BT(R)

J – 2053

(Pages : 3)

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, March 2020

Career Related First Degree Programme under CBCSS

Common for Group 2 (a) Botany and Biotechnology and Group 2(b) Biotechnology (Multimajor)

BB 1641/BV 1641.1 : GENETICS

(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions in a word or one or two sentences. Each questions carries **1** mark.

1. What is crossing over?
2. What is chromosome mapping?
3. Define back cross
4. What is Turner's syndrome?
5. Give two examples for sex-linked inheritance.
6. How do Z form of DNA differ from 'B' DNA?
7. What are kappa particles?
8. Name the enzyme for reverse transcription.
9. What are stop codons? Give examples.
10. What is meant by gene frequency in a population?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions. Each question carries **2** marks. Answer not to exceed one paragraph.

11. Explain the mode of inheritance in self sterility in *Nicotiana*.
12. What are Mendel's law of Inheritance?
13. Explain three point test cross.
14. Compare the mode of inheritance of pisum flower colour and Drosophila eye colour.
15. How satellite DNA differ from repetitive DNA. Mention their salient features.
16. Briefly explain replication in circular DNAs.
17. Describe the functions of housekeeping and luxury genes.
18. Explain the importance of primase.
19. Differentiate the A and B forms of DNA.
20. What is a genetic code? What are anti-codons and where are they located?
21. What are recon and muton?
22. What are exons and introns? What is their function?

(8× 2 = 16 Marks)

SECTION – C

Answer **any six** questions. (Answer not to exceed **120** words). Each questions carries **4** marks.

23. Compare and contrast multiple allelism and polygenic trait with suitable examples.
24. What are linked genes? Explain with appropriate diagram. How does linkage affect independent assortment?
25. Explain the genic balance theory of sex determination in Drosophila.

26. Compare the chromosomal basis of sex determination in Melandrium album with humans.
27. Explain the mode of inheritance of kappa particle in paramecium and shell coiling in snails.
28. Explain the role of ribosome and rRNA in translation.
29. Explain the functions and properties of tRNA.
30. What are transposons? Briefly explain the different types.
31. Who discovered semi-conservative mode of replication and explain how this was scientifically proven?

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. Not more than three pages. Each question carries **15** marks.

32. Explain epistasis and different types of epistasis in detail, with examples.
33. Give a detailed account of maternal inheritance with appropriate examples.
34. Explain the functions of various enzymes involved in DNA replication and repair.
35. Explain transcription in detail with diagrams.

(2 × 15 = 30 Marks)

(Pages : 4) L – 1859

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme Under CBCSS

Group 2 (a) Botany and Biotechnology and Group 2 (b) Biotechnology Multimajor

BB 1641/BV 1641.1 – GENETICS

(2018 Admission Regular)

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions in **one** word to maximum of **2** sentences.

1. Define epistasis
2. What are multiple alleles?
3. What is test cross?
4. What are barr bodies?
5. How do you identify the progenies with double cross overs in a three point test cross?
6. What causes Turner's syndrome?
7. What is pitch of helix in the structure of DNA?
8. What are Transposons?

P.T.O.

9. What is meant by disruptive selection?

10. Comment on Hardy Weinberg law.

(10 × 1 = 10 Marks)

PART – B

Answer any **eight** questions in not more than **one** paragraph.

11. Point out the driving forces of evolution.

12. What is a gene pool?

13. What is dihybrid cross?

14. What are polygenic traits?

15. Explain complementary gene action in *Lathyrus*.

16. Comment on aneuploidy in humans citing one example.

17. Explain the inheritance of haemophilia.

18. Comment on XX-XO mechanism of sex determination.

19. Write a note on extra nuclear inheritance.

20. How do linkage and crossovers help in mapping genes?

21. Point out the role of topoisomerase in DNA replication.

22. What are proto oncogenes?

23. What is Central dogma?

24. Comment on house keeping genes.

25. What are introns?

26. What are okazaki fragments?

(8 × 2 = 16 Marks)

PART – C

Answer any **six** questions in not more than **120** words.

27. Explain the role of mutation in evolution.

28. What is hardy Weinberg law? How is it helpful population genetic studies?

29. Write an account on transposons.

30. Write a note on DNA polymerase and DNA ligase.

31. What is reverse transcription?

32. Explain the role of tRNA in protein synthesis.

33. Briefly explain rho dependent and rho independent termination of transcription

34. Explain the reasons behind Mendel's success.

35. Explain maternal effect with an example.

36. Explain Genic balance theory of Sex determination in *Drosophila*.

37. In a breeding experiment in summer squashes, the fruit colour in F2 generation appeared in the ratio 12:3:1. Explain the genetic mechanism involved in the cross.

38. Comment on DNA repairing mechanisms.

(6 × 4 = 24 Marks)

PART – D

Answer any **two** questions. **Each** question carries **15** marks.

