



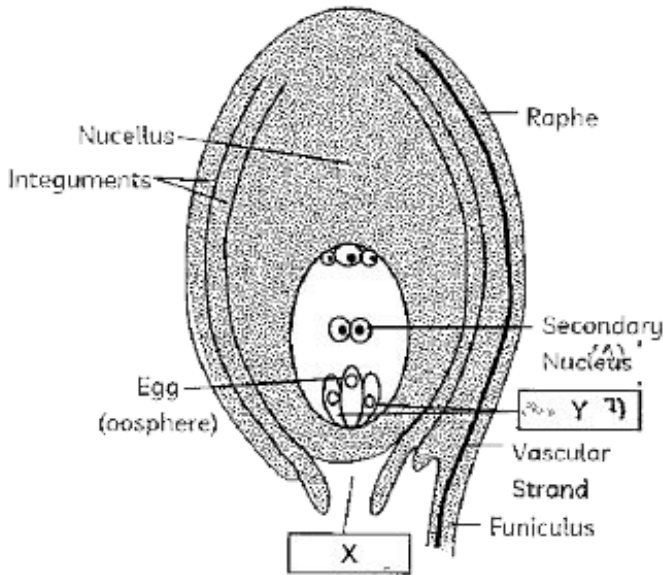
BIOLOGY

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 6

Section A

1. Identify X and Y in the given figure.



Diagrammatic View Of A Typical Anatropous Ovule

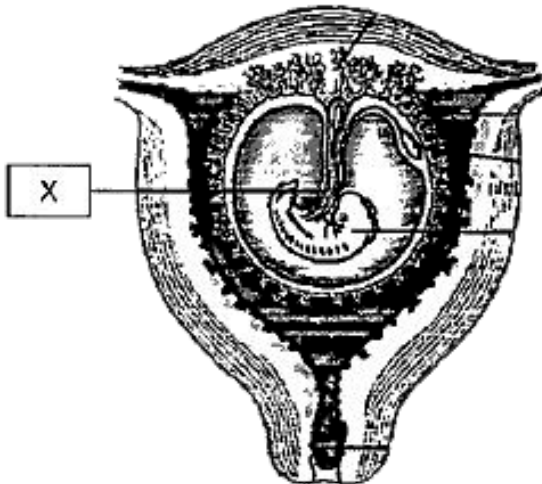
- A. X = Secondary Space, Y = Synergids
- B. X = Pollen Pore, Y = Tapetum
- C. X = Micropyle, Y = Synergids
- D. X = X = Micropyle, Y = Antipodals

Answer: C



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2. Identify X:



The human foetus within the Uterus

A. X = Umbilical cord

B. X = Embryo

C. X = Yolk sac

D. X = Placental villi

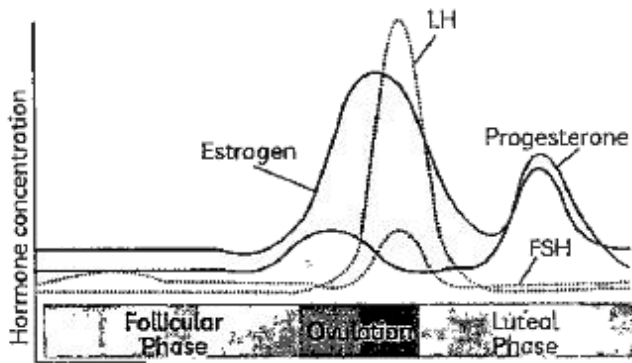
Answer: A



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3. The relative concentrations of three female hormones in the blood for the period of 28 days are represented by the following graph. In which of the following days interval the

fertilisation (conception) is most likely to happen.



- A. 1-5 days
- B. 10-14 days
- C. 15-20 days
- D. 20-24 days

Answer: B



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4. Find out the correctly matched option:

(A)	Syncarpous	Pistils are free (not fused).
(B)	Apocarpous	Pistils are fused together.
(C)	Monocarpellary gynoecium.	When the gynoecium consists of a single pistil or carpel.
(D)	Syncarpellary gynoecium.	When the gynoecium consists of a single pistil or carpel.

A. A

B. A, B, D

C. C

D. B

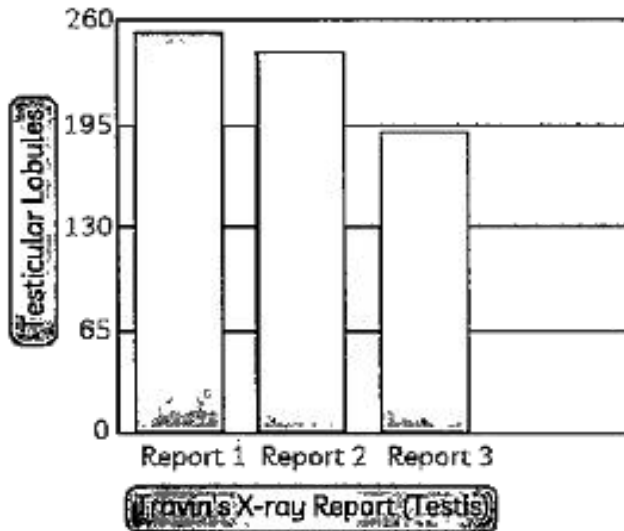
Answer: C



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5. Study the graph and help Ajay to find out, which of these reports concerning the X-RAY of the testis in some random patients could

be correct:



