AS PER NEW PATTERN 2023-2024

PREPARATORY EXAMINATION-2024

SUPER COLLECTION OF QUESTION PAPERS FOR

POCKET MARKS 70/70

PUC II YEAR

BIOLOGY

COLLECTION OF
DIFFERENT DISTRICT

PREPARATORY EXAMINATION
JANUARY-2024

QUESTION PAPERS

By :

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- ಅರ್ಪಣೆ -

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BIOLOGY
SUPER COLLECTION OF QUESTION PAPERS FOR
POCKET MARKS 70/70

KABBUR PUBLICATIONS SAVADATTI 9738237960

DISTRICT DEPUTY DIRECTOR DEPT. OF SCHOOL EDUCATION TUMAKURU

II PUC Preparatory Examination - Jan. - 2024

Time : 3.15 hours | Sub : BIOLOGY (36) | 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: **1X15=15**

1) Pollen grains of rice are viable up to
   a) 30 minutes b) several months c)One month d)Both b and c
2) Read the following statements
   i) Seed is a final product of sexual reproduction ii) Seed is a fertilized ovule.
   iii) Seed formed inside the fruit iv) Seed consist of seed coats, cotyledons and embryo axis
   a) i and ii are correct b) ii and iii are correct
   c) iii and iv are correct d) All the above statements are correct.
3) **Assertion** - Parturition is a complex neuroendocrine mechanism.
   Reason- The signals of parturitions are originate from fully developed foetus and placenta.
   a) Both assertion and reason are true and reason is the correct explanation of assertion.
   b) Both assertion and reason are true but reason is not a correct explanation of assertion.
   c) Assertion is correct but reason is false d) Both assertion and reason are false.
4) Which among the following has 23 chromosomes?
   a) Spermatogonia b) Zygote c) Secondary oocytes d) Oogonia
5) MTP is considered safe up to
   a) 12 weeks b) 24 weeks c) 36 weeks d) 28 weeks
6) In artificial insemination sperms are transferred into
   a) Ovary b) Uterus c) ovum d) Oogonial cells
7) The phenotypic ratio obtained by Mendel in his dihybrid test cross was
   a) 1:1:1:1 b) 3:1 c) 1:2:1 d) 2:1:2
8) What is the name of the process where the introns are removed and exons are joined together in a defined order?
   a) Tailing b) Capping c) Trailing d) Splicing
9) The mechanism of adaptive radiation was first explained by
   a) Darwin b) Morgan c) Lamarck d) Hugo- de- vries
10) Entamoeba histolytica is a protozoan parasite which infects
   a) Stomach b) Small intestine c) Large intestine d) Liver
11) Which among the following micro-organism is not used as a biofertilizer
   a) Rizoobium b) Nostock c) Mycorraiza d) Agrobacterium tumefaciens
12) Technique used to separate DNA fragments are
   a) DNA fingerprinting b) Gel electrophoresis c) PCR d) DNA cloning
13) The factor which is not responsible for increasing population density is
   a) Natality b) Immigration c) Both a&b d) Mortality
14) Presence of feathery stigma in a flower shows
   a) Anemophily b) Entomophily c) Hydrophily d) Ornithophily
15) The NPP is equal to
   a) GPP b) GPP+R c) GPP/R d) GPP-R

II. Fill in the blanks by choosing the appropriate word /words from those given below. **1x5=5**

(LH, hpL, Mutagens , Fishes, Fossils, Abingdon tortoise)

16) Ovulation is induced by hormone called ———-———-
17) Agents that causes mutations is ———-————
18) Paleontological evidence of evolution refers to the ———-————
19) The organism which becomes extinct in Galapagos Island is—— ————-
20) Among vertebrates which exhibits maximum species diversity————-

PART – B

III. Answer any FIVE of the following questions in 3 to 5 sentences, wherever applicable. 2x5=10

21) What is amniocentesis? Write its significance.
22) List any four reasons for infertility.
23) What is Pedigree analysis? Write its significance.
24) What are analogous organs give one example each from plants and animals.
25) What is biolistics? Name the host to which this technique is adopted.
26) Mention any four factors which affect on the process of decomposition.
27) Differentiate Food Chain and Food Web.
28) What are biodiversity Hotspots? Name any two Indian biodiversity Hotspots.

PART – C

IV. Answer any FIVE of the following questions in 40-80 words each wherever applicable. 3X5=15

29) What is emasculation? When and why does a plant breeder employee this technique?
30) Write the functions of the following terms: a)Acrosome b)Carpus luteum c)Fimbriae
31) RNA polymerase exhibit clear cut division of labour. Justify the statement with suitable reason.
32) Sketch and label Stanley L Millers experiment.
33) Write a short note on Bt- cotton.
34) Mention any three reasons for creation of transgenic animals.
35) Define the following terms : a) Totipotency b) Callus c)Somatic hybrids
36) Mention the reasons, why we should conserve Biodiversity?

PART – D

SECTION-I

V. Answer any FOUR of the following questions in about 200 to 250 words each wherever applicable. 5X4=20

37) Sketch and label diagrammatic sectional view of male reproductive system.
38) Define incomplete dominance Explain it with reference to Snapdragon plant.
39) Describe the life cycle of malarial parasite.
40) Enumerate the salient features of genetic code.
41) Describe Meselson and Stahl's experiment that provides an experimental proof for semiconservative mode of DNA replication.
42) Give a brief account on the role of microbes in the production of Industrial Products.
43) a) Describe the features of cloning vector plasmid.
    b) Sketch and label pBR 322 plasmid.
44) Name the type of population interaction of the following examples
    a) Lice on human b) Cuckoo lays the eggs in the nest of crow.
    c) An Orchid growing as an epiphyte on the mango branch d) Mycorrhiza.
    e) South American lakes visiting flamingos and resident fishes.

SECTION-II

VI. Answer any ONE of the following questions in about 200 to 250 words each wherever applicable. 5X1=05

45) Describe how does the pollination occurs in vallisnaria and sea grass.
46) State and explain the law of independent assortment with the help of inheritance of two genes.
47) a) Name the specific type of antibody produced against allergic reactions in the body.
    b) Mention two chemicals secreted during allergy by the mast cells.
    c) List any four cancer detection and diagnostic tests.

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DISTRICT LEVEL II PUC PREPARATORY EXAM, JANUARY – 2024

Time: 3 Hrs. 15 Mins. **Sub: BIOLOGY (36)** **Max. Marks: 70**

General Instructions: 1. The question paper consists of four parts A, B, C and D.
2. Part – A consists of I and II and Part – D consists of V and VI.
3. All parts are compulsory.
4. Draw diagrams wherever necessary, unlabelled diagrams or illustrations do not attract any marks.

PART – A

I. **Select the correct alternative from the choices given below:** $15 \times 1 = 15$

1. In angiosperms, embryo sac is formed from the megaspore mother cell by
   (a) 1 mitosis and 3 meiosis (b) 1 meiosis and 3 mitosis
   (c) 1 mitosis and 2 meiosis (d) 2 meiosis and 2 mitosis

2. Scutellum of maize embryo represents
   (a) Cotyledon (b) Endosperm (c) Coleoptile (d) Coleorhiza

3. Which one is the correct sequence of development in the humans?
   (a) Fertilization → Zygote → Cleavage → Morula → Blastocyst
   (b) Fertilization → Zygote → Morula → Cleavage → Blastocyst
   (c) Fertilization → Cleavage → Zygote → Morula → Blastocyst
   (d) Cleavage → Fertilization → Zygote → Morula → Blastocyst

4. The first movements of the foetus and appearance of hair on the head are usually observed during which month of pregnancy?
   (a) Fifth month (b) Sixth month (c) Third month (d) Fourth month

5. Multiload 375 prevents conception by
   (a) Increasing phagocytosis of sperms
   (b) Suppressing sperm motility
   (c) Preventing ovulation
   (d) Preventing entry sperms into the uterus by altering cervical mucus quality

6. In ZIFT
   (a) 8 – celled embryo is transferred into the fallopian tube
   (b) 8 – celled embryo is transferred into the uterus
   (c) 32 – celled embryo is transferred into the fallopian tube
   (d) 32 – celled embryo is made to implant in the wall of the uterus

7. In the genetic disorder β - Thalassemia, the synthesis of beta chains of haemoglobin is reduced and the disorder is controlled by a single gene present on chromosome _____ of each parent
   (a) 16 (b) 11 (c) 12 (d) 4

8. If Meselson and Stahl's experiment is continued for three generations in bacteria E.coli, the ratio of ^{15}N / ^{15}N, ^{15}N / ^{14}N and ^{14}N / ^{14}N, containing DNA in the third generation would be
   (a) 1 : 1 : 0 (b) 1 : 4 : 0 (c) 0 : 1 : 3 (d) 0 : 1 : 7

9. The transport of neurotransmitter dopamine is inhibited by the drug
   (a) Morphine (b) Hashish (c) Heroin (d) Cocaine

10. The gaseous mixture used by Miller in his experiment contained
    (a) CH_4, CO_2, N_2 and H_2O (b) NH_3, CO_2, H_2O and N_2
    (c) CH_4, NH_3, H_2 and H_2O (d) CH_4, NH_3, H_2 and O_2

11. In the insertional inactivation method in rDNA technology, the gene of interest is inserted in the
    (a) Coding sequence of Lac – Z gene
    (b) Coding sequence of Lac – A gene
    (c) Recognition sequence in any one of the two antibiotic resistance genes
    (d) Origin of replication site

12. Which of the following microbe is used for preparation of bread?
(a) *Saccharomyces cerevisae* (b) *Aspergillus niger*
(c) *Acetobacter aceti* (d) *Lactobacillus*

13. Which of the following are more adversely affected by the competition?
(a) Herbivorous and Carnivores (b) Carnivores and plants
(c) Herbivores and plants (d) All of these

14. Mass of living matter present at each trophic level in an area at any time is
(a) Standing state (b) Humus (c) Standing crop (d) Detritus

15. The narrowly utilitarian reasons for biodiversity conservation includes
(a) The aesthetic pleasure of walking through thick woods
(b) Watching spring flowers in full bloom
(c) More than 25% of drugs currently sold in the market world wide are derived from the plants
(d) Providing pollinators like bees, birds and bats

II. **Fill in the blanks by choosing appropriate word / words from those given below** $5 \times 1 = 5$

(Antirrhinum sp, Salmon fish, HCG, Pea, Evening primrose)

16. The hormone present in the blood of pregnant women is _____.
17. The animal which breeds only once in its life time is _____.
18. _____ is the non-endospermic seed.
19. Hugo de Vries proposed mutation theory of evolution by working on _____.
20. Incomplete dominance is exhibited by the _____.

PART – B

III. **Answer any <u>FIVE</u> of the following questions in 3- 5 sentences each, wherever applicable:** $5 \times 2 = 10$

21. What are the major tasks of Reproductive and Child Health Care (RCH) Programmes?
22. List any two similarities between behaviour of genes and of chromosomes during cell division.
23. What are analogous organs? Mention any two analogous organs of the animals.
24. Write the features of an ideal contraceptives.
25. Differentiate between benign and malignant tumours.
26. Mention the significance of Lactic Acid Bacteria (LAB).
27. Write the causative organisms of (a) Elephantiasis (b) Malignant malaria.
28. "Energy flow in an ecosystem is always unidirectional". Justify the statement.

PART – C

IV. **Answer any <u>FIVE</u> of the following questions in about 40 – 80 words, each wherever applicable:** $5 \times 3 = 15$

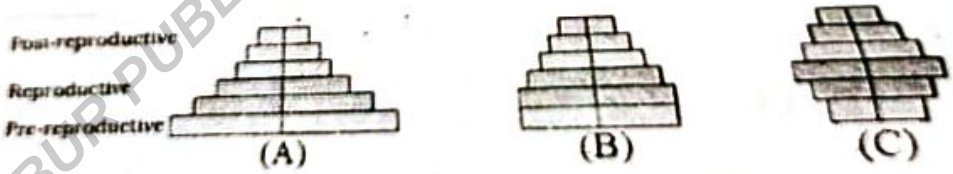
29. Write the schematic representation of spermatogenesis.
30. With respect to the evolution of man, mention the period of existence, brain capacity and probable food habit of Homo erectus.
31. "RNA polymerase of the eukaryotes show division of labour". Substantiate the statement.
32. Expand GEAC set up by the Indian Government and mention its responsibilities.

33. (a) Write any two uses of polymerase chain reaction.
    (b) Mention the basic principle involved in ELISA.
34. "Introduction of Alien species leads to the loss of biodiversity". Justify the statement with three examples.
35. Mention the factors affecting primary productivity. What is the net primary productivity of whole biosphere?
36. How pollination is achieved in Vallisneria and Zostera?

PART – D (Section – I)

V. **Answer any FOUR of the following questions in about 200 – 250 words each, wherever applicable:** **4 × 5 = 20**

37. Draw a neat labelled diagram of female reproductive system.
38. State law of dominance. Explain it with a suitable example in Pisum sativum.
39. (a) Mention the enzyme responsible for the synthesis of cDNA in HIV. [1M]
    (b) List the individuals who are at high risk of getting HIV infection. [2M]
    (c) Write any four steps taken by the WHO to prevent spreading of HIV infection. [2M]
40. (a) Who developed the technique of DNA finger printing? [1M]
    (b) List the different steps involved in DNA finger printing. [4M]
41. Explain any five salient features of Human Genome Project.
42. Describe the role of microbes as biocontrol agents.
43. (a) With reference to rDNA technology, explain isolation of DNA. [3M]
    (b) Draw a neat labelled diagram of Gel electrophoresis. [2M]
44. (a) Study the diagrams of age distribution given below and answer the questions that follows:



    (i) What will be the growth status of population in A and B? [1M]
    (ii) What will be the shape of age pyramid in B and C? [1M]

    (b) Explain Commensalism with any three examples. [3M]

Section – II

VI. **Answer any ONE of the following questions in about 200 – 250 words each, wherever applicable:** $1 \times 5 = 5$

45. (a) Post fertilization events leads the formation of endosperm, embryo, seeds and fruits. With reference to this, give reasons for the following:
    (i) Most of zygotes in angiosperms divide only after certain amount of endosperm is formed.
    (ii) Micropyle remains as a small pore in the seed coat of a seed.
    (iii) Water content is highly reduced as the seed matures. [3M]

    (b) Apomixis is a type of asexual reproduction that mimics sexual reproduction in which seeds are formed without fertilization. Explain any two ways in which embryos of apomitic seeds are formed. [2M]

46. Colour blindness is an allosome linked recessive gene disorder in which affected individuals cannot differentiate red and green colours. In context to this:
    (a) A normal vision man marries a normal vision woman whose father was colour blind. Work out a cross to show the genotype of the couple and their respective progeny. [3M]
    (b) Why colour blindness is usually seen in the human males? [2M]

47. The immune system consists of lymphoid organs, tissues, cells and antibodies. It recognizes foreign antigens, respond to them and also retain memory of the same. In context to this, explain:
    (a) How vaccines provide resistance to the microbial infections? [2M]
    (b) What will be the consequence, if thymus gland is removed from the body of a person? [1M]
    (c) Why an antibody is designated as H_2L_2? [2M]

SECOND PUC PREPARATORY EXAM JANUARY - 2024

Code : **36**
Date :

Subject : **BIOLOGY**

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

General Instructions :

i) This question paper consists of parts - A, B, C, D.
ii) Part-A consists of Section I and II and Part -D consists of two parts - Section V and VI
(iii) All the parts are compulsory.
(iv) Draw diagram wherever necessary, unlabeled diagram illustration do not carry any marks.

PART - A

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

1. Filiform apparatus is characteristic of

a) Aleurone cell b) synergid c) Antipodals d) Nucellus

2. Statement I : formation of fruit without fertilisation is called as apomixes

Statement II : In some species of Asteraceae and grasses seeds are formed without fruit.

a) Both statement I and statement II are correct
b) Both statement I and statement II are incorrect
c) Statement I correct and statement II are incorrect
d) Statement I is incorrect and statement II are incorrect.

3. Pollen grains can be stored in several years in liquid nitrogen having temperature of

a) –120° C b) – 80° C c) –196° C d) –100 °C

4. Signal for parturition originates from

a) Both placenta as well as fully developed foetus
b) Oxytocin released from maternal pituitary
c) Placenta only
d) Fully developed foetus

5. After ovulation Graffian follicle regresses into

a) Corpus artesia b) Corpus callosum c) Corpus luteum d) Corpus albicans

6. How many sperms are formed from a secondary spermatocyte ?

a) 4 b) 8 c) 2 d) 1

(P.T.O.)

7. Name the contraceptive pill developed by CDRI.
   a) Mala b) Saheli c) Sakhi d) Today

8. In human being multiple genes are involved in the inheritance of
   a) Sickle cell anemia b) Skin colour
   c) Colour blindness d) Phenylketonuria

9. A woman with 47 chromosomes due to three copies of chromosome 21 is categorized by
   a) Super females b) triploidy c)Turner's syndrome d) Down's syndrome

10. If one strand of DNA has the nitrogenous base sequence ATCTG. What would be the complementary RNA strand sequence
    a) TTAGU b) UAGAC c) AACTG d) ATCGU

11. Whose work on populations influenced Darwin
    a) Richter b) T. Malthus c) Oparin d) Haldane

12. Single step mutation lead to formation of different
    a) Genus b) Kingdom c) Species d) Phylum

13. Drugs called Heroin is synthesized by
    a) Methylation of Morphine b) Dimethylation of morphine
    c) Acetylation of morphine d) Dehydrogenation of morphine

14. Butyric acid is synthesised by
    a) Asperagillus niger b) Acetobacter aceti
    c) Clostridium butylicum d) Lactobacillus

15. NPP is equal to
    a) GPP b) GPP+R C) GPP/2 d) GPP-R

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

(Microinjection, Animals, Polyembroyany, zooplanktons, competition)

16) More than 70% of all the species recorded are _____.

17) More than one embryo in a seed _____.

18) A suitable method to introduced alien DNA in to animal cell is _____.

19) A population interaction in which both partner are harmed is called _____.

20) _____ are the second trophic level organisms in lake.

PART - B

III. Answer any FIVE of the following questions in 3-5 sentences wherever applicable: **2 x 5**

21) Differntiate Vasectomy and Tubectomy.

22) Define point mutation and Frame shift mutation.

23) What is homologus organs ? Give an example.

24) How DNA fragments are separated ? Name the stain used in that process.

25) Name the source and bioactive agent and function of Cyclosporin–A.

26) Differentiate Exo-nuclease and Endo-nuclease.

27) Sketch and label pBR322.

28) What are exons and introns ?

PART - C

IV. Answer any FIVE of the following questions in 40-80 words each wherever applicable: **3 x**

29) Distinguish between true fruits, false fruit and Parthenocarpic friuts.

30) Define Placenta. Name the placental hormones.

31) Mention the types of IUD with one example.

32) Write a short note on sexual decit and pseudocopulation.

33) Give brief account on PCR.

34) What is commensalism ? Give any two examples.

35) Mention four causes for biodiversity loss. Explain any one of them.

36) Give a brief account on adaptive radiation with example.

