

KANKOR EXAMS QUESTIONS

2. Match the IUDs in Column I with suitable example in Column II.

<i>Column I</i>	<i>Column II</i>
a. Non-medicated	i. Lippes loop
b. Copper releasing	ii. LNG-20
c. Hormone releasing	iii. Multiload 375

Options :

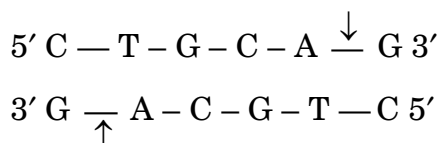
- (A) a-iii, b-ii, c-i
- (B) a-i, b-ii, c-iii
- (C) a-i, b-iii, c-ii
- (D) a-ii, b-i, c-iii
3. In *Pisum sativum*, the flower colour may be violet (V) or white (v). What proportion of the offspring in a cross of 'VV' $\times$ 'vv' would be expected to be violet ?
- (A) 25%
- (B) 50%
- (C) 75%
- (D) 100%
4. Arrange the following in the correct sequence of their evolution and select the correct option :
- (i) Seaweed
- (ii) Invertebrates
- (iii) Jawless fish

Options :

- (A) (i), (ii), (iii) (B) (i), (iii), (ii)
- (C) (ii), (iii), (i) (D) (ii), (i), (iii)

5. If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is :
- (A) autosomal dominant
 - (B) autosomal recessive
 - (C) sex-linked dominant
 - (D) sex-linked recessive
6. A DNA molecule is 160 base pairs long. It has 30% Guanine. How many Adenine bases are present in this DNA molecule ?
- (A) 48
 - (B) 64
 - (C) 96
 - (D) 192
7. A doctor identifies symptoms of nasal congestion, headache, sore throat, hoarseness and cough in a patient. The conclusion is that the patient is infected by a pathogen :
- (A) *Plasmodium*
 - (B) Adenovirus
 - (C) *Salmonella*
 - (D) Rhinovirus
8. Which type of selection is industrial melanism observed in moth, *Biston betularia* ?
- (A) Stabilising
 - (B) Directional
 - (C) Disruptive
 - (D) Artificial

9. C-peptide of human insulin is :
- a part of mature insulin molecule.
 - responsible for formation of disulphide bridges.
 - removed during maturation of pro-insulin to insulin.
 - responsible for its biological activity.
10. Given below is the restriction site of a restriction endonuclease Pst I and the cleavage sites on a DNA molecule.



Choose the option that gives the correct resultant fragments.

- $5' \text{ C — T — G} \qquad \qquad \qquad \text{C — A — G } 3'$
 $3' \text{ G — A — C — G — T} \qquad \qquad \qquad \text{C } 5'$
 - $5' \text{ C — T} \qquad \qquad \qquad \text{G — C — A — G } 3'$
 $3' \text{ G — A — C — G} \qquad \qquad \qquad \text{T — C } 5'$
 - $5' \text{ C — T — G — C} \qquad \qquad \qquad \text{A — G } 3'$
 $3' \text{ G — A — C — G} \qquad \qquad \qquad \text{T — C } 5'$
 - $5' \text{ C — T — G — C — A} \qquad \qquad \qquad \text{G } 3'$
 $3' \text{ G} \qquad \qquad \qquad \text{A — C — G — T — C } 5'$
11. Which of the following fish led to the extinction of an ecologically unique assemblage of more than 200 species of cichlid fish in Lake Victoria of East Africa ?
- Catla Catla
 - Dogfish
 - Nile Perch
 - African Catfish
12. Cattle or goats are never seen browsing on the weed, *Calotropis*. Select the correct option for the reason.
- The plant produces highly poisonous tannins.
 - The plant produces quinine, which is bitter in taste.
 - The plant produces the poisonous chemical, cardiac glycoside.
 - The plant bears prickles.



For Questions number **13** to **16**, two statements are given – one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of the Assertion (A).
- (C) Assertion (A) is true, but Reason (R) is false.
- (D) Assertion (A) is false, but Reason (R) is true.

13. *Assertion (A) :* Repetitive sequences make up a very large portion of human genome.

Reason (R) : Repetitive sequences do not have direct coding functions in the genome.

14. *Assertion (A) :* The embryo with 8 to 16 blastomeres is called a morula.