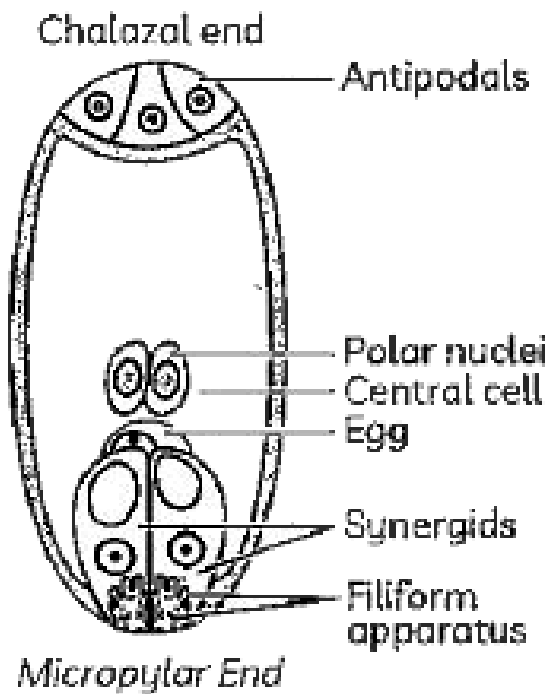
- A. Report 1
- B. Report 1, 2
- C. Report 2, 3
- D. Report 3

Answer: B



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6. The given diagram represents a embryo sac.



- A. 2-nucleate stage embryo sac
- B. 4-nucleate stage embryo sac
- C. 8-nucleate stage embryo sac
- D. 8-nucleate, 7-celled.

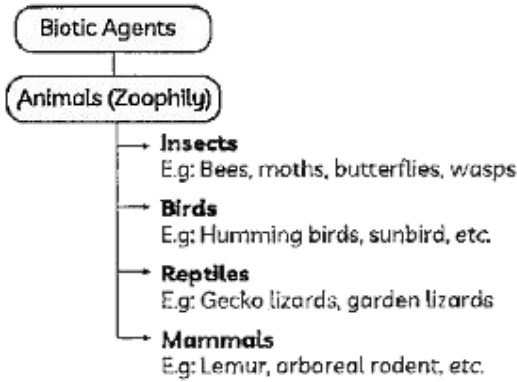
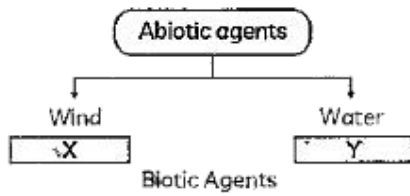
Answer: D



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7. Observe the given diagram and the table.

Answer the question that follows:



	X	Y	Z
(A)	Hydrophily	Anemophily	Zoophily
(B)	Anemophily	Hydrophily	Zoophily
(C)	Zoophily	Hydrophily	Anemophily
(D)	Zoophily	Anemophily	Hydrophily

The correct option will be :

A. A

B. B

C. C

D. D

Answer: A



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8. Cells producing testosterone under the influence of LH and present in interstitial spaces are:

A. Spermatogonium

B. Leydig cells

C. Secondary spermatocytes

D. Sertoli cells

Answer: B



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9. The types of endosperm based on their mode of formation are:

A. Nuclear

B. Cellular

C. Helobial

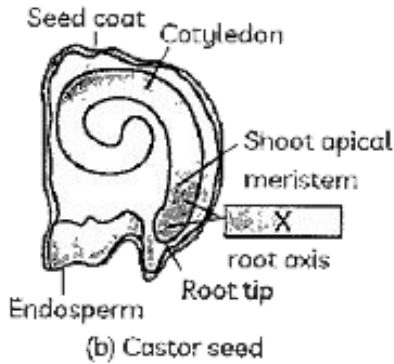
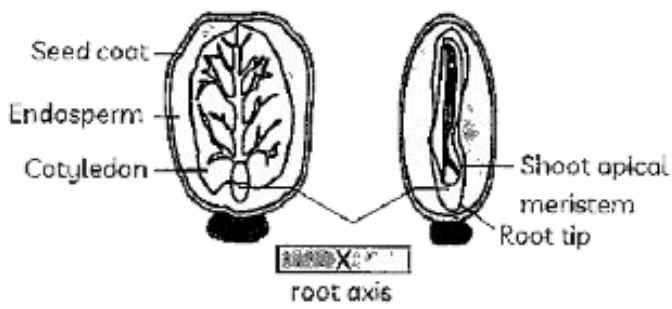
D. All of them

Answer: D



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10. Which of the following statements are true related to X?



(i) X is epicotyl

(ii) X is hypocotyl

(iii) X terminates in the radical or root tip.

(iv) X Hypocotyl is the portion of embryonal axis that is above

A. (i), (ii)

B. (iii), (iv)

C. (ii), (iii), (iv)

D. (i), (iii)

Answer: C



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11. In an embryo sac, the cells that degenerate after fertilisation are:

A. Synergids and primary endosperm cell

B. Synergids and antipodals

C. Antipodals and primary endosperm cell

D. Egg and antipodals

Answer: B



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12. Scutellum is the functional cotyledon present in a monocotyledonous embryo. Can you determine its ploidy level?

