



THE DOON GLOBAL SCHOOL
PR-EBOARD EXAMINATION (2024-25)

CLASS –XII

SUBJECT-BIOLOGY

CODE-044

SET1

TIME - 3 Hr.

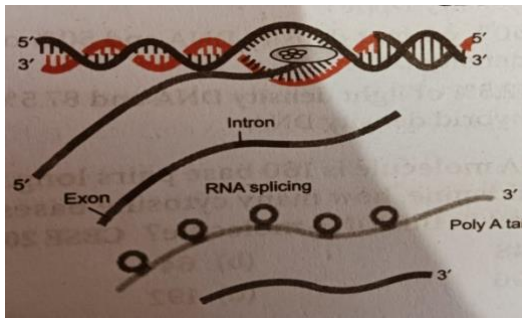
M. M- 70

INSTRUCTIONS:

- 1) All questions are compulsory.
- 2) The question paper has five sections and 33 questions.
- 3) Section-A has 16 question of One mark each; Section-B is of 5 questions of 2 marks each; Section-C has 7 questions of 3 marks each; Section-D is of 2 case based questions of 4 marks each; and section E has 3 questions of five marks each.
- 3) There is no overall choice. However internal choice has been provided.
- 4) Wherever necessary, neat and properly labelled. diagrams should be drawn

SECTION-A

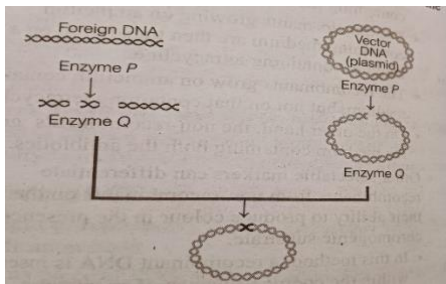
- 1) The hormone responsible for the contraction of uterine muscles for parturition is A and is released from B
 - a) A -oxytocin, B- foetal posterior pituitary
 - b) A -oxytocin, B- maternal posterior pituitary
 - c) A -progesterone, B Corpus Luteum
 - d) A- progesterone, B- Graafian follicle
- 2) In angiosperms, after double fertilisation
 - a) The Zygote the primary and sperm nucleus/cell starts dividing simultaneously
 - b) Both the zygote and the primary endosperm nucleus/cell undergo a period of rest before the start dividing simultaneously
 - c) The primary endosperm cell starts dividing to form the endosperm before the zygote starts dividing.
 - d) The Zygote starts dividing before the primary endosperm cell and forms the embryo.
- 3) A diagrammatic illustration of the process of transcription by RNA polymerase II in eukaryotes is given below. Choose the most appropriate statement with respect to the fate of the precursor of mRNA transcribe that will be



- a) Translation will take place once the precursor of mRNA leaves the nucleus.
 - b) Translation of mRNA will not take place once the precursor of mRNA leaves the nucleus .
 - c) Translation will take place in the nucleus
 - d) The Precursor of mRNA has to be processed further in next step before being translated
- 4) Mendelian principles are not applicable in case of
- a) Sex linked alleles
 - b) Asexually reproducing forms
 - c) Sexually interbreeding forms
 - d) diploid homozygous forms
- 5) If a population of 50 Paramecium present in a pool increases 150 after an hour, what would be the growth rate of population?
- a) 50 per hour
 - b) 200 per hour
 - c) 5 per hour
 - d) 100 per hour
- 6) Single step large mutation leading to speciation is also called
- a) Founder effect
 - b) Saltation
 - c) Branching descent
 - d) Natural selection
- 7) The trigger for activation of toxin of *Bacillus thuringiensis* is
- a) Acidic pH of stomach
 - b) High temperature
 - c) Alkaline pH of gut
 - d) Mechanical action in the insect gut
- 8) Which of the following is not a feature of biodiversity hotspot?
- a) Large number of species
 - b) Abundance of endemic species
 - c) Mostly located in the polar regions
 - d) Mostly located in the tropics
- 9) Which of the given statement is correct in the context of observing DNA separated by agarose gel electrophoresis?
- a) DNA can be seen in visible light.
 - b) DNA can be seen without staining in visible light.
 - c) Ethidium bromide stained DNA can be seen in visible light.
 - d) Ethidium bromide stained DNA can be seen under exposure to UV light.
- 10) An IUD recommended to promote the cervix hostility to the sperm is
- a) Cu-T
 - b) Multiload-375
 - c) LNG-20
 - d) Cu7
- 11) Which one among the following is an example for homology
- a) Eyes of octopus and mammals
 - b) Wings of butterfly and birds
 - c) Flippers of Penguins and dolphins

d) Thorns and tendrils of Bougainvillea and Cucurbita

12) Name the enzymes P and Q that are involved in the process given below.



