केंद्रीय विद्यालय संगठन , अहमदाबाद संभाग SET - B

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कक्षा बारहवीं प्री बोर्ड II परीक्षा (2025-26)

PRE-BOARD II Examination for Class XII (2025-26)

Subject: Biology(044)

M.M.-70 **Time: 3 Hours**

General Instructions:

(i) All questions are compulsory.

(ii) The question paper has five sections and 33 questions.

(iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.

(iv) There is no overall choice. Answer all 33 questions. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

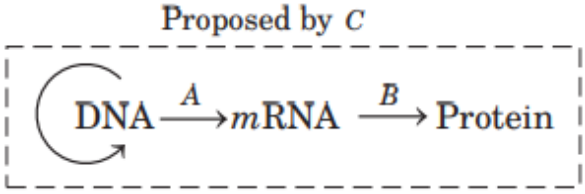
(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION -A

Q.1 A couple has two daughters. What is the probability that the third child will also be a female? 1

A. 25% B. 50% C. 75% D. 100%

Q.2 The diagram shows an important concept in the genetic implication of DNA. Fill in the blanks A to C. 1



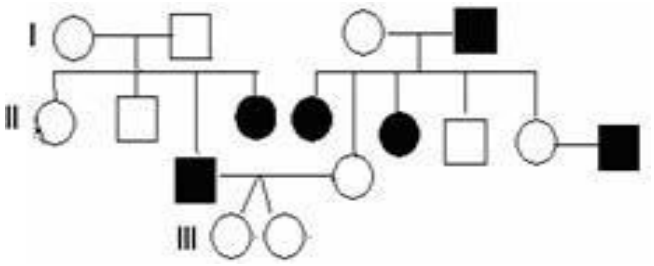
(a) A–transcription, B–replication, C–James Watson

(b) A–translation, B–transcription, C–Erwin Chargaff

(c) A–transcription, B–translation, C–Francis Crick

(d) A–translation, B–extension, C–Rosalind Franklin

Q.3

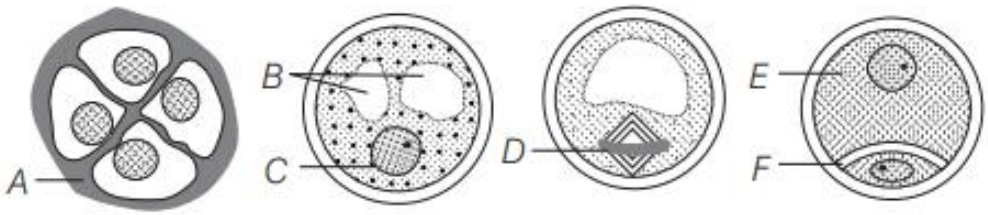


What is the pattern of inheritance in the above pedigree chart?
A. Autosomal dominant B. Autosomal recessive
C. Sex -linked dominant D. Sex -linked recessive

Q.4 Important RNA processing events lead to specialized end sequences in most human mRNAs: 1
(i) at the 5’ end, and
(ii) at the 3’ end.
(iii)At the 5’end the most distinctive specialized end nucleotide is added,
(iv) sequence of about 200 is added to the 3’ end.
A. (i) Initiator codon (ii) Promotor (iii) Terminator codon (iv) Release factors
B. (i). Promotor (ii) Elongation (iii) Regulation (iv) Termination.
C. (i) Capping (ii) Polyadenylation (iii) mGppp (iv) Poly(A).
D. (i) Repressor (ii) Co repressor (iii) Operon (iv) Release factors

Q.5 During parturition, a pregnant woman is having prolonged labour pains and child birth has to be fastened. It is advisable to administer a hormone that can 1
A. increase the metabolic rate. B. release glucose in the blood.
C. stimulate the ovary. D. activate smooth muscles.

