIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

I. Answer any *two* questions in not more than 500 words :

1 Describe photosynthesis in plants. Highlight the difference between C3 and C4 cycles.

2 Write an account on the physiological changes during floral initiation in plants.

3 Describe the process of active and passive transport of solutes across the cell membranes.

(2 × 10 = 20 marks)

Part B

II. Answer any *eight* questions in not more than 250 words :

4 What is osmosis ? Illustrate and explain the potato osmoscope.

5 Explain the energy mechanisms in nutrient uptake.

6 What is the role of genes and proteins in the regulation of plant growth and development ?

7 Write an account on the ABC model of flower development.

8 Distinguish between climacteric and non-climacteric fruits.

9 Describe the role of macronutrient and micronutrients in plant growth.

10 Describe the impact of brassinosteroids in the plant growth.

11 Differentiate between cryptochromes and phytochromes.

12 What is cell senescence ? Explain the biochemical and genetic basis of senescence.

13 What is QTL mapping ? Is it possible to relate QTLs with stress mechanism in plants ?

(8 × 5 = 40 marks)

Part C

III. Answer any *ten* questions in not more than *five* sentences. Each question carries 2 marks :

14 What is the function of VAM in nutrient uptake ?

15 What is an orthodox seed ?

16 Expand the term 'CAM' and describe.

17 What are vacuolar malate channels ?

18 Identify the steps between which ATP molecules are generated in the citric acid cycle.

19 What is growth velocity profile ?

20 What is oxidative phosphorylation ?

21 Name and describe one model plant used in botanical experiments, highlighting its importance.

22 What is Cytochrome C oxidase ?

23 Write a brief account on any one application of the QTL mapping.

24 What are ureides ?

25 Do the heat shock proteins protect the plants ? How do they work ?

(10 × 2 = 20 marks)