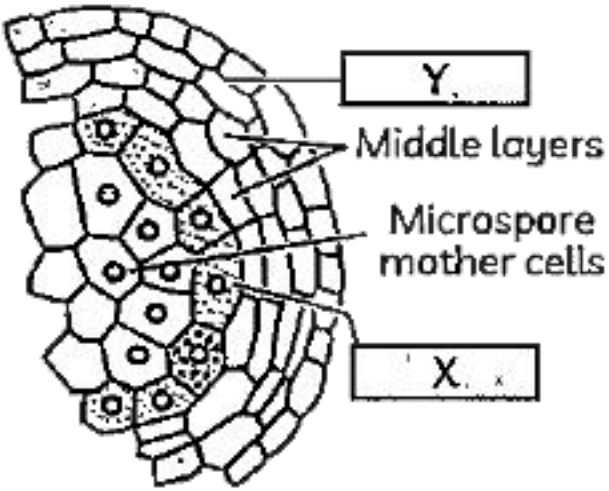
BIOLOGY

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 4 (SOLVED)

Section A

1. Identify X and Y in the given figure.



A. X = Epidermis, Y= Tapetum

B. X = Intine, Y = Tapetum

C. X = Epidermis, Y = Exine

D. X = Tapetum, Y = Endothecium

Answer: D

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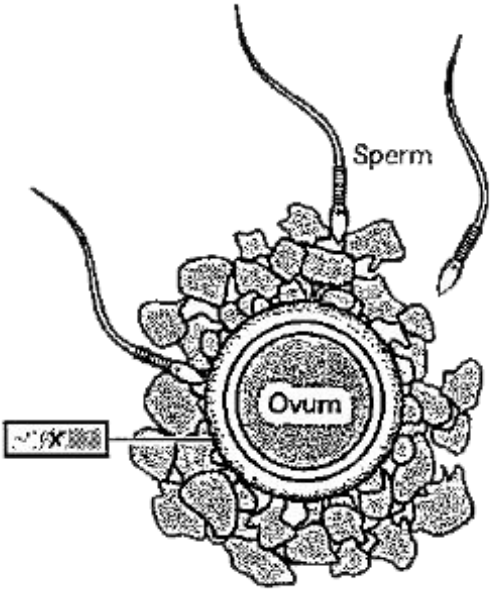
2. Identify X:



A. X = Perivitelline space

B. X = Zona pellucida

C. X= Corona radiata

D. X = Plasma membrane

Answer: B

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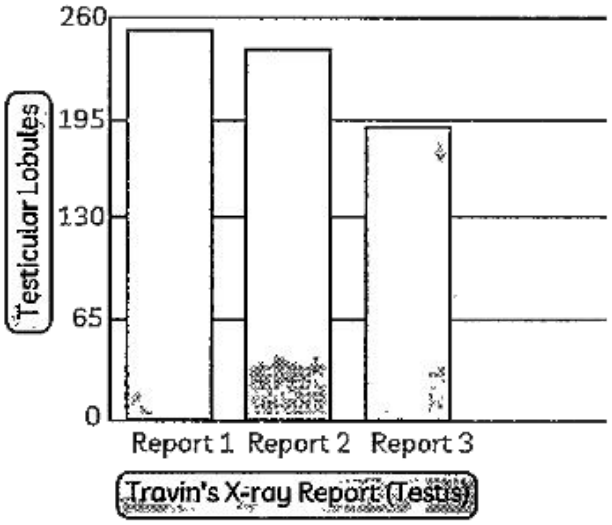
3. Study the graph and help Rakesh to find out which of these report(s) concerning the X-RAY of the testis in some random patients could

be correct.



A. Report 1

B. Report 1,2

C. Report 2,3

D. Report 3

Answer: B

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4. Find out the correctly matched option:

(A)	Vegetative cell	Contains abundant food reserver.
(B)	Generative cell	It is a small, spindle shaped cell with dense cytoplasm
(C)	Vegetative cell	Has a small and regularly shaped nucleus.
(D)	Generative cell	Has a nucleus that floats in the cytoplasm of vegetative cell.