Reason (R) : The morula continues to divide and transform into trophoblast.

15. *Assertion (A) :* The use of chitinase enzyme is necessary for the separation of DNA from yeast cells but not in the case of Spirogyra.

Reason (R) : Fungal cell wall is made up of fungal chitin.

16. *Assertion (A) :* Besides curdling of milk, LAB also improves its nutritional quality by increasing Vitamin B12.

Reason (R) : LAB, when present in the stomach checks disease-causing microbes.

SECTION B

17. State the role of thymus as a lymphoid organ. Name the cells that are released from it and mention their functions. 2

18. (a) Explain the mutually rewarding relationship between *Yucca* plant and species of moth. 2

OR

(b) Pollination success will be reduced unless the orchid flower co-evolves with the pollinator. Explain. 2

19. (a) Differentiate between grazing food chain and detritus food chain. 2

OR

(b) Ecological pyramids are widely accepted but they still have some limitations. Write any two limitations. 2

20. How do 'implants' act as an effective method of contraception in human females ? Mention one advantage of implants over contraceptive pills. 2

21. (a) Explain any two methods of vectorless gene transfer. 2

OR

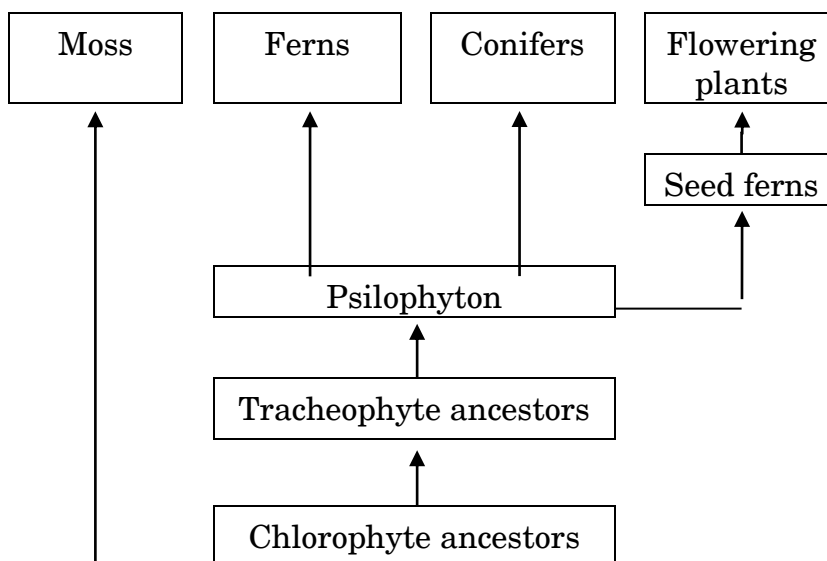
(b) Name the most commonly used bioreactor. List the advantages of the bioreactor. Also write the importance of sampling ports. 2

SECTION C

22. Draw a labelled diagram of a 'replicating fork' showing the polarity. Why does DNA replication occur within such 'fork' ? 3

23. List any three outbreeding devices that flowering plants have developed for cross-pollination and explain how they help to encourage cross-pollination. 3

24. Explain how the following microbes act as biocontrol agents : 3
- (a) *Bacillus thuringiensis*
- (b) *Nucleopolyhedrovirus*
25. Transgenic animals are produced by man. Explain any three ways in which such animals can be beneficial to humans. 3
26. Explain the level of biodiversity at genetic, species and ecological levels with the help of one example each. 3
27. Study the given chart showing evolution of plants. Answer the following questions : 3



- (a) Identify the plant which acts as an immediate ancestor of both ferns and conifers.
- (b) Name the nearest ancestors of flowering plants.
- (c) Name the most primitive group of plants.
- (d) Psilophyton provides common ancestry to which classes ?
- (e) Name the common ancestor of psilophyton and seed ferns.
- (f) Name the common ancestor of mosses and tracheophytes.

28. Given below is an equation describing the growth pattern of a population :

$$dN/dt = rN$$

- (a) Mention the type of growth model or growth pattern of the population described by the given equation.
- (b) What does 'r' in the equation signify ?
- (c) Mention the type of growth curve that will be obtained if the population density (N) is plotted against time (t).
- (d) According to you, will the resource availability be limited or unlimited for this type of growth in the given population ?