A. Haploid (n)

B. Diploid ($2n$)

C. Triploid ($3n$)

D. Both haploid(n) & diploid ($2n$)

Answer: B



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13. What is the name accorded to the type of pollination that takes place in self-incompatible plants?

A. Autogamy

B. Xenogamy

C. Geitonogamy

D. Allogamy

Answer: B



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14. Arrange the following steps in correct order: (The Experimental Proof for semiconservative mode of DNA replication was

first provided by Matthew Meselson and Franklin Stahl):

(I) The cells were transferred into a medium with normal $^{14}\text{NH}_4\text{Cl}$ and as the cells multiplied, the samples were taken out at definite time intervals.

(II) E. coli was grown for many generations in a medium containing $^{15}\text{NH}_4\text{Cl}$ (^{15}N is the heavy isotope of nitrogen) as the only nitrogen source.

(III) Various samples were separated independently in order to measure the densities of DNA.

(IV) Incorporation of ^{15}N into newly synthesized DNA (as well as other nitrogen containing compounds).

A. (I), (II), (III), (IV)

B. (IV), (III), (II), (I)

C. (III), (II), (I), (IV)

D. (II), (IV), (I), (III)

Answer: D



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15. Megakaryocyte of rice has 24 chromosomes.

Determine the number of chromosomes in the synergids.

A. 24

B. 48

C. 72

D. 12

Answer: D



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16. The total percentage of moisture in a dry seed is roughly around

A. 29 %

B. 15 %

C. 50 %

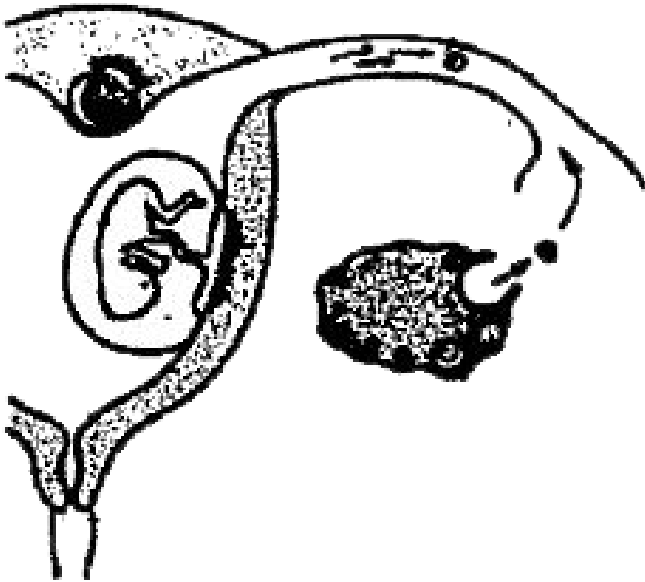
D. 0 %

Answer: B



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17. Given below is the diagram that represents the events leading to fertilisation, implantation and development. Based on this, answer the questions that follow.



Which of the following occurs to the zygote immediately after fertilisation?

A. A specialization of cells occurs, forming a foetus.

B. The zygote divides, ultimately forming a hollow bundle of cells.

C. A single-celled embryo forms, containing twice the number of chromosomes as the parents.

D. The fertilized egg undergoes breakdown forming new gametes for growing organism.

Answer: B



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18. The replication process involves the following steps:

(I) Stronger and stronger contractions result from the stimulatory reflex between the uterine contraction and oxytocin secretion.

(II) The maternal pituitary is triggered to release oxytocin.

(III) The fully developed foetus and the

placenta is responsible for giving rise to the signals for parturition which induce mild uterine contractions

(IV) Expulsion of the baby.

Choose the correct option:

A. (I), (II), (IV), (III)

B. (III), (IV), (II), (I)

C. (I), (II), (III), (IV)

D. (III), (II), (I), (IV)

Answer: D



19. Nucleosome existence and structure was first proposed in 1974 by:

- A. William Asbury
- B. Rosalind Franklin
- C. Roger Kornberg
- D. John Crick

Answer: C



20. Spot the incorrect statement:

A. A monocot embryo has only one cotyledon.

B. Scutellum is situated towards one side of the embryonal axis.

C. The embryonal axis has the radical and root cap at its upper end. It is enclosed by an undifferentiated sheath called seed coat.

D. The part of embryonal axis above the level of attachment of scutellum is called as epicotyl.

Answer: C



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21. In a dihybrid cross, if you get 9:3:3:1 ratio, it denotes that:

- A. The alleles of two genes are interacting with each other.
- B. It is a multigenic inheritance.
- C. It is a case of multiple allelism.
- D. The alleles of two genes are segregating independently.

Answer: D



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22. For many decades, amniocentesis has been misused in several parts of India for determination of the gender of the foetus. People in many regions have shown an uncanny preference for a male child. Female foeticide has thus been rampant in these regions. However, the original purpose of Amniocentesis was much different and was actually beneficial.