A. (A), (C)

B. (B),(C)

C. (A),(B),(D)

D. (A),(B),(C)

Answer: C

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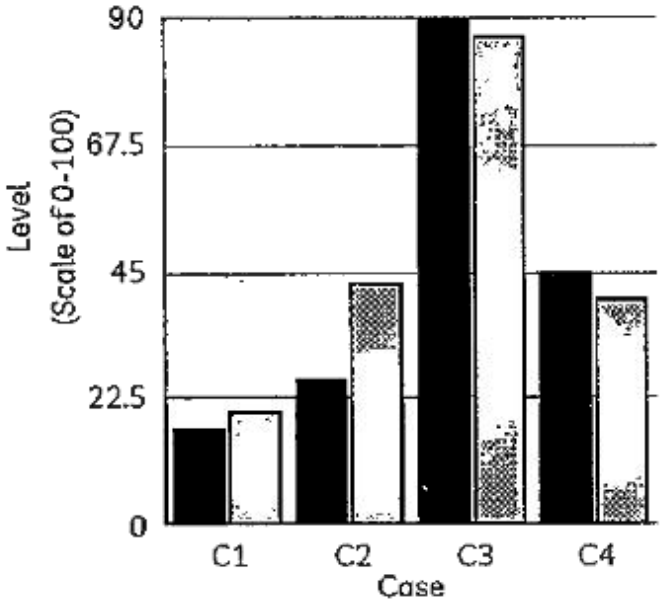
5. The black bar tin the given graph represents the LH and the other one represents the FSH. Which among these cases could represent the

middle phase of menstrual cycle?



A. C1

B. C2

C. C3

D. C4

Answer: C

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6. Which of the following contains the filiform apparatus?

A. Zygote

B. Generative cell

C. Synergids

D. Egg

Answer: C

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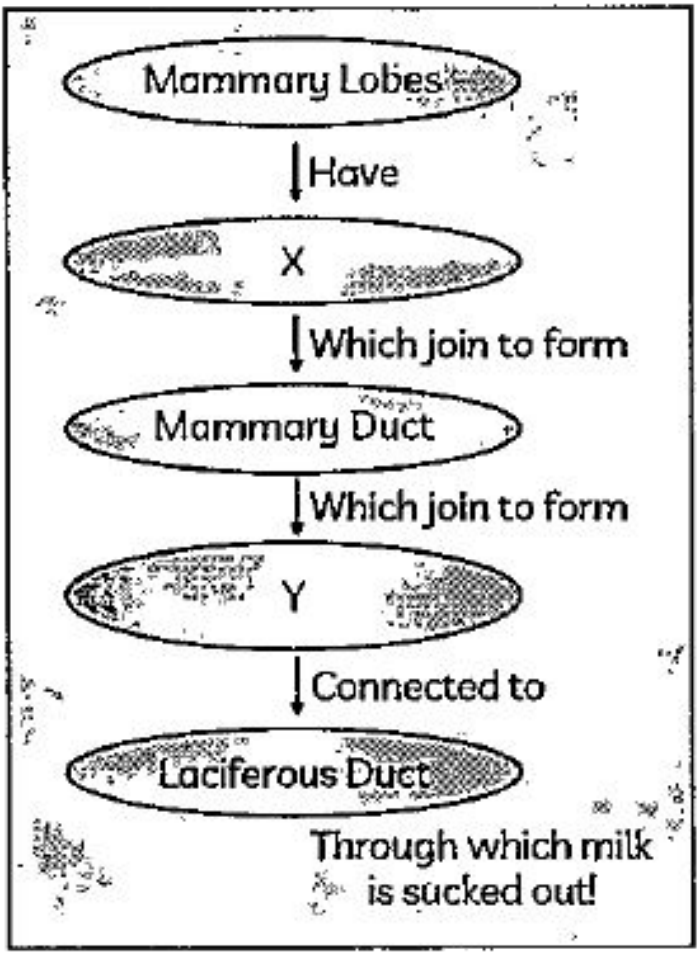
7. Observe the give diagram and the table.

Answer the question that follows:



	X	Y
(a)	Mammary Tubules	Mammary Ampulla
(b)	Laciferous Lobes	Mammary Ampulla
(c)	Mammary Ampulla	Mammary Tubules
(d)	Mammary Ampulla	Laciferous Lobes

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8. Gestation period is:

A. Time period between two successive phases in menstrual cycle

B. Time period required for Trophoblast formation.

C. Time period between implantation and parturition.

D. None of these

Answer: C

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9. Which one of the following is not found in a female gametophyte of an angiosperm?