PART - D

SECTION - I

V. Answer any FOUR of the following questions in about 200-250 words each wherever applicable. 5 x

37) Differentiate spermatogenesis and Oogenesis.

38) Mention the salient feature of genetic code.

39) Graphical representation of incomplete dominance.

40) Justify DNA as a genetic material by Griffith, Avery and Mac Lloyd and Mac Carty experiment.

41) Give a brief account on Innate immunity.

42) Explain how sewage is treated in sewage treatment plant.

43) Graphical representation of replication of HIV.

44) Write any five application of Transgenic animals.

SECTION - II

VI. Answer any one of the following questions in about 200-250 words each wherever applicable. 5

45) Explain YYRR genotype plant are crossed with yyrr plant, what would be the phenotypic ratio.

46) Double fertilisation is unique feature of angiosperms and the products of this double fertilisation 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.

47) Identify the disease based on the characteristic symptoms.

a) Blockage of intestine and internal bleeding.

b) Constipation and stools with excess mucus.

c) Intestinal perforation.

d) Alveoli gets filled with fluid and severe problems of respiration

e) Chill and recurring high feaver

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II PUC PREPARATORY EXAMINATION, JANUARY-2024

SUBJECT : BIOLOGY (36)

Max. Marks : 70

TIME : 3 Hours 15 Mins.

GENERAL INSTRUCTIONS:

1. **The question paper consists of four parts A, B, C, and D.**
2. **PART-A consists of I & II and Part-D consists of two Sections, Section-I & Section-II.**
3. **All the parts are compulsory.**
4. **Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any marks.**

PART - A

15x1=15

I **Select the correct alternative from the choices given below:**

1. The structure that forms endosperm after fertilization in angiosperms is
a) Haploid b) Diploid c) Triploid d) 7 celled and 8 nucleated

2. Which of the following statements about contraceptives are false ?
A. They are regular requirements for the maintenance of reproductive health.
B. They are practiced against a natural reproductive health.
C. They have a significant role in checking uncontrolled population growth.
D. The side effects of use of these contraceptives should be totally ignored.
a) A b) A & B c) A & C d) A & D

3. The change in gene frequency that occurs in a population by chance is
a) Genetic drift b) Founder effect c) Gene flow d) Genetic equilibrium

4. The enzymes that are used for clarification of fruit juices are
a) Streptokinase b) Pectinase c) Lipases d) Hexokinase

5. The process in which the reproductive fitness of one species is significantly lower in the presence of another species is known as
a) Predation b) Competition
c) Competitive release d) Gause's Competitive exclusion principle

6. Which of the following chemical conditions of the detritus favour decomposition ?
a) Detritus rich in lignin and chitin
b) Detritus rich in nitrogen and water-soluble sugars
c) Warm and moist environment
d) Low temperature and anaerobiosis

7. The regression coefficient for frugivorous birds and mammals in the tropical forests of different continents is found to be
a) 0.6 b) 1.2 c) 1.15 d) 2.0

8. Pollination by wind is observed in
a) Corn cob b) *Zostera* c) *Vallisneria* d) *Hydrilla*

9. The foetus develops limbs and digits by the end of
a) First month of pregnancy b) Second month of pregnancy
c) Fifth month of pregnancy d) Nine months of pregnancy

10. The sex-linked recessive trait among the following is
a) Haemophila b) Sickle cell anaemia c) Myotonic dystrophy d) Thalassemia

11. The evolutionary idea that life came out of decaying and rotten matter like straw, mud, etc is advocated by
a) Big Bang theory b) Theory of Panspermia
c) Theory of spontaneous generation d) Theory of chemical evolution

(P.T.O)

12. Identify the correct example of commensalism form the following :
    a) An orchid growing as an epiphyte on a mango branch
    b) *Cuscuta* growing on hedge plants
    c) A sparrow eating on a seed
    d) Marine fishes infested with copepods

13. The granulosa cells are associated with
    a) Testis b) Primary follicle c) Sperm d) Mammary gland

14. Identify the mismatched pair :
    a) Non-medicated IUD - Lippes loop
    b) Hormone releasing IUD - LNG -20
    c) Copper releasing IUD - Progestasert
    d) A once-week pill-Saheli

15. The manifestation of phenotypic expression characterized by mental retardation, reduction in hair and skin pigmentation is an example for
    a) Epitropy b) Multiple allelism c) Polygenic inheritance d) Pleiotropy

II **Fill in the blanks by choosing the appropriate word/words from those given below: 5x1=5**
(***Thermus aquaticus, Caenorhabditis elegans, Propionibacterium sharmanii, Lupinus arcticus, Pheonix dactylifera, Meloidegyne incognitia***)

16. The oldest and viable seed that germinated after an estimated record of 10,000 years of dormancy is _____.
17. Thermostable DNA polymerase enzyme used in PCR is isolated from _____.
18. _____ is a free-living nematode whose genome has been completely sequenced.
19. Swiss cheese is obtained from _____.
20. The nematode that infects the roots of tobacco plants is _____.

PART-B

III **Answer any <u>FIVE</u> of the following questions in 3-5 sentences each, wherever applicable: 5x2=10**

21. Mention any 4 characteristics of an ideal contraceptive.
22. Distinguish between linkage and recombination.
23. Sketch and label a transcription unit.
24. What are analogous organs ? Give an example for analogous organs in plants.
25. Name the confirmative/diagonstic tests for a) Typhoid and b) AIDS.
26. "Microbes are used to synthesize a number of products useful to mankind". Justify the statement by mentioning any two bioactive molecules and microbes that produce them.
27. Mention any two limitations of ecological pyramids.
28. Write any four functions of an ecosystem.

PART-C

IV **Answer any <u>FIVE</u> of the following questions in 40-80 words each, wherever applicable: 5x3=15**

29. What is placenta ? Mention any 4 hormones secreted by it.
30. Write a note on the causes and effects of thalassemia.
31. a) DNA is a better genetic material than RNA. Justify.
    b) The codon AUG has a dual function. Substantiate.
    c) Genetic code is degenerate. Give reason.
32. What is biopiracy ? Explain with reference to basmati rice.

33. Flowering plants have developed many devices to discourage self pollination. Mention any three of them.

34. What is adaptive radiation ? Darwin finches of the Galapagos Islands represent one of the best examples of adaptive radiation. Comment.

35. a) Define cry proteins.
    b) Name the cry genes that control i) Cotton bollworms ii) Corn borer

36. a) Define heterochromatin. **(1)**
    b) A biomolecule that acts as a genetic material must fulfil certain criteria. Mention them. **(2)**

PART-D (SECTION-I)

V Answer any FOUR of the following questions in 200-250 words each, wherever applicable: 4x5=20

37. Draw a neat labelled diagram of an anatropous ovule.
38. What is incomplete dominance ? Explain with reference to flower colour in *Snapdragon*.
39. Describe an experiment that provides a scientific proof that DNA replicates semi-conservatively.
40. Schematically represent the replication of retroviruses (HIV) in an animal cell.
41. Describe the role of microbes in household products.
42. Explain the technique of separation and isolation of DNA fragments.
43. What is drug abuse ? Name the drugs that act as or known for following effects.
    i) Depressant and slow down body functions
    ii) Effects cardiovascular system
    iii) Produces a sense of euphoria and increase energy
    iv) Sedative and painkiller.
44. a) Write short noes on brood parasitism. **(2)**
    b) Describe sexual deceit on *Ophrys*. **(3)**

SECTION-II

VI Answer any ONE of the following questions in about 200-250 words each, wherever applicable: 1x5=5

45. Draw a neat labelled sectional view of the human female reproductive system.
46. a) Mention the methods available for the introduction r-DNA into plant and animal cells respectively. **(2)**
    b) Define plasmid. Comment on the features of an ideal plasmid with reference to selectable markers, mentioning their significance in genetic engineering. **(3)**
47. a) Describe the levels of biodiversity citing an example for each. **(3)**
    b) Name "the evil quartet" of biodiversity losses in a given habitat. **(2)**

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GOVERNMENT OF KARNATAKA

DEPUTY DIRECTOR, DEPT. OF SCHOOL EDUCATION (PRE-UNIVERSITY)

PUC-II YEAR PREPARATORY EXAMINATION-2024

Time : 3 Hours 15 Minutes | SUBJECT : **BIOLOGY (36)** | MARKS : 70

Instructions : 1) The question paper consists of four parts A,B,C and D.
2) Part-A consists of I and II, Part-D consists of V and VI.
3) Only the first written answer's will be considered for the part-A.
4) All the parts are compulsory.
5) Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any marks.

PART-A

I. **Select the correct alternative from the choices given below :** **15X1=15**

1) Identify the wrong statement regarding past-Fertilization development
   a) the ovary wall develops into pericarp
   b) The outer integument of ovule develops into tegmen
   c) The fusion of nucleus (Triple-fusion) develops into endosperm
   d) The ovule develops into seed

2) Even in the absence of pollinating agent seed setting is assured in
   a) Commelina b) Zostera c) Salvia d) Fig

3) An Embryo with eight to sixteen blastomere's is called
   a) Blastocyst b) Trophoblast c) Morula d) Zygote

4) Medical Termination of pregnancy was legalised in India in
   a) 1971 b) 1975 c) 1965 d) 1961

5) Which of the following is non-medicated Intrauterine device
   a) Cu-T b) Lippes loop c) LNG-20 d) Cu-7

6) Which of the following character was not chosen by mendel
   a) pod shape b) pod colour c) Location of flower d) Location of pod

7) Histone proteins are
   a) basic negatively charged b) basic positively charged
   c) Acidic negatively charged d) Acidic positively charged

8) The brain capacity of Homo-erectus was about
   a) 650 CC b) 900 CC c) 1500 CC d) 1400 CC

9) The primary treatment of waste water involves the removal of
   a) dissolved impurities b) stable particles
   c) Toxic substances d) Harmful bacteria

10) Vaccine against polio-virus is an example of
   a) Auto-immunisation b) Passive immunization
   c) Active Immunity d) Simple immunization

11) Bio-active molecules statins produced by
   a) Bacteria b) Yeast c) Virus d) Protozoa

12) The Inter-specific Interaction in which one partner is benefitted and the other is neutral is calle
   a) Ammensalism b) Mutation c) Completion d) Communalism

13) The phenomenon of industrial melanism demonstrates
   a) Geographical isolation b) reproductive isolation
   c) natural selection d) Induced mutation

14) Which of the following has 23- chromosomes
   a) Spermatogonia b) Zygote c) Secondary oocyte d) Oogonia

15) Which group of vertebrates, comprises the highest number of endangered species
   a) Fishes b) Reptiles c) Birds d) Mammals

II. Fill in the blanks by choosing the appropriate word/words from the brackets : 5X1=5
(Allogeneic Graft, PCR, Corona radiata, Lichens, Auto Immune)

16) Rheumatoid arthritis is ..... disease.
17) Which of the following is a pioneer species in xeric succession .....
18) The technique that serves the purpose of early diagnosis is .....
19) Animals form colder climates generally have shorter limbs. This is called .....
20) Immediately after ovulation, the mammalian egg is covered by a membrane known as .....

PART-B

III. Answer any FIVE of the following questions in 3-5 sentence each, wherever applicable : 5X2=10

21) Name the techniques used in Artificial hybridization.
22) Distinguish between menstrual cycle and oestrous cycle.
23) Draw a neat labelled diagram of pollen grain.
24) What is point mutation ? Give an example.
25) Expand the terms ICSI and ZIFT.
26) What are the techniques used to detect cancer ?
27) Write any four symptoms of Down's syndrome.
28) What are Homologous organs ? Give an example.

PART-C

IV. Answer ANY FIVE of the following questions in about 40 to 80 sentences each, wherever applicable : 5X3=15

29) Briefly explain any three prevention and control measures of drug and alcohol abuse.
30) Draw a neat labelled diagram of L. S. of Flower.
31) Write the schematic structure of transcription unit and labelled the parts.
32) Schematically represents Oogenesis.
33) Name the organisms that produce citric acid, Acetic acid and butyric acid.
34) Mention any three examples of Ex-situ conservation.
35) Draw a neat labelled diagram of S. L. Miller's experiment.
36) What are Lymphoid organs ? Mention the types with one example each.

PART-D

V. Answer any THREE of the following questions in about 200 to 250 words each wherever applicable : 3X5=15

37) Explain the inheritance of one gene with respect to height in garden pea-plant.
38) Write the steps involved in DNA. Finger printing technique.
39) Explain the primary and secondary stages of sewage treatment.
40) Draw a labelled diagram of sectional view of female reproductive system.
41) Explain the life cycle of plasmodium vivax.
42) Enumerate the salient features of H.G.P.

Answer any TWO of the following questions in about 200 to 250 words each wherever applicable : 2X5=10

43) One of the application of Biotechnology is the production of Insect-resistant crop-Justify the statement with reference to Bt-cotton.
44) Explain the role of microbes in house hold products.
45) Describe lac-operon concept on carbohydrate metabolism.
46) a) Write any four tools used in Recombinant-DNA-technology.
b) Mention any two methods of introducing alien DNA into host-cells.
c) Name the stain used to visualise DNA fragments in Gel electrophoresis.
47) Name the diseases caused by the following organisms.
a) Entamoeba histolytica b) Rhino viruses c) Microsporum trichophyton
d) Plasmodium e) Salmonella typhi

II PUC PREPARATORY EXAMINATION- JANUARY2024

SUBJECT – BIOLOGY (36)

Duration: 3hr 15 Min

Max.Marks: 70

General Instructions:

- The 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: 1x15=15

1. The body of the ovule is fused with in the funicle is
   a. Nucellus b. Chalaza c. Hilium d. Micropyle
2. The nourishing cells in the seminiferous tubules are
   a. Follicular cells b. Sertoli cells c. Leydig cells d. Spermatogonial cells
3. Lippes loop is a type of contraceptive used as
   a. Copper releasing IUD b. Cervical barrier
   c. Vault barrier d. Non-medicated IUD
4. The method of directly injecting a sperm into ovum is
   a. GIFT b. ZIFT c. ICSI d. IVF-ET
5. Which of the following is a classic example of point mutation
   a. Phenyl ketonuria b. Sickle cell anemia c. Heamophilia d. Thalassemia
6. Gene mapping technology was developed by
   a. Mendal b. Tschermak c. Correns d. Sturtevent
7. An adapter molecule in protein synthesis is
   a. mRNA b. rRNA c. tRNA d. cRNA
8. The number of genes present on Y-Chromosome
   a. 2968 genes b. 242 genes c. 231 genes d. 2898 genes
9. A type of Natural selection in which more individual acquire mean character value is called
   a. Stabilizing selection b. Disruptive selection
   c. Directional selection d. Dominant selection
10. Identify the technique useful in detecting the cancer of intestinal organ
    a. CT b. MRI c. X-ray d. All the above
11. Identify the symptoms of Pneumonia
    a. High fever,weakness,stomach pain,loss of appetite
    b. Difficulty in breathing, fever ,chills,cough, headache
    c. Nasal congestion&discharge,cough,sore throat,headache
    d. Constipation,Abdominal pain,cramps,blood clots

12. The Fungus not used in the production of any industrial product is

a. Penciillium b. Aspergillus c. Trichodermapolysporum d. Glomus

13. Silencing of specific m-RNA in RNAi is by

a. ds DNA b. ds RNA c. ss RNA d. ss DNA

14. The integral form of exponential growth of population is

a. $N_t=N_0e^n$ b. $N_0=N_tert$ c. $N_t=N_0erd$. $N_0=N_ter$

15. Which one of the following is not included under in-situ conservation?

a. National park b. Wild life sanctuary c. Botanical garden d. Biosphere Reserve

II. Filling the blanks by choosing appropriate words from those given below: 1x5=5

(Fishes, Thymine, Amniocentesis, 900cc, Liver fluke)

16. _____ is a foetal sexdetermination test.

17. The brain capacity of Homo erectus is_____.

18. Additional stability to DNA when compared to RNA is due to the presence of_____.

19. An example for Endoparasite is_____.

20. Among vertebrates the group of animals exhibits maximum species diversity is_____.

PART-B

III. Answer any FIVE of the following questions in 3-5 sentences wherever applicable: 2x5=10

21. Distinguish between albuminous and non- albuminous seeds.

22. List any four Hormones secreted by placenta

23. Mention two symptoms of Turner's syndrome.

24. Write the genotype of the parents, when their chiidren are with A, B, AB, O blood groups.

25. Write the schematic structure of Transcription unit.

26. Define adaptive radiation? Give an example.

27. Mention the any two methods of HIV transmission.

28. What are Baculoviruses? Mention their role as bio control agents.

PART-C

IV. Answer any FIVE of the following questions in about 40-80 words wherever applicable: 3x5=15

29. *Explain any three out breeding devices in flowering plants.*

30.a. What is Menarche?

b. Ovulation takes place on the 14th day of menstrual cycle why?

c. Name the hormone secreted by Corpus luteum.

31. Define infertility? Write any two assisted reproductive technology to overcome infertility?

32. Explain the sex determination in Honeybees.

33. Enumerate on convergent and divergent evolution with suitable examples.

34. Mention the three types of carcinogens with an example for each.

35. Draw a neat labeled diagram of PBR 322.

36. List out any three effects of loss of Biodiversity.

PART-D Scetion-I

V. Answer any FOUR of the following questions in about 200-250 words wherever applicable: 4x5=20

37. Define megasporogenesis? Describe the internal structures of a matured embryo sac of angiosperms.

38. Explain the steps involved in the process of decomposition.

39. State and explain the Law of Dominance by taking the inheritance of one gene.

40. Write schematic representation of the replication of Retro virus.

41. Oswald Avery and others have continued Griffith's transforming principle to prove DNA as genetic material-Substantiate.

42. a. Explain the role of any three organisms as biofertilisers. (3)

b. What is the significance of BOD? (1)

c. Give an example for bacteria used to control butterfly caterpillars. (1)

43.a. Write the any four tools used in recombinant DNA technology. (2)

b. Explain any three techniques to make Host competent in r-DNA technology (3)

44. How is ADA deficiency cured by gene therapy?

Section-II

VI. Answer any ONE of the following questions in about 200-250 words wherever applicable: 1x5=5

45. Draw a neat labelled diagram of female reproductive system.

46. Explain the salient features of genetic code.

47. Mention the population interaction exists among the followings.

a. Abingdon tortoise and goats in Galapagos Islands.

b. Cuckoo lays eggs in crow's nest.

c. Sea anemone and clown fish

d. Wasp laying eggs in Fig fruit

e. Orchid ophrys and bees.

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DISTRICT P.U. COLLEGES PRINCIPALS' ASSOCIATION, CHIKKABALLAPUR.

II PUC PREPARATORY EXAMINATION JANUARY- 2024

Subject Code : **36** | Total No.of Ques.**47**

BIOLOGY

Time : **3-15 hours** | Max Marks : **70**

General Instructions: 1] This Question paper consists of four parts A, B, C and D.
Part-A consists of I and II and Part-D consists of two parts Section-V and Section-VI
2] All the parts are compulsory.
3]Draw diagrams wherever necessary. Unlabelled diagrams do not carry any marks.