Amniotic fluid can be utilised for checking:

A. Gender of the foetus

B. Down's syndrome

C. Sickle cell Anaemia

D. All of the above

Answer: D



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23. Which out of these is an example of

Pleiotropism:

A. Human skin colour.

B. Phenylketonuria.

C. Inheritance of flower colour in Snapdragon.

D. ABO blood grouping in humans.

Answer: B



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24. Mendel utilised which had undergone and demonstrate the stable trait inheritance for several generations.

A. Cross breeding, Cross pollination

B. True breeding line, autogamy

C. Hybridisation, Cross pollination

D. None of these

Answer: B



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Section B

1. Assertion (A): A karyotype of 45 with X0 is the key genetic diagnostic point in case of an individual suffering from the Turner's syndrome.

Reason (R): It is caused due to the presence of an additional copy of the chromosome number 21.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C



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2. Assertion (A): Polygenic inheritance gives rise to varied skin tones in F_2 generation.

Reason (R): Phenotype reflects the

contribution of each allele, is influenced by the environment in case of polygenic inheritance.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A



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3. Assertion (A): Thalassemia is passed on from parents to the progeny when both the partners are heterozygous (unaffected carrier) for the gene.

Reason(R): Production of α and β globin chain is affected in α Thalassemia and the β Thalassemia.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A



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4. Assertion (A): Dihybrid cross is the only way to study the law of independent assortment.

Reason (R): Only linked genes can

demonstrate the law of independent assortment.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C



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5. Which among these is not a Mendelian disorder?

(I) Turner's syndrome

(II) Colour-blindness,

(III) Cystic fibrosis

(IV) Myotonic dystrophy

A. (I)

B. (II) and (IV)

C. (I), (III) and (IV)

D. (IV)

Answer: A



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6. Most studies show that individuals belonging to the age group of years are more vulnerable to Sexually Transmitted Infections.

A. 40-50

B. 28-45

C. 15-24

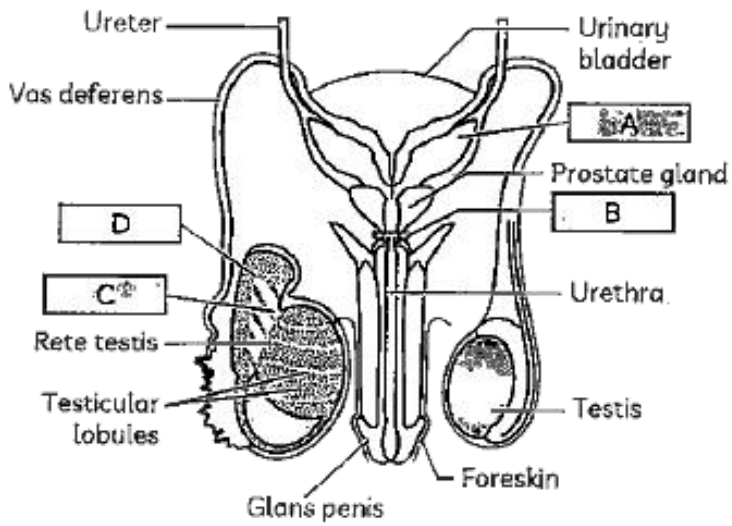
D. 35-50

Answer: C



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7. Cowper's glands is a name synonymous with:



A. A

B. B

C. C

D. D

Answer: B



8. Males in which testis fail to descend to the scrotum are generally Infertile due to inhibition of Gametogenesis and this disorder is known as

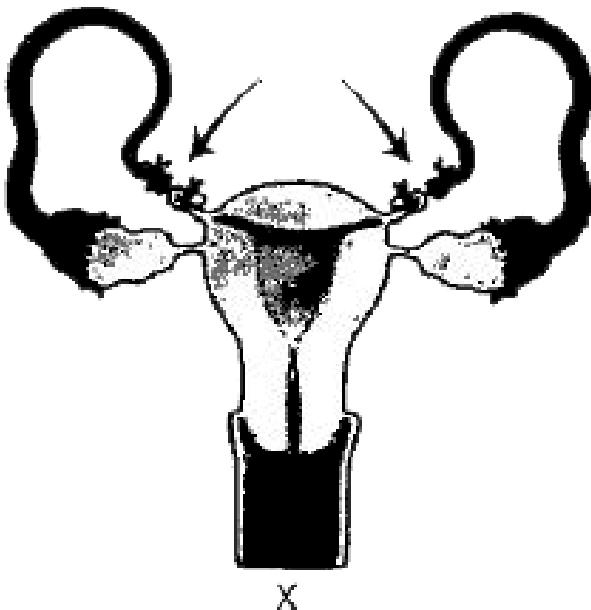
- A. Anarchoidism
- B. Cryptorchidism
- C. Gynaecomastia
- D. None of these

Answer: B



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9. Which of the following statements are true related to X?



(I) X involves blocking of gamete transport.

(II) In X, a small part of the vas deferens is removed or tied up.

(III) X prevents conception with the help of a surgical intervention.

(IV) X is easily reversible.

A. (I), (II)

B. (II), (IV)

C. (II), (III)

D. (I), (III)

Answer: D



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10. Which of the following statements correctly describes eukaryotic histones in a nucleosome structure?