A. Germ pore

B. Synergids

C. Filiform apparatus

D. Central cell

Answer: A

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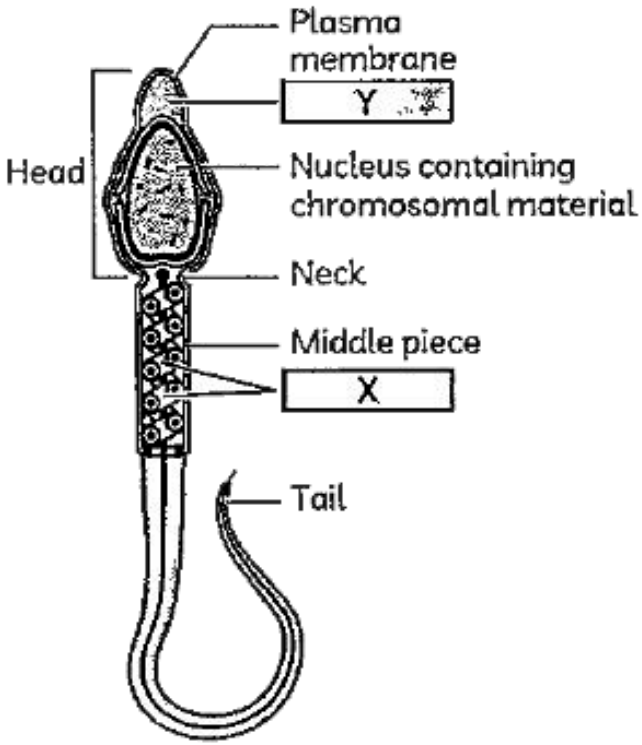
10. Which of the following statements are true related to X, Y?



(I) X is Mitochondria, Y is Acrosome.

(II) X is Acrosome, Y is Mitochondria.

(III) has certain enzymes in it which help the sperm in penetrating the ovum for fertilisation.

(IV)X contains Globular sperm bases

A. (I),(II)

B. (III),(IV)

C. (II),(III)

D. (I),(III)

Answer: D

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11. The process in which a diploid egg cell is formed which later develops into an embryo without fertilisation is called:

A. Parthenogenesis

B. Parthenocarpy

C. Polyembryony

D. Agamospermy

Answer: D

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12. In a seed, the layer called Testa can be formed by:

A. Middle integument

B. Inner integument

C. Outer integument

D. Both inner and outer integument

Answer: C

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13. An area has reported higher instances of pollen allergy in humans. The area has good

number of individuals of following plants or trees. Which one could be responsible for it?

A. Carrot grass

B. Aloe vera

C. Fern

D. Rose bushes

Answer: A

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14. Arrange the following steps in correct order: (TRANSCRIPTION):

(I) The nascent RNA separates and RNA polymerase also detaches and thus terminates the process of transcription.

(II)RNA polymerase loses the factor, but continues to add ribonucleotides to form RNA.

(III) Binding of RNA polymerase to the promoter and its association with initiation factor (σ).

(IV) The RNA polymerase associates with

termination-factor (ρ) transiently to stop the transcription process.

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

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

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

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

Answer: C

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15. Which of the following is a true fruit?

A. Apple

B. Cashew

C. Strawberry

D. Mango

Answer: D

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16. Micropyle facilitates the entry of _____ into the seed during germination.

A. Oxygen

B. Water

C. Both (a) and (b)

D. Neither (a) nor (b)

Answer: C

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17. Bulbourethral gland secretes:

A. Mucus into urethra

B. Alkaline fluid into urethra

C. Fluids for semen during ejaculation

D. All of these

Answer: D

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18. The replication process involves the following steps:

(I) The enzyme DNA-dependent DNA poly merases catalyse the polymerisation of DNA strand.

(II) The lagging strand is synthesized in frag ments known as Okazaki fragments, which are later joined by the enzyme DNA Ligase.

(III) The origin of replication serves as the recognition site for DNA polymerase and also it provides the site for attachment of RNA primer.

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

Choose the correct option:

A. (I),(II)

B. (III),(IV)

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

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

Answer: C

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19. If the diploid number of chromosomes in an angiospermic plant is 16. Mention number of chromosomes in the endosperm and antipodal cell.

