II PU MODEL QUESTION PAPER 2023-2024

SUBJECT – BIOLOGY (36)

Duration: 3hr 15 Min **Max. Marks: 70**

- **General Instructions**
  This Question paper consists of four parts A, B, C, D.
- Part – A consists of I and II and Part D consists of two parts, section –V and – VI
- All the parts are compulsory
- Draw diagrams wherever necessary. Unlabeled diagrams do not carry any marks

PART – A

I. Select the correct alternative from the choices given below: **1 x 15 = 15**

1. Haploid conditionis not observed in which of the following cells
   a) Synergids and Egg b) Zygote and PEN
   c) Antipodal and Egg d) Antipodal and Synergids
2. Statement I: Formation of fruit without fertilization is called apomixis
   Statement II: In some species of Asteraceae and grasses seeds are formed without fertilization
   a) Both Statement I and Statement II are correct
   b) Both Statement I and Statement II are incorrect
   c) Statement I is correct and Statement II is incorrect
   d) Statement I is incorrect and Statement II is correct
3. During gestation the foetus develops limbs and digits by the end
   a) First month b) Second month c) Third month d) Fifth month
4. The secondary oocyte after ovulation is covered by a non-cellular layer of
   a) Cumulus oophorus b) Corona radiata
   c) Zona pellucida d) Cortical layer
5. An example of hormone releasing IUD among the following
   a) Cu – 7 b) Lippes loop c) LNG – 20 d) Multiload 375
6. Which of the following is a foetal sex determination test?
   a) ZIFT b) GIFT c) MTP d) Amniocentesis
7. Which of the following Mendelian gene disorder is the representation of allosomal recessive trait?
   a) Hemophilia b) Thalassemia c) Sickle cell anemia d) Myotonic dystrophy
8. The process of removal of introns and joining of exons in a defined order in a primary transcripts occurs in
   a) Prokaryotes b) Eukaryotes
   c) Prokaryotes and Eukaryotes d) Prokaryotes and Protista
9. A type of Natural selection in which more individuals acquire mean character value is called
   a) Stabilizing selection b) Disruptive selection
   c) Directional selection d) Dominant selection
10. Drug called "Heroin is synthesized by
    a) Methylation of Morphine b) demethylation of Morphine
    c) Acetylation of Morphine d) deacytalation of Morphine
11. The fungus not used in the production of any Industrial product is
    a) *Penicillium* b) *Aspergillus* c) *Trichoderma polysporum* d) *Glomus*
12. Significance of Insertional inactivation method in Recombinant DNA technology is to
    a) Introduce the recombinants b) Isolate gene of Interest
    c) Select the recombinants d) Select the gene of interest

13. Which of the following organisms are studied by Cornell's in his elegant field experiments to study competition
    a) Warbler species b) Chathamalus and Balanus c) Cucko and Crow d) Cattle egret and grazing cattle
14. The correct sequence in the process of decomposition is
    a) Humification----Leaching----Catabolism---- Mineralisation ----Fragmentation
    b) Catabolism----Leaching----Fragmentation----Humification---- Mineralisation
    c) Leaching----Fragmentation ----Catabolism----Humification---- Mineralisation
    d) Fragmentation ----Leaching----Catabolism-----Humification----Mineralisation
15. Western Ghats have a greater diversity of
    a) Amphibians b) Reptiles c) Aves d) Mammals

II. Fill in the blanks by choosing the appropriate word/Words from those given below: 1 x 5 = 5

(Commensalism, Alveoli,Ammensalism, Panspermia, Codominance, Perisperm)

16. The residual, persistent nucellus is called-------
17. The cells of ----------secrete milk in the mammary glands.
18. AB blood group inheritance is an example for ----------
19. --------- is the theory that proposes that units of life called spores were transferred to different planets including earth
20. A population interaction in which one species is harmed and the other species is unaffected is ----------

PART - B

Answer any FIVE of the following questions in 3 – 5 sentences wherever applicable: 2 x 5 = 10

21. List any four complications a person suffers from untreated sexually transmitted infections?
22. State the two medical grounds on which a pregnancy can be terminated according to the amended Medical termination of pregnancy act 2017.
23. Give the phenotypes of the parental Drosophila that has produced 1.3% and 37.2% recombinants respectively in T. H. Morgan Dihybrid cross experiment.
24. Differentiate divergent evolution from convergent evolution.
25. List any two differences between active and passive immunity.
26. What are primary lymphoid organs? Give two examples
27. Baculoviruses are excellent biocontrol agents in Integrated Pest Management. Comment.
28. Ecological pyramids have limitations. Justify the statement with two reasons.