A. A core histone heptamer plus a linker histone.

B. A core histone octamer plus a linker histone.

C. A core histone plus a linker histone octamer.

D. A core histone octamer plus three linker histones.

Answer: B



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11. Who among these contributed to the double-helical model of DNA?

A. Wilkins

B. Crick

C. Watson

D. All of them

Answer: D



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12. STIs or STDs are also known as:

A. Venereal Diseases (VD)

B. Genetic diseases (GD)

C. Urinary tract infections (UTI)

D. Cardio-vascular diseases

Answer: A



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13. The cells which are elongated and slender within the seminiferous tubules and provide nourishment to the developing spermatocytes are:

A. Spermatozoa

B. Leydig cells

C. Sertoli cells

D. Epithelial cells

Answer: C



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14. Hershey and Chase's experiment was based on the principle:

A. Transformation

B. Translation

C. Transduction

D. Transcription

Answer: C

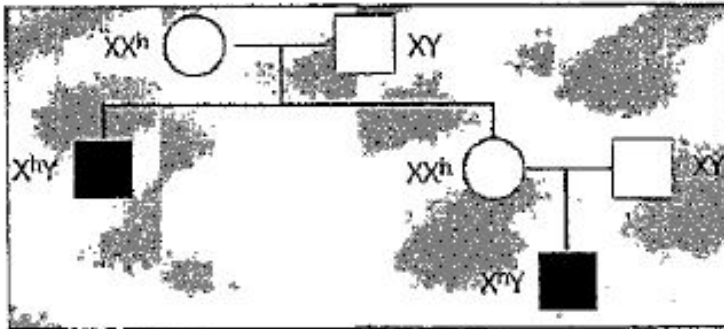


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15. A couple had a son who was haemophilic along with a normal daughter.

The daughter then grew older and was

married to a man who was normal. They daughter had a haemophilic son.



Study the pedigree chart given above and find out the correct analysis-

- A. The chart shows a sex-linked inheritance.
- B. A criss-cross pattern is visible.
- C. The female here is acting as the carrier of the disease.

D. (a), (b) and (c) are correct.

Answer: D



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16. Males have.....the number of chromosomes than that of a female in case of Indian honey bees.

A. Twice

B. One-fourth

C. Thrice

D. Half

Answer: D



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17. Hemophilic patients don't have the natural blood clotting abilities due to absence of

.

A. clotting factor VII.

B. clotting factor VIII.

C. clotting factor VI.

D. clotting factor V.

Answer: B



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18. Which among these affect pollen viability?

A. Temperature

B. Humidity

C. Plant species

D. All of them.

Answer: D



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19. If two genes in a dihybrid cross were located on the same chromosome, the proportion of parental gene combinations will be:















- A. Lower than the non-parental type.
- B. Remains same as the non-parental type.
- C. Higher than the non-parental type.
- D. No change

Answer: C



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20. Mendel didn't use one of the following characteristic for his experiments. Identify:

Character	Dominant Trait	Recessive Trait
Stem length	 Tall	 Dwarf
Pod shape	 Inflated	 Constricted
Seed shape	 Round	 Wrinkled
Seed colour	 Yellow	 Green
Flower position	 Axial	 Terminal
Flower colour	 Purple	 White
Pod colour	 Green	 Yellow

A. Pea plant demonstrated frequent mutations.

B. Pea plant has many distinct contrasting characteristics.

C. Pea plant are annual plants with short life span.

D. Pea plant flowers demonstrate self-pollination as the plant has bisexual cleistogamous flowers (closed flowers), but cross-pollination is also possible.

Answer: A



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21. Identify the correct statement w.r.t. haemophilia ?

A. It shows criss cross inheritance.

B. It is an autosomal disorder.

C. Single allele produces its effect in both sexes.

D. All of these

Answer: A



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22. The replication of DNA in eukaryotes takes place at X = the cell-cycle. The two processes: DNA replication and cell division should be 3' highly coordinated as failure in cell division after DNA replication results into Y =

A. X = M-Phase, Y = Aneuploidy

B. X = G-Phase, Y = Polyploidy

C. X = S-Phase, Y = Polyploidy

D. X = F-Phase, Y = Haploidy

Answer: C



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23. What is the approximate length of DNA in a single human cell?

A. 4.1 m

B. 1.1 m

C. 2.2 m

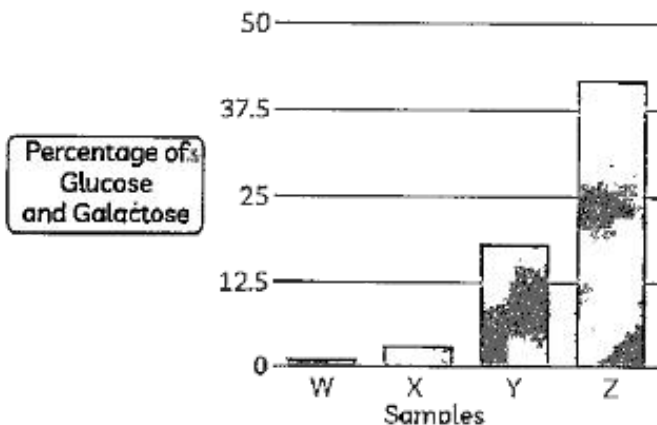
D. 5.1 m

Answer: C



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24. The given graph shows the presence of Glucose and Galactose in the medium when Lac operon was operational.