A. Endosperm-48, Antipodals- 16

B. Endosperm-22, Antipodals- 11

C. Endosperm-24, Antipodals- 8

D. Endosperm-46, Antipodals-23

Answer: C

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20. The Hypocotyl has its terminal point at:

A. Micropyle

B. Plumule

C. Stem tip

D. Radicle

Answer: D

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21. All genes located on the same chromosome:-

A. Form different groups depending upon their relative distance

B. Form one linkage group

C. will not form any linkage groups

D. Form interactive groups that affect the phenotype.

Answer: B

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22. Which among these is not true for injectable contraceptives?

A. Intramuscular administration

B. Conception provision for a 1-3 months

C. Progestogens/Progestogens-Estrogen combination

D. Natural hormonal preparations

Answer: D

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23. Which of the following traits are present on the X-Chromosome in Drosophila melanogaster?

A. Eye colour

B. Wing type

C. Body colour

D. All of these

Answer: D

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24. The wrinkled phenotype of pea seeds is genetically based on:

A. It's a recessive trait

B. It's a homozygous trait

C. It's expressed only under the homozygous allelic condition.

D. All of these

Answer: D

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Section B

1. Assertion (A): Removal of gonads results in complete sterilisation.

Reason (R): It is the best option available and offers exceptional results.

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

B. Both A and R are true but R 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): Pelvic inflammatory disease is an infection that happens in the Men's reproductive tract.

Reason (R): Salmonella typhi is the causative organism.

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

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

C. A is true but R is false

D. A is false but R is true

Answer: D

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3. Assertion (A): The secondary follicle changes into the tertiary follicle.

Reason (R): The change of the secondary follicle into the tertiary follicle is due to the development of a cavity called antrum.

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

B. Both A and R are true but R 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): Gamete disseminated by the male determines whether the child produced will be male or female in Homo sapiens.

Reason (R): Some genes on X-chromo some and Y-chromosomes determine the gender of the progeny. Its a polygenic trait.

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

B. Both A and R are true but R 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 are spread by bacteria?

(I) Gonorrhoea

(II) Syphilis

(III) AIDS

(IV) Genital herpes

A. (I) and (II)

B. (II) and (IV)

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

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

Answer: A

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6. Zoophilous flowers can be associated with:

A. Geltonogamy

B. Xenogamy

C. Autogamy

D. Geitonogamy and Xenogamy

Answer: D

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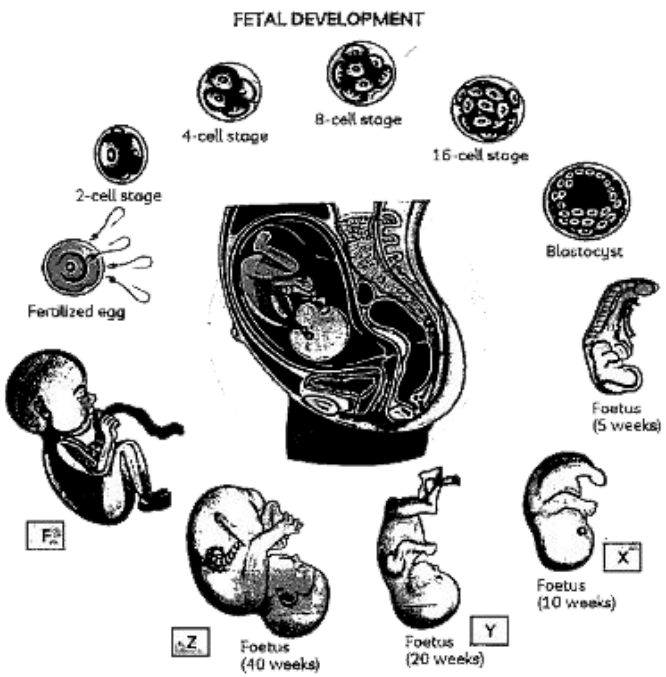
7. Out of X, Y, Z, F which stage will mark the completion of heart and limb development?