- a) Enzyme P Exonuclease and enzyme Q -Permease
- b) Enzyme P-Exonuclease and enzyme Q- Ligase
- c) Enzyme P-endonuclease and enzyme Q- Permease
- d) Enzyme P-restriction endonuclease and enzyme Q -Ligase

Direction (question Nos.13 -16) In the questions given below two statements an assertion and a reason are given give the appropriate response as

- a) If both A and R are true and R is the correct explanation of A
 - b) If both A and R are true but R is not the correct explanation of A
 - c) If A is true, but R is false
 - d) If A is false but R is true
- 13) Assertion- Dodo, Passenger pigeon, stellar's sea cow have become extinct
Reason- Excessive exploitation of a species whether animal or plant reduce size of its population so that it becomes vulnerable to extinction.
- 14) Assertion- Cannabinoids are drugs of abuse
Reason -They affect cardiovascular system and central nervous system activity.
- 15) Assertion Biopatents are awarded for biological entities and all products derived from them
Reason- Patent on use of turmeric in wound healing was cancelled in 2008
- 16) Assertion -Parturition is induced by a complex neuroendocrine mechanism
Reason- At the end of gestation. the maternal pituitary releases prolactin which causes uterine contractions

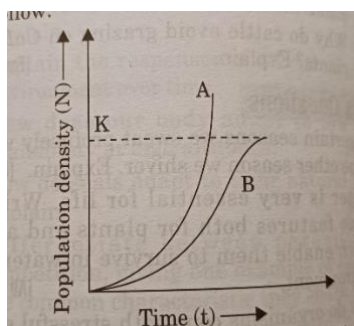
SECTION-B

17) Where do the signals for parturition originate in humans? Why is it important to feed the newborn babies on colostrum?

18) Identify ,B ,C and D in the following table

SNo	Scientific name of the source plant	Drug	Harmful effects/Human body part affected
1	Papaver somniferum	A	Depressent/ Slows body function
2	Cannabis sativa	Cannabinoids	B
3	Erythroxylum coca	C	D

- 19) Explain the work carried out by Cohen and Boyer that contributed immensely in biotechnology.
- 20) Name the lymphoid organ in humans where all the blood cells are produced?
Where do the lymphocyte produce by the lymphoid organ mention above migrate and how do they affect immunity?
- 21) Study the population growth curves in the draught giving blow and answer the questions which follow



- Identify the growth curves A and B.
- Which one of them is considered a more realistic one and why?
- If $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$ is the equation of the logistic growth curve what does K stand for?
- What is symbolised by N?

OR

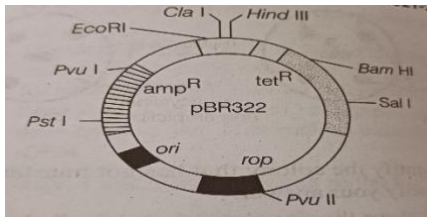
- What is primary productivity? Why does it vary in different types of ecosystems?
- State the relation between gross and net primary productivity

