B

1539

Register Number

Part III — BIOLOGY

(English Version)

Time Allowed : 3 Hours] [Maximum Marks : 150

N. B. : Candidates should answer **Part – I** (Botany) & **Part – II** (Zoology) in separate answer-books.

PART - I (BOTANY)

(Marks : 75)

SECTION – A

Note : i) Answer *all* the questions.

ii) Choose and write the correct answer.

iii) Each question carries *one* mark. 14 × 1 = 14

1. The bio-chemical research on *Neurospora* was conducted by

a) Charles Darwin b) Beadle and Tatum

c) Reginald Punnett d) Bateson and Punnett.

2. The enterotoxin is produced by

a) *Escherichia coli* b) *Agrobacterium*

c) *Pseudomonas* d) *Streptomyces*.

3. The fifth International Botanical Congress was held at

a) Cambridge b) Leningrad

c) Sweden d) Germany.

[Turn over

4. The most stable form of RNA is

a) transfer RNA b) messenger RNA

c) ribosomal RNA d) antisense RNA.

5. Lamellar collenchyma is present in the hypodermis of

a) *Helianthus* b) *Datura*

c) *Nicotiana* d) *Ipomoea*.

6. The plant used to treat jaundice is

a) *Phyllanthus embilica* b) *Phyllanthus amarus*

c) *Ricinus communis* d) *Jatropha curcas*.

7. The collateral and the closed vascular bundles are seen in

a) sunflower stem b) sunflower leaf

c) bean root d) maize root.

8. The *Manducta sexta* is the pest of

a) paddy b) tobacco

c) cotton d) brinjal.

9. The herbicide 'Basta' can be inactivated by a gene obtained from

a) *Bacillus thuringiensis* b) *Agrobacterium tumefaciens*

c) *Pseudomonas putida* d) *Streptomyces hygroscopicus*.

10. The photolysis of water occurs during

a) non-cyclic photophosphorylation

b) photorespiration

c) cyclic photophosphorylation

d) Calvin cycle.

11. The aldolase acts on

a) 3-phosphoglyceric acid b) glyceraldehyde 3-phosphate

c) fructose 1,6-bisphosphate d) 1,3-bisphosphoglyceric acid.

12. The type of fruit seen in *Abelmoschus esculentus* is

a) schizocarpic capsule b) regma

c) septicidal capsule d) loculicidal capsule.

13. The chloromycetin is used to cure

a) pneumonia b) urinary infection

c) typhoid d) tuberculosis.

14. The closure of stomata is caused by

a) auxin b) gibberellin

c) cytokinin d) abscisic acid.

SECTION – B

Note : i) Answer any *seven* questions.

ii) *Each* question carries *three* marks. $7 \times 3 = 21$

15. What is bio-piracy ?

16. Write the objectives of classification of plants.

17. Write any three benefits obtained by the release of genetically modified organisms into the environment.

18. Draw the ground plan for T.S. of dicot root and label its parts.

19. Bring out any three characteristics of meristematic cells.

20. Draw the polytene chromosome and label the parts.

21. Write the binomials of any three medicinally useful plants of solanaceae and state their useful parts.

22. Write about the structure of ATP.

23. What are dimorphic chloroplasts ?

24. State the conditions under which cyclic photophosphorylation occurs.

SECTION – C

Note : i) Answer any *four* questions including Question No. **27** which is compulsory.

ii) Draw diagrams wherever necessary.

iii) Each question carries *five* marks. 4 × 5 = 20

25. Write a short note on Bio-patent.

26. With examples, explain any *two* types of collenchyma with diagram.

27. Explain Kuhne's fermentation experiment with diagram.

28. Explain allopolyploidy with an example.

29. State any *five* physiological effects of auxin.

30. Explain the steps involved in the production of human insulin by a bacterial cell with diagram.

31. Bring out any *five* significances of herbarium.

SECTION – D

Note : i) Answer any *two* questions.

ii) Draw diagrams wherever necessary.

iii) Each question carries *ten* marks. 2 × 10 = 20

32. Describe *Datura metal* in technical terms. Draw the floral diagram and write the floral formula.

33. Describe Hatch and Slack pathway of carbon dioxide fixation in plants with flow-chart.

34. With the help of diagrams, describe the process of protoplasmic fusion.

35. Discuss the anatomy of monocot root with diagram.

PART – II (ZOOLOGY)

(Marks : 75)

SECTION – A

Note : i) Answer *all* questions.

ii) Choose and write the correct answer.

iii) Each question carries *one* mark. $16 \times 1 = 16$

1. The X chromosome that belongs to the group classified by karyotyping in man is

   a) Group C b) Group B

   c) Group A d) Group D.

2. Bubble Boy syndrome is also called

   a) BLAST b) HGP

   c) SCID d) DOPA.

3. The most abundant greenhouse gas is

   a) NO_2 b) CO_2

   c) O_3 d) SO_2.