FETAL DEVELOPMENT
4-cell stage
8-cell stage
16-cell stage
2-cell stage
Blastocyst
Fertilized egg
Foetus
(5 weeks)
F
Z
Foetus
(40 weeks)
Foetus
(20 weeks)
Y
X
Foetus
(10 weeks)

A. X

B. Y

C. Z

D. F

Answer: B

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8. Geitonogamy is:

A. Pollination between two flowers of the same plant .

B. Pollination between two flowers of two different plants.

C. Pollination between two flowers of two genetically dissimilar plants.

D. Option (a) and (c)

Answer: B

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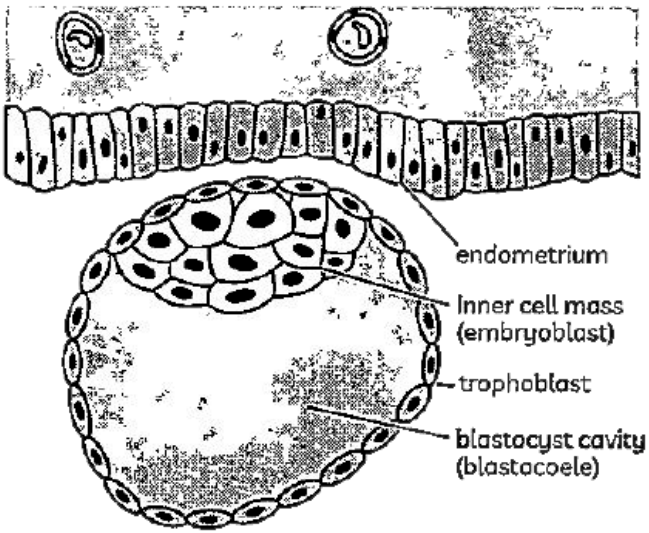
9. Which of the following statements are true related to given figure:



(I) Ectoderm is the outermost layer.

(II) Trophoblast is the outermost layer.

(III) The trophoblast layer attaches to the endometrium wall of mother's womb.

(IV)An inner group of cells attached to trophoblast is called the inner cell mass.

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

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

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

D. (I),(IV)

Answer: B

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10. Which part of the flower is represented by the tassels of the corn-cob?

A. Stigma and Style

B. Ovule and Ovary

C. Anther and Filament

D. Both (a) and (c)

Answer: A

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11. Parogamy can be defined as:

A. Fertilisation in which the pollen tube enters the ovule through chalazal end

B. Fertilisation in which the pollen tube enters the ovule through micropyle

C. Fertilisation in which the pollen tube enters the ovule through integument

D. Fertilisation without pollen grains

Answer: B

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12. The fruits that develop only from ovary are known as .....

A. Parthenocarpic fruits

B. True fruits

C. False fruits

D. Apomictic fruits

Answer: B

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13. Which among these are the examples of polygenic traits in humans?

A. Height

B. Skin colour

C. Eye colour

D. All of these

Answer: D

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14. A cross was developed between 2 Rose plants. They showed contrasting traits Writ the height of the plant. The final result had 50 percent parental traits. This cross can be classified as:

A. Cross exhibiting co-dominance

B. Test cross

C. Incomplete dominance

D. Trihybrid cross

Answer: B

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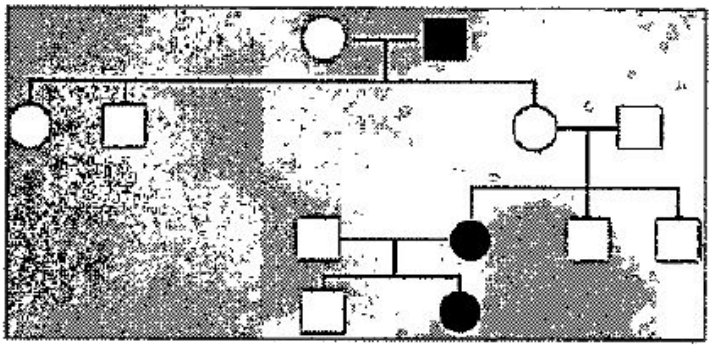
15. Study the pedigree chart given below and find out whether the given hypothetical trait is:



A. Recessive

B. Dominant

C. Cannot say

D. No trait is present

Answer: A

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16. A ..... was utilised by Mendel which had undergone ..... for several generations.