PART -A

I **Select the correct alternative from the choices given below:** **15x1=15**

1) Radical and root cap enclosed in an undifferentiated sheath called _____
a]coleoptile b] coleorrhiza c] plumule d] scutellum

2) Statement I : Occurance of more than one embryo in a seed is referred to as polyembryony
Statement II : More often , as in many citrus and mango varieties some of the nucellular cells surrounding the embryo sac start dividing protude into the embryo sac and develops into embryo.
a]Both statements I and II are correct. b] Both statements I and II are incorrect
c]Statement I is correct and II is incorrect d] Statement I is incorrect and statement II is correct

3) The hormone testosterone is secreted from _____
a]sertoli cells b] epididymis c] Leydig cells d] Spermatogonia

4) Statement I : Vagina is often covered partially by a membrane called hymen
Statement II: It can be broken only by a sudden fall or jolt.
a]Both statement I and II is correct b] Both statement I and II is incorrect
c] Statement I is correct and II is incorrect
d] Statement I is incorrect and statement II is correct

5) An example of copper releasing IUD among the following ____
a]Cu-T b] LNG-20 c] Both a and d d] Cu-7

6) The method used to test for the pressence of certain genctic disorders such as Haemophilia etc____
a]Amnio centesis b] MTP c] both a and b d] ZIFT

7) Which of the following mendelion disorder is the representation of sex-linked recessive trait____
a]phenyl Ketonuria b]Sickle cell anamia c] Haemophilia d] both b and c

8) The process of removal of introns and joining of exons in a defined order in a primary transcrepts occurs in
a]prokaryotes b] Eukaryotes c] Prokaryotes and Eukaryotes d] in protista

9) A type of natural selection in which more individuals acquire peripheral character value is called ____
a]stabilized b] Disruptive selection c] Directional selection d] Dominant selection

10) If regular dose of drugs / alcohol is abrypthy _____ discontinued. This is characterised by anxiety etc. This unpleasant character is conformed as ____
a]Addiction b] withdrawl syndrome c] Alcohol abuse d] none of these

11) Methanogenic bacteria is not found in _____
a]Rumen of cattle b] Biogas plant c]water logged paddy field d]Activated sludge

12) Autonomously replicating circular extra chromosomal DNA is formed as ___
a]cosmid b] plasmid c]r-DNA d] clown vector

13) Koel lay their eggs in the neighbour's host nest is characterised by which population interaction_____
a] commensalism b] Amensalism c]Parasitism d] competetion

14) Each trophic level has a certain mass of living material at a particular time called as ____
a]Biomas b]Standing crop c] standing state d] both b and c

15) logS = logC + ZlogA where Z indicates _____
a]C-Y intercept b] regression coefficient c] species richness d] Area

II **Fill in the blanks by choosing the appropriate word/words from those given below:** **5x1=5**
[competetion, saltation, implantation , perisperm , Big bang theory]

16) The residual persistant nucellus in a mature seed is called ____

17) Attachment of embryo to uterus is called _____

18) An example for mutation also arise due to change in a simple base pair of DNA is ____ P.T.O.

19) _____ theory attempts to explain to us the origin of universe.

20) A population interaction in which both species are harmed is _____

PART -B

III Answer any FIVE of the following questions in 3-5 sentences each wherever applicable. **5x2=10**

21) List any four preventive measures against STI.

22) What is MTP? Mention the safe period to conduct MTP.

23) Give the phenotypes of the parental Drosophila that has produced 1.3% and 37.2% recombinant respectively in T.H. Morgon Dihybrid cross.

24) Differentiate between Homologous and Analogous organs by giving one example.

25) List any two differences between Innate immunity and Acquired immunity.

26) What are Secondary lymphoid organs? Give two examples.

27) Name the microbes involved in the production of organic acids.
i) citric acid ii) Butyric acid

28) Mention the functions of Ecosystem.

PART-C

IV Answer any FIVE of the following questions in about 40-80 words each wherever applicable. **5x3=15**

29) Draw a neat labelled diagram of Monocot embryo.

30) Define Menstrual cycle. Mention the phases involved in it.

31) Draw a diagrammatic sketch of the Lac operon. When Lactose is absent in the medium.

32) Briefly explain about Adaptive radiation with respect to variety of beak of finches faced by Darwin.

33) Sketch the diagrammatic representation of recombinant DNA technology.

34) What is gene therapy? Explain the steps involved in curing ADA deficiency by gene therapy.

35) a] Invasion of Alien species leads to loss of biodiversity. Justify the statement with two examples.
b] What are the hot spots of biodiversity? Mention any two of it.

36) Define Decomposition. Mention the factors affecting decomposition.

PART-D SECTION -I

V Answer any FOUR of the following questions in about 200-250 words each wherever applicable. **5x4=20**

37) Draw a neat labeled diagram of human female reproductive system.

38) What is the law of Independent assortment represent the schematic representation with respect to shape of the seed and colour of the cotyledons in pea plants.

39) With the help of schematic representation illustrate how an infected animal cell can survive while retro viruses are being replicated and released.

40) a]With reference to DNA finger printing. Define the following i)VNTR ii) Satellite DNA
b] Enumerate the Applications of DNA finger printing.

41) Describe the structure of Biogas plant with a neat labelled diagram.

42) What is genetic code? Explain any four salient features of genetic code.

43) a] Draw a neat labelled diagram of pBR 322 vector.
b] Differentiate between Exonuclease and Endonuclease.

44) a]Define the terms of the following i) Natality (ii) Mortality (iii) Immigration (iv) Emmigration
b] If 'N' is the population density at time t, then its density at time t + 1 is determined as

SECTION -II

VI Answer any ONE of the following questions in about 200-250 words each wherever applicable. **5x1=5**

45) What are out breeding devices? Explain the types of devices to prevent autogamy.

46) a] Write the different / various symbols used in human pedegree analysis.
b]Mention the Multiple alleles of blood group A and B.

47) a] Draw a neat labelled diagram of Antibody molecule.
b] Three patients suffering from certain diseases. They have visited a local primary health centre. The Doctor does a through check and prepares a report of the 3 patients and is indicated in the below given table.
Analyse the table and diagnose the disease they are suffering from causative agent of the disease.

Patient 1	Soar throat , hoarseness nasal congestion
Patient 2	lips and fingernails may turn grey to bluish colour
Patient 3	Dry, scaly lesions on skin, nails and scalp.

✦✦✦✦✦✦✦

II PU PREPARATORY EXAMINATION JANUARY 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. Formation of pollen from pollen mother cell is referred to as
   (a) Pollenogenesis (b) Megasporogenesis
   (c) Microsporogenesis (d) Ovulation
2. Which one of the following is correct for Vallisneria?
   (A) It grows in fresh water.
   (B) Female flowers or pollen grains reach the surface by long stalk.
   (C) Male flowers are released on to the surface of water.
   (D) Pollen grains are carried passively by water currents.
   (a) Only A (b) Only A and B (c) Only A, B and C (d) A, B, C and D
3. Select the correct anatomical sequence.
   (a) Seminiferous tubules → Rete testis → Vasa efferentia → Vasa deferens → Epididymis
   (b) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vasa deferens
   (c) Seminiferous tubules → Vasa efferentia → Rete testis → Vasa deferens → Epididymis
   (d) Seminiferous tubules → Vasa deferens → Rete testis → Vasa efferentia → Epididymis
4. The layer of uterine tissues responsible for strong contractions during childbirth is
   (a) Perimetrium (b) Myometrium (c) Mesoderm (d) Myocardium
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. When a true breeding pea plant that has yellow seeds is pollinated by a plant that has green seeds, then all the F1 plants have yellow seeds. This means that the allele for yellow is
   (a) Heterozygous (b) Dominant (c) Recessive (d) Lethal
8. Histones are rich in which amino acid?
   (a) Methionine, Arginine (b) Lysine, Arginine
   (c) Lysine, Proline (d) Methionine, Lysine
9. The findings of Miller's experiment on origin of life have provided evidence for
   (a) Theory of biogenesis (b) Oparin-Haldane theory
   (c) Theory of special creation (d) Theory of organic evolution
10. Saliva in mouth and tears from eye protects from microbial infection. This type of barrier is known as
    (a) Cellular (b) Physical (c) Physiological (d) Cytokine

11. The enzyme streptokinase is used medicinally to
(a) Check growth of microbes in body fluids
(b) Remove blood clots from the blood vessels
(c) Weaken walls of blood vessels
(d) Create blood clots in blood vessels

12. To make bacterium competent (Transformation with recombinant DNA) we use
(a) Specific concentration of Ca2+ ion (b) Heat shock (42°C)
(c) Both (a) and (b) (d) None of these

13. Example of brood parasitism
(a) Cuckoo (koel) and crow (b) Crow and parrot
(c) Parrot and pigeon (d) Koel and parrot

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. Steller's Sea cow and Passenger pigeon became extinct due to
(a) Alien species invasion (b) Co-extinction
(c) Habitat loss and fragmentation (d) Over exploitation

II. Fill in the blanks choosing the appropriate word given below: **1 x 5 = 5**

(Zona pellucida, Sickle cell anaemia, Electric spark, Unisexual, Biomass, Bisexual)

16. Emasculation is not required in flowers which are --------
17. The sperm comes into contact with the ____ layer of ovum to cause fertilization.
18. A classic example of point mutation is --------
19. The energy used in the Miller–Urey experiment was -------
20. _____ is a more meaningful measure of population size.

PART - B

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

21. Mention any two preventive measures of STD.
22. What is amniocentesis? Why has the government imposed a statutory ban despite its importance in the medical field?
23. Drosophila melanogaster is a model organism in genetic studies. Give two reasons to justify this statement.
24. Differentiate divergent evolution from convergent evolution.
25. Name any two drugs used to reduce symptoms of allergy.
26. Differentiate between benign and malignant tumours.
27. Why is Rhizobium called as 'symbiotic bacterium'? How does it act as a biofertilizer?
28. Ecological pyramids have limitations. Justify the statement with two reasons.

PART - C

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

29. Draw a labelled diagram of a mature embryo sac.
30. What is pregnancy hormone? Name two sources of the hormone in a human female.
31. Where do you find code, codon and anticodons?
32. (a) How does Hardy Weinberg expression ($P^2 + 2pq + q^2 = 1$) explain that genetic equilibrium maintained in a population?
    (b) List any two factors that can disturb the genetic equilibrium. **1**
33. What is ADA deficiency? Describe any two methods to cure it. **2**
34. Mention the three critical areas of biotechnology.
35. (a) Co-extinctions lead to loss of biodiversity. Justify the statement with two examples.
    (b) What are hot spots of biodiversity?
36. Construct an ideal pyramid of energy when 1,000,000 joules of sunlight are available. Label all the trophic levels.

PART – D Section - I

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

37. Draw a neat, labelled diagram of human male reproductive system.
38. Work out a cross between true breeding red and white flowered Snapdragon (Dog flower) plants up to F2progeny. Explain the results of F1and F2 generations.
39. With the help of schematic representation illustrate how an infected animal cell can survive while viruses are being replicated and released.
40. List the salient features of double helix structure of DNA.
41. What is genetic code? Explain any four salient features of genetic code.
42. Describe the biological treatment of primary effluent.
43. Give the diagrammatic representation of recombinant DNA technology.
44. Name the type of interaction seen in each of the following examples.
    (i) Ascaris worms living in the intestine of human.
    (ii) Wasp pollinating fig inflorescence.
    (iii) Clown fish living among the tentacles of sea anemone.
    (iv) Mycorrhizae living is the roots of higher plants.
    (v) Disappearance of smaller barnacles when Cathamalanus dominated in the coast of Scotland.

Section – II

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

45. Give reasons why
    (i) Most zygotes in angiosperms divide only after certain amount of endosperm is formed.
    (ii) Groundnut seeds are exalbuminous and Caster seeds are albuminous.
    (iii) Micropyle remains as a small pore in the seed coat of a seed.

(iv) Integuments of an ovule harden and the water content is highly reduced as the seed matures.

(v) Apple and Cashew are not called true fruits.

46. (a) Why is haemophilia generally observed in human males? Explain the conditions under which a human female can be haemophilic.

(b) A pregnant human female was advised to undergo MTP. It was diagnosed by her doctor that the foetus she was carrying has developed from a zygote formed by an XX-egg fertilized by a Y- carrying sperm. Why was she advised to undergo MTP?

47.(a) Cancer is one of the most dreaded diseases. Explain 'Contact inhibition' and 'Metastasis' with respect to the disease. **2**

(b) Name any two techniques that are useful in detecting cancers of internal organs. **2**

(c) Why are cancer patients often given α-interferon as part of the treatment? **1**

*******GOOD LUCK*******

II PUC Peparatory Examination Jan. 2024

Time : 3.15 hours **SUBJECT : BIOLOGY (36)** Marks : 70

INSTRUCTIONS :

1. This question paper Consist of four Parts A, B, C, D.
2. Part - A Consist of I & II and Part - D Consist of two parts Section - V & VI.
3. All the parts are compulsory
4. Draw daigrams wherever neccessary, Unlabled diagrams do not carry any marks.

PART - A

I. Select the correct alternative from the choices given below :

1. In mature embryo sac, the central cell is
   a) Single nucleate b) Binucleate c) Four nucleate d) Eight nucleate
2. The machanism of production of seed without fertilisation
   a) Apomixis b) Polyembrayony c) Parthenocarpy d) Parthenogenesis
3. The human unpaired male reproductive strucutre is
   a) Testis b) Seminal Vesicle c) Bulburethral Gland d) Prostrate Gland
4. Hormones for the menstrual cycle are produced by
   a) Ovaries only b) Uterus only c) Ovaries and uterus d) Ovaries and anterior pituitary
5. Transmission of sexually transmitted infections can be prevented by
   a) Medical termination of pregnancy b) By tubectomy
   c) By good birth control pills d) By using Barriers
6. CDRI Stands for
   a) Central Dairy Research Institute b) Central Drug Related Institute
   c) Central Drug Research Institute d) Central Development Research Institute
7. Pleiotrophy refers to a situation where
   a) A gene affects one specific trait only b) A gene affects more than one seemingly unrelated traits
   c) Many genes affect a Single trait d) A Single gene masks the effect of another gene.
8. Total amount of 'A' and 'T' in DNA is 45% then Amount of Guanine will be...
   a) 22.5% b) 27.5% c) 45% d) 55%
9. Variation in gene frequencies within populations can occur by chance rather than by natural selection this is reffered as
   a) Random mating b) Genetic load c) Gene flow d) Genetic Drift
10. The antibody produced against allergens is
    a) IgG b) IgD c) IgE d) IgM
11. A patient brought to hospital with Myocardial infarction is normally given..... to prevent Blood clotting.
    a) Penicillin b) Streptokinase c) Cyclosporin -A d) Statins
12. Restriction enzymes are used in genetic engineering becuase
    a) They can join different DNA fragments b) They can cut DNA at specific target.
    c) They are nucleases that cut DNA at variable sites d) They are proteolytic enzymes which can degrade harmfulll enzymes
13. Two species competing for the same resources cannot co-exist indefinitely this Statement is
    a) Gause's competitive exclusion principle b) Connell's elegant field experiment
    c) Rivet Popper hypothesis c) Mac-Arthur experiment
14. The Mass of living material at a trophic level at a particular time is called.
    a) Net primary productivity b) Gross primary productivity c) Standing crop D) Standing State
15. The Number of biosphere reserves present in India are
    a) 14 b) 90 c) 448 d) 34

II. Fill in the blanks by choosing the appropriate word / words from those given below
(Blastocyst, Saltation, Endosperm, Point Mutation, logistic, exponential)

16. Double fertilisation and tripple fusion results in the formation of .....
17. Pregnancy begins with implantation of .....
18. Sickle cell anaemia is an example of .....
19. ..... is single step large mutation leading to speciation.
20. Population growth curve is sigmoid in the environment is .....

PART - B

Answer any FIVE of the following questions in 3 - 5 sentences wherever applicable. **2 x 5 = 10**

21. Name any two sexually transmitted infections that caused by viruses.
22. What is medical termination of pregnancy ? why it is performed ?
23. What kind of linkage observed in Drossophila melanogaster ? Define
24. Differntiate between convergent evolution from divergent evolition
25. What is autommunity ? Give example
26. Differentiate between active immunity and passive immunity.
27. What are Biocontrol agents ? Give two examples
28. The Pyramid of energy is always upright. Give reason.

PART - C

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

29. Explain any three outbreeding devices for cross pollination.
30. Explain the function of each of the following
    a) Umbilical cord b) Seminal Vesicle c) Scrotum
31. Draw a daigrametic sketch of the Lac Operon When Lactose is present in the medium
32. Mention the brain capacity and important features of
    a) Australopicthecus (Ape Man) b) Homo erectus
    c) Homo Sapiens (The modern Man)
33. Mention the different types of vectors used for cloning genes in plants and animals
34. What is gene therapy? How the ADA dificiency cured be gene therapy
35. Describe the components of aquatic ecosystem taking pond as an example.
36. What is biodiversity conservation ? Mention the two types of biodiversity conservation.

