CUET PRACTICE PAPER

02

1.Which of the following statements best describes the difference between natural selection and sexual selection?

a) Sexual selection occurs during sexual intercourse.
b) Natural selection is a type of sexual selection.
c) Sexual selection is a type of natural selection.
d) Sexual selection occurs within demes.

2.In Mendel's experiment, when did the recessive character of dwarfness appear?

a) F1 b) F2 c) F3 d) F2 and F3

3.Oldest viable seed is of

a) Lupine b) Ficus c) Date palm d) Phoenix

4. In the species area relationship, 'S' represents

a)Species richness b)Slope of the line c)Specific area d)Special species

5.What are primers?

a) Small chemically synthesized oligonucleotides of about 10-18 nucleotides that are complementary to the region of template DNA
b) Chemically synthesized oligonucleotides of about 10-18 nucleotides that are not complementary to the region of template DNA
c) The double-stranded DNA that needs to be amplified
d) Specific sequences present on recombinant DNA
e)

6.What does pedology refer to the study of?

a) Soil b) Water c) Population d) Fossils

7. Which two organisms are considered producers?

a) Plants and phytoplankton's

b) Plants and consumers

c) Zooplanktons and phytoplankton's

d) Phytoplankton's and chlorophylls

8.Minamata disease occurs in which country?

a) Japan b) Australia c) India d)China

9.Which restriction endonuclease recognizes the recognition site GAATTC?

a) Eco RI b) Hind II c) Eco RII d) Bam HI

10.Which enzymes are required for protoplast fusion?

a) Cellulose, hemicellulose, pectinase

b) Pectinase

c) Ligase, hemicellulose

c) Hemicellulose

11.Carcinoma refers to

a) Malignant tumor of the colon

b) Benign tumor of the connective tissue

c)Malignant tumor of the connective tissue

d)Malignant tumor of the skin or mucous membrane

12.Which of the following is not a type of assisted reproductive technology (ART)?

a) In vitro fertilization (IVF)

b) Intrauterine insemination (IUI)

c) Gamete intrafallopian transfer (GIFT)

d) Natural cycle reproduction

13. Strobilanthes kunthiana is also called

a) Neelakurinji b) Peela kuranji c) Hara kuranji d) Kala kuranji

14.The hormone responsible for milk production in the mammary glands is

a) Prolactin b) Estrogen c)Progesterone d) Oxytocin

15. In a cross between plants having yellow round (YYRR) and green wrinkled (yyrr) seeds, what will be the ratio between seeds having yellow and green seed color?

a) 3:2 b) 3:1 c) 9:7 d)7:9

16.The polypeptide chains present in gamma immunoglobulin are

a)2 b)4 c)6 d)8

17.Which term describes the lightly stained, transcriptionally active part of chromatin?

a) Euchromatin b) Heterochromatin c) Chromatosome d) Chromonemata

18.Which substance is used as a "clot buster" to remove clots from blood vessels in patients who have had a heart attack?

a) Ethanol b) Statins c) Cyclosporin-A d) Streptokinase

19.How does the efficiency of energy transfer between trophic levels affect the length of a food chain?

a) Higher energy transfer efficiency leads to shorter food chains.

b) Lower energy transfer efficiency leads to shorter food chains.

c) Higher energy transfer efficiency leads to longer food chains.

d)Lower energy transfer efficiency leads to longer food chains

20.The Kyoto Protocol is related to:

a) Ozone layer depletion b) Greenhouse effect

c) Water pollution d) Conservation of wildlife

21.Which type of RNA molecule is synthesized using a DNA template during transcription?

a) Messenger RNA (mRNA) b) Transfer RNA (tRNA)

c) Ribosomal RNA (rRNA) d)All of the above

22.What is CO_2 fixation in the context of ecosystem services?

a) The process of converting carbon dioxide into organic compounds by plants during photosynthesis.

b) The removal of excess carbon dioxide from the atmosphere by human activities.

c) The release of carbon dioxide during cellular respiration by animals.

d) None of the above.