A. Hybridisation, Cross-pollination

B. Cross-breeding, Cross-pollination.

C. True breeding, autogamy.

D. Artificial Hybridisation

Answer: C

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17. Choose the subunit of a ribosome which encounters an mRNA

A. Larger

B. Smaller

C. Both (a) and (b)

D. Not define

Answer: B

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18. A nucleoside lacks:

A. phosphate group

B. sugar

C. base

D. hydroxyl group

Answer: A

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19. Methionine is coded by:

A. AUG

B. GUA

C. AGU

D. TUG

Answer: A

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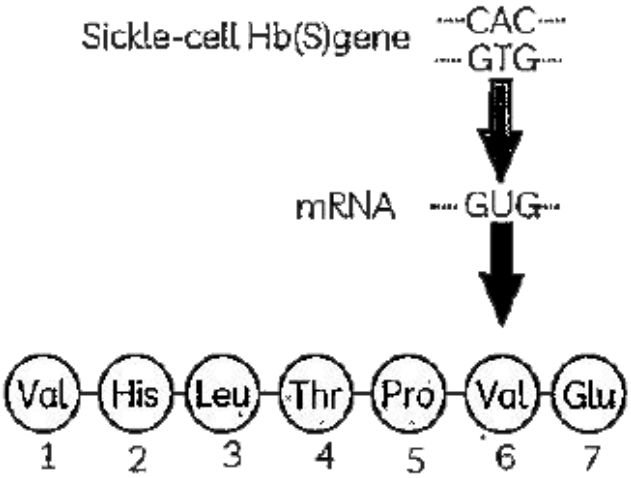
20. This defect results from:



A. substitution of Glutamic acid (Glu) by Valine (Val) at the sixth position of the (β) globin chain of the haemoglobin molecule.

B. substitution of Serine (Ser) by Glutamic acid (Glu) at the sixth position of the (β)

globin chain of the haemoglobin molecule.

C. substitution of Glutamic acid (Glu) by Phenylalanine at the sixth position of the β globin chain of the haemoglobin molecule.

D. substitution of Glutamic acid (Glu) by Leucine (Leu) at the sixth position of the β globin chain of the haemoglobin molecule.

Answer: A

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21. In prokaryotes, the negatively charged DNA is held with some positively charged proteins in a region called as:

A. Nucleus

B. Nucleoid

C. Nucleolus

D. Nucleoli

Answer: B

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22. X = ... identified DNA as an acidic substance present in the nucleus of a cell. He named it as Y = ...

A. X = Avery, Y = Negatoid.

B. X = Stein, Y = DNA Nucleolus.

C. X = William Harvey, Y = Nucleoid

D. X = Friedrich Meischer Y = Nuclein

Answer: D

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23. A double stranded DNA has 30 per cent of Guanine, What will be the percentage of Cytosine?

A. 90

B. 60

C. 20

D. 30

Answer: D

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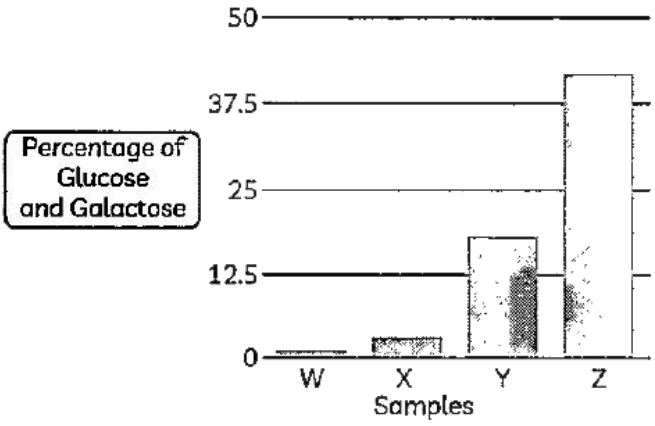
24. The given graph shows the presence of Glucose and Galactose in the medium when Lac operon was operational.



A. W and X

B. Y and Z

C. Y

D. Z

Answer: B

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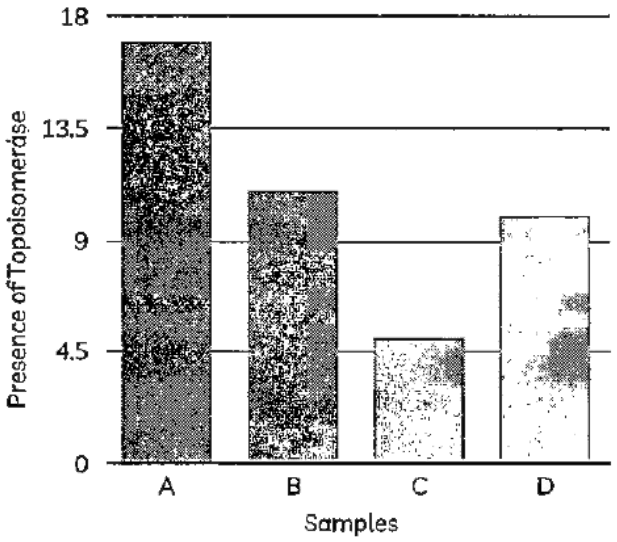
Section C