Based on the given graph, which of the samples might have an activated Gene z?

A. (W) and (X)

B. (Y) and (Z)

C. (Y)

D. (Z)

Answer: B



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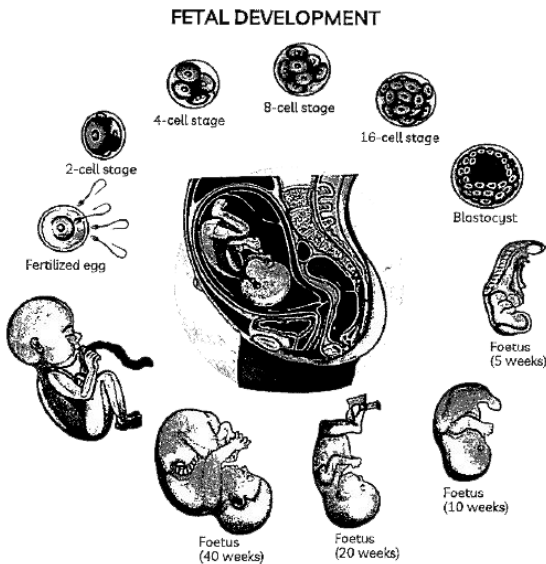
1. The human pregnancy

The gestation period in humans is about 9 months. Although premature deliveries do happen, but it largely sticks to this timeframe.

After a month of pregnancy, the embryo's heart is formed. As the second month ends, the foetus develops limbs and digits. By 12 weeks (first trimester) major organ systems are formed.

Movements of the foetus and appearance of hair on the head are usually observed during

the 5th month. By the end of about 24 weeks (end of second trimester) the body is covered with fine hair, eyelids separate and eyelashes are formed.



Oxytocin is produced during pregnancy to:

A. induce uterine contractions during parturition

B. initiate vasopressin secretion

C. differentiation of mammary glands

D. released from anterior pituitary gland

Answer: A



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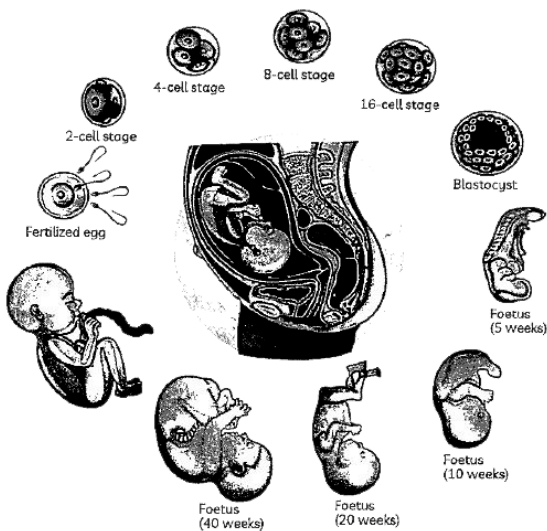
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FETAL DEVELOPMENT



Which among these happens first during the embryonic development?

- A. Organ system formation
- B. Heart formation
- C. Appearance of hair
- D. Digit formation

Answer: B



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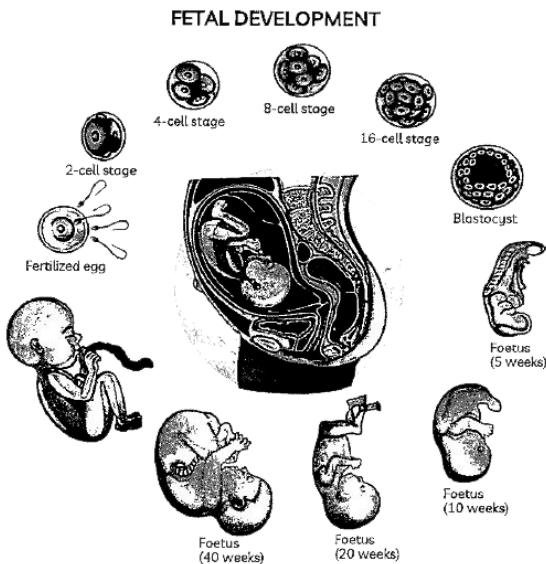
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Placenta directly or indirectly produces following hormones

- A. hcG (Human Chorionic Gonadotropin)
- B. hpL (Human Placental Lactagen)
- C. Estrogen
- D. All of these.

Answer: D



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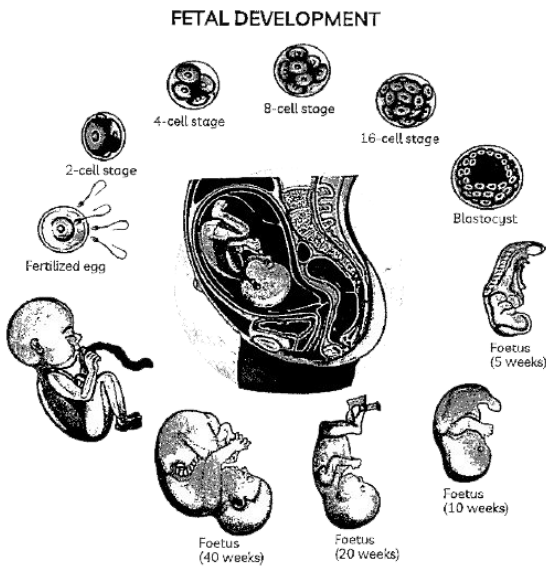
4. The human pregnancy

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Movements of the foetus and appearance of hair on the head are usually observed during the 5th month. By the end of about 24 weeks

(end of second trimester) the body is covered with fine hair, eyelids separate and eyelashes are formed.