PART - D

SECTION - I

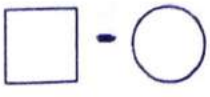
Answer any FOUR of the following questions in about 200-250 words each wherever applicable **5 x 4 = 20**

37. Draw a neat labeled daigram of human female reproductive system.
38. Mention the Karotype, Symptoms of klinefelter's syndrome.
39. With labeled daigram illustrate replication of HIV in Human Cell.
40. What is recombinent DNA Technology ? Explain the steps involved in it.
41. What is translation ? Explain the mechanis of Protien Biosynthesis.
42. Describe the process of sewage water treatment
43. a) Draw an neat labeled daigram of PBR 322 Vector - 3
    b) Mention the technique involved in DNA insertion in to the host cell - 2
44. Define population density? Explain the various process that affect population density of an area

SECTION - II

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

45. What is embryogeny ? With daigram briefly describe the process of development of dicotyledonous embryo
46. What is drug / alchol abused ? Mention the prevention and control measures for drug / alchol abuse.
47. What is pedigree analysis ? indentify and write the sybmols used in pedigree analysis.

a)  b)  c)  d) 

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II PUC PREPARATORY EXAMINATION - 2024

Time 3 Hours 15 Minutes

BIOLOGY (36)

Max Marks 70

General Instructions : -

* This question paper consists of four parts A.B.C.D
* PART-A Consists of I AND II Part -D Consists of two parts section V and VI
* All the parts are compulsory
* Draw diagrams wherever necessary unlabelled diagram do not carry any marks

PART - A

I. Select the correct altranative from the choices given below. 1x15=15

1) Pollen grain exine has prominent apertures called germpores where.....
   a) Intine is absent b) Intine is present
   c) Sporopollenin is absent d) Sporopollenin is present

2) The wall of the ovary develops into the wall of fruit called.....
   a) epicarp b) pericasp c) perisperm d) periderm

3) The papaya plant species prevent both the autogamy and geitonogamy because.....
   a) flowers are bisexual b) flowers are unisexual
   c) male and female flowers are present on the same plant
   d) male and female flowers present on different plants

4) The following number of testicular lobules are present in each testis of humans
   a) 50 b) 150 c) 250 d) 450

5) The Secretions of the acrosome help the sperm entry into the cytoplasm of the ovum through the.....
   a) Zona pellucida and the plasma membrane b) Corona radiata and the plasma membrane
   c) Plasma membrane and the zona pellucida d) plasma membrane and the corona radiata

6) The followings are one of the most widely accepted methods of contraception in India
   a) Condoms b) Paills c) IUD's d) Diaphragm

7) In Incomplete dominance, F2 Generation shows the following ratio.....
   a) 1:1 b) 1:2:1 c) 9:3:3:1 d) 3:1

8) The untranslated region (UTRS) are present on m-RNA at .....
   a) 5 end b) 3 end c) both 5 end and 3 end d) None of the above

9) In 1953 S.L. Miller an American Scientist created electric dischange in a closed flask containing the followings .....at 800^0c
   a) CH_3, NH_2, NH_3 and water vapour b) CH_4, H_2, and water vapour
   c) CH_4, NH_3, and water vapour d) CH_4, H_2, NH_3 and water vapour

10) Select the incorrect matching
   a) Typhoid..... bacterial disease b) Pneumonia.....Viral disease
   c) Common cold..... Viral disease d) AIDS .....Viral disease

11) Flocs means .....
   a) Masses of bacteria assosciated with fungul filaments to form mesh like structures
   b) Masses Of bacteria assosciated with protozoans to form mesh like structures
   c) Masses of Protozoans assosciated with fungul filaments to form mesh like structures
   d) Masses of bacteria associated with bacteriophages to form mesh like structures

12) Isolation of the genetic material (DNA) is achived by treating the bacterial cellls with the enzyme.....
   a) Lysosome b) Lysozyme c) Cellulase d) Chitinase

13) The capacity to generate a whole plant from explant is called.....
   a) Biopotency b) Totipotency c) Pleuripotency d) Tissue culture

14) With reference to population interactions select the odd one

	Spacies-A	Species-B	Name of Interaction
a	+	+	Mutualism
b	-	-	Parasitism
c	+	-	Predation
d	+	o	Commensalism

15) Net primary productivity represents.....
a) GPP-R=NPP b) GPP+R=NPP c) GPPXR=NPP d) GPP / R = NPP

II. Fill in the blanks by choosing the appropriate word/ words from those below. 1x5=5
(Convergent evolution, stratification, trophoblast, Aneuploidy, Immigration)

16) The blastomeres in the blasto cyst are arranged into an outer layer called.....
17) Failure of segregation of chromatids during cell division cycle results in gain OR loss of chroomosome (s) called.....
18) .....results the analogous structures
19) ..... is the number of individuals of the same species have come into the habitat from else where during the time period under consideration
20) .....is the vertical distribution of different species occupying different levels

PART-B

III. Answer any five of the following questions in 3-5 sentences whereve applicable. 2x5=10

21) Write karyotype of klinefleter's syndiome and turner's syndrome
22) what is adaptive radiation ? give two examples
23) List the four barriers of innate immunity with one example each
24) Distinguish between B-lymphocyte and T-lymphocyte
25) Name the microbes that are used in industries to produce the following acids
a) Citric acid b) Acetic acid
26) Write a note on gel electrophorosis
27) Mention any four modifications of genetically modified plants
28) List the four causes of biodiversity losses in the nature

PART-C

IV. Answer any five of the following question in 40-80 words each wuerever applicable. 3x5 = 15

29) Draw a neat labbelled diagram of mature female gamtophyte.
30) Write the schematic representation of Spermatogensis.
31) Explain the Schematic structure of transcription unit in DNA.
32) Distinguish between Homologous and Analogous organs.
33) Describe the structure of an antibody molecule.
34) How the tools of recombinant DNA tecnology are helpful in gentic engineering?
35) Explain the role of Decomposers in an ecosystem.
36) What is conservation? Differentiate between insitu and exsitu conservation.

PART -D

SECTION - I

V. Answer any four of the following questions in about 200-250 words each wherever apllicable 5x4=20

37) Describe the Structure of T.S of microsporangiun with a neat labbelled diagram.
38) Draw a neat labelled diagram of sectional view of female reproductive system.
39) Expand ART Explain any four technologies to over come the problem of infertility.
40) Explain the inheritance of two genes with a classical example.
41) What is genetic code? Write any four salient features of genetic code.
42) Explain the swtich on and switch off mechanism with reference to lactose metabolism in E.Coli.
43) Describe the life cycle of plasmodium.
44) Discuss the role of microbes in sewage treatment process.

PART-D

SECTION - II

VI. Answer any one of the following question in about 200-250 words. Each werever applicable. 5x1=5

45) What is Incomplete dominanc? Explain it with suitable example.
46) Explain the structure of P^{BR-322} with neat labelled diagram.
47) Define the following terms
a) Mutualism b) Parasitism c) Predation d)Commensalism e) Competition

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Department of Pre University Education

DISTRICT P.U. COLLEGE PRINCIPAL'S ASSOCIATION

PRE-24 KT 12

P.U.C. II Year Preparatory Examination 2023-24

SUB : BIOLOGY (36)

Date : 24-01-2024

Time: 10.00 am to 1.15 pm

Max. Marks : 70

General Instruction :
- This Question paper consists of four parts A, B, C, and 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 whenever necessary. Unlabeled diagrams do not carry any marks

PART-A

I. Select the correct alternative from the choices given below: 1x15=15

1. Polygonum type of embryosac is _____
   a) 7-celled, 7-nucleate b) 7-celled, 8-nucleate c) 8-celled, 7-nucleate d) 8-celled, 8- nucleate
2. Which of the following statement is incorrect?
   a) Sporogenous tissue is haploid. b) Endothecium produces the microspore.
   c) Tapetum nourishes the developing pollen. d) Hard outer layer of pollen is called intine.
3. The embryo with 8 to 16 blastomeres is called _____
   a) Zygote b) Morula c) Placenta d) Blastocyst
4. Foetal ejection reflex in human female is induced by _____
   a) Placenta only b) Fully developed foetus & placenta
   c) Release of oxytocin from pituitary gland d) Release of fully developed corpus luteum
5. Progestasert and LNG-20 are _____
   a) Implants b) Copper releasing IUD's c) Non-medicated IUD's d) Hormone releasing IUD's
6. To form embryo in-vitro, the male gamete is transferred into female gamete directly. Such technique is called
   a) IUI b) IUT c) ICSI d) GIFT
7. Sickel-cell anaemia is an example of _____
   a) Sex-linked inheritance b) Deficiency disease c) Autosomal heritable disease d) Infectious disease
8. Information flow or central dogma of molecular biology is _____
   a) RNA →Proteins →DNA b) DNA →RNA→RNA c) RNA →DNA→ Proteins d) DNA→ RNA →Proteins
9. The finches of Galapagos islands provide an evidence in favour of _____
   a) Evolution due to mutation b) Retrogressive evolution c) Biogeographical evolution d) Special creation
10. Amoebiasis is caused by _____
    a) Entamoeba histolytica b) Escherichia coli c) Clostridium botulium d) Plasmodium Vivax
11. The symbiotic association between fungi and roots of higher plants is called _____
    a) Lichen b) Mycorrhiza c) Biofertilizer d) BOD
12. Biolistics (gene-gun) is suitable for _____
    a) DNA finger printing b) Disarming pathogen vectors
    c) Transformation of plant cells d) Constructing recombinant DNA molecule.
13. If in a pond, there were 20 lotus last year and through reproduction 8 new plants are added taking current population to 28, the birth rate per year is _____
    a) 0.2 b) 0.4 c) 0.6 d) 0.8
14. Energy flow in an ecosystem is _____
    a) Unidirectional b) Bidirectional c) Multidirectional d) All of these
15. Which one of the following is an example of ex-situ conservation?
    a) National park b) Wild life sanctuary c) Seed bank d) Sacred groves

II. Fill in the blanks by choosing the appropriate word/words from those given below: 1x5=5

(Mac-Arthur principle, Relaxin, Gause's principle, Saltation, Linkage, Non-endospermic)

16. The seed in which endosperm is used by embryo is called seed _____
17. Hormone secreted by the ovary in the later phase of pregnancy is _____
18. The physical association of genes on a chromosomes is called _____
19. _____ is termed as single-step large mutation.
20. Two closely related species competing for the some resources cannot co-exist indefinitely and the competitively inferior one will be eliminated eventually this is known as _____

P.T

PART-B

Answer any FIVE of the following questions in 3-5 sentences wherever applicable: 2x5=10

21. Mention any four sexually transmitted diseases.
22. Why "Saheli" is a well-accepted contraceptive pill? Justify with two reasons.
23. What is Pleiotrophy? Give an example.
24. Differentiate homologous and analogous organs.
25. List any two differences between cell mediated and Humoral Mediated immunity.
26. What are secondary lymphoid organs? Give two examples.
27. Expand the abbreviation a) LAB b) BOD
28. Diagrammatically represent an ideal pyramid of energy.

PART-C

Answer any FIVE of the following questions in 40-80 words each wherever applicable: 3x5=15

29. a) What is pollination? b) What type of pollination is expected in cleistogamous flower?
    c) Give an example for hydrophilly.
30. Draw a diagrammatic sketch of the Lac operon when lactose is present in the medium.
31. Write a note on fertilization and implantation.
32. Draw a neat labeled diagram of "Stanley-Miller" experiment.
33. What are pest resistance plants? Mention their significance by giving an example.
34. List any three applications of Biotechnology.
35. a) Tropical region has greater biodiversity than temperate region. Justify the statement with two reasons.
    b) What are sacred groves?
36. Explain the important steps involved in the process of decomposition.

PART-D Section - I

Answer any four of the following questions in about 200-250 words each wherever applicable: 5x4=20

37. Draw a neat labeled diagram of sectional view of mammary gland.
38. Explain dihybrid cross experiment in garden pea plant with reference to shape and colour of the seeds.
39. Describe replication of HIV or retrovirus with schematic representation.
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. Mention any five useful household products and the microbes involved in it.
42. What is genetic code? Explain any four silent features of genetic code.
43. a) What is a bioreactor? 1
    b) Briefly describe stirred tank bioreactor. 4
44. a) Graphically represent the exponential growth curve. 2
    b) Mention equation for exponential growth curve. 1
    c) Write any four factors that influence population density. 2

PART-D Section - II

Answer any one of the following questions in about 200-250 words each wherever applicable 5x1=5

45. a) Name the organic material of exine part of pollen grain. How is this material advantageous to pollen grain? (2)
    b) Still it is observed that it does not form a continuous layer around the pollen grain. Give reason (1)
    c) How are "Pollen banks" useful ? (2)
46. In snapdragon a cross between true-breeding red flowered (RR) plants and true-breeding white flowered (rr) plants showed a progeny of plants with all pink flowers.
    a) What is this phenomenon known as? (1)
    b) Show the cross with schematic representation. (3)
    c) Mention their phenotypic & genotypic ratio. (1)
47. Fill the missing data in the table depicting diseases, their causatives and symptoms.

Name of the disease	Causative organism	Symptoms
I) Ascariasis	Ascaris	
II)	Trichophyton	Appearance of dry, scaly lesions on various parts of the body
III) Pneumonia	Streptococcus pneumoniae	
IV) Typhoid		High fever weakness, headache stomach pain, constipation
V)	Rhino viruses	Nasal congestion and discharge, sorethroat, cough, headache

II PU Preparatory Examination 2023-2024

SUBJECT - BIOLOGY (36)

Duration: 3hr 15min | 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 section-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: **1X15=15**

1. Pollen viability for rice and wheat plant is
   (a) 30 hrs (b) 30 minutes
   (c) Several months (d) 30 seconds
2. In some plants stigma and anther mature at different times because
   (a) It attracts pollinators (b) It prevents cross pollination
   (c) It facilitates self pollination (d) It facilitates cross pollination
3. Which layer of blastocyst gets attached to the endometrium
   (a) Trophoblast (b) Umbilical cord
   (c) Inner cell mass (d) Both (a) & (c)
4. Accessory ducts of reproductive system of human female include
   (a) Oviduct, Uterus & Vagina (b) Oviduct, Ovaries & Mammary glands
   (c) Oviduct, Ovaries & Ovarian ligaments (d) Ovaries, Uterus & Vagina
5. Saheli was developed by scientists at _____ in India
   (a) Indian Institute of Science (b) Central Drug Research Institute
   (c) Indian Institute of Technology d) Acropolis
6. The technique of transferring gametes directly into the fallopian tube is called
   (a) GIFT (b) IVF
   (c) ET (d) ZIFT
7. Gynecomastia is a symptom of
   (a) Turner's syndrome b) Cri-du-chat syndrome
   (c) Down's syndrome d) Klinefelter's syndrome
8. In which region of the tRNA molecule is the amino acid binding site located?
   (a) 5' end (b) 3' end
   (c) Anticodon loop (d) None of the above
9. Genetic drift operates only in
   (a) Small population (b) Larger population
   (c) Island population (d) Isolated population
10. One of the side effect of the use of anabolic steroids in females
    (a) Cirrhosis of liver (b) Masculinisation
    (c) Loss of memory (d) Hallucination
11. Baculovirus used as biological control agents belongs to the genus
    (a) Eubacteria (b) Nucleopolyhedrovirus
    (c) Cyanobacteria (d) T4 phages
12. Most suitable method of introducing alien DNA into a plant cell is
    (a) Biolistics (b) Lipofection
    (c) Microinjection (d) Heat shock method

13. The "Two closely related species competing for the same resources cannot co-exist indefinitely and the competitively inferior will be eliminated eventually" was aid by the principle
(a) Gause's competitive exclusion principle (b) MacArthur principle
(c) Resource partitioning (d) Connell's elegant field experiment
14. The breakdown of detritus into smaller particles by earthworm is a process called
(a) Humification (b) Mineralisation
(c) Fragmentation (d) Catabolism
15. Extinction of Steller's sea cow has resulted from
(a) Mutualism (b) Co extinction
(c) Over exploitation (d) Mass extinction

II. Fill in the blanks by choosing the appropriate word/Words from those given below: 1x5=5
(Honey Bees, Spermatogonia, Coelacanths, Chasmogamous, Emigration, Sertoli cells)
16. _____ flowers which are similar to flowers of other species with exposed anthers and stigma
17. After spermiogenesis sperm heads become embedded in the _____
18. Haplo-diploid sex determination is seen in _____
19. The ancestors of modern day frogs and salamanders are _____
20. Number of individuals of the population who left the habit and gone elsewhere during a given time period is _____

PART-B

Answer any FIVE of the following questions in 3-5 sentences wherever applicable : 2x5=10
21. Mention any two natural methods of birth control.
22. What is amniocentesis? Write its significance.
23. What are the conclusions drawn by T.H Morgan from the crossing experiment in Drosophila with respect to linkage?
24 Differentiate between Homologous and Analogous organs by giving plant examples.
25. What is contact inhibition? Mention the types of tumors.
26. What are ophioids? How Heroin is obtained?
27. How the fungal genus Glomus benefits plants?
28. Distinguish between primary productivity and secondary productivity in an ecosystem

PART-C

Answer any FIVE of the following questions in 40-80 words wherever applicable: 3x5=15
29. Write three advantages offered by the seeds to angiosperms.
30. Name the accessory glands of male reproductive system
31. Draw schematic structure of transcription unit
32. Darwin finches of Galapagos Islands represent one of the best examples for adaptive radiation Comment with valid reasons.
33. Mention the 3 basic steps in genetically modifying an organism.
34. Write a note on Biopiracy with reference to "Basmati Rice".
35. Why do tropical regions have greater biodiversity than temperate regions?
36. Construct an ideal pyramid of energy when 1,000,000 J of sunlight is available label all its trophic levels.

PART-D Section-I

Answer any FOUR of the following questions in about 200-250 words each wherever applicable: 5x4=20

37. Draw a neat labeled diagram of the human female reproductive system.
38. State and explain the law of independent assortment with the help of inheritance of two genes
39. Explain how lac operon ensures the switching on and switching off of genes during lactose metabolism.
40. (a) Name the causative agents of
    (i) Malaria (ii) Filariasis (iii)Amoebiasis
    (b) Write the confirmatory test for Typhoid
    (c) Give an example for autoimmune disease
41. Describe semiconservative mode of DNA replication with a diagram.
42. (a) Mention the biological role of
    (i) Statins (ii) Cyctorporin A (iii) Streptokinase
    (b) Name the microbes used in the production of
    (i) Citric acid (ii) Acetic acid
43. (a) Explain the features of cloning vector
    (b) Write the functions of the following in genetic engineering
    (i) Thermus aquaticus (ii) DNA ligase
44. Mutualism is a method of population interaction. Explain with examples.

Section-II

Answer any ONE of the following question in about 200-250 words wherever applicable: 5x1=5

45. (a) "Cleistogamous flowers produce assured seed-set in the absence of pollinators". Justify the statement
    (b)How does pollination is achieved in vallisneria
46. (a) Describe the individuals with the following chromosomal abnormalities
    (i) Trisomy of chromosome 21 (ii) 44A+XXY
    (b) A plant with yellow flowers was crossed with a plant with red flowers. The F1 progeny obtained had orange flowers. What is the inheritance pattern?
47. What is the role of each of the following in the body defenses
    (a) Antihistamines
    (b) B-lymphocyte
    (c) T-lymphocytes
    (d) PMNL
    (e) Interferons

H – O –

GOVERNMENT OF KARNATAKA

DEPARTMENT OF PRE-UNIVERSITY EDUCATION (PRE-UNIVERSITY)

PUC-II YEAR PREPARATORY EXAMINATION-2024

Time : 3 Hours 15 Minutes | SUBJECT : **BIOLOGY (36)** | MARKS : 70

Instructions : 1) The question paper consists of four parts A,B,C & D.
2) Part-A consists of I & II and Part-D consists of two parts. Section V and VI.
3) All the parts are compulsory.
4) Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any mark.