SECTION-C

- Do you think apomixis can be compared with asexual production? Support your answer giving one reason. How is apomixis beneficial to farmers? Explain.
- Both haemophilia and thalassemia are blood related disorders in humans. Write their causes and the difference between the two. Name the category of genetic disorder they both come under.
- Cancer is one of the most dreaded disease explain contact inhibition and metastasis with respect to the disease.
 - Name the group of genes that have been identified in normal cells that could lead to cancer. How do these genes cause cancer?
 - Why are cancer patients given alpha interferon as a part of the treatment?
- Rearrange the following in the correct sequence to accomplish an important biotechnological reaction
 - In vitro synthesis of copies of DNA of interest
 - Chemically synthesised oligonucleotide
 - Enzyme DNA polymerase
 - Complementary region of DNA
 - Genomic DNA template
 - Nucleotides provided
 - Primers
 - Thermostable DNA polymerase
- Answer the following questions based on Hershey and Chase experiment
 - Name the kind of virus they worked with and why?
 - Why did they use two types of culture media to grow viruses in?
 - What was the need for using a blender and later a centrifuge during their experiment?
- Explain the mode of action of copper releasing IUD's as good contraceptive. How is hormone releasing IUD different from it?
Why is Saheli a preferred contraceptive by women (any two reasons)?
- OR
How do implants act as an effective method of contraception in human females? Mention its one advantage over contraceptive pills. What is lactational amenorrhea?
- Given below is a list of six microorganisms. State their usefulness to humans.
 - Nucleopolyhedrovirus
 - Saccharomyces cerevisiae*
 - Monascus purpureus*
 - Trichoderma polysporum*
 - Penicillium notatum*
 - Propionibacterium sharmanii*

SECTION-D

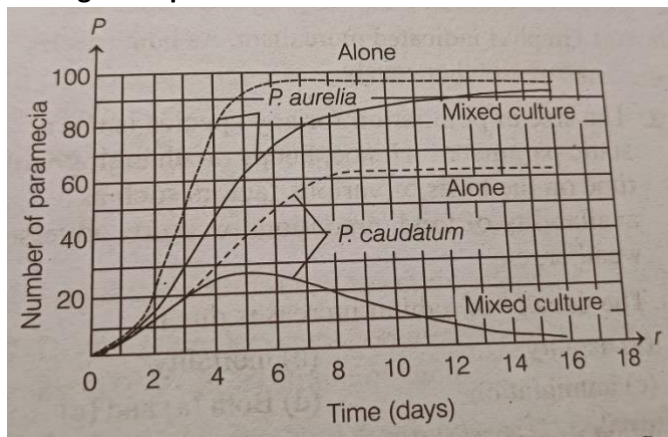
29) Gene of interest alien is introduced by a cloning vector into a host cell to bring about a desired phenotypic expression in a host cell. The cloning vector used are plasmid and bacteriophages. Biotechnologist in their labs for desired results engineered specialised cloning vector. One such vector is pBR322. Study the diagram carefully and answer the questions that follow (any four).



- What do EcoRI, Bam HI and Hind III Represent? State their functions.
- Identify the gene you would select for the role of selectable marker in pBR322. Explain why?
- Write the property of plasmid and bacteriophage that makes them efficient cloning vectors.
- Biotechnologist always insert ori gene in their engineered cloning vector. Justify the statement.
- Will the experiment be successful if the alien DNA is ligated at Hind III restriction site? Give reason to support your answer.

30) Observe the graph given below

The graph represents Inter specific interaction between the two species of paramecia competing for the same resource in a culture medium. *Paramecium caudatum* and *Paramecium aurelia* Were grown in separate cultures as well as in mixed cultures. It was found that each species grew in numbers according to the logistic equation.



- Which species is competitively superior? Support it with the data provided in the graph.
- State the underlying principle for the above result and name the scientist associated with this principle.
- Explain the mechanism in which two or more species competing with each other can coexist.

SECTION-E

- Mention the event that induces completion of the meiotic division of the secondary oocyte.
- Trace the journey of the ovum from the ovary its fertilisation and further development until the implantation of embryo.

OR

Given below is the illustration of the sequence of ovarian events A-I in human female

- Identify the figure that illustrates corpus luteum and name the pituitary hormone that influences its formation.
- Specify the endocrine function of corpus luteum. How does it influence the uterus? Why is it essential?
- What is the difference between D and E?
- Draw a neat labelled sketch of Graafian follicle

32) Explain the role of Regulatory gene, operator gene, promoter gene and structural gene in lac operon when E coli is growing in a culture medium with the source of energy as lactose.

Mention what would happen if lactose is withdrawn from the cultural medium.

OR

How do mRNA, rRNA, tRNA and ribosomes help in the process of translation?

33) What is polygenic inheritance? Explain with the help of suitable example

How are pleiotropy and Mendelian pattern of inheritance difference from polygenic in pattern of inheritance?

OR

Write the scientific name of the organism Thomas Hunt Morgan and his colleagues work with their experiments. Explain the correlation between linkage and recombination with respect to genes as studied by them. How did Sturtevant Explain gene mapping while working with Morgan?