39. Explain the structure of B-DNA with suitable diagram.

40. Explain the genetic interactions of comb pattern in poultry.

41. Write an essay on the semi-conservative model of DNA replication.

42. Explain the various steps involved in prokaryotic transcription.

43. Briefly explain the genetics of sex determination in higher plants with reference to *Melandrium album*.

44. Explain the structure of tRNA with suitable diagram.

(2 × 15 = 30 Marks)

(Pages : 3)

L – 1858

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, March 2021

Career Related First Degree Programme under CBCSS

Common for Group 2(a) Botany and Biotechnology and Group 2(b) Biotechnology (Multimajor)

BB 1641/BV 1641.1 : GENETICS

(2015 - 2017 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions in a word or one or two sentences. Each question carries **1** mark.

1. Define Cistron.
2. What is Crossing Over?
3. Define Back Cross and Test Cross.
4. What is Central Dogma?
5. What is a Termination Codon?
6. What is Enhancer?
7. What is Sigma Factor?

P.T.O.

8. What is Rolling Circle Mechanism?

9. What is Chargaff Rule?

10. Who is Popularly known as the 'Dark Lady of DNA'?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. Each question carries **2** Marks. (Answer not to Exceed **One** Paragraph)

11. Differentiate Between Recon and Muton.

12. Describe the Structure of 'A' form of Nucleic Acid.

13. What is overlapping Gene?

14. Explain Interference and Coincidence.

15. What are Duplicate Genes? Explain with examples that you have studied.

16. Explain Chiasma Formation.

17. Write Short note on DNA Polymerase.

18. Explain Turner's Syndrome.

19. What is Telomere and How it is related to Aging?

20. What is SOS repair?

21. What is Repetitive DNA?

22. Comment on Cellular Oncogenes.

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** Questions. Each question carries **4** Marks. (Answer not to exceed **120** Words)

23. How eye colour in Drosophila is Inherited?

24. Explain Complementary Gene interaction with an example.

25. What is Cell Cycle? What are the different Stages in the Cell Cycle?

26. Why Initiation of DNA synthesis needs RNA Primer?

27. Comment on Topoisomerase.

28. Explain Dominant Epistasis.

29. Explain the role of Helicase and Primase.

30. Explain the Meselson and Stahl Experiment and Its Implications.

31. What is alternate splicing of RNA?

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. Each questions carries **15** marks. (Answer not to exceed **3** pages)

32. Explain the Hardy Weinberg law of equilibrium and comment on the factors affecting it.

33. Explain chromosomal basis of the Transcription and Translation in Eukaryotes.

34. Explain sex determination.

35. Describe extranuclear inheritance with examples.

(2 × 15 = 30 Marks)

N – 1588

(Pages : 3)

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

Career Related First Degree Programme under CBCSS

Group 2(a) Botany & Biotechnology

Group 2(b) Biotechnology (Multimajor)

BB 1641/BV1641.1: GENETICS

(2017 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer ***all*** *questions in a word or* **one** or **two** sentences. **Each** question carries **1** *mark.*

1. What is Rediscovery of Mendelism?
2. Which Genetic Elements are known as jumping genes?
3. Name the scientists who proved DNA as genetic material.
4. What is Nucleosomes?
5. The extension of chromosome ends has been carried out by the Enzyme?
6. What is 'Wild' Type?
7. Explain Penetrance.
8. Define Promoters.

P.T.O.

9. What is snRNA?
10. Define Epistasis.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. **Each** question carries **2** marks. (Answer not to exceed one paragraph)

11. Write short note on Histones.
12. What is Satellite DNA?
13. Explain Protooncogens and its significance.
14. What is a replication fork?
15. What is hemizygote?
16. What is TATA Box?
17. What is Genic balance theory of Sex determination?
18. Explain the Structure of tRNA.
19. Differentiate between B and Z form of DNA.
20. Define Hardy weinberg law of equilibrium.
21. What made Garden pea the perfect experimental material for Mendels genetical Experiments?
22. How did Virus codes for diverse proteins with limited Genome size?

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. **Each** question carries **4** marks. (Answer not to exceed **120** words)

23. Briefly explain the Hershey - Chase Experiment.
24. What makes GAPDH β – Actin as a perfect common marker for loading control in PCR experiments?
25. Differentiate between Introns and Exons, Add a note on its Significance.

26. Comment on RNA splicing.
27. Briefly explain Plastid inheritance in *Mirabilis*.
28. Comment on Pleiotropy.
29. Write Short note on Transposons and Its Significance in Evolution.
30. Briefly explain Sex chromosome abnormalities in Man.
31. Explain the Self Sterility in Nicotiana.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks. (Answer not to exceed **3** pages)

32. Briefly explain the Structure Function and Importance of different types of RNA.
33. Explain Multiple allelism with ABO Blood Group as Example. Comment on Rh factor.
34. Explain various Gene Interactions and Inheritance patterns out of it.
35. Explain the Enzymology of DNA replication following the sequence of events.

(2 × 15 = 30 Marks)

(Pages : 4) **N – 1590**

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

Career Related First Degree Programme under CBCSS

Botany and Biotechnology/Biotechnology (Multimajor)

Core Course

BB 1641/BV 1641.1 : GENETICS

(2018 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** the questions in a **word** or **one or two** sentences. Each question carries **1** mark.