18/20

PART -A

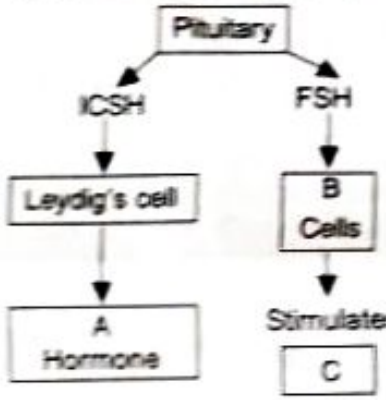
I. **Select the correct alternative from the choices given below :** 15X1=15

1) A dioecious flowering plant prevents
a) Geitonogamy and Xenogamy b) Autogamy and Xenogamy
c) Autogamy and geitonogamy d) Cleistogamy and Xenogamy

2) The fruit which shows poly Embryony condition
a) Potato b) Mango c) Banana d) Potato lemon

3) Which one of the following is not a male accessory gland ?
a) Bulbourethral gland b) Ampulla
c) Prostate d) Seminal Vesicle

4) The observing flow-chart is related to spermatogenesis under the hormonal control in which you have to identify A, B, C



	A	B	C
a)	Progesterone	Follicular	Spermatogenesis
b)	GnRH	Follicular	Spermatogenesis
c)	GnRH	Sertoli	Spermatogenesis
d)	Androgens	Sertoli	Spermatogenesis

5) Medical Termination of pregnancy (MTP) can be performed in all given cases except
a) Pregnancy can be fatal to foetus and mother with an accident
b) Unwanting pregnancy resulting from rape
c) Conception due to failure of the contraceptives
d) Pregnancy was reached middle of the third trimester

6) Which of the following is a test cross ?
a) TTxTT b) TtxTt c) Ttxtt d) ttxtt

7) The copper releasing IUD is
a) Multiload 375 b) Lippes loop c) LNG-20 d) Progestasert

8) Pick out the wrong statement about Euchromatin
a) It stains dark b) It is loosely packed
c) It is transcriptionally active chromatin d) It stains light

9) The Brain capacity of Neanderthal man is
a) 900 CC b) 650 CC c) 1400 CC d) 200 CC

10) The plant from which marijuana charas and ganja is produced
a) Cannabis sativa b) Erythroxylum coca
c) Papaver somniferum d) Vinca rosea

11) Blood-Cholesterol lowering agent is extracted from
a) Bacteria b) Yeast c) Fungus d) Algae

12) The correct sequence of PCR is
a) Annealing→Denaturation→Extension b) Denaturation→Extension→Annealing
c) Denaturation→Annealing→Extension d) Extension→Denaturation→Annealing

[P.T.O]

13) The number of deaths in the population during a given period is
a) Natality b) Mortality c) Emigration d) Immigration

14) In the food chain, the saprophytic organisms are
a) Producers b) Consumers c) Predators d) Decomposers

15) The total number of wildlife sanctuaries in India, is
a) 90 b) 448 c) 14 d) 03

II. Fill in the blanks by choosing the appropriate word/words from those given in bracket : 5X1=5
(Anitrum, Tapetum, Tyrannosaurus, Aneuploidy, Lichens, Mycorrhizae)

16) ..... is the innermost wall layer of the microsporangium.
17) The fluid filled cavity of tertiary follicle is called .....
18) ..... is the Failure of segregation of chromatids during cell division cycle which results in the abnormal number of chromosome (S) in individuals.
19) The biggest dinosaur is .....
20) ..... is the symbiotic association between the fungi and the roots of higher plants.

PART -B

III. Answer any FIVE of the following questions in 3-5 sentences wherever applicable : 5X2=10

21) List out any four venereal diseases.
22) What are the suggested reasons for population explosion ?
23) Define the terms : i) Pleiotrophy ii) Polygenic inheritance
24) Differentiate between Homologous and analogous organs.
25) Name the Pathogens which are responsible for Pneumonia.
26) i) Which bacterium is used in the preparation of Swiss cheese ?
ii) What is the reason for big holes in Swiss cheese ?
27) Enlist the tools of recombinant DNA technology.
28) What is food chain ? Mention their types.

PART-C

IV. Answer ANY FIVE of the following questions in 40 -80 sentences each, wherever applicable : 5X3=15

29) What is Seed ? Write the difference between albuminous and exalbuminous seed.
30) Explain the Sex-determination in Honey Bee.
31) Write the schematic structure of transcription unit.
32) State Hardy-Weinberg principle and mention any four factors that affect it.
33) Mention the three critical areas of research in biotechnology.
34) Define the following terms : i) Stratification
ii) Primary productivity iii) Standing crop
35) Briefly explain the three levels of Biodiversity.
36) Name the techniques in the diagnosis of some bacterial/ viral diseases in human beings.

PART-D (Section - V)

V. Answer any FOUR of the following questions in 200-250 words each wherever applicable : 4X5=20

37) Draw a Neat labelled diagram of human female reproductive system.
38) Write the Pedigree symbols of the following : i) Sex unspecified
ii) Consanguineous mating iii) five unaffected offsprings
iv) affected individuals v) Female (5M)
39) Give the schematic representation of retrovirus.
40) Explain the Messelson and Stahl's experiment.
41) Write the steps involved in DNA finger-printing.
42) Describe the secondary treatment of primary effluent.
43) Explain the separation and isolation of DNA fragments by using gel Electrophoresis.
44) Describe Verhulst-Pearl Logistic growth with the help of population growth curve.

(Section - VI)

VI. Answer any ONE of the following questions in about 200- 250 words each wherever applicable : 1X5=5

45) Double fertilization is unique feature of angiosperms. Discuss.
46) State and justify the law of independent assortment with a suitable example.
47) i) Compare between benign tumour and malignant tumour. (2M)
ii) Mention any four methods of cancer diagnosis. (2M)
iii) Name a biological response modifier used in the treatment of cancer. (1M)

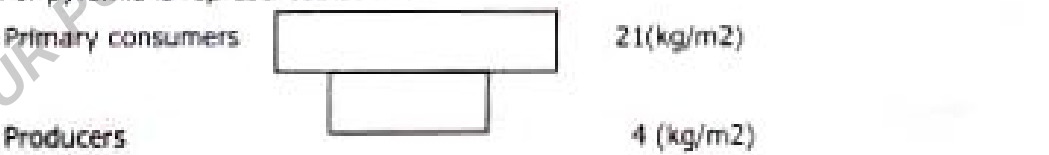
Time: 3.15 Hours Subject: **BIOLOGY (36)** Max. Marks: 70

INSTRUCTIONS: i) The question paper consists of four parts A,B,C and D.
ii) Part - A consists of section I & II and Part - D consists of section V & VI
iii) All the parts are compulsory
iv) Draw diagrams wherever necessary. Unlabelled diagrams do not attract any marks.

PART – A

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

1. In a pollen grain the large cell with abundant reserve food is
   a) Generative cell b) Vegetative cell c) microspore mother cell d) megaspore mother cell
2. The residual and persistent nucellus in the seed is observed in
   a) Pea b) Groundnut c) Wheat d) Black pepper
3. The last part of oviduct with narrow lumen is
   a) ampulla b) Infundibulum c) womb d) Isthmus
4. Transfer of embryos with more than 8 blastomeres into the uterus refers to
   a) IUT b) IUI c) ZIFT. d) ICSI
5. When a cross is made between tall plant with yellow seeds (TtYy) and tall plant with green seed (Ttyy). What is the proportion of tall & green plants and dwarf & green plants
   a) 3:1 b) 1:3 c) 6:1. d) 1:6
6. In sickle cell anaemia Hbs at the 6th position has the amino acid
   a) Glutamic acid. b) Valine c) Proline d) Leucine
7. In lac operon , the enzyme that increases the permeability of the cell to ß – galactosides is
   a) ß – galactosidase b) transacetylase c) permease d) RNA polymerase
8. Which of the following statements are true
   i) Increase in melanised moths after industrial revolution in England is proof for Natural selection
   ii) When more individuals acquire a mean character value it is called disruption
   iii) Gene frequency of a population remains constant according to Hardey-Weinbergs principle
   a) i & ii are correct . b) i & iii are correct c) ii & iii are correct d) only i is correct
9. Which of the following set includes only bacterial disease?
   a) Amoebiasis,Ascariasis,Filariasis b) Typhoid,Pneumonia,Plague
   c) Common cold,Typhoid,Malaria d) Malaria,Typhoid,Pneumonia
10. Morphine is extracted for the latex of
    a) Erythroxylum coca . b) Atropa belladona c) Cannabis sativa d) Papaver somniferum
11. Baculoviruses (nucleopolyhedrovirus) do not show
    a) Species specific b) narrow spectrum applications
    c) negative impact on non target insects d)utility in IPM programme
12. Dragon flies used to get rid of
    a) mosquitoes . b) aphids c) caterpillars d) both (a) & (b)
13. The capacity to generate a whole plat from explant refers to
    a) micropropagation b) totipotency c) somatic hybridisation, d) production of somaclones
14. Which kind of pyramid is represented below ?



    a) pyramid of numbers in terrestrial ecosystem b) pyramid of biomass terrestrial ecosystem
    c) pyramid of biomass in aquaqtic ecosystem d) pyramid of numbers in aquqtic ecosystem
15. Genetic diversity refers to to
    a) the presence of different types of genes in different species
    b) Existence of genetically different strains of same species
    c) presence of different species in an ecosystem d) Both a and b

II Fill in the blanks by choosing the appropriate word/words from those given below 5 X 1 = 5
(colostrum, apomixis , Gross primary productivity, Genetic drift, Elution)

16. Production of seeds without fertilization is called _____
17. Change in gene frequency by chance is _____.
18. _____ is the yellowish fluid secreted by mother during the initial days of lactation.
19. Cutting of agarose gel and extraction of DNA from it is called _____
20. _____ of an ecosystem is the rate of production of organic matter during photosynthesis.

PART - B

III Answer any FIVE of the following questions in 3 – 5 sentences each, wherever applicable. 5 X 2 = 10

21. Differentiate spermiogenesis & spermiation
22. What is a Pleiotropic gene? Give an example.
23. How do euchromatin differs from heterochromatin ?
24. Draw a neat labeled diagram showing structure of antibody molecule.
25. Write the scientific name of the source and the application of Statin.
26. Mention any two methods of introducing alien DNA into host cells.
27. Sketch and label PBR -322.
28. Write the equation for exponential growth and logistic growth.

PART - C

IV Answer any FIVE of the following questions in 40 – 80 words each, wherever applicable. 5 X 3 = 15

29. Mention any three out breeding devices in flowering plants.
30. What is placenta? Mention hormones secreted by it.
31. What are the criteria to be fulfilled by a molecule that can act as genetic material?
32. List salient features of genetic code.
33. a) Differentiate active and passive immunity
    b) Define allergy
34. Draw labeled diagram of biogas plant.
35. Mention three steps in Polymerase chain reaction.
36. Write a note on limitations of ecological pyramids.

PART - D

V. Answer any FOUR of the following questions in 200- 250 words each, wherever applicable. 4 X5=20

37. Explain the process of development of embryosac.
38. Draw a labeled diagram showing sectional view of mammary gland.
39. a) List the complications of untreated sexually transmitted infections in females -2
    b) Mention the methods of natural contraceptives -3
40. Describe incomplete dominance.
41. How does the sex is determined in Honeybees? Describe
42. a) Differentiate template strand & coding strand during transcription - 2
    b) Explain division of labour in RNA Polymerase - 3
43. Write a note on Origin & evolution of man
44. What is Innate immunity? Add a note on types of barriers.

VI. Answer any ONE of the following questions in 200- 250 words each, wherever applicable. 1 X 5=5

45. What are cry proteins? Name an organism that produce it. How has man exploited this protein?
46. Based on the following examples, write the kind of population interaction expressed
    a) Sparrow eating any seed
    b) Balanus which excludes Chathamalus from intertidal area.
    c) Cuckoo and Crow
    d) Sea anemone & Clown fish
    e) Flowering plants and Pollinators
47. a) Explain any three major causes of biodiversity loss. -3
    b) What are biodiversity hotspots? Give an example. -2

MD

II PUC PREPARATORY EXAMINATION, JANUARY - 2024

II

Time : 3:15 Hours | BIOLOGY - 36 | Max. Marks : 70

General instructions:

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

PART-A

I. Select the correct alternative from the choices given below: **1x15=15**

1) The phenomenon, wherein the ovary develops into a fruit without fertilization is called
a) Parthenocarpy b) Apomixis c) Asexual reproduction d) Sexual reproduction

2) The method of directly injecting a sperm into ovum in assisted reproductive technologies is called
a) GIFT b) ZIFT c) ICSI d) ET

3) Analogous organs arise due to
a) Divergent evolution b)Artificial selection c) Genetic drift d) Convergent evolution

4) The technology of biogas production from dung of cattle was developed in India largely due to the efforts of
a) Gas Authority of India
b) Oil and Natural gas Commission
c) Indian Agricultural Research Institute and Khadi and Village Industries Commission
d) India Oil Corporation

5) Amensalism is an association between two species where:
a) One species is harmed and other is benefitted
b) One species is harmed and other is unaffected
c) One species is benefitted and other is Unaffected
d) Both the species are harmed

6) Pyramid of numbers is
a) Always upright
b) Always inverted
c) Either Upright or inverted
d) Neither Upright nor inverted

7) The historic Convention on Biological Diversity held in Rio de Janerio in 1992 is known as
a) CITES Convention b) G-16 Summit c) The Earth Summit d) MAB programme

8) In an embryosac ;the cells that degenerate after fertilization are
a) Synergids and primary endosperm cell
b) Synergids and antipodals
c) Antipodals and primary endosperm cell
d) Egg and antipodals

9) Which of the following hormones is not secreted by human placenta?
a) hCG b) Estrogen c) Progesterone d) LH

10) A person having genotype I^AI^B would show the blood group as AB. This is because of
a) Pleiotropy b) Co-dominance c) segregation d) incomplete dominance

11) The formula exponential population growth is
a) dN/dt=rN b) dt/dN =rN c) dN/rN =dt d) rN/dN =dt

12) While planning for an artificial hybridization programme involving dioecious plants, which of the following steps would not be relevant
a) Bagging of female flower b) Dusting of pollen on stigma c) Emasculation d) Collection of pollen

(P.T.O.)

13) The correct sequential order of reproductive events in human
a) Insemination→fertilization→implantation→gestation→parturition
b) parturition→gestation→implantation→Insemination→fertilization
c) gestation→implantation→fertilization→Insemination→parturition
d) Insemination→implantation→fertilization→gestation→parturition

14) In E-coli the lac operon gets switched on when
a) Lactose is present and it binds to the repressor
b) Repressor binds to operator
c) RNA polymerase binds to the operator
d) Lactose is present and it binds to RNA polymerase

15) Many diseases can be diagnosed by observing the symptoms in the patient. Which group of symptoms are indicative of typhoid?
a) Difficulty in respiration, fever, chill, cough, headache
b) Constipation, abdominal pain, cramps, blood clots
c) Nasal congestion and discharge, cough, sore throat, headache
d) Sustained high fever (39°c to 40°c), weakness, stomach pain, loss of appetite, constipation, headache

II. Fill in the blanks by choosing the appropriate word/words from those given below: **1x5=5**

(Male heterogamety, Placenta, saltation , Saheli, Elution ,Female heterogamety)

16. A structural and functional unit between developing embryo(foetus) and maternal body is called _____
17. The phenomenon in which the males produce two types of gametes with respect to determination of sex is called_____
18. Single step large mutation that causes speciation is called _____
19. _____ is a once a week pill with very few side effects and high contraceptive value .
20. _____ is the process in which the separated bands of DNA are cut out from the agarose gel and extracted from the gel piece .

PART -B

III. Answer any FIVE of the following questions in 3-5 sentences wherever applicable: **2x5=10**

21. Report two reasons for infertility among young couple.
22. Enumerate the complications that untreated sexually transmitted infections can lead to .
23. What is test cross ? Mention its significance.
24. Mention the factors that affect Hardy- Weinberg equilibrium .
25. If a regular dose of drug or alcohol is not provided to an addicted person he shows some withdrawal symptoms. List any four such withdrawal symptoms.
26. Differentiate exonucleases from endonucleases.
27. What are the functional components of ecosystem.
28. Name any two industrially important enzymes.

PART-C

IV. Answer any FIVE of the following questions in 40-80 words each wherever applicable: **3x5=15**

29. Differentiate between spermatogenesis and oogenesis.
30. Draw a neat labelled diagram of a typical anatropous ovule
31. What is mutation? Mention their types.
32. Name the ancestral forms of man in the order of their evolution.
33. What are the types of agriculture for increasing food production.
34. Expand GEAC. Mention its objectives and responsibilities.
35. What is pyramid of numbers? Give the graphical representation of pyramid of numbers in a grassland ecosystem.

36. a) What is endemism? 1
    b) Name the biodiversity hot spots in India. 2

PART-D SECTION-I

V. Answer any FOUR of the following questions in about 200-250 words each wherever applicable: 5x4=20

37. Draw a neat labelled diagram of Human female reproductive system .
38. Explain the inheritance of one gene with schematic representation
39. Describe Meselson and stahl's experiment that proved semiconservative DNA replication.
40. What are lymphoid organs? Explain the types with examples.
41. Mention the attributes shown by a population, but not by an individual species.
42. What is an age pyramid? What is its significance?
43. Describe the role of microbes as biofertilisers.
44. a) Explain the process of polymerase chain reaction in amplification of desired DNA. 3
    b) Draw a labeled diagram of pBR322 vector DNA. 2

SECTION-II

VI. Answer any one of the following questions in about 200-250 words each wherever applicable: 5x1=5

45. In angiosperms, seed is described as fertilised ovule. A seed consists of seed coat(s),cotyledon(s) and an embryonal axis . Mature seeds may be non-albuminous and albuminous. Nucellus does not persist in mature seeds, occasionally in some seeds remnants of nucellus are also persistent. In context to this,
    a) Identify the part of seed which is thick and swollen due to storage of food reserve (as in legumes). 1
    b) Cite an example for non-albuminous and albuminous seeds each. 2
    c) Name the remnants of persistent nucellus by giving two examples 2

46. Colour blindness is one of the example for inheritance of X-linked Recessive traits.
    a) Enlist the characteristic features of inheritance of X-linked recessive traits. 2
    b) A normal visioned woman ,whose father is colourblind, marries a normal visioned man. What would be probability of her sons and daughters to be colour blind.explain with the help of a pedigree chart. 3

47. In a community health check up programme in a village. A community health officer was explaining to villagers about vector borne diseases that spreads during rainy season. He also explained one of the type of disease malaria shows chill and high fever recurring every 3 to 4 days. From the above piece of Information,
    a) Mention the insect vector which transmit the disease and causative agent of disease malaria.
    b) Explain the reason for developing such symptoms of this disease.
    c) Name the species that causes malignant malaria. P. falciparum

SECOND PUC PREPARATORY EXAMINATION, JANUARY 2024

SUB: BIOLOGY (36)

Time: 3.15 Hrs] [Max. Marks: 70

General Instructions:

a) *The Question paper consists of FOUR parts A, B, C and D.*
b) *Part – A consists of I & II and Part – D consists of two parts, Section V and VI*
c) *All the parts are compulsory.*
d) *Draw diagram wherever necessary, Unlabelled diagrams or illustrations do not carry any marks.*

PART – A

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

1) Occurence of more than one embryo in a seed is referred to as
   a) Apomixis b) Polyembryony c) Parthenogenesis d) Parthenocarpy
2) Mention the organic resistant material present in the exine of pollengrains
   a) sporopollenin b) cellulose c) Starch d) pectin
3) Write the scientific name of the plant from which coca alkaloid is obtained
   a) Marijuana b) Erythroxylum coca c) Cannabis sativa d) Opium
4) Phenyl ketonurea is an example for
   a) Polygenic inheritance b) Pleiotropy c) Sexualdimorphism d) aneuploidy
5) Sterile female is the symptom of
   a) Klinefeller's syndrome b) Turner's syndrome c) down's syndrome d) Haemophilia
6) Enzyme which acts as molecular scissors is
   a) DNA ligase b) Restriction endonuclease c) exonucleases d) DNA polymerase
7) Example for harmone releasing IUDs
   a) CU – 7 b) Lippes loop c) LNG – 20 d) Multiload 375
8) Antibodies produced due to Allergy is.
   a) IgE b) IgA c) IgM d) IgD
9) Extra chromosomal DNA found in bacteria Salmonella typhimurium.
   a) Vector b) plasmid c) tumor d) recombinant DNA
10) organisms that enrich nutrient quality of soil is
   a) Microrganisms b) Earthworm c) Biofertilisers d) Sacchharomyces cerevisiae
11) Example for immunosuppressive agent is
   a) Statins b) Cyclosporin A c) methanogens d) Streptokinase
12) First gene therapy was given to treat a disease known as
   a) Diabetes melitus b) Thalessemia c) ADA deficiency d) Haemophilia
13) When a species becomes extinct the plant and animal species associated with it in an obligatory way also become extinct is called
   a) Endemism b) Co-extinctions c) Over exploitation d) Alien species invasions
14) Baculoviruses belongs to the genus
   a) retrovirus b) Nucleopoly hedrovirus c) trichoderma d) Aspergillus niger
15) Drug called Heroin is syntherized by
   a) Methylation of Morphine b) demethylation of morphine
   c) Acetylation of morphine d) deacetylation & morphine

Fill in the blanks by choosing appropriate word/words from those given below: **5 x 1 = 05**

(Homologous. Thymus, endemism, analogous organ, menarche. Homologous organ)

16) Example for primary lymphoid organ is _____
17) Eyes of octopus and that of mammals is example for _____
18) First menstruation beginning at puberty is called _____
19) Thorn and tendrils of Bougain villea and cucurbita represent _____
20) Species confined to particular area not found anywhere is termed as _____

PART – B

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

21) Mention any two principles to prevent STD.
22) Expand the following.
    a) GIFT b) ZIFT c) ICSI d) IUT
23) Explain Pleiotropy briefly.
24) Draw the schematic structure of Transcription unit.
25) Differentiate divergent evolution from Convergent evolution
26) Name the biological products obtained from the following organisms
    a) Aspergillus niger b) Clostridium butylicum
27) Write the brain capacity of:
    a) Homo habilis b) Homo erectus
28) List any four approaches to treat cancer.