Which among these is the terminal stage in parturition?

A. Secondary uterine contractions.

B. Delivery of the baby

C. Expulsion of the placenta

D. None of these

Answer: C



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5. The human pregnancy

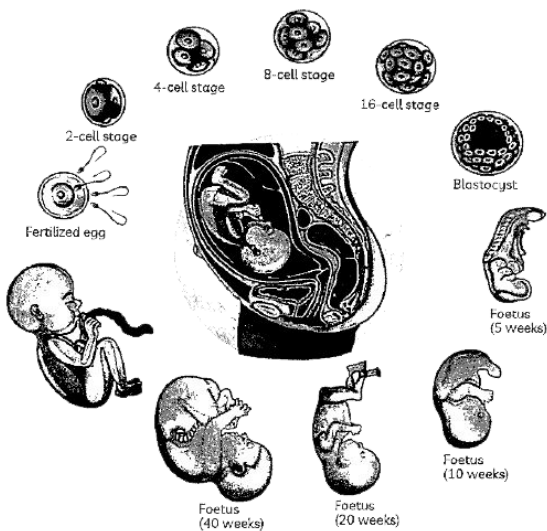
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FETAL DEVELOPMENT



Colostrum:

A. contains several antibodies (IgA) for the baby.

B. develops passive immunity apart from supplying essential nutrients.

C. is the best for a newborn baby

D. All of these

Answer: D



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6. The human pregnancy

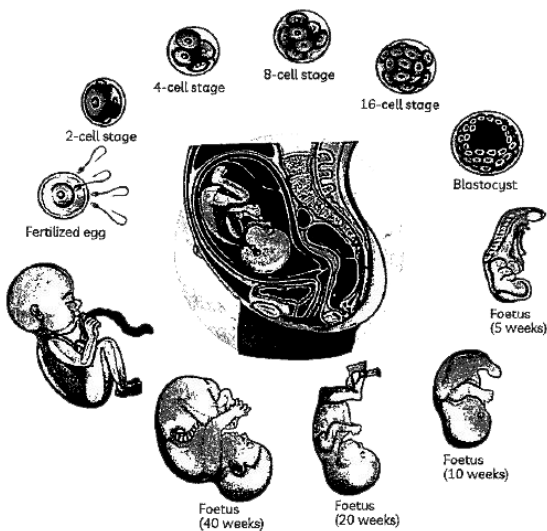
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FETAL DEVELOPMENT



Cervical canal, along with forms the birth canal.

A. Cervix

B. Isthmus

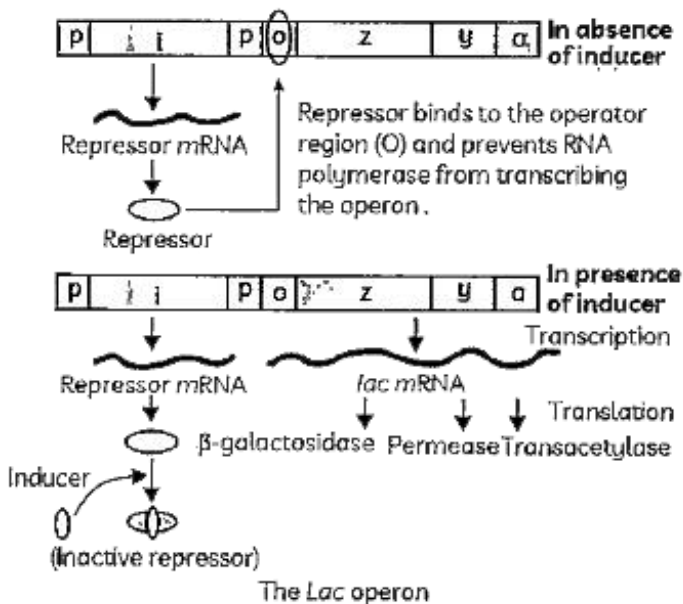
C. Vagina

D. All of these

Answer: C

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7. The given diagram shows the functioning of the Lac operon.



The mRNA strand, which is transcribed in the Lac operon system is also called:

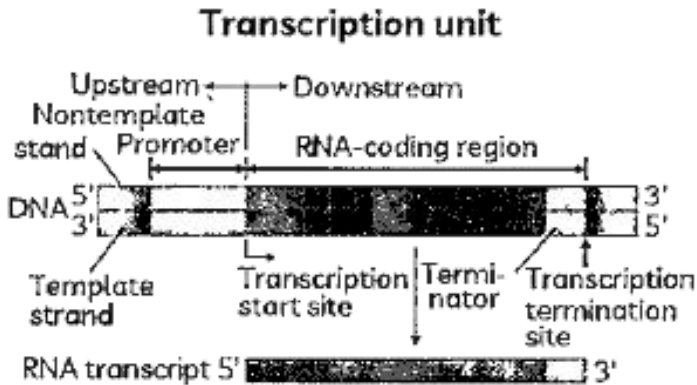
- A. Monocistronic
- B. Dicistronic
- C. Polycistronic
- D. None of these

Answer: C



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8. Observe the given diagram and find out the incorrect statement:



(I) Promoter: It can be defined as a DNA sequence that serves as the binding site for RNA polymerase.