23.Colostrum helps in providing the infant with

a) Autoimmunity b) Passive immunity c) Active immunity d) Innate immunity

24.Which of the following organisms have RNA as their genetic material?

a) All bacteria b) Tobacco Mosaic Viruses (TMV)

c) QB bacteriophage d) both b) and c)

25.What is the name of the piece of DNA that Agrobacterium tumefaciens delivers into a dicot plant?

a) rDNA b) T-DNA c) mDNA d) cDNA

26.The relationship between the alga Microcystis and the surrounding fauna corresponds to:

a) Amensalism b) Parasitism c) Predation d) Exploitation

27.Hugo de Vries proposed his idea of mutation based on his work with which of the following plants?

a) Pea plant b) Drosophila c) Evening primrose d) Maize plant

28.Which one of the following is correctly matched?

a)Body louse - Typhoid b)House fly - Yellow fever

c)Anopheles - Malaria d)Aedes - Plague

29.According to the National Forest Policy (1988), the recommended percentage of forest cover is:

a) 33% for plains and 67% for hills, b) 37% for plains and 63% for hills,

c) 20% for plains and 70% for hills, d) 23% for plains and 77% for hills.

30.Which of the following is not a type of assisted reproductive technology (ART)?

a) In vitro fertilisation (IVF) b) Gamete intrafallopian transfer (GIFT)

c) Intrauterine insemination (IUI) d) Tubal ligation

31.The transfer of pollen from the anther to the stigma of a flower is known as:

a) Fertilization b) Pollination c) Double fertilization d) None of the above

32.Which of the following best describes a point mutation?

a) A change in the number of chromosomes
b) A change in the sequence of DNA bases
c) A change in the structure of a chromosome
d) A change in the function of a protein

33.Which of the following is not a characteristic of Baculoviruses (Nucleopolyhedrovirus)?

a) Host specificity b) Narrow spectrum applications

c) Effects on non-target insects d) Utility in IPM programme

34.Which of the following diseases can be controlled by enhancing resistance through mutation in moong bean?

a) Yellow mosaic virus b) Powdery mildew c) Black rust d) All of the above

35.Which is the most effective method for obtaining virus-free plants through tissue culture?

a) Protoplast culture b) Embryo rescue c) Anther culture d) Meristem culture

36.Acid rain is caused by:

a) CO_2 and H_2O b) CO_2 and NO_2 c) SO_2 and NO_2 d) SO_2 and N_2O

37.Pronuba and Yucca have a mutualistic relationship in nature. This situation is described as:

a) Pollution, b) Coextinctions, c) Alien species invasions, d) Over-exploitation.

38. Choose the incorrect statement regarding the observations drawn from the human genome project.

(a) Repetitive sequences are stretches of RNA.
(b) Less than 2 per cent of the genome codes for protein.

c)SNPs help in tracing human history.

d)Repetitive sequences make up a very large portion of the human genome.

39.Which is correct about anthers. They are:

a)Haploid b)Diploid c)Diploid as well as triploid d)Haploid, diploid and triploid

40.Which of the following processes occur(s) during the charging or aminoacylation of tRNA?

a) Activation of amino acids in the presence of ATP

b) Linking of amino acids to their cognate tRNA

c)Both (a) and (b)

d)None of the above

41. How many seminiferous tubules are present in a testicular lobule?

(a) 3-5 (b) 22-6 (c) 5-7 (d) 1-3

42.What is the phenotypic ratio of a monohybrid cross in the F2 generation?

a) 3:1 b) 1:2:1 c) 2:1:1 d) 9:3:3:1

43.The concept of biodiversity hotspots was introduced by:

(a) Charles Darwin (b) Alexander von Humboldt

(c) Jane Goodall (d)Rachel Carson

44.Consider the following statements:

I. Soil without a vegetation cover is eroded by both wind and water.

II. Excessive irrigation results in waterlogging of soil.

III. Increased salt concentration damages agriculture.

Which of the statements given above are correct?

a) I and II b) I and III c) II and III d) I, II, and III

45.What bacteria was the first to be used as a biopesticide on a commercial scale in the world?

a) Bacillus thuringiensis b) E. coli

c) Pseudomonas aeruginosa d) Agrobacterium tumefaciens

46.Mast cells have important role in the development of

a)Allergens b)Allergy c)Inflammation d)Both (b) and (c)

47. Why some organisms switch from asexual to sexual reproduction under stressful conditions?

a) Sexual reproduction is simple and more rapid, allowing larger numbers of offspring to be produced
b) Sexual reproduction requires two separate individuals who can mutually provide nutrient support during stress
c) Sexual reproduction produces individuals with new combinations of recombined chromosomes, increasing diversity
d) Asexual reproduction requires more energy

48.Which hormone is primarily responsible for thickening the endometrial lining during the menstrual cycle?