Q.6 Identify the structures marked A to F in the given diagram. 1



(a) A–Asymmetric nucleus, B–Nucleus, C–Generative cell, D–Vegetative cell, E–Pollen, F–Pollen tetrad
(b) A–Pollen tetrad, B–Pollen, C–Generative cell, D–Vegetative cell, E–Asymmetric spindle, F–Nucleus
(c) A–Pollen tetrad, B–Vacuole, C–Nucleus, D–Asymmetric spindle, E–Vegetative cell, F–Generative cell
(d) A–Vacuole, B–Nucleus, C–Pollen tetrad, D–Vegetative cell, E–Asymmetric spindle, F–Generative cell

Q.7 The correct sequence of hormone secretion from beginning of menstruation is 1
A. FSH, progesterone, estrogen. B. estrogen, FSH, progesterone.
C. FSH, estrogen, progesterone. D. estrogen, progesterone, FSH.

Q.8 Penetration of the sperm in the ovum is followed by 1
A. formation of first polar body. B. completion of meiosis II.
C. first meiosis. D. dissolution of zona pellucida.

Q.9 Genotypic ratio of 1:2:1 is obtained in a cross between 1
A. AB X AB B. Ab X Ab C. Ab X ab D. ab X ab

Q.10 To produce 400 seeds, the number of meiotic divisions required will be 1
A. 400 B. 200 C. 500 D. 800

Q.11 What contributed to Mendel's success? 1
I. Selection of pureline pea varieties.
II. Knowledge of history.
III. Selecting one character at a time.
IV. Statistical analysis and mathematical logic.
Choose the correct option.
(a) I, II, III and IV (b) II and III
(c) I, III and IV (d) II, III and IV

Q.12 A female undergoing IVF treatment has blocked fallopian tubes. The technique by which the embryo with more than 8 blastomeres will be transferred into the female for further development is 1
A. ZIFT B. GIFT C. IUT D. AI

Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:
A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true and R is not the correct explanation of A
C. A is true but R is false
D. A is False but R is true

Q.13 Assertion: Biopiracy is the practice of commercially exploiting naturally occurring biochemical or genetic material, especially by obtaining patents that restrict its future use, while failing to pay fair compensation to the community from which it originates. 1
Reason: US patented turmeric and neem which is a case of biopiracy.

Q.14 Assertion (A) A person should be considered reproductively healthy, if he has healthy reproductive organs, but is emotionally imbalanced. Reason (R) It is significant to maintain reproductive health of people and society. 1

Q.15 Assertion (A) Restriction endonucleases are also called 'molecular scissors'. 1
Reason (R) When fragments generated by restriction endonucleases are mixed, they join together due to their sticky ends

Q.16 Assertion:The variation in Rauwolfia growing in different Himalayan ranges might be interms of the potency and concentration of the active chemical (reserpine) that the plantproduces. 1
Reason: A single species might show high diversity at the genetic level over itsdistributionalrange.

SECTION –B

Q.17 Why is proinsulin so called? How is insulin different from it? 2

Q.18 Mention the characteristics of a stable community. 2

Q.19 How do the following help in cancer treatment? 2
i) Alpha interferon
ii) Radiotherapy

Q.20 If a given segment of double-stranded DNA has A+C =60% & guanine is 20%, calculate the % of Thymine in the DNA. 2

Q.21 Draw a neat labelled diagram of a nucleosome. 2

SECTION -C

Q.22 Explain Verhulst-Pearl Logistic Growth of a population. 3

Q.23 What is genetic engineering? List the steps involved in rDNA technology? 3

Q.24 When a garden Pea plant with green pods was cross pollinated with another Pea plant with yellow pods, 50% of the progeny bear green pods. 3

i) Work out the cross to illustrate this.
ii) What do you refer to this type of cross? Why is such a cross done?

Q.25 Give reasons for the following: 3

a) Larger holes are observed in Swiss cheese.
b) Alcoholic content in whisky is more than in beer, although both are made using malted barley and yeast.
C) Nucleo-polyhedro virus can be used effectively in ecological fragile areas.