(II) The binding site is located at the 5'-end (upstream) of the structural gene.

(III) Terminator is located towards 5'- end

(downstream) of the coding strand.

(IV) The structural gene coding for a particular protein is flanked by the promoter and terminator.

A. (I), (II)

B. (II)

C. (III)

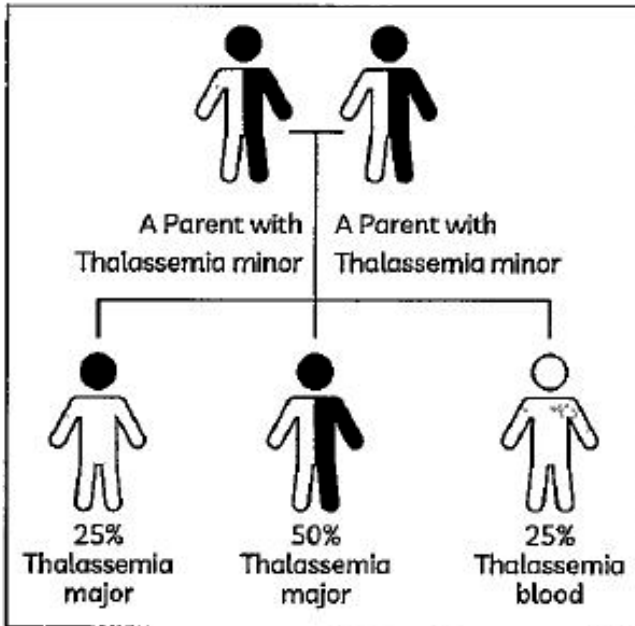
D. (III), (IV)

Answer: C



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9. Observe the given figure and answer:



Thalassemia is a blood disease which is transmitted from parents to the offsprings when both the partners are heterozygous (unaffected carrier) for the gene. It is:

- A. an autosome-linked dominant disease
- B. an autosome-linked recessive disease
- C. Sex-linked dominant disease
- D. None of these

Answer: B



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10. Observe the diagram given below and answer the question that follows:

Table Showing the Genetic Basis of Blood Groups

Allele from Parent 1	Allele from Parent 2	Geno-type of off-spring	Blood types of off-spring
I ^A	I ^A	I ^A I ^A	A
I ^A	I ^B	I ^A I ^B	AB
I ^A	i	I ^A i	A
I ^B	I ^A	I ^A I ^B	AB
I ^B	I ^B	I ^B I ^B	B
I ^B	i	I ^B i	B
i	i	ii	O

The pattern of inheritance of blood group in humans shows which of the following phenomena?

A. Incomplete dominance

B. Polygenic inheritance

C. Co-dominance

D. Both (b) and (c)

Answer: C



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11. Arrange these steps for DNA fingerprinting in the correct order:

(I) Separated DNA fragments were transferred (blotting technique) to synthetic membranes,

such as nitrocellulose or nylon.

(II) Use of autoradiography for detection of hybridised DNA fragments.

(III) DNA isolation: the DNA is isolated from the desired cells.

(IV) Digestion of DNA by restriction endonucleases Order:

A. (I), (II), (III), (IV)

B. (IV), (III), (II), (I)

C. (III), (IV), (I), (II)

D. (II), (III), (IV), (I)

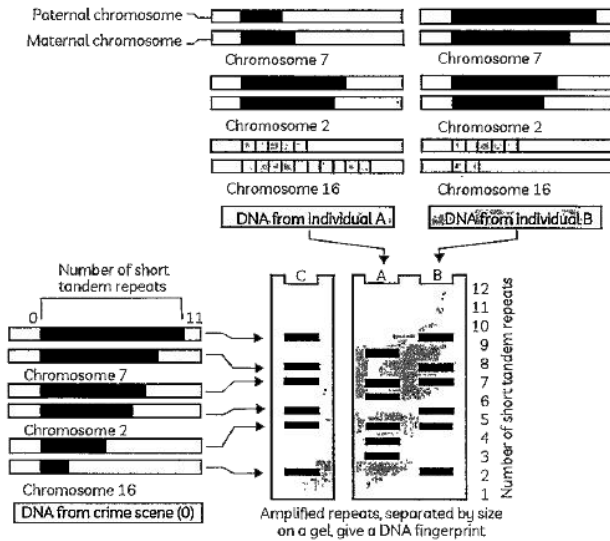
Answer: C



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12. A Every individual DNA has a characteristic pattern of these bands. This pattern differs from individual to individual in a population

except in:



A. Monozygotic (identical) twins.

B. Dizygotic twins

C. All siblings

D. The pattern doesn't differ.

Answer: A



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