a) Luteinizing hormone (LH)
b) Follicle-stimulating hormone (FSH)
c) Estrogen
d) Progesterone

49.Acrosome secretes

a)Hyaluronic acid

b)Hyaluronidase

c)TSH

d)Fertilizin

50.For optimal ecological balance, the land mass of a country in plains should be covered with forests to the extent of:

a) 23%
b) 33%
c) 44%
d) 35%

Answers

1.(c) Sexual selection is a type of natural selection: Natural selection is the process by which certain traits become more or less common in a population over time due to their effects on survival and reproduction. Sexual selection is a specific type of natural selection that operates through the competition for mates, where certain traits are favored because they increase an individual's ability to attract and mate with a partner.

2.Answer: (a) F1. When Mendel crossed a true-breeding tall plant with a true-breeding dwarf plant, all of the F1 offspring were tall. The dwarf trait did not appear in this generation because it was recessive and masked by the dominant tall trait.

3.The most oldest viable seed is of:

a) Date palm.

The oldest viable seed is the one that can germinate and grow into a plant. The oldest viable seed to date is the Judean date palm, which is believed to be approximately 2,000 years old. The seed was discovered during excavations at the Masada fortress in Israel.

4.The correct answer is (a) Species richness. In the species-area relationship, 'S' represents species richness. The species-area relationship describes the pattern that as the size or area of a habitat or ecosystem increases, the number of species it can support also increases. 'S' denotes the total number of species present in a given area or habitat, reflecting the species richness or biodiversity of that area.

5.Answer: a) Small chemically synthesized oligonucleotides of about 10-18 nucleotides that are complementary to the region of template DNA

6.Answer: (a) Soil

Explanation: Pedology is the study of soil in its natural environment. It includes the physical, chemical, biological, and mineralogical properties of soils, as well as their formation, classification, and distribution.

7. (a) Plants and phytoplanktons: Plants and phytoplanktons are considered producers. Plants are the primary producers on land, utilizing sunlight through photosynthesis to produce organic compounds. Phytoplankton, consisting of microscopic photosynthetic organisms, are the primary producers in aquatic ecosystems, including oceans and freshwater bodies. Both plants and phytoplankton play a crucial.

8.Answer: a) Japan

Explanation: Minamata disease is a neurological syndrome caused by the ingestion of seafood contaminated with methylmercury compounds. It was first discovered in the city of Minamata, Japan, in the 1950s due to industrial pollution. The disease is characterized by severe neurological symptoms and can lead to permanent damage or death.

9. a) Eco RI

Explanation: Eco RI is a restriction endonuclease that recognizes the recognition site GAATTC and cleaves the DNA at this site.

10.Answer: b) Pectinase

Explanation: Pectinase is the enzyme required for protoplast fusion, which is the process of fusing two plant cells together to create a single cell with a new genetic makeup.

11. d) Malignant tumour of the skin or mucous membrane

Explanation: Carcinoma is a type of cancer that starts in the epithelial cells, which are the cells that line the skin or the mucous membranes of organs.

12. Answer: D) Natural cycle reproduction. Natural cycle reproduction is not considered an ART because it does not involve any medical intervention or manipulation of the reproductive process.

13.Strobilanthes kunthiana is also called (a) Neelakurinji. Strobilanthes kunthiana, also known as Neelakurinji, is a shrub that is native to the Western Ghats of India. It is known for its mass flowering that occurs once every 12 years, covering the hills in a blue-purple hue.

14.Answer: (a) Prolactin. Prolactin is a hormone produced by the pituitary gland that stimulates milk production in the mammary glands.

15. Explanation: The ratio of seeds having yellow to green color will be 3:1, so the correct answer is (b).

16. b) 4

Gamma immunoglobulin, also known as IgG, is a type of antibody that is involved in the immune response to foreign substances in the body. It is made up of four polypeptide chains: two heavy chains and two light chains, which are linked together by disulfide bonds.

17.The correct answer is (a) euchromatin. Euchromatin is a lightly stained region of chromatin that remains loosely packed during the interphase stage of the cell cycle. This region is transcriptionally active and allows for gene expression and DNA replication. In contrast, heterochromatin is a more tightly packed region of chromatin that is not transcriptionally active and is often involved in structural functions, such as maintaining chromosome shape.

18.(d) Streptokinase

Streptokinase is a protein produced by the bacterium Streptococcus that is used as a “clot buster” to break down blood clots in patients who have had a heart attack or other serious blood clotting disorder.