1. The proof for semiconservative mode of DNA replication was First provided by Matthew Meselson and Franklin Stahl. Escherichia coli were the first organism to be used for this experiment and then it was done in with higher organisms such as plants and human cells. The process of DNA replication in terms of energy is a very expensive process. It involves the formation of a replication fork. Given below is a graph showing the percentage of Adenine in two different double stranded DNA.

Study the graph given below. One of the samples will easily sail through the supercoiling developed on the end of DNA opposite to the replication fork. The sample will be:



A. A

B. B

C. C

D. D

Answer: A

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2. The proof for semiconservative mode of DNA replication was First provided by Matthew Meselson and Franklin Stahl. Escherichia coli were the first organism to be used for this experiment and then it was done

in with higher organisms such as plants and human cells. The process of DNA replication in terms of energy is a very expensive process. It involves the formation of a replication fork. Given below is a graph showing the percentage of Adenine in two different double stranded DNA.

DNA replication is often termed as a semi-discontinuous process because:

A. Formation of a primer strand takes place during replication of DNA.

B. Helicase unwinds the helix in phases

C. Okazaki fragments are formed during DNA replication.

D. Information insufficient

Answer: C

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3. The proof for semiconservative mode of DNA replication was First provided by Matthew Meselson and Franklin Stahl. Escherichia coli were the first organism to be

used for this experiment and then it was done in with higher organisms such as plants and human cells. The process of DNA replication in terms of energy is a very expensive process. It involves the formation of a replication fork. Given below is a graph showing the percentage of Adenine in two different double stranded DNA.

Which among the following is the appropriate reason for Primase being the primary enzyme responsible for initiation of DNA synthesis?

A. DNA polymerase III can't initiate DNA synthesis.

B. Primase is the only true replicase in the process of DNA replication.

C. Primase can replicated and unwind the DNA helix easily.

D. Information insufficient.

Answer: A

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4. The proof for semiconservative mode of DNA replication was First provided by Matthew Meselson and Franklin Stahl. Escherichia coli were the first organism to be used for this experiment and then it was done in with higher organisms such as plants and human cells. The process of DNA replication in terms of energy is a very expensive process. It involves the formation of a replication fork. Given below is a graph showing the percentage of Adenine in two different double stranded DNA.

Turner's syndrome results due to ..... of one of the X chromosome.

A. Absence

B. Excess

C. Presence

D. None of these

Answer: A

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5. The proof for semiconservative mode of DNA replication was First provided by Matthew Meselson and Franklin Stahl. Escherichia coli were the first organism to be used for this experiment and then it was done in with higher organisms such as plants and human cells. The process of DNA replication in terms of energy is a very expensive process. It involves the formation of a replication fork. Given below is a graph showing the percentage of Adenine in two different double

stranded DNA.

Helicase helps in:

A. Stabilising the strands

B. Unwinding the helix

C. Formation of primer strand

D. All of them.

Answer: B

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6. The proof for semiconservative mode of DNA replication was First provided by Matthew Meselson and Franklin Stahl. Escherichia coli were the first organism to be used for this experiment and then it was done in with higher organisms such as plants and human cells. The process of DNA replication in terms of energy is a very expensive process. It involves the formation of a replication fork. Given below is a graph showing the percentage of Adenine in two different double stranded DNA.

Meselson and Stahl provided confirmation to whose model of DNA?