PART – C

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

29) Draw a neat labelled diagram of L.S of an embryo of grass.
30) Schematically represent spermatogenesis.
31) Explain the process of polymerase chain reaction in amplification of desired DNA.
32) a) What is species diversity?
    b) Mention the causes of biodiversity losses.
33) Explain the packaging of DNA Helix (Nucleosome) in Eukaryotes.
34) Write a diagrammatic representation of pyramid of numbers in a grassland eco system.
35) List any three advantages of Genetically modified plants.
36) Draw a neat labelled diagrammatic representation of Stanly Miller's experiment.

PART – D

Section – I

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

37) Sketch and label the sectional view of human female reproductive system.
38) Write any four outbreeding devices in plant. Which type of pollination is controlled by out breeding devices.
39) What is law of Segregation? Write the Schematic representation of monohybrid cross in pea plants.
40) Describe the biological treatment of primary effluent.
41) Mention the steps in rDNA technology
42) Define Innate Immunity. Explain the four types of barriers with respect to Innate Immunity
43) Explain the regulation of lac-operon concept in gene regulation.
44) Define the following terms
    a) Natality b) Mortality c) Immigration d) Emigration e) Ammensalism

Section – II

Answer any ONE of the following questions in about 200 – 250 words each, wherever applicable: **1 x 5 = 05**

45) Describe a matured embryo sac with a neat labelled diagram.
46) Explain any two Mendelian disorders
47) Name the causative organisms for the following diseases.
    a) Ascariasis b) Amoebiasis c) Common cold
    d) Pneumonia e) Elphentiasis

* * * * * * *

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RN

II PUC PREPARATORY EXAMINATION, JANUARY - 2024

II

Time : 3 Hours 15 min. BIOLOGY - 36 Max. Marks : 70

GENERAL INSTRUCTION:

1. The question paper consists of four parts A, B, C, D
2. PART A consists of i and II and part D consists of V and VI
3. All the parts are compulsory
4. Draw diagrams wherever necessary, unlabelled diagrams do not attract any marks

PART A

I Select the correct alternative from the choices given below: 15×1=15

1. Identify the odd one from the following
   a. Labia Minora b. Fimbriae c. Isthmus d. Ampulla
2. Microsporangium is generally surrounded by four wall layers that are involved in protection, dehiscence and nourishment of pollen grains. Which of the following layers of microsporangium posses more than one nucleus
   a. Epidermis b. Endothecium c. Middle layers d. Tapetum
3. A cross between two tall plants resulted in offspring having few dwarf plants. What would be the genotypes of both the parents?
   a. TT and Tt b. TT and TT c. Tt and Tt d. Tt and tt
4. The disease caused by *Haemophilus influenzae* is _____
   a. Influenzae b. Haemophilia c. Pneumonia d. Elephantiasis
5. Drug "Heroin" is synthesized by
   a. Methylation of Morphine b. Demethylation of Morphine
   c. Acetylation of Morphine d. Deacetylation of Morphine
6. The fragmented DNA can be visualized by staining DNA with
   a. NaCl b. Ethylene bromide c. NaBr d. Ethidium Bromide
7. Bt toxin kills the insect by
   a. Blocking mitochondrial respiration b. creating pores in body surface
   c. creating pores in Midgut d. Blocking transfer of nerve impulse
8. Carbon cycle is an example for
   a. Sedimentary nutrient cycle b. Gaseous nutrient cycle c. Hydrological cycle d. Calvin cycle
9. The missing trophic level in the below flow chart is
   SUN------→PRODUCERS------→PRIMARY CONSUMER------→------?---- ------→TERTIARY CONSUMER
   a. Quarternary consumer b. Secondary consumer c. Plants d. Eagle
10. Electrostatic precipitator is used in
    a. Nuclear power plants b. Hydroelectric power stations
    c. thermal power plants d. solar power stations
11. Homologous organs represent
    a. Convergent evolution b. Divergent evolution c. Anthropogenic evolution d. Genetic drift
12. All are examples of albuminous seeds except
    a. Wheat b. Sunflower c. Castor d. Groundnut
13. Under HGP the largest known gene was of
    a. Somatotrophin b. Dystrophin c. Insulin d. Somatostatin
14. Cirrhosis of the liver is caused by the chronic intake of
    a. Opium b. Alcohol c. Tobacco (chewing) d. Cocaine
15. The immunity conferred by B- lymphocytes is also known as
    a. Immediate b. Histological c. Humoral d. Cell-mediate

II Fill in the blanks by choosing correct word that are given below in bracket: 5×1=5

[Thermus aquaticus, parthenocarpy, food web, 'S'strain, ELISA, 'R'strain)

16. AIDS is mainly diagonised by _____
17. In Griffith's experiment mice died when it was injected with _____ of *Sterptococcus pneumoniae*

(P.T.O.)

18. The process of formation of seeds without fertilization is called _____
19. The natural interconnection of food chains forms a _____
20. The bacterium from which thermos stable endonuclease is isolated is _____

PART-B

III Answer any Five of the following questions in 3-5 sentences each, wherever applicable: **5×2=10**

21. Mention two symptoms of Turner's syndrome
22. List four evil quartets of biodiversity losses
23. Write the role of the following cells: a. Sertoli cells b. Leydig cells
24. Name the nucleotides of DNA.
25. Why the cells of Malignant tumors considered dangerous?
26. Draw a neat labeled diagram of typical Agarose gel electrophoresis.
27. Define sewage. What is the need for sewage treatment?
28. Give the four applications of biotechnology.
29. Represent an ideal pyramid of number of grassland ecosystem

PART-C

IV Answer any five of the following questions in 40-80 words, wherever applicable: **5×3=15**

30. What is infertility? Give two reasons for infertility in humans.
31. Mention three applications of DNA fingerprinting technique.
32. Classify the following as examples of Homologous and Analogous organs
    i) Tubers of potato and sweet potato
    ii) forelimbs of horses and wings of birds
    iii) Wings of birds and wings of insects
33. What is bio control? Give any two examples.
34. Draw a graph showing exponential growth curve.
35. List any three functions of placenta.
36. Explain XX-XO type of sex determination.

PART D

V Answer any three of the following questions in 200-250 words each wherever applicable: **3×5=15**

37. Draw a neat labeled diagram of Male reproductive system.
38. List five characters of genetic code.
39. What is innate immunity? Explain four types of barriers of innate immunity
40. Describe any five roles of microbes in household products.
41. Explain the five important steps in the process of decomposition.
42. Mention the different steps in the process of recombinant DNA technology.

VI Answer any two of the following questions in 200-250 words each wherever applicable: **2×5=10**

43. Name the type of interaction seen in each of the following:
    i. Ascaris worm living in the intestine of man.
    ii. Wasp pollinating in fig inflorescence.
    iii. Clown fish lives among tentacles of sea anemone.
    iv. Mycorrhizae living on the roots of higher plants.
    v. Orchid growing on a branch of mango tree.
44. Give the schematic representation of spermatogenesis.
45. Explain inheritance of one gene with an example.
46. Describe the structure of double helical structure of DNA.
47. How does RNA interference help to develop resistance in tobacco crop for nematode infestation.

GOVERNMENT OF KARNATAKA
DEPUTY DIRECTOR, DEPT. OF SCHOOL EDUCATION (PRE-UNIVERSITY)

PUC-II YEAR PREPARATORY EXAMINATION-2024

Time : 3 Hours 15 Minutes | SUBJECT : **BIOLOGY (36)** | MARKS : 70

Instructions : 1) The question paper consists of four parts A,B,C & D.
2) Part-A consists of I & II and Part-D consists of V & VI.
3) All the parts are compulsory.
4) Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any marks.

PART -A

I. Select the correct alternative from the choices given : **15X1=15**

1. Which of the following is not an invasive alien species in Indian context ?
   a) Cynodon b) Parthenium c) Eichhornia d) Lantana

2. 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

3. Which of the following is plasmid ?
   a) PBR 322 b) Bam HI c) SaL I d) E-CORI

4. Match the following list of the Bioactive molecules and their roles

Bioactive molecule	Role
i) Statin	a) Removal of oilstain
ii) Cyclosporin	b) Remove clot from blood vessel
iii) Streptokinase	c) Lower Blood cholesterol
iv) Lipase	d) Immuno suppresive agent

   a) i-c, ii-d, iii-b, iv-a b) i-b, ii-a, iii-d, iv-c c) i-d, ii-b, iii-a, iv-c d) i-b, ii-c, iii-a, iv-d

5. Statement I : Bone marrow and thymus are primary Lymphoid organs
   Statement II : It is organ to which lymphocytes migrate, interact with organ with antigens and then proliferate to become effector cells.
   a) Both statement I and II are correct b) Both statement I and II are incorrect
   c) Statement-I is correct, Statement-II incorrect
   d) Statement-I is incorrect, statement-II is correct

6. The most accepted line of descent in Human evolution is :
   a) Ramapithecus →Homohabilis →Homoerectus →Homosepien
   b) Ramapithecus →Homoerectus →Homohabilis →Homosepien
   c) Homoerectus →Homohabilis →Homosepien →Ramapithecus
   d) Homohabilis →Ramapithecus →Homosepien →Homoerectus

7. The net electric charge on DNA and Histone is :
   a) Negative and positive b) Both negative
   c) Both positive d) None

8. Person having genotype $I^A I^B$ would show the Blood group AB. This is because of
   a) Co-dominance b) Pleiotropy c) Segregation d) In-complete dominance

9. "SAHELI" a new oral contraceptive developed by
   a) All India Institute of Medical Science b) Central Drug Research Institute
   c) Health care Pvt. Ltd., d) Bharat Immunologicals Ltd.,

10. Which among following first country in the world to initiate plan and programmes at National level to attain reproductive Health as social goal ?
    a) CHINA b) INDIA c) JAPAN d) USA

11. In 28 days, woman menstrual cycle, ovulation occurs on
    a) 1st day b) 5th day c) 14th day d) 28th day

12. Location and secretion of Leydig's cells are
    a) Liver - Cholesterol b) Ovary - estrogen
    c) Testis - Testosterone d) Pancreas - Glucagon

13. Heterostylous flowers are
    a) Wind-pollinated b) Self-pollinated c) Cross pollinated d) insect-pollinated

14. Egg appartus consists of
a) Egg-cell and antipodal cell b) Egg-cell and central cell
c) Egg-cell and two synergid d) Egg cell and one syneroid

15. Number of individuals of same species that have come into habitat from elsewhere during time period is
a) Migration b) Immigration c) Emigration d) None

II. Fill in the blanks by choosing the appropriate word from those given in below : 5X1=5
(Aneuploidy, Ammensalism, Malay Archepalago, Monocarpellary, Scrotum, Pedigre Analysis)

16. Alfred Wallace a naturalist who worked in .....
17. Testis situated outside abdominal cavity within a pouch called .....
18. Gynoecium consists of a single pistil is .....
19. Study of family history about inheritance of particular trait is .....
20. A population interaction, where one species is harmed and other species is unaffected is .....

PART -B

III. Answer any FIVE of the following questions in 3-5 sentence each, wherever applicable : 5X2=10

21. Briefly comment on Detritus food chain.
22. Define : a) Vasactomy b) Tubactomy
23. Differentiate between Homologous organ and Analogous organ.
24. Mention causative agent of pneumonia and symptoms of it.
25. What are the role of immune system ?
26. i) Define Biophyracy (1M)
ii) Expand GEAC (1M)
27. What is mutation and give example for classical mutation ?
28. Why IUD's are ideal contraceptives for woman and widely accepted ?

PART-C

IV. Answer ANY FIVE of the following questions in 40 -80 sentences each, wherever applicable : 5X3=15

29. Draw and label schematic structure of Transcription unit.
30. a) State Hardy Weinberg principle. (1M)
b) Mention any two factors of Hardy weinberg principle. (1M)
c) Name fish caught in south africa in year 1938 to be extinct. (1M)
31. Define terms : a) Parturition b) Fetal ejection reflex c) Lactation (3M)
32. What are outbreeding devices and mention devices which promote outbreeding ?
33. Mention three basic steps in development of Genetically modified organism.
34. a) What is Ex-situconservation ? Give two examples of it. (2M)
b) Name technique gamets of threatened species preserved in viable and fertile condition for long period. (1M)
35. Write three limitations of ecological pyramid.
36. How Biotechnology applications in molecular diagnosis ?

PART-D (Section-I)

V. Answer any FOUR of the following questions in 200-250 words each wherever applicable : 4X5=20

37. Explain TWO GENES of inheritance with suitable example.
38. Describe the process of Lac-operon concept of Generegulation.
39. Schematically represent process of OOGENESIS.
40. Define terms : a) FIOCS b) Biochemical oxygen demant
c) Bio control agents d) Biogas e) Biofertilisers (5M)
41. Describe the structure of T.S of immatured anther and label it.
42. Draw and lable the different stages in life cycle of plasmodium.
43. Mention FIVE steps in Recombinant DNA technology.
44. a) Mention population attributes. (2M)
b) Draw shape of pyramids that reflects the growth status of population. (3M)

(Section - II)

VI. Answer any ONE of the following questions in about 200- 250 words each wherever applicable : 1X5=5

45. a) Name source and effects of coccaine or coca alkaloids. (2M)
b) What are side effects of Anabolic steriods in Female. (3M)
46. i) What are Mendel disorders ? Give two examples. (2M)
ii) What is Aneuploidy and polyploidy. (2M)
iii) Name genetic disorder is presence of additional copy of chromosome number 21. (1M)
iv) Salient features of Human Genome Project.

Department Of School Education (PUC)

II PUC Preparatory Examination January, 2024

BIOLOGY (36)

Time: 3 Hours 15 Minutes **Max. Marks: 70**

Instructions: 1. This paper consists of four parts: A, B, C and D.
2. Part-A consists of I & II and part –D consists of V & VI.
3. All parts are compulsory. 4. Draw diagrams wherever necessary, unlabelled diagrams or illustration do not attract any marks.

PART-A

I. SELECT THE CORRECT ALTERNATIVE FROM CHOICES GIVEN BELOW: 1X15=15

1. Perisperm is found in
   a) Black pepper b) Wheat c) Maize d) Groundnut.
2. The tallest flower of the world is
   a) Yucca b) Hibiscus c) Amorphophallus d) Sunflower
3. Number of autosomes in human primary spermatocyte is
   a) 22 b) 23 c)44 d)46
4. A small part of the fallopian tube is removed or tied up through a small incision in abdomen
   a) Vasectomy b) Tubectomy c) MTP d) IUD
5. A foetal sex determination test
   a) Widal test b) ART c) PCR d) Amniocentesis
6. A cross between F_1 plant and its recessive parents
   a) Dihybrid cross b) Mono hybrid cross c) Test cross d) Incomplete dominance
7. The child of O-group has B-group father. The genotype of father will be
   a) ii b) I^BI^B c) I^AI^B d) I^Bi
8. Fore limbs of humans and wings of birds are
   a) Analogous organs b) Homologous organs c) Vestigial organs d) parallel organs
9. Identify the wrongly matched pair
   a) Typhoid –Salmonella typhi b) Ringworm-Rhino virus
   c) Filariasis-Wuchereria malayi d) Malaria-Plasmodium vivax
10. Lactic acid bacteria convert milk into curd and improve nutrition by increasing vitamin.
    a) A b)B_6 c) D d)B_{12}
11. Species confined to that region and not found anywhere else
    c) Lion safari b) Sacred groves c) Endemism d) Zoo.
12. The formula of exponential population growth curve, is
    a) dN/ dt=rN b) dt/ dN=rN c) dN/ rN=dt d) rN/dn=dt
13. The path of energy flow in an ecosystem is
    a) Herbivores → Producer → Carnivores → Decomposer
    b) Herbivores → Carnivores → Producer → Decomposer
    c) Producer → Carnivores → Herbivores → Decomposer
    d) Producer → Herbivores → Carnivores → Decomposer

14. Cessation of menstrual cycle in women is called
    a) Menopause b) Ovulation c) Menarch d) Menses
15. In slit genes, the coding sequences are called
    a) Operons b) Introns c) Exons d)Amnion

II FILL IN THE BLANKS BY CHOOSING THE APPROPRIATE WORD/WORDS FROM THOSE GIVEN BELOW: 1X5=5

(emasculation, saltation, resource partitioning, implantation , bioreactors)

16. The removal of anthers from the flower bud, _____
17. _____ is the process of attachment of blastocyst in the endometrium of uterus.
18. Single step large mutation is called _____.
19. The mechanism that promotes the coexistence of competing species, _____
20. The vessels in which raw materials are biologically converted into specific products are called_____

PART-B

III ANSWER ANY FIVE OF THE FOLLWING QUESTIONS IN 3TO 5 SENTENCES EACH, WHEREVER APPLICABLE. 2x5=10

21. Is sex education necessary in school? Why.
22. List any four complications, a person suffer from untreated STDs.
23. a) Name the type of immunity, the mother provides to the newborn baby.
    b) Which type of antibody present in colostrums?
24. What is pedigree analysis? Suggest how such an analysis can be useful.
25. Name the ancestors of man based on the features given below:
    a) Human like, vegetarian, with brain capacity between 650cc - 800cc.
    b) Man like primate that existed about 15 mya. Fossils found in Tanzania.
26. What is the difference between genetic engineering and bioprocess engineering?
27. Construct an ideal pyramid of energy. Where 1000000 Joules of sunlight is available. Label all its trophic level.
28. Name the blank spaces **a, b, c** and **d** given in the following table:

Type of Microbe	*Name*	*Commercial product*
Bacterium	a	Lactic acid
b	Trichoderma polysporum	Cyclospoin A
Fungus	Monascus purpureus	c
fungus	d	penicillin

PART-C

IV ANSWER ANY FIVE OF THE FOLLWING QUESTIONS IN ABOUT 40 TO 80 WORDS EACH, WHEREVER APPLICABLE. 3x5=15

29. Explain any three out breeding devices.
30. Briefly describe the process of spermatogenesis.
31. ATGGAGTACTTCGTGTGA is the coding strand of DNA in a transcription unit.
    a) Write the mRNA transcribed from this DNA segment.
    b) How many amino acids does it code for? Why.
32. Draw a neat labeled diagram of miller's experiment.
33. Mention any two molecular diagnostic techniques and write one application of each.
34. What is a GMO? List any two advantages of a GMO.
35. Why earthworm is considered a farmers friend? List any two factors that enhance the rate of decomposition.
36. Explain rivet popper hypothesis?