19.(a) Higher energy transfer efficiency leads to shorter food chains: The efficiency of energy transfer between trophic levels affects the length of a food chain.

20.Correct answer: b) Greenhouse effect

Explanation: The Kyoto Protocol is an international environmental agreement adopted in 1997. It aims to address the issue of global climate change by setting targets for the reduction of greenhouse gas emissions, particularly from developed countries, and promoting measures to mitigate climate change impacts.

21. Answer: (d) All of the above

Explanation: During transcription, all three types of RNA molecules (mRNA, tRNA, and rRNA) are synthesized using a DNA template. RNA polymerase enzymes are responsible for catalyzing the synthesis of these RNA molecules, using one of the DNA strands as a template.

22.The correct answer is (a) The process of converting carbon dioxide into organic compounds by plants during photosynthesis. CO2 fixation refers to the process by which plants convert carbon dioxide CO2.

23.Answer: b) Passive immunity

Explanation: Colostrum is the first milk produced by a mother after giving birth. It contains high levels of antibodies, which provide passive immunity to the infant. This means that the infant can receive temporary protection against diseases until its own immune system becomes fully functional.

24.Answer: both (b) and (c)

Explanation: RNA is the genetic material for both Tobacco Mosaic Viruses and QB bacteriophage. In bacteria, DNA is the genetic material.

25. b) T-DNA – Agrobacterium tumefaciens is a bacterium that is commonly used in genetic engineering to transfer DNA into plant cells. The piece of DNA that is delivered by the bacterium is called T-DNA, or transfer DNA.

26.Answer: d) Exploitation

The relationship between the alga Microcystis and the surrounding fauna corresponds to exploitation. Exploitation is an interaction in which one species benefits by feeding on another species, but the second species is not killed immediately.

27.(c) Evening primrose. Hugo de Vries proposed his idea of mutation based on his work with the evening primrose (Oenothera Lamarckiana). He observed sudden changes in the characteristics of the plant, which he called “mutations,” and suggested that these mutations could be the source of new species.

28.c) Anopheles – Malaria

Explanation: Anopheles mosquitoes are the primary vectors of the malaria parasite, which is transmitted to humans through their bites. Body lice are associated with typhus fever, while houseflies and Aedes mosquitoes are not associated with either typhoid or plague but can transmit other diseases.

29.The correct answer is (a) 33% for plains and 67% for hills. According to the National Forest Policy (1988) in India, the recommended percentage of forest cover is 33% for plains and 67% for hills. This policy aims to ensure a minimum percentage of forest area in different geographical regions to maintain ecological balance, conserve biodiversity, and promote sustainable development.

30.Answer: d) Tubal ligation. Tubal ligation is a form of permanent sterilisation, not an ART.

31. b) Pollination. Pollination is the process of transfer of pollen from the male reproductive organ (anther) to the female reproductive organ (stigma) in flowering plants.

32. b) A point mutation is a change in the sequence of DNA bases. A point mutation occurs when a single nucleotide base is added, deleted, or replaced in a DNA sequence. This can result in a change in the amino acid sequence of a protein, which can affect its function. Point mutations can be silent, meaning they do not change the resulting protein, or they can be missense or nonsense mutations, which result in a different amino acid or a premature stop codon, respectively.

33.(c) Effects on non-target insects. Baculoviruses, including Nucleopolyhedrovirus (NPV), are highly specific to certain insect pests and have been used as biopesticides in integrated pest management programs. They have a narrow spectrum of activity and are not known to have significant effects on non-target insects.

34.a) Yellow mosaic virus. Yellow mosaic virus is a disease that can be controlled by enhancing resistance through mutation in moong bean. Powdery mildew and black rust are not controlled by mutation in moong bean

35.Answer: d) Meristem culture
Explanation: Meristem culture is a tissue culture technique that involves the growth of plants from the meristematic tissue, which is the region of the plant that contains the actively dividing cells. This technique is highly effective for obtaining virus-free plants, as the meristem tissue is usually free of viral infection. In contrast, other tissue culture techniques such as anther culture or protoplast culture may carry over viral infections from the original plant.
36.Correct answer: c) SO_2 and NO_2
Explanation: Acid rain is caused by the emission of sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) into the atmosphere. These pollutants react with water, oxygen, and other chemicals to form sulfuric acid and nitric acid, which then fall to the Earth's surface as acid rain.