PART - C

Answer any FIVE of the following questions in 40 – 80 words each wherever applicable:3 x 5 = 15

29. a) Why is bagging of emasculated flowers essential during hybridization experiment?
    b) Mention the cells of the mature pollen grain.
    c) Give the scientific name of the plant that has the viability record of 10,000 years.
30. Explain the changes that occur in ovary and uterus during luteal phase of menstrual cycle.
31. Draw a diagrammatic sketch of the Lac operon when lactose is present in the medium
32. With respect to the evolution of man, name a, b, c, d, e, and f

Period	Places of origin	Type of man
2 million years ago	a	Australopithecines
b	Java	c
1,00,000 – 40,000 years	d	e

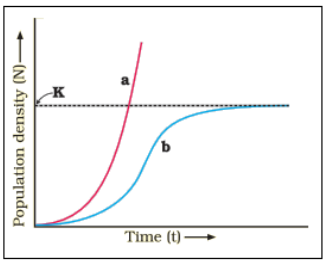
f	Africa	Homo sapiens

33. Mention the three critical areas of biotechnology
34. What is gene therapy? Explain the steps involved in curing ADA deficiency by gene therapy.
35. a) Co-extinctions lead to loss of biodiversity. Justify the statement with two examples.
    b) What are hot spots of biodiversity?
36. Describe the components of an aquatic ecosystem taking pond as an example

PART – DSection - I

Answer any FOUR of the following questions in about 200 – 250 words each wherever applicable: 5 x 4 = 20

37. Draw a neat labeled diagram of human male reproductive system.
38. Mention the chromosomal disorders that are due to trisomy, represent their karyotype and two symptoms each
39. With the help of schematic representation illustrate how an infected animal cell can survive while viruses are being replicated and released
40. With reference to DNA finger printing define the following terms: a) Repetitive DNA b) Satellite DNA c) DNA polymorphism d) VNTR e) Probe
41. What is genetic code? Explain any four salient features of genetic code
42. Describe the biological treatment of primary effluent.
43. a) Explain the process of Polymerase chain reaction in amplification of desired DNA
    b) Draw a labeled diagram of pBR^{322} vector.
44. a) Study the population growth curve given below and answer the questions that follows;



i)Identify the growth curves 'a' and 'b'

ii) Mention the conditions responsible for the curves 'a' and 'b' respectively.

b) Explain the mechanism of sexual deceit in relation to mutualism.

Section – II

Answer any ONE of the following questions in about 200 – 250 words each wherever applicable: 5x 1= 5

45. Double fertilization is the unique feature of angiosperms and the products of this double fertilization is zygote and PEN. In context of this when a hexaploid plant is pollinated by a tetraploid plant find out the ploidy of zygote and PEN through a schematic illustration.
46. ABO blood grouping provides a good example of multiple alleles and are controlled by the gene 'I'. This gene product is responsible for the production of a sugar polymer that protrudes from its surface. The 'I' gene has three alleles they all follow a specific pattern of in,
    a) What are the probable number ofphenotypes and genotypes for ABO blood group in human population
    b) Mention the genotypes of all the blood group phenotypes.
    c) Name the type of blood groups of the parental combination in which both their blood group is not inherited to their children

47. Five patients suffering from certain diseases visit a local primary health centre. The Doctor does a thorough check and prepares the report of the five patients and is indicated in the below given table. Analyse the table and diagnose the disease they are suffering from and causative agent of the diseases.

Patient 1	High fever, constipation, stomach ache, loss of appetite, headache
Patient 2	Chills and high fever recurring every 3 – 4 days
Patient 3	Constipation, mucous and blood clots in stool, abdominal pain and cramps
Patient 4	Internal bleeding, blockage in the internal passage, muscular pain, fever
Patient 5	Dry, scaly lesions on skin, nails and scalp

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