3

SECTION D

Questions No. 29 and 30 are Case-Based questions. Each question has 3 sub-questions with internal choice in one sub-question.

29. Read the following passage and answer the questions that follow :

4

The process of copying genetic information from template strand of DNA into RNA is called transcription. It is mediated by RNA polymerase. Transcription takes place in the nucleus of eukaryotic cells. In transcription, only a segment of DNA and only one of the strands is copied into RNA.

- (a) Why is the strand of DNA with 3' → 5' polarity transcribed and not the other strand of 5' → 3' polarity ?
- (b) (i) Why is hnRNA required to undergo splicing ?

1

1

OR

- (b) (ii) Mention the two additional processes which hnRNA needs to undergo after splicing to become functional.
- (c) Why is only one strand of the DNA transcribed ? Give two reasons.

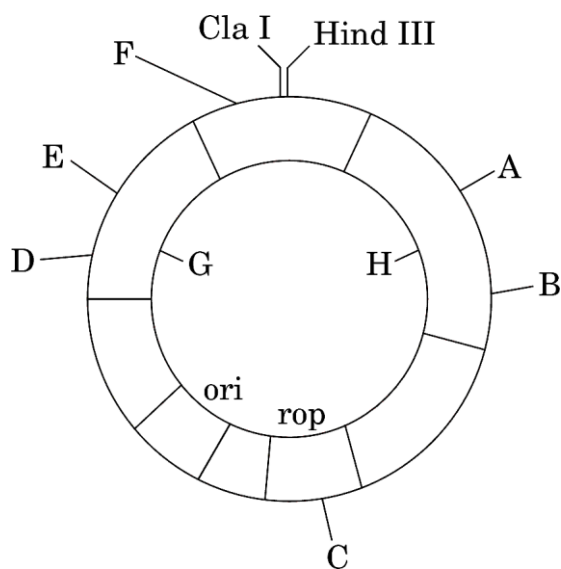
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1+1=2

30. Read the following passage and answer the questions that follow :

4

We know that plasmids and bacteriophages are the most commonly used vectors in biotechnology experiments. If we can link an alien piece of DNA to the plasmid DNA, the alien DNA can be multiplied equal to the copy number of the plasmid. Engineered vectors are used these days. Study the diagram of the *E. coli* cloning vector pBR322 and answer the questions that follow :



- (a) Why are plasmids and bacteriophages used as cloning vectors ? 1
- (b) (i) Identify : $\frac{1}{2} + \frac{1}{2} = 1$
- (I) The gene in the cloning vector that controls the copy number of the vector.
- (II) The restriction site – C in the 'rop' gene.

OR

- (b) (ii) Identify and name two selectable markers shown in the diagram. 1
- (c) Name the two restriction sites each in the two genes you have identified as selectable markers. 2

SECTION E

31. (a) Work out separate monohybrid crosses up to F_2 generation between two pea plants and two *Antirrhinum* plants, both having contrasting traits with respect to the colour of the flower. Comment on the patterns of inheritance in the crosses carried out in such two cases. 5

OR

- (b) Answer the following questions : 2+3=5
- (i) How does a chromosomal disorder differ from a Mendelian disorder ? Write one example for each.
 - (ii) Name the phenomenon that leads to situations like 'XO' abnormality in humans. Also name this genetic disorder. How are individuals with an XO chromosomal abnormality affected ? Write its symptoms as well as karyotype.

32. (a) (i) Draw the structure of an antibody molecule and label any four of its parts.
- (ii) Differentiate between active and passive immunity. Write any three differences. 2+3=5

OR

- (b) (i) (I) Write the scientific names of the two species of filarial worms causing filariasis.
- (II) How do they affect the body of infected persons ?
- (III) How does the disease spread ?
- (ii) Mention the source and the role of the following in providing defence against infection in the human body :
- (I) Histamine
 - (II) Interferons 1+1+1+2=5

- 33.** (a) Briefly explain the events of fertilisation and implantation in an adult human female.

5

OR

- (b) (i) Arrange the following hormones in sequence of their secretion in a pregnant woman :
hCG; LH; FSH; Relaxin.
- (ii) Mention the source and the functions of the above mentioned hormones.

1+4=5