4. The plants that can break down cyanide and reduce it to a non-toxic form are

   a) Xerophytes b) Phytoplanktons

   c) *Gibberella fusarium* d) Pseudomonas.

5. Deficiency of *Vitamin* B_1 causes

   a) Pellagra b) Nyctalopia

   c) Beri-beri d) Scurvy.

6. The disease due to inborn error of purine metabolism is commonly called

   a) Rickets b) Gout

   c) Nyctalopia d) Pellagra.

7. Which of the following is associated with atrophy of cerebral cortex ?

a) Amnesia b) Stroke

c) Meningitis d) Alzheimer's disease.

8. The principal organ of urea biosynthesis is

a) Pancreas b) Stomach

c) Kidney d) Liver.

9. The milk of which of the following cows is characterised by high carotene content ?

a) Sindhi b) Haryana

c) Gir d) Jersey.

10. Which is the most popular and commercial breed of fowl in India ?

a) Aseel b) Busra

c) Leghorn d) Chittagong.

11. The diluting fluid used to count RBC is

a) Turk's solution b) Lymphatic fluid

c) Hayem's solution d) Eosin.

12. The classical example of polymorphism is

a) Mutation b) SCID

c) Sickle cell anaemia d) Huntington's chorea.

13. Tumour inducing viruses are called

a) variola viruses b) oncogenic viruses

c) pathogenic viruses d) para viruses.

14. Which of the following is associated with diarrhoea in children ?

a) *Yersinia pestis* b) Neisseria

c) *Giardia intestinalis* d) Trichomonads.

15. Who discovered a system for "antiseptic" surgery ?

a) Louis Pasteur b) Joseph Lister

c) Robert Koch d) Darwin.

16. Which of the following are the largest of all viruses ?

a) RNA viruses b) Polioma viruses

c) Rabies viruses d) Pox viruses.

SECTION – B

Note : i) Answer any *eight* questions.

ii) *Each* question carries *three* marks. 8 × 3 = 24

17. What is Angiogram ?

18. What is Vasectomy ?

19. Mention the various Morphological features of bacteria.

20. When do auto-immune diseases occur ? Give an example.

21. What is hapten ?

22. Mention the clinical manifestations of Thalassemia.

23. What is gene therapy ? What are its types ?

24. Mention any *two* demerits of cloning.

25. Mention any three causes of global warming.

26. What is artificial insemination ?

27. Mention the uses of stethoscope.

28. Define bottleneck effect.

SECTION – C

Note : i) Answer any *three* questions including Question No. **31** which is compulsory.

ii) Each question carries *five* marks. $3 \times 5 = 15$

29. Explain different types of fracture.

30. Write notes on *two* bacterial diseases in man.

31. What is organ transplantation ? Classify the types of graft.

32. Write a note on the significance and benefits of Human Genome Project (HGP).

33. Explain pre-mating isolation.

SECTION – D

Note : i) Answer *any two* questions.

ii) Each question carries *ten* marks. $2 \times 10 = 20$

34. Explain the digestive process taking place in small intestine.

35. Explain the importance of Pancreas as an endocrine gland.

36. Enumerate any *five* steps to be taken to resolve energy crisis.

37. Give a detailed account on the contagious diseases of cattle.

A

1545

Register Number

Part III — BOTANY

(English Version)

Time Allowed : 3 Hours] [Maximum Marks : 150

SECTION – A

Note : i) Answer *all* questions.

ii) Choose and write the correct answer.

iii) Each question carries *one* mark. 30 × 1 = 30

1. Botanical name of groundnut is

a) *Cajanus cajan* b) *Vigna mungo*

c) *Lablab purpureus* d) *Arachis hypogea.*

2. The phyllotaxy in *Ixora coccinea* is

a) alternate b) opposite decussate

c) whorled d) spiral.

3. The other name for cork cambium is

a) phellogen b) phelloderm

c) phellum d) periderm.

4. In leaf, the bundle sheath is made up of

a) parenchyma b) collenchyma

c) chlorenchyma d) sclerenchyma.

5. Meristem found in the nodal region of grass is

a) apical meristem b) intercalary meristem

c) lateral meristem d) cambium.

6. Replication of DNA in *E.coli* is completed in

a) 60 minutes b) 30 minutes

c) 40 minutes d) 50 minutes.

7. The 'Superbug' is

a) *Bacillus thuringiensis* b) *Escherichia coli*

c) *Agrobacterium* d) *Pseudomonas putida*.

8. Bhabha Atomic Research Centre is located at

a) New Delhi b) Mumbai

c) Kolkata d) Lucknow.

9. In tissue culture technique, during callus formation auxin induces

a) cell division b) cell elongation

c) differentiation d) embryogenesis.

10. The enzymes that catalyse the formation of C–C, C–S, C–O and C–N bonds are

a) ligases b) lyases

c) hydrolases d) transferases.

11. Experiment to explain fermentation is

a) Ganong's respiroscope

b) Kuhne's experiment

c) Test tube funnel experiment

d) Lever auxanometer.

