C 3023 (Pages : 3) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE (SPECIAL) EXAMINATION MARCH 2021

Microbiology

MBG 6B 16 (E2)—BIOSAFETY AND BIOETHICS

(2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Draw diagrams wherever necessary.

Section A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. Expand FAO.
2. The CBD on biosafety entered into effect on.

   (November 23,1993 ; December 29, 1992 ; November 23, 1992 ; January 1,1993)
3. Microbial agents causing serious lethal diseases for which therapeutic interventions are not available are grouped under

   (RG 1 ; RG 2 ; RG 3 ; RG 4).
4. The first Indian rDNA biosafety guidelines was prepared by ————.
5. The GMO rich in β-carotene is ————.
6. The first draft of the human genome was published by ———— in February, 2001.
7. The genetic screening test used for diagnosis of phenylketonuria is ————.
8. Among the following the genetic disorder is :

   (Huntington's disease; Myasthenia gravis; Pernicious anaemia; Liver cirrhosis).
9. Example for a single gene disorder is :

   (Sickle cell anaemia; don's syndrome; Kleinfelter syndrome; Pearson syndrome).
10. The first human chromosome sequenced was ————.

11. Expand CBD.

12. The way of determining risks and dangers at work places is called ————.

(12 × 1 = 12 marks)

Section B

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

13. Define Bioethics.

14. Biosafety level 1.

15. LMOs.

16. Genome.

17. RFLP.

18. GRAIL.

19. Single gene disorders.

20. Chromosome staining.

21. Ethnic races.

22. Cartagena Protocol of Biosafety.

(8 × 3 = 24 marks)

Section C

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

23. Criteria used for biosafety levels.

24. Physical map of genome.

25. Techniques used for prenatal diagnosis.

26. Reasons for genetic testing.

27. Genetic manipulations.

28. Goals for ELSI programme.

29. Applications of genetic studies on ethnic races.

30. Aims of NIH guidelines on biosafety.

(5 × 6 = 30 marks)

Section D

Answer at least **one** *question.*

The question carries 14 *marks.*

31. Write a note on biosafety guidelines in India and its implementation.

32. Write a note on human genome project. Discuss ELSI of human genome project.

33. Write on biosafety levels required for experiments involving transgenic plants.

(1 × 14 = 14 marks)

C 3022 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE [SPECIAL] EXAMINATION MARCH 2021

Microbiology

MBG 6B 15 (E1)—CELL AND TISSUE CULTURE

(2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Expand BAP.
2. What is Totipotency ?
3. What are Explants ?
4. What is friable callus ?
5. What is MS medium ?
6. What are somaclonal variants ?
7. What are Elicitors ?
8. What are pluripotent stem cells ?
9. What is the role HEPA filters ?
10. Name a surface sterilant used in tissue culture.
11. What is Androgenesis ?
12. What are stem cell markers ?

(12 × 1 = 12 marks)

Section B (Short Answer Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

13. How is it possible to get homozygous diploids from haploids ?
14. Write a brief account on hardening process.

Turn over

15. What are plant growth regulators ?

16. Why is sub-culturing essential in tissue culture ?

17. What is direct embryogenesis ?

18. What are Micronutrients ? Name any *two* used in tissue culture medium.

19. Write a brief account on the effect of auxin/cytokinin ratio on organ formation.

20. What are Cybrids ?

21. What is biolistic method of gene transfer ?

22. What is the role of elicitors in Secondary Compound Production ?

(8 × 3 = 24 marks)

Section C (Short Essay Questions)

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

23. Write a short note on the applications of cell lines in medical field.

24. Make a comparison of direct and indirect organogenesis.

25. What are the strategies for the enhanced production of secondary metabolites in tissue culture ?

26. Write a brief account on human embryonic stem cell culture.

27. Write a short note cell suspension culture and its applications.

28. What is MS medium ? Mention the role of hormones in the medium ?

29. How do somatic embryos different from zygotic embryos ?

30. Write a short account on direct and indirect gene transfer.

(5 × 6 = 30 marks)

Section D (Essay Questions)

Answer at least **one** *question.*
The question carries 14 *marks.*

31. What is Micropropagation ? Explain the steps involved in it and applications.

32. Explain the methodology involved in somatic hybridization. Add a note on its applications.

33. Write a detailed account on culture types.

(1 × 14 = 14 marks)