PART-D

SECTION-I

V ANSWER ANY FOUR OF THE FOLLWING QUESTIONS IN ABOUT 200 TO 250 WORDS EACH, WHEREVER APPLICABLE. 5x4=20

37. Draw a neat labeled diagram of the sectional view of human mammary gland.
38. a) Differentiate between male heterogamety and female heterogamety.
    b) Explain the mechanism of sex determination in birds.
39. Explain incomplete dominance with reference to flower colour in snapdragon.
40. a)Draw a neat labeled diagram of nucleasome.
    b) Why does hnRNA need to undergo splicing? Where does splicing occur in the cell?
    c) Write the number of genes found on Y-chromosome of humans.
41. Secondary treatment of sewage is also called biological treatment. Justify and explain the process.
42. List any five steps that could be taken in prevention and control of alcohol and drug abuse in adolescents.
43. a) Describe any three ways used to introduce a desired DNA segment into a bacterial cell in recombinant DNA technology.
    b) Name the organism from where the thermostable DNA polymerase is isolated. State its role in genetic engineering.
44. Explain the different ways of diagnosing cancer.

SECTION-II

VI ANSWER ANY ONE OF THE FOLLWING QUESTIONS IN ABOUT 200 TO 250 WORDS EACH, WHEREVER APPLICABLE. 5x1=5

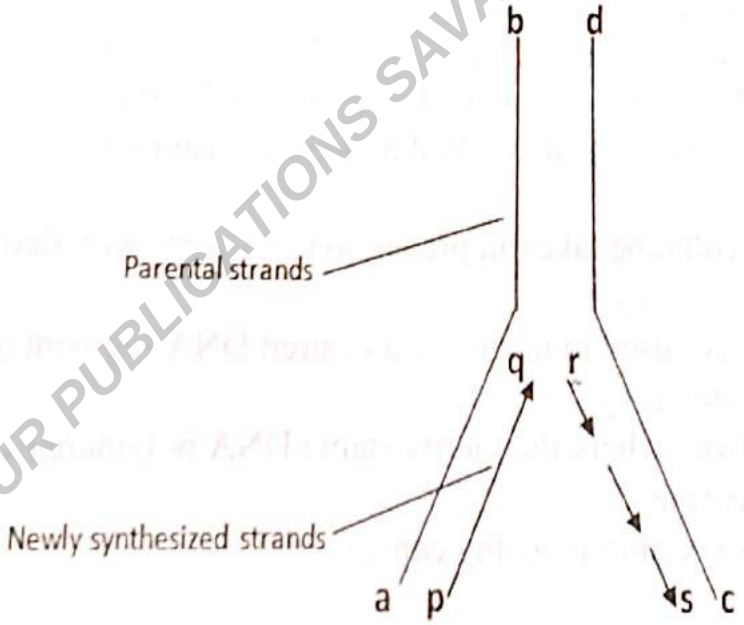
45. Parthenocarpic and apomixis have been observed in some plants. Give an example of each. State a similarity and differences observed between the two processes. Apomixis is a type of asexual reproduction. Justify.

46. Living organism cannot live in isolation and they do interact in various ways to form biological communities. (+ indicates positive effects, - indicates negative effects and 0 indicates no effects on the species). Study the following table and answer the questions that follow:

Species A	Species B	Name of interaction
+	+	P
-	-	Q
0	-	R
+	0	S

a) Name the type of population interaction of P, Q, R, and S.
b) Give one example to each type of interaction.
c) Define the type of interaction 'Q'

47. The DNA replication fork is shown below. Observe the sketch and answer the questions.



a) When does DNA replication take place in the cell of eukaryotes?
b) Name the main enzyme that catalyses this process.
c) Identify the polarity of the strands a-b and c-d.
d) DNA ligase can be considered as molecular glue. Justify.
e) Why is DNA synthesis continuous (p-q) and discontinuous(r-s) on the two strands?

TUMAKURU DISTRICT P.U. COLLEGES PRINCIPALS' ASSOCIATION (R.)

II PUC PREPARATORY EXAMINATION JANUARY-2024

Subject Code : 36 | **BIOLOGY** | Total No.of Ques.47

Time : 3-15 hours | Max Marks : 70

General Instructions: 1] This Question paper consists of four parts A, B, C and D.
Part-A consists of I and II and Part-D consists of two parts Section-V and Section-VI
2] All the parts are compulsory.
3]Draw diagrams wherever necessary. Unlabelled diagrams do not carry any marks .

PART -A

I Select the correct alternative from the choices given below: 15x1=15

1) Developing pollengrains are nourished by ____
a]Pollen mother cells b] Epidermalcells
c] Endothecium cells d] Tapetum

2) Which among the following has haploid set of chromosomes?
a]Spermatogonia b] Zygote
c] Primary spermatocyte d] Secondary Spermatocyte

3) Amniocentesis is used to ____
a]Test Foetal sex b] Test for the presence of certain genetic disordes
c]Determination of survivability of foetus d] All the above

4) The term 'Linkage ' was coined by ____
a]Henking b] Gregor Mendel c] Sutton & Boveri d] T.H. Morgan

5) The basic amino acids that gives positive charge to histone proteins are ____
a] Lysine & Histidine b] Lysine & Arginine
c] Tyrosine & Valine d] Glycine & Valine

6) Variety of beaks in finches observed by Darwin in Galapagos island is an example for ____
a]Mutuations b] Divergent evolution
c] Natural selection d] Adaptive radiation

7) Biological response modifiers such as alpha-interferons are given to the patients suffering from____
a] AIDS b]Cancer c] Rheumatoid arthritis d] Malaria

8) Cyanobacteria that fix atmospheric nitrogen is ____
a]Azotobacter b] Rhizobium c] Azospirillum d] Nostoc

9) Baculoviruses may be used to control ____
a] Insects & Arthropods b] Butterfly Caterpillars
c] Aphids & Mosquitoes d] Nematodes

10) The vector used to deliver gene of interest into animal cells are ____
a] Ti Plasmid of agrobacterium b] Disarmed retroviruses
c] pBR322 d] Trasposons

11) The milk produced by [illegible]

a] Alpha 1 -antitrypsin b] alpha lactalbumin c] Healthier fat d] Carbohydrates

12) Statement I: Gause's competitive exclusion principle states that two closely related species competing for the same resources cannot coexist indefinitely and the competitively inferior one will be eliminated eventually.

Statement II : Recent studies also point out that species facing competition might evolve mechanisms like 'resource partitioning' that promotes coexistence rather than exclusion.

a] Statement I is correct and statement II is incorrect

b]Both the statements I and II are correct

c] Statement I is incorrect and Statement II is correct

d] Both the statements I and II are incorrect

13) Pyramid of energy is always upright, can never be inverted because____

a]some energy is gained at each step during their flow from one trophic level to the next

b]Some energy is lost at each step during their flow from one trophic level to the next.

c]Energy at lower trophic level is always more than higher trophic level.

d] Both (b) and (C)

14) According to Robert May the global species diversity is of about ____

a] 20 millions b] 5 millions c] 7 millions d] 50 millions

15) The relation between species richness and area for a variety of taxa on a logarithmic scale is _____

a] Rectangular hyperbola b] Straight line

c] Sigmoid curve d] Triangular curve

II Fill in the blanks by choosing the appropriate word/words from those given below: [Emigration, Aneuploidy, Polyploidy , Trophic level, over exploitation, Staphylococci] **5x1=5**

16) Turners disease is due to _____

17) Alexander Fleming discovered penicillin while working on _____

18) The density of a population in a given habitat will be decreased by ____

19) The specific place occupied by organisms in the food chain based on their source of nutrition is ____

20) Stellar's sea cow and passenger pigeon were extincted due to _______

PART-B

Answer any FIVE of the following questions in 3-5 sentences wherever applicable : 5x2=10

21) What is Syncarpous and Apocarpous condition?

22) Which are the two major events that occur during follicular phase of menstrual cycle?

Cont...

23) List advantages of using Drosophila melanogaster by Morgan in his experiments.
24) What are the possible number of phenotypes and genotypes in the progeny blood group when both their parents are heterozygous A?
25) Differentiate between primary and secondary lymphoid organs .
26) Name the microbes used to obtain cyclosporine A and statins respectively.
27) What is Gel electrophoresis? Name the stain used to visualise DNA fragments under UV light.
28) Differentiate between in -situ and Ex-sito conservation with examples .

PART-C

Answer any FIVE of the following questions in 40-80 words each wherever applicable : **5x3=15**

29) Draw a neat labelled diagram of a mature embryosac.
30) What is Placenta? Name the hormones produced by them .
31) Write symptoms and causes for phenylketonuria .
32) Explain Griffiths transforming principle experiment .
33) State Hardy-Weinberg principle of genetic equilibrium and mention the factors affecting genetic equillibrium.
34) Sketch and label diagrammatic representation of Miller's experiment .
35) Explain the process of secondary treatment of sewage.
36) What is primary productivity? Why does it varies in different types of ecosystems

PART-D
SECTION -V

Answer any FOUR of the following questions in 200-250 words each wherever applicable : **5x4=20**

37) Sketch and label sectional view of mammary gland.
38) What is infertility? Explain any 4 ARTs to overcome this problem .
39) Explain salient features of human genome .
40) Explain the translation process.
41) a] Identify a, b and c in the below table.

Pathogen	Disease
a	Pheumoniae
Wuchereria bancrofti	b
c	Malaria

Pneumoniae

b] Differentiate between active and passive immunity.

42) What is gene therapy? Explain the possible methods of treating ADA deficiency.
43) Draw and explain a logistic curve for a population density (N) at a time (t) whose intrinsic rate of natural increase is (r) and carrying capacity (K)
44) a] Draw a neat labelled diagram of simple stirred tank bioreactor .
b] Explain the process of amplification of gene of interest using PCR.

P.T.O.

SECTION -VI

Answer any ONE of the following question in 200-250 words each wherever applicable : 1x5=5

45) Though cultivation of hybrid varieties tremendously increased productivity, seeds collected from them are not admissible for sowing. Justify with reasons and discuss about possible approach to overcome this problem.

46) a] In human beings sex of the child is determined by father and not by mother. Justify with your answer. 3

b]Identify the abnormality and symptoms due to either mutation or deletion of a gene involved in the synthesis of one of the globin chain that make up haemoglobin. 2

47) a] A patient suffering from malfunctioning of kidney needs transplantation. Why kidney from any source -an animal, another primate or from any human beigns are not transplanted. What are the pre and post essential measures to be followed during transplantation. 3

b]Exposure to pollen triggers sneezing in some individuals . Name the condition and chemicals responsible for it. 2

✦✦✦✦✦✦✦

Udupi District II Term Examination - 2023

II P.U.C – BIOLOGY (36)

Date: 21.12.2023 Duration: 90 min Max Marks: 35

General Instructions:

1. The question paper consists of four parts A, B, C and D.
2. Part-A consists of I and II and Part-D consists of V and VI.
3. All the parts are compulsory.
4. Draw diagram wherever necessary, unlabelled diagrams (or) illustrations do not attract any marks.

PART-A

I. Select the correct alternative from the choices given below **1×7= 7**

1. Which of the following enzymes catalyse the removal of nucleotides from the ends of DNA?
   (A) Endonuclease (B) Exonuclease (C) DNA ligase (D) Hind – II
2. α -1 antitrypsin is:
   (A) An antacid (B)An enzyme
   (C) Used to treat arthritis (D) Used to treat emphysema
3. Which of the following would necessarily decrease the density of a population in a given habitat?
   (A) Natality > mortality (B) Immigration > emigration
   (C) Mortality and emigration (D) Natality and immigration
4. Which of the given statements is correct in the context of visualizing DNA molecules 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
5. Silencing of a gene could be achieved through the use of:
   (A) RNAi only (B) Antisense RNA only
   (C) Both RNAi and antisense RNA (D) DNA only
6. Two closely related species competing for the same resource cannot co-exist indefinitely and the competitively inferior one will be eliminated eventually. This is the statement of
   (A) Connell's elegant field experiment
   (B) Gause's competitive exclusion principle
   (C) Mac Arthur experiment competitive release
   (D) Mac Arthur resource partitioning.
7. Plasmids present in the bacterial cells are
   (A) Linear double helical RNA molecules
   (B) Linear double helical DNA molecules
   (C) Circular double helical RNA molecules
   (D) Circular double helical DNA molecules

P.T.O

II. Fill in the blanks by choosing the appropriate word from the given below. (*Bacillus thuringiensis, Ophrys, Agrobacterium tumefaciens*) 1x3=3

8. _____, a pathogen of several dicot plants is able to deliver a piece of DNA known as 'T-DNA' to transform normal plant cells into tumour cells.
9. Bt toxin is produced by a bacterium called _____,
10. The Mediterranean orchid employs 'sexual deceit' to get pollination done by a _____, species of bee.

PART-B

III. Answer any THREE of the following questions in 3 to 5 sentences each, wherever applicable. 2x3=6

11. What is brood parasitism? Give an example.
12. Mention any four benefits of genetically modified plants.
13. Name four population attributes
14. What does the terms 'E', 'co' 'R' and 'I' refer to in the enzyme EcoRI?
15. Explain mutualism in mycorrhizae

PART-C

III. Answer any THREE of the following questions in about 40-80 words each, wherever applicable. 3x3=9

16. Draw a labelled diagram of simple stirred tank bioreactor.
17. Explain any three benefits of creating transgenic animals.
18. Define the following terms and give one example for each:
    (a) Commensalism (b) Camouflage (c) Interspecific competition
19. Give reasons for the following statements:
    (a) Alien DNA is linked with 'ori' site of a vector in gene cloning.
    (b) Restriction enzymes are called 'molecular scissors'.
    (c) Non-transformant bacteria cannot be grown on antibiotic containing media.

PART-D

III. Answer any TWO of the following questions in about 200-250 words each, wherever applicable. 5x2=10

20. List the various steps involved in Recombinant DNA technology with the help of a labelled diagram.
21. One of the applications of biotechnology is the production of insect-resistant crop plants. Justify the statement with reference to Bt cotton.
22. With the help of a diagram explain the separation and isolation of DNA fragments.
23. Explain Verhulst – Pearl logistic growth with a diagram and write its mathematical expression.

Code No.: SU 3826

II PUC PREPARATORY EXAMINATION JANUARY 2024

BIOLOGY (36)

Total No. of Questions : 47 | Total No. of printed pages : 4
Date : 25-01-2024 | Max Marks : 70
Time : 10.00 AM to 01.15 PM | Duration : 3 Hours 15 Minutes

General Instructions :-

- The Question paper consists of four parts A,B, C and 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. Unlabelled diagrams do not carry any marks.

PART - A

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

1. Filiform apparatus is seen in
   a) Generative cell b) Antipodals c) Synergids d) Central cell
2. Development of seed from an unfertilized egg is
   a) Vivipary b) Parthenocarpy c) Apogamy d) Apospory
3. The embryo with 8 to 16 blastomeres is called
   a) Blastula b) Blastocyst c) Morula d) Embryoblast
4. In human female, meiosis II is not completed until
   a) Puberty b) Fertilization c) Uterine implantation d) Cleavage
5. MTPs are considered relatively safe during the
   a) First trimester b) Second trimester c) Sixth month d) Sixth week
6. Trisomy of 21st chromosome causes
   a) Klinefelter's syndrome b)Turner's syndrome
   c) Haemophilia d)Down's syndrome
7. RNA is more labile and easily degradable due to the presence of
   a) Uracil base b) 2'-OH group at every nucleotide
   c) Thymine base d) Adenine base
8. Analogous organs are the result of
   a) Natural selection b) Divergent evolution
   c) Convergent evolution d) Mutation
9. The primary lymphoid organs are
   a) Bone marrow b) Thymus c) Spleen d) Both a and b
10. Methanogenic bacteria are not found in
    a) Rumen of cattle b) Gobar gas plant
    c) Water logged paddy fields d) Activated sludge

11. "Molecular scissors" used in genetic engineering is
    a) DNA ligase b) DNA polymerase
    c) Helicase d) Restriction endonuclease
12. The two polypeptides of human insulin are combined by creating
    a) Disulphide bonds b) Hydrogen bonds
    c) Phosphodiester bond d) Glycosidic bonds
13. Mutualism occurs between
    a) Sea anemone and clown fish b) Cuckoo and the crow
    c) Fungi and the roots of higher plants d) Tiger and the deer
14. Pyramid of energy is inverted in
    a) Grassland b) Tree c) Ocean d) None of these
15. The historic convention on biological diversity held in Rio de Janeiro in the year
    a) 2010 b) 1992 c) 2002 d) 2020

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

(Mango, co-dominance, Calotropis, Water, Lactational, Methionine)

16. In Vallisneria pollination takes place by_____
17. Immediately after parturition, women experience _____ amenorrhea.
18. When both the alleles of a gene are expressed, it is _____.
19. Triplet UUU codes for_____.
20. The plant which produces highly poisonous cardiac glycosides is _____ _____.

III. Answer any five of the following questions in 3-5 sentences each, wherever applicable: **5 x 2 = 10**

21. Why is "Saheli" considered a well accepted contraceptive pill?
22. How many chromosomes do drones of honey bee posess? Name the type of cell division involved in the production of sperms by them.
23. An infertile couple is advised to go for test tube programme. Describe two principal procedures adopted for that techniques.
24. When was earth formed? Why was prebiotic earth atmosphere in reduced state?
25. Expand and mention one application of ELISA.
26. What are biofertilizers? Give two examples.
27. Mention two types of food chain. Which food chain begins with death of organisms?
28. Tropical regions have greater biological diversity. Why?