12. Apical dominance is due to

a) Auxin b) Gibberellin

c) Ethylene d) Cytokinin.

13. Transgencic plant that secretes human interferon is

a) wheat b) tomato

c) maize d) barley.

14. Powdered seeds of which of the following plants is a substitute for coffee ?

a) *Catharanthus roseus* b) *Cola nitida*

c) *Ilex paraguriensis* d) *Penta diplantra*.

15. *Aegle marmelos* belongs to the family

a) Rutaceae b) Verbenaceae

c) Malvaceae d) Fabaceae.

16. Cypsela is a fruit of

a) Malvaceae b) Solanaceae

c) Asteraceae d) Rubiaceae.

17. In which of the following plants does the inflorescence grow upto ten metres ?

a) *Cocos nucifera* b) *Corypha umbraculifera*

c) *Caryota urens* d) *Phoenix sylvestris*.

18. Euphorbiaceae is kept under the series

a) Coronarieae b) Unisexuales

c) Polemoniales d) Calycinae.

19. Carolus Linnaeus belongs to

a) Germany b) Sweden

c) Russia d) England.

20. In *Schizanthus pinnatus* the number of fertile stamens is

a) 2 b) 3

c) 4 d) 5.

21. Root hair arises from

a) endodermis b) trichoblast

c) hypodermis d) pericycle.

22. Bicollateral vascular bundle is seen in the family

a) Malvaceae b) Cucurbitaceae

c) Solanaceae d) Rubiaceae.

23. Number of autosomes found in the human diploid cell is

a) 46 b) 23

c) 44 d) 22.

24. The percentage of recombinants in the test cross progeny of Bateson & Punnet's linkage experiment is

a) 88 b) 12

c) 44 d) 6.

25. The 17th human chromosome is

a) acrocentric b) metacentric

c) telocentric d) paracentric.

26. C_4 cycle is otherwise called

a) EMP pathway b) Hatch-Slack pathway

c) Calvin cycle d) Kreb's cycle.

27. Which of the following is a sundew plant ?

a) Cuscuta b) Drosera

c) Viscum d) Vanda.

28. The gas evolved during photosynthesis is

a) CO_2 b) O_2

c) H_2 d) N_2.

29. Which of the following is three carbon compound ?

a) Malic acid b) Aspartic acid

c) Oxaloacetic acid d) Phosphoglyceric acid.

30. Pentose Phosphate pathway takes place in

a) chloroplast b) mitochondria

c) peroxisome d) cytoplasm.

SECTION – B

Note : i) Answer any *fifteen* questions.

ii) Each question carries *three* marks. 15 × 3 = 45

31. Define herbarium.

32. What is toddy ?

33. Write a note on sub-class Polypetalae.

34. Describe the gynoecium of *Clitoria ternatea*.

35. What is collateral vascular bundle ?

36. What are the uses of genetic map ?

37. What is substitution mutation ? What are the two kinds of it ?

38. What are the rules of Chargaff based on the bases of DNA ?

39. Name three transgenic monocot plants.

40. What is callus ?

41. What is sigmoid curve ?

42. What are thylakoids ?

43. What is photorespiration ?

44. What is fermentation ?

45. Why is Kreb's cycle called amphibolic process ?

46. Under which condition does cyclic photophosphorylation occur ?

47. What are phytochromes ?

48. What is devernalization ?

49. What is soil reclamation ? Which organism plays an important role in it ?

50. What is pure line selection ?

SECTION – C

Note : i) Answer any *seven* questions.

ii) Answer to Question No. **53** is compulsory and this question should not be left as option.

iii) Each question carries *five* marks.

iv) Draw diagrams wherever necessary. $7 \times 5 = 35$

51. Write any *five* salient features of ICBN.

52. Describe the various types of androecium of Fabaceae.

53. Define meristem. What are its different kinds based on location ?

54. Differentiate the vascular bundles of dicot stem from that of monocot stem.

55. Draw the structure of tyloses and label the parts.

56. Draw and label the structure of special types of chromosomes.

57. Write notes on mutagenic agents.

58. How is DNA cut ?

59. What is tissue culture ? What is the basic concept of it ?

60. Describe Vanda.

61. Write short notes on photosynthetic pigments.

62. Write a note on microbes in medicine.

SECTION – D

Note : i) Answer any *four* questions.

ii) Each question carries *ten* marks.

iii) Draw diagrams wherever necessary. 4 × 10 = 40

63. Describe *Hibiscus rosasinensis* with technical terms. Draw floral diagram. Write floral formula.

64. a) Give an account of economic importance of Arecaceae.

b) Describe various types of inflorescence in the family Euphorbiaceae.

65. Describe the Transverse Section of dicot leaf with diagram.

66. Write an account on chromosomal aberration on the basis of structure.

67. Explain the steps involved in protoplasmic fusion to bring out somatic hybridization in plants.

68. Describe glycolysis.

69. Write the practical applications of auxin and gibberellin.

70. Write an essay on biopiracy.