C 3021 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE [SPECIAL] EXAMINATION MARCH 2021

Microbiology

MBG 6B 11—MEDICAL MICROBIOLOGY–II

(2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. Give an example for granulomatous mycoses.
2. Name the vaccine given in the form of oral polio vaccine.
3. What is meant by extrinsic incubation period ?
4. Swine flu is caused by ————.
5. ———— is the dermatophyte that infects skin and nail but not hair.
6. ———— is commonly called the beef tapeworm.
7. Filariasis is caused by ————.
8. Expand BCG.
9. Name the scientist who formulated the first vaccine against rabies.
10. Process of reducing the virulence of a pathogen is known as ————.
11. Chikungunya is transmitted through ————.
12. Sterile vesicular lesions produced in case of cutaneous mycoses is known as ————.

(12 × 1 = 12 marks)

Section B (Short Answer Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

Briefly explain :

13. The life cycle of Plasmodium.
14. Pulse immunisation.

15. Dengue shock syndrome.
16. Candidiasis.
17. Sleeping sickness.
18. Pathogenesis of hepatitis B virus.
19. Dimorphic fungi.
20. Giardiasis.
21. DPT Vaccine.
22. Beta lactam antibiotics.

(8 × 3 = 24 marks)

Section C (Short Essay Questions)

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

23. Explain the methods used in the laboratory diagnosis of parasitic infections.
24. How does bacteria develop resistance against antibiotics ?
25. What are the various routes of vaccine administration ? mention its advantages & disadvantages.
26. What are dermatophytes ? comment on diseases caused.
27. Comment on SARS.
28. What are opportunistic mycoses ? Explain with examples.
29. Explain the pathogenesis and prophylaxis of rabies.
30. Explain the lifecycle & pathogenesis of *Ascaris lumbricoides.*

(5 × 6 = 30 marks)

Section D (Essay Questions)

Answer at least **one** *question.*
The question carries 14 *marks.*

31. Write an essay on the symptoms, pathogenesis, transmission, prophylaxis and control of any two vector borne viral disease.
32. What are vaccines ? Comment on various types of vaccines.
33. Write an essay on amoebiasis.

(1 × 14 = 14 marks)

C 3020 (Pages : 3) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE (SPECIAL) EXAMINATION MARCH 2021

Microbiology

MBG 6B 10—GENETICS AND GENETIC ENGINEERING

(2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Draw diagrams wherever necessary.

Section A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. The term "genetics" was coined by :

   (G. Mendel ; W. Bateson ; A, E. Garrod ; T. H. Morgan).

2. A group of genetically identical cells derived by asexual division from a common ancestor is called ———.

3. In dihybrid cross between yellow round and green wrinkled seeded pea plants, the F2 phenotypic ratio observed was ———.

4. Who proposed the duplication theory to explain the mechanism of crossing over ?

5. The number of linkage groups of a species corresponds to ——— chromosome number of that species.

   (Haploid ; Diploid ; Total number ; Autosomal).

6. The mode of replication of F plasmid occurring during conjugative transfer is ———.

7. The G_1 phase where the cell division process arrested is called ———.

8. The enzyme used for synthesis of cDNA from mRNA is ———.

9. The vectors that can propagate in one host and then move into another host without any extra manipulation is called ———.

10. Taq polymerase used in PCR is obtained from ———.

11. A collection of clones that includes all the DNA sequences of a given species is called ————.

12. Name the personalities developed chemical method of DMA sequencing.

(12 × 1 = 12 marks)

Section B

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

13. Codominance.

14. Polyploidy.

15. Homologous recombination.

16. Lysogenic cycle.

17. Linkage groups.

18. Cyclin dependent kinases.

19. Freezing-thawing.

20. Renaturation.

21. Promoter sequence.

22. Expression vectors.

(8 × 3 = 24 marks)

Section C

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

23. Sex linked inheritance.

24. Mechanism of crossing over.

25. Cell cycle check points and its significance.

26. Cell disruption techniques.

27. Southern blotting.

28. Chromosomal aberrations.

29. Differences between mitosis and meiosis.

30. Ethical issues associated with rDNA technology.

(5 × 6 = 30 marks)

Section D

Answer any **one** *question.*
The question carries 14 *marks.*

31. Write a note on the mechanism of apoptosis. Write on the regulation and significance of apoptosis.

32. Define Transduction. Describe the mechanism of generalized and specialized transductions.

33. Write a note on enzymes used in rDNA technology. Add a note on screening techniques used for isolation of recombinant clones.