IV. Answer any five of the following questions in about 40-80 words each, wherever applicable: **5 x 3 = 15**

29. Draw a neat labelled diagram of a fertilized embryo sac.

30. After implantation, interdigestion of maternal and foetal tissues takes place. Identify the tissues involved and justify their role.
31. a) Who suggested the triplet condon system
    b) Why is genetic code said to be
        i) degenerate ii) universal
32. State "Hardy-Weinberg" principle. Mention different factors known to affect it.
33. How are genetically modified plants useful to mankind?
34. The manipulation of living organisms by the human race can not go on any further, without regulation. Discuss the statement.
36. Write any three limitations of ecological pyramids.

PART-D

V. Answer any FOUR of the following questions in about 200-250 words each, wherever applicable : **4 x 5 = 20**

37. Explain important outbreeding devices seen in the flowers of angiosperms.
38. a) Draw a labelled diagram of sectional view of human ovary showing different stages of oogenesis.
    b) Where is morula formed in humans? Draw a flow chart to explain the process of its development from zygote.
39. Explain with suitable example Mendel's principle of independent assortment.
40. How did Hershy and Chase prove that DNA is the genetic material?
41. Answer the question according to instruction.
    a) Amoebiasis : Pathogen name, mode of infection, any 2 symptoms.
    b) Heroin : Which type of drug? What is its chemical composition?
42. Describe the process of sewage treatment.
43. What is bioreactor? Draw a labelled diagram of simple stirred tank bioreactor.
44. Explain with the help of a graph, the population growth curve when the resources are i) limiting and ii) unlimiting.

SECTION – II

VI. Answer any one of the following questions in about 200-250 words each wherever applicable : **1 x 5 = 5**

45. A normal visioned woman whose father is colour blind, marries a normal visioned man. What would be the probability of her sons and daughters to be colour blind? Explain with the help of a pedigree chart.
46. Give an outline of the steps involved in DNA finger printing.
47. What is innate immunity? Explain the role of four types of barriers in protection from infectious agents.

UKDPUCPA

II PUC PREPARATORY EXAMINATION JANUARY- 2024

BIOLOGY (36)

Time 3.15 Hours | Max Marks 70

General Instructions :

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

PART – A

I. Select the correct alternative from the choices given below: 1x15=15

1. Which one of the following statements is correct?
   a) Endothecium produces the microspores
   b) Tapetum nourishes the developing pollen grains
   c) Hard outer layer of pollen grain is called intine
   d) Sporogenous tissue is haploid
2. During microsporogenesis, meiosis occurs in
   a) Endothecium
   b) Microspore mother cells
   c) Microspore tetrads
   d) Pollen grains
3. In spermatogenesis, reduction division of chromosome occurs during conversion of
   a) spermatogonia to primary spermatocytes
   b) primary spermatocytes to secondary spermatocytes
   c) secondary spermatocytes to spermatids
   d) spermatids to sperms.
4. Select the incorrect statement:
   a) FSH stimulates the Sertoli cells which help in spermiogenesis
   b) LH triggers ovulation in ovary
   c) LH and FSH decrease gradually during the follicular phase
   d) LH triggers secretion of androgens from the Leydig cell
5. Which of the following is hormone releasing IUD?
   a) Lippes loop b) Cu7 c) LNG-20 d) Multiload 375
6. Which of the following is a foetal sex determination test?
   a) MTP b) Amniocentesis c) ZIFT d) GIFT
7. In sickle cell anaemia glutamic acid is replaced by valine. Which one of the following triplet codes for valine?
   a) GGG b) AAG c) GAA d) GUG
8. If a double stranded DNA has 20% of cytosine, what will be the percentage of adenine in it?
   a) 20% b) 40% c) 30% d) 60%
9. Antibodies present in colostrum which protect the new born from certain diseases is of
   a) IgG type b) IgA type c) IgD type d) IgE type.
10. Diosaurs dominated the world in which of the geological era?
    a) Devonian b) Caenozoic c) Jurassic d) Mesozoic

11. Cyclosporin A is used for
    a) dissolving blood clots b) lowering cholesterol level
    c) immunosuppression d) none of the above
12. 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 bromidestained DNA can be seen in visible light
    (d) Ethidium bromide stained DNA can be seen under exposure to UV light
13. Biodiversity is the term popularized by the biologist
    a) Karl Marx b) Edward Wilson
    c) Herbert Spencer d) Robert E. Park
14. The correct sequence in the process of decomposition is
    a) Humification——Leaching——Catabolism—— Mineralization ——Fragmentation
    b) Catabolism——Leaching——Fragmentation——Humification—— Mineralization
    c) Leaching——Fragmentation ——Catabolism——Humification—— Mineralization
    d) Fragmentation ——Leaching——Catabolism——Humification——Mineralization
15. Lichens are the associations of:
    a) Bacteria and fungus b) Algae and bacterium
    c) Fungus and algae d) Fungus and virus

II. Fill in the blanks by choosing the appropriate word/Words from thosegivenbelow: **1x5=5**
(Co-dominance, Commensalism, Oxytocin, Thalamus, Fossils, Insulin)

16. The edible part of fruit apple is _____
17. Thefoetalejection reflex in humantriggers release of _____ hormones.
18. AB blood group inheritance is an example for _____
19. _____ are remains of hard parts of life-forms found in rocks.
20. Orchids growing as an epiphyte on a mango branch is an example for_____type of population interaction.

PART- B

III. Answer any FIVE of the following questions in 3–5 sentences wherever applicable: **2x5=10**

21. Name any two copper releasing IUDs.
22. Why is tubectomy considered as a contraceptive method?
23. Mention the two symptoms of Down's syndrome.
24. What are homologous organs? Mention an example.
25. Write the scientific names of the pathogens which cause:
    (a) Amoebiais
    (b) Ringworm disease
26. Differentiate between benign and malignant tumors.
27. Mention the scientific names of source organisms of acetic acid and streptokinase
28. Define productivity and mention its types.

PART - C

IV. Answer any FIVE of the following questions in 40 – 80 words each wherever applicable: **3x5=15**

29. Explain briefly pollination in *Zostera*.
30. Draw a neat labelled diagram of sectional view of seminiferous tubules.
31. Mention the anticodon of AUG. Justify the statement that AUG has dual role in translation.
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. (a) What is Bt toxin? (1M)
    (b) How does it kill cotton boll worms? (2M)
34. Explain any three benefits of creating transgenic animals.
35. Show diagrammatic representation of different trophic levels in an ecosystem.
36. "Tropical rain forests have greater biodiversity compared to temperate forest". Justify with three reasons.

PART–D - Section - I

V. Answer any FOUR of the following questions in about 200–250 words each wherever applicable: ***5x4=20***

37. Draw a labelled diagram of the sectional view of human female reproductive system.
38. State the law of independent assortment. Explain it with reference to the inheritance of colour and shape of the seed in pea plant.
39. Write the schematic representation of the life cycle of HIV.
40. Describe the experiment of Hershey – Chase which proves that DNA is the genetic material.
41. What is genetic code? Explain any four salient features of genetic code.
42. Write the products obtained from following microorganisms:
    a) Clostridium butylicum b) Aspergillusniger c) Saccharomyces cerevisiae
    d) Monascuspurpureus e) Penicillium notatum
43. (a) What is polymerase chain reaction? (1M)
    (b) Name the bacterium from which the polymerase enzyme used in this technique is obtained. (1M)
    (c) Write the schematic representation polymerase chain reaction technique. (3M)
44. What is mutualism? Explain any four examples of mutualism.

Section – II

VI. Answer any ONE of the following questions in about 200–250 words each wherever applicable: **5x1=5**

45. Why plants have developed devices to discourage self-pollination? Explain the devices that flowering plants have developed to encourage cross pollination.
46. What is pedigree analysis? Mention its significance. Write the representative pedigree chart of myotonic dystrophy as an example for autosomal dominant trait.

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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GOVERNMENT OF KARNATAKA

DEPUTY DIRECTOR, DEPT. OF SCHOOL EDUCATION (PRE-UNIVERSITY)

PUC-II YEAR PREPARATORY EXAMINATION-2024

Time : 3 Hours 15 Minutes | SUBJECT : **BIOLOGY (36)** | MARKS : 70

Instructions : 1) The question paper consists of four parts A,B,C & D)
2) Part - A consists of I and II and Part D consists of two parts, section-I and II
3) All the parts are compulsory.
4) Draw diagrams wherever necessary. Unlabeled diagrams do not carry any marks

PART-A

I. Select the correct alternative from the choices given below : **1X15=5**

1. Seeds offer many advantages to angiosperms because
   a) they maintain dormancy. b) they protect young embryo.
   c) they store food for young plants and facilitate dispersal d) All of the above
2. Statement 1: Endosperm is a nutritive tissue and it is triploid.
   Statement II: Endosperm is formed by fusion of egg nucleus with second male gamete.
   a) Both Statement I and Statement II are correct b) Both Statement 1 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. Which of the following produces sperms in spermatogenesis?
   a) Primary spermatocytes. b) Interstitial cells
   c) Sertoli cells d) Immature male germ cells.
4. Foetal ejection reflex in human female is induced by
   a) placenta only. b) fully developed foetus and placenta.
   c) release of oxytocin from pituitary gland. d) release of full developed corpus luteum.
5. Progestasert and LNG-20 are
   a) implants b) copper releasing IUDs
   c) non-medicated IUDs d) hormone releasing IUDs
6. The technique called gamete intra fallopian transfer (GIFT) is recommended for those females
   a) who cannot produce an ovum. b) who cannot retain the foetus inside uterus.
   c) whose cervical canal is too narrow to allow passage for the sperms.
   d) who cannot provide suitable environment for fertilization.
7. Human skin colour is a classic example for :
   a) Co-dominance b) Pleiotropy c) Polygenic inheritance d) Multiple alleles
8. In eukaryotes, mRNA is synthesized with the aid of
   a) RNA polymerase III. b) RNA polmerase II. c) RNA polymerase I. d) reverse transcriptase
9. The extinct human ancestor who ate only fruits and hunted with stone weapons was
   a) Ramapithecus b) Australopithecus c) Dryopithecus d) Homo habilis
10. To which type of barriers under innate immunity, do the saliva in the mouth and the tears from the eyes, belong ?
    a) Physical barriers b) Cytokine barriers c) Cellular barriers d) Physiological barriers
11. LAB mediated change of milk to curd occurs due to
    a) coagulation and partial digestion of milk fats. :
    b) coagulation and partial digestion of milk proteins.
    c) coagulation of milk proteins and complete digestion of milk fats.
    d) coagulation of milk fats and complete digestion of proteins.
12. Biolistics (gene-gun) is suitable for
    a) DNA finger printing. b) Disarming pathogen vectors.
    c) Transformation of plant cells d) Transformation of animal cells.
13. Mac Arthur observed that five closely related species of Warblers living on the same tree were able to avoid competition and co-exist due to
    a) behavioural differences in their foraging activities.
    b) cooperation in their foraging efforts.
    c) different kinds of insects they eat. d) all of the above
14. The pyramid of biomass in sea is generally
    a) linear b) upright c) inverted d) linear upright
15. Which of the following is considered a hot-spot of biodiversity in India?
    a) Indo-Gangetic Plain b) Eastern Ghats c) Aravalli Hills d) Western Ghats

II. Fill in the blanks by choosing the appropriate word/Words from those given below : 1X5=5
(Lobefins, Endemism, Dinosaurs, Acrosome, Synergid, Mutation)

16. The filiform apparatus is present in ———— cells of the embryo sac.

[P.T.O]

17. Enzyme containing cap like structure covering haploid nucleus of the sperm is ————
18. The phenomenon of alteration of DNA sequences which results in the changes in phenotype and genotype of an organism is called————
19. ——— are the animals which evolved into the first amphibians on this earth.
20. A species confined to a particular region and not found anywhere else is called ————

PART-B

Answer any FIVE of the following questions in 3 - 5 sentences wherever applicable: 2X5=10

21. List the possible ill-effects of various contraceptive methods.
22. Mention the reasons for infertility.
23. What is test cross? Mention its significance
24. What is divergent evolution? Give an example.
25. Distinguish between benign and malignant tumors.
26. Mention four side effects of the use of anabolic steroids in females.
27. Name the microbe used for statin production. How does it lower blood cholesterol level?
28. Define productivity and mention its types.

PART-C

Answer any FIVE of the following questions in 40 - 80 words each wherever applicable: 3X5=15

29. List three characters of flowers that help them to get pollinated by insects.
30. Mention the events that occur during the follicular phase of menstrual cycle.
31. Write the schematic structure of a transcription unit.
32. After industrialization in England, it was observed there were less white winged moths and more dark winged moths. Explain.
33. With reference to recombinant DNA technology, define :
    a) Microinjection b) Elution c) palindromic nucleotide sequences.
34. a) Transgenic animals can be used to produce biological products. Justify with two examples. (2M)
    b) Which transgenic animal is used to test the safety of polio vaccine ? (1M)
35. List out the three causes of loss of biodiversity.
36. What is decomposition? Mention two conditions which increase the rate of decomposition in ecosystem.

PART-D Section-I

Answer any FOUR of the following questions in about 200 - 250 words each wherever applicable : 5x4=20

37. Draw a neat labelled diagram of human female reproductive system.
38. State the law of Independent assortment. Explain it with reference to the inheritance of colour of the seed and shape of the seed in pea plant.
39. Write the diagrammatic representation of replication of a retrovirus.
40. Describe the experiment of Messelson and Stahl that proves that replication of DNA is semi-conservative.
41. Mention the salient features of human genome.
42. Microbes can be used to decrease the use of chemical fertilisers. Explain with examples how this can be achieved.
43. a) Explain the method to introduce recombinant DNA into the bacterial cell as a host. (3M)
    b) Draw a labelled diagram of simple stirred tank reactor. (2M)
44. a) Name the population interaction in the following. (2M)
    i) Lice on humans. ii) The egrets and grazing cattle.
    b) Explain the mechanism of sexual deceit in relation to mutualism. (3M)

Section - II

Answer any ONE of the following questions in about 200 - 250 words each wherever applicable : 5x1=5

45. a) What is common in function performed by nucellus and cotyledon. (1M)
    b) Name the parts represented by tassels of corn cob. Mention its function. (2M)
    c) Why do we need to emasculate a flower in artificial hybridisation ? Mention the condition where emasculation is not needed. (2M)
46. a) Identify the sex of the organism as male or female in which the sex chromosome is found as
    i) ZW in birds ii) XO in insects (2M)
    b) Mention the genetic disorder in the following cases.
    i) In an affected individual a simple cut will result in non-stop bleeding. (1M)
    ii) The disorder caused due to the presence of an additional copy of chromosome number 21. (1M)
    iii) The affected individuals lack the enzyme that converts phenyl alanine to tyrosine. (1M)
47. Mention the type of immunity/immune response in the following cases.
    a) The immunity in which the body attacks self-cells.
    b) The protection of infant against the antigens by antibody IgA present in colostrum.
    c) The immunity mediated directly by the T-lymphocytes.
    d) The immune response in which chemicals like histamine and serotonin are released from the mast cells.
    e) Non-specific type of defence that is present at the time of birth.

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

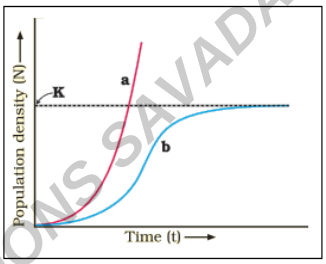
f	Africa	Homo sapiens

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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SUBJECT: BIOLOGY (H) BLUE PRINT CLASS – II P U

Question Paper Part	Question type	Number of questions	Marks
PART – A I	MCQ	15	15
PART – A II	FILL IN THE BLANKS	05	05
PART – B III	SHORT ANSWERS (2 MARKS)	08	16
PART – C IV	SHORT ANSWERS (3 MARKS)	08	24
PART – D V	LONG ANSWERS (5 MARKS)	08	40
PART – D VI	LONG ANSWERS (5 MARKS)	03	15
	TOTAL	**47**	**115**

Chapter	No. of periods	Marks	Remember				Understand				Application				HOTS		
			MCQ	SA2	SA3	LA	MCQ	SA2	SA3	LA	MCQ	SA2	SA3	LA	MCQ	SA	LA
1. Sexual reproduction in flowering plants	12	11	1	*		*	1		1	*	1	*	*	*	*	*	1
2. Human reproduction	11	11			1	*	1	*		1	1	*	*	*	1	*	
3. Reproductive health	7	6	1	1		*	*	1		*	1	*		*	*	*	*
4. Principles of Inheritance	15	14	*	1		*	1	*		1	*	*		*	1	*	1
5. Molecular basis of Inheritance	15	14	*		1	1		*		1	*	*		*	1	*	*
6. Evolution	8	7	1	1		*	1	*	1	*	*	*		*	*	*	*
7. Human health and disease	13	13		1		1	*	*		*	*	*		*	1	*	1
8. Microbes in Human welfare	8	8	1	1		*	*	*		1	*	*		*	*	*	*
9. Biotechnology: Principles and Processes	8	8		*		*	*	1		*	*	*		1	1	*	*
10. Biotechnology and its applications	7	6	*		1	*	*		1	*	*	*		*	*	*	*
11. Organism and population	6	7	1	*		1	1	*		*	*	*		*	*	*	*
12. Ecosystem	5	5	1	1		*	*	1		*	*	*		*	*	*	*
13. Biodiversity and Conservation	5	5	1	1		*	*	*		*	*	*		*	*	*	*
Total	120	115	07	07	03	03	05	03	03	04	03	00		01	05	00	03

SCHEME OF QUESTION PAPER PATTERN

1. The Question paper consists of Four parts; A, B, C and D
2. Part A - I consists of 15 Multiple choice questions, Part A – II consists of 5 fill up the blanks questions
3. All the questions of Part A – I and II are to be answered compulsorily
4. Part B consists of 8 short answer type questions carrying 2 marks each, out of which 5 questions to be answered
5. Part C consists of 8 short answer type questions carrying 3 marks each, out of which 5 questions to be answered
6. Part – D consists of V and VI. Part D – V consists of 8 long answer type questions carrying 5 marks each, out of which 4 questions to be answered. Part D – VI consists of 3 long answer type questions carrying 5 marks each, out of which 1 question to be answered.

GENERAL GUIDELINES FOR SETTING THE QUESTION PAPER

1. The questions should be simpleand unambiguous
2. The answers for the questions should be available in the prescribed text book or can be derived from the concepts of text book for application/reasoning/analytical/HOT questions
3. In part D, section VI only questions of Higher Order Thinking Skills to be framed.
4. The question paper should be prepared on the individual blue print on the basis of weightage of marks fixed for each chapter and units
5. At least one question carrying 1mark, 2 marks, 3 marks and 5 marks have to be derived from each chapter wherever possible
6. When a question carrying 3 or 5 marks is split the sub questions should be derived from the same concept or different concepts of same chapter
7. Please avoid questions like explain with a neat labelled diagram. Frame questions only to expect neat labelled diagram
8. A variation of 1% weightage per objective of questions is allowed
9. Variation of 1 mark in each chapter or unit weightage is permitted while preparing the blue print and the total marks should not exceed 115.