37.The correct answer is (b) Coextinctions. Pronuba and Yucca have a mutualistic relationship in nature. This means that they rely on each other for survival and reproduction. If one of the species, such as Pronuba, were to go extinct, it could lead to the coextinction of the other species, in this case, Yucca. Coextinctions occur when two or more species are interdependent, and the loss of one species leads to the extinction of the other(s).

38.(a) Repetitive sequences are stretches of RNA.
Explanation: Repetitive sequences are DNA sequences that occur in multiple copies throughout the genome. These sequences do not code for proteins, but they have other functions, such as regulating gene expression and maintaining the structure of chromosomes. Repetitive sequences make up a very large portion of the human genome. Option (a) is incorrect because repetitive sequences are stretches of DNA, not RNA.
39. a) Haploid
Explanation: Anthers are the male reproductive structures found in flowering plants, and they contain pollen grains, which are the structures that produce the sperm cells used in sexual reproduction. The cells in the anther that give rise to the pollen grains undergo meiosis, a type of cell division that reduces the chromosome number by half, resulting in haploid cells with one set of chromosomes.

40. Explanation: Both (a) and (b) occur during the charging or aminoacylation of tRNA. First, the amino acid is activated in the presence of ATP, forming an aminoacyl-AMP intermediate. Then, the activated amino acid is linked to the appropriate tRNA molecule by an enzyme called aminoacyl-tRNA synthetase. Option (c) is correct.

41. Testicular lobules contain 1-3 seminiferous tubules. Explanation: This answer is the correct option (d) and is a better way of presenting information as it is more specific and accurate.

42.Answer: (b) 1:2:1. In a monohybrid cross, where only one trait is being studied, the phenotypic ratio in the F2 generation is 1:2:1. This means that for every three offspring, one will show the homozygous dominant phenotype, two will show the heterozygous phenotype, and one homozygous recessive.

43.The correct answer is (b) Alexander von Humboldt. Alexander von Humboldt, a renowned naturalist and explorer, introduced the concept of biodiversity hotspots in his works. He identified certain regions with high species richness and endemism that are under significant threat and require conservation efforts.

44.Correct answer: d) I, II, and III – All statements are correct.
Explanation: All the statements are correct. Soil without vegetation cover is prone to erosion by wind and water. Excessive irrigation can lead to waterlogging, where the soil becomes saturated with water and adversely affects plant growth. Increased salt concentration in the soil can result in salinization, which damages agricultural productivity.

45. a) Bacillus thuringiensis

Explanation: Bacillus thuringiensis (Bt) is a bacterium that produces proteins that are toxic to insects. Bt has been used as a biopesticide on a commercial scale since the 1950s.

46.Answer: d) Both (b) and (c)

Explanation: Mast cells play a significant role in both allergic reactions and inflammatory responses. When activated, mast cells release a variety of chemicals, including histamine, which causes the symptoms of allergies such as itching, swelling, and redness. In addition, mast cells play a critical role in inflammation by recruiting other immune cells to the site of injury or infection. Therefore, the correct answer is option d.

47.c) Organisms may switch from asexual to sexual reproduction under stressful conditions because sexual reproduction produces individuals with new combinations of recombined chromosomes, which can increase genetic diversity and enhance the species' ability to adapt to changing environments.

48.Answer: c) Estrogen is primarily responsible for thickening the endometrial lining during the menstrual cycle. It is produced by the developing follicles in the ovaries during the follicular phase of the menstrual cycle.

49.The correct option is (b) Hyaluronidase. The acrosome is a specialized structure located at the tip of the sperm head that contains enzymes necessary for the sperm to penetrate the outer layer of the female egg during fertilization. One of the enzymes found in the acrosome is hyaluronidase, which helps to break down the hyaluronic acid in the extracellular matrix surrounding the egg and allows the sperm to penetrate through to the egg membrane. TSH (thyroid-stimulating hormone) is a hormone produced by the pituitary gland that stimulates the thyroid gland to produce thyroid hormones, while fertilizin is a glycoprotein found on the surface of the egg that plays a role in sperm-egg recognition and binding.

50.Correct answer: b) 33%

Explanation: For optimal ecological balance, it is recommended that the land mass of a country in plains should be covered with forests to the extent of approximately 33%. Forests play a crucial role in maintaining biodiversity, regulating climate, conserving water resources, and providing various ecological services