1. What is a dihybrid cross?
2. Define a gene pool.
3. What are oncogenes?
4. State Genic balance theory.
5. Give an example for codominance.
6. What is a cistron?
7. Define linkage.
8. What is chiasmata?

P.T.O.

9. Write the function of DNA helicase.

10. What are okazaki fragments?

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. Each question carries **2** marks. (Answer not to exceed **one** paragraph)

11. Explain the structure of tRNA.

12. What is criss-cross inheritance?

13. Differentiate between back cross and test cross.

14. What are house keeping genes?

15. Mention the significance of kappa particles in *Paramecium*.

16. What are split genes?

17. Explain the flower colour pattern in *Mirabilis jalapa*.

18. What is inbreeding depression?

19. Comment on haemophilia.

20. What is two point test cross?

21. Briefly explain reverse transcription.

22. What is translation?

23. What is cross over value? What is its significance?

24. Explain Hardy-Weinberg principle.

25. What is polygenic inheritance?

26. Briefly explain duplicate gene action in *Capsella*.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. Each question carries **4** marks. (Answer not to exceed **120** words)

27. What are jumping genes? Explain its types.

28. Comment on multiple allelism in terms of blood groups in man.

29. Differentiate between interference and coincidence.

30. Explain the function of different types of RNA.

31. Discuss the mechanism of inheritance of ear size in Maize.

32. What is a genetic map? How is it constructed?

33. Comment on Klinefelter's syndrome.

34. Discuss the reasons for success of Mendel during garden pea experiments.

35. Explain the chromosomal basis of sex determination.

36. What are the features of genetic code?

37. Explain complementary genes with an example.

38. Discuss any three factors affecting genetic equilibrium.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. Each question carries **15** marks. (Answer not to exceed **three** pages)

39. With suitable diagrams, describe DNA replication in prokaryotes.

40. Define epistasis. Give an account on various epistatic gene interactions citing examples.

41. Describe sex linked inheritance with suitable examples.

42. What is extranuclear inheritance? Explain the inheritance pattern of shell coiling in snails and plastid inheritance in *Mirabilis*.

43. Discuss in detail Mendel's Laws of inheritance citing suitable crosses.

44. Explain Hershey and Chase experiment to identify DNA as the genetic material. Compare and contrast A, B and Z forms of DNA.

(2 × 15 = 30 Marks)

(Pages : 4) **N – 1589**

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree Examination, April 2022

Career Related First Degree Programme under CBCSS

Botany and Biotechnology

BB 1641 : GENETICS

(2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions in **one** word or **two** sentences. **Each** question carries **1** mark.

1. What is recon?
2. What is Self sterility?
3. What is a luxury gene?
4. Expand rRNA.
5. What is degeneracy of genetic code?
6. What is a back cross?
7. What is the role of primase?
8. Define muton?
9. What is Y linked inheritance?
10. Define coefficient of coincidence.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer any **eight** questions. Short Answer (Not to Exceed **One** Paragraph). **Each** question carries **2** marks.

11. Explain dihybrid cross.
12. State the law of dominance.
13. List the characteristics of Garden pea which make the best material for genetic experiments.
14. What are complementary genes?
15. What is polygenic inheritance?
16. Differentiate between B and Z DNA.
17. How does shell coiling in snails inherit?
18. What is a transcription factor?
19. Comment on enhancers.
20. Differentiate between dominant and recessive epistasis.
21. What is the function of helicase in DNA replication?
22. What is Junk DNA? What is its significance?
23. What is genetic drift?
24. With an example elaborate 1:1:1:1 ratio of inheritance.
25. Comment on Rh factor.
26. How is skin colour in man inherited?

(8 × 2 = 16 Marks)

SECTION – C

Short Essay(Answer any **six** questions). **Each** carries **4** marks.

27. Explain triplet code and its properties.
28. What is SOS DNA repair?
29. What is RNA splicing?
30. Comment on Turners Syndrome.
31. What are the functions of rRNA?
32. How does base excision repairwork?
33. What is a rolling circle mechanism?
34. Discuss genic balance theory.
35. Explain the 9:6:1 ratio in genetics.
36. What is Klinefelter's syndrome?
37. How is ear size inherited in maize?
38. Discuss the inheritance of flower colour in *Lathyrus*.

(6 × 4 = 24 Marks)

SECTION – D

Essay Questions (Answer any **two** questions). **Each** question carries **15** marks.

39. Give an account on modified mendelian ratios? Explain the mechanisms of inheritance of these ratios.
40. Elaborate the mechanisms of extra nuclear inheritance with examples.
41. Give a detailed sketch on the structure and functions of DNA? Comment on DNA mutation.

42. Comment on the enzymology of DNA replication process.

43. Explain how quantitative characters are inherited with suitable examples.

44. What is sex determination? Discuss various methods and abnormalities.

(2 × 15 = 30 Marks)