(1 × 14 = 14 marks)

C 3016 (Pages : 3) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE (SPECIAL) EXAMINATION MARCH 2021

Microbiology

MBY 6B 14—MICROBIAL GENETICS AND GENETIC ENGINEERING

(2014 Admissions)

Time : Three Hours Maximum : 120 Marks

(Draw diagrams wherever necessary).

Section A

Answer **all** *questions.*
Each question carries ½ marks.

1. The cross pollination of corns with yellow kernel and white kernel results in ears of corn that have an approximately even mix of yellow and white kernels. The pattern of inheritance in this case is ————.
2. Acridine orange is an intercalating agent that causes ———— mutation.
3. In *E. coli*, a mutation changes the DNA sequence from 5'GCCATTGGA3' to 5'GCCCTTGGA3', the type of mutation is called ————.
4. In a cross there are 80 % parental and 20 % recombinant organisms in the offsprings. The recombination frequency of the cross is ————.
5. In sonication method for cell disruption the range of frequency applied to the sample is ————.
6. The most common state of natural DNA is the ————.
7. How many types of deoxynucleoside triphosphates are used in Sanger sequencing ?
8. The therapeutic strategy that replaces a mutated gene that causes disease with a healthy copy of the gene is called ————.
9. The eukaryotic cell organelle involved in the spindle fibre development during mitosis is ————.
10. Cdks interact with specific ———— to acquire enzyme activity and regulate the cell cycle.

11. In males meiosis occurs during ————.

12. The phenomenon where the effect of one gene is dependent on the presence of one or more 'modifier genes' is called ————.

(12 × ½ = 6 marks)

Section B

Answer **all** *questions.*
Each question carries 3 *marks.*

13. What are lethal alleles ?

14. What is recombination frequency ?

15. What are cloning vectors ?

16. What are the functions of hsdM, hsdR and hsdS gene products of EcoK restriction modification system in bacteria ?

17. What is 'terminator' gene technology ?

18. What is DNA sequencing ?

19. Write on the problems associated with GMOs.

20. Suppose the brown allele for eye colour (B) is completely dominant over the blue allele for eye (b). If brown-eyed parents produce a child that is blue-eyed, what is the probability that at least one out of the two children they produce will also have blue eyes ?

21. What is crossing over ?

22. Write on sex linked inheritance.

(10 × 3 = 30 marks)

Section C

Answer any **six** *of the following.*
Each question carries 8 *marks.*

23. A cross between a blue blahblah bird and a white blahblah bird produces offspring that are silver. The colour of blahblah bird is determined by just two alleles. Then answer the following :

    (a) What are the genotypes of the parent blahblah birds in the original cross ? (3 marks)

    (b) What is/are the genotype(s) of the silver offspring ? (3 marks)

    (c) What would be the phenotypic ratios of offspring produced by two silver blahblah birds ? (2 marks)

24. How can the concept of genetic recombination frequency be used in genetic mapping ?

25. Write a note on meiosis.

26. What is gene therapy ? What are the steps involved in the process ? What are the different types and techniques in gene therapy ?

27. Describe the steps involved in the production of GM crops. How does the genetic modification differ from conventional plant breeding ?

28. Comment on :

    (a) Apoptosis is part of development. (2 marks)

    (b) Apoptosis can eliminate infected or cancerous cells. (3 marks)

    (c) Apoptosis is key to immune function. (3 marks)

29. Write a note on cell cycle.

30. Write a note on Ame's test and its application.

(6 × 8 = 48 marks)

Section D

Write essays on any **two** *of the following.*

Each question carries 18 *marks.*

31. Define mutagens. Discuss the mechanisms of mutagenesis by various mutagens.

32. Discuss the steps involved in the development of transgenic animals. Write on the ethical issues related with the use of rDNA technology.

33. Discuss the mechanism of conjugation in bacteria. Write on interrupted mating technique and its applications.

(2 × 18 = 36 marks)