Q.26 Differentiate between spermatogenesis and oogenesis, with reference to the following aspects: 3

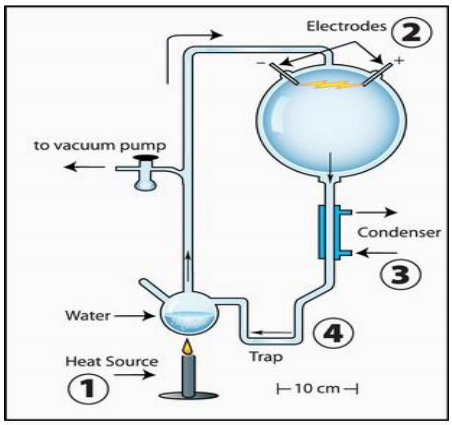
(a) Formation and multiplication of oogonial and spermatogonial cells.
(b) Number of gametes produced from one gamete mother cell.
(c) Completion of the processes.

Q.27 Some allergens trigger sneezing and wheezing in human beings. What causes this type of response by the body? 3

OR

A boy of ten years had chicken-pox. He is not expected to have the same disease for the rest of his life. Mention how it is possible.

Q.28



A.

a.) State the hypothesis which S.L. Miller tried to prove in the laboratory with the help of the set up given above. 3
b.) Name the organic compound observed by him in the liquid water after running the above experiment.
c.) A scientist simulated a similar set up and added CH_4, NH_3 and water vapour at 800 ℃. Which important component is missing in his experiment?

SECTION -D

Q.29 Sewage or municipal waste contains human excreta and other organic wastes. It also contains a number of pathogenic microbes, so should not be passed into rivers, streams and other water bodies. It is made less polluting by passing it through sewage treatment plants (STPs). 4

(a) BOD of two samples of water A and B were 120 mg/L and 400 mg/L respectively. Which sample is more polluted?
(b) Describe the functions of activated sludge in a sewage treatment plant.
(c) Why is sewage water treatment essential?

OR

sludge can be used as an inoculum or as a source of biogas. Explain

Q.30 **Pyramid of numbers :-** 4

It shows the number of individuals per unit area at each trophic level. It is usually upright, e.g. in grasslands, however, in a parasitic food chain, a single plant may support the growth of many herbivores and each herbivore in turn may provide nutrition to several parasites, which support many hyperparasites.

Pyramid of biomass:-

It is the representation of the total biomass present (sequence wise) per unit area at different trophic levels. Pyramid of biomass is upright for grassland and forest ecosystems. In a pond, the producers are small organisms, their biomass is least, and this value gradually shows an increase towards the apex of the pyramid, thus making the pyramid of biomass inverted in shape.

(a) Why the pyramid of energy is always upright? Explain.
(b) Construct an ideal pyramid of energy when 1,000,000 joules of sunlight is available. Label all its trophic levels.(four trophic levels)
(c) Write any two limitations of ecological pyramids.

OR

Explain the significance of ecological pyramid with the help of an example.

SECTION -E

Q.31 Trace the development of a megaspore mother cell of a flower into a mature ovule. Give a labeled diagram of the final stage. 5

OR

Describe oogenesis in a human female? What promotes the completion of second meiotic division in oogenesis?

Q.32 (a) How many codons code for amino acids and how many do not? 5

(b) Explain the following giving one example of each:
(i) specific codon
(ii) degenerate codon
(iii) universal codon
(iv) initiator codon.

OR

(a) Why is tRNA called an adaptor?

(b) Draw and label a secondary structure of tRNA. How does the actual structure of tRNA look like?

Q.33 Name the components a bioreactor must possess to achieve the desired product? 5
What is Bioreactor? What are the advantages of Stirred tank Bioreactor over Shake flask. Show diagrammatically a simple Stirred tank Bioreactor?

OR

What are Restriction enzyme? Why do bacteria have these restriction enzymes. Show diagrammatically a restriction enzyme its recognition & the product it produces?

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