A. Linus Pauling

B. Johann Friedrich Miescher

C. Watson and Crick

D. None of these

Answer: C

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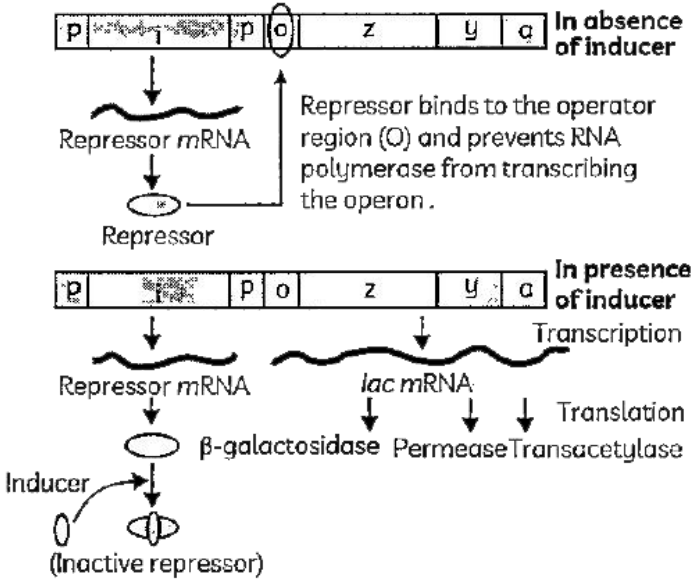
7. Observe the given figure and answer:



RNA polymerase binds to ..... for transcribing the Lac operon.

A. Regulator region

B. Structural protein region

C. Operator region

D. None of these.

Answer: C

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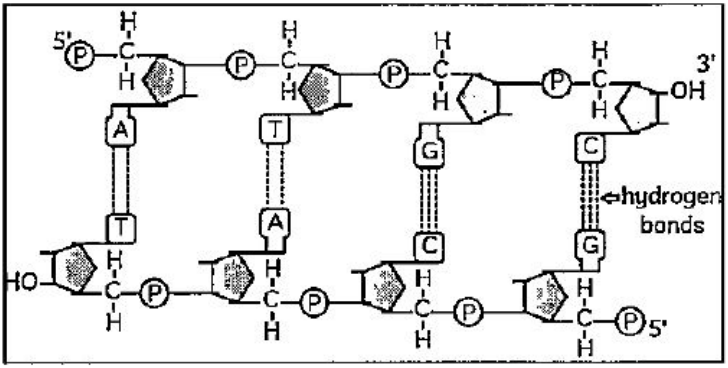
8. Observe the given diagram and find out the incorrect statement:



(I) The two DNA chains are coiled in a right-handed fashion.

(II) Adenine is bonded by two hydrogen bonds with Thymine from the opposite strand and vice-versa.

(III) A purine always comes opposite to a pyrimidine.

(IV) Guanine forms two H-bonds with Cytosine.

A. (I),(II)

B. (II)

C. (IV)

D. (III),(IV)

Answer: C

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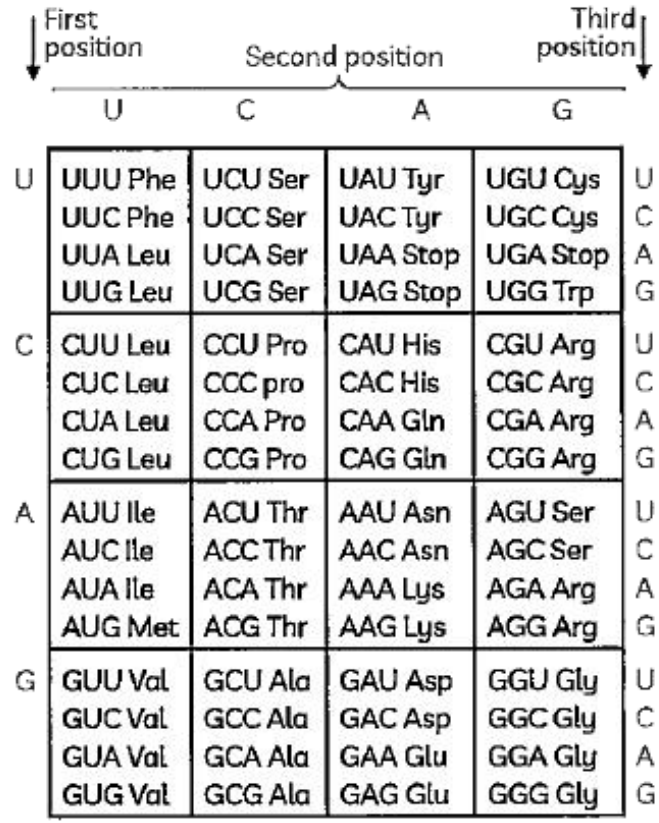
9. Observe the given figure and identify the incorrect statement:



(I) The genetic code is degenerate.

(II) AUG serves dual functions.

(III) The genetic code is nearly universal with not exceptions.

(IV) The genetic code is non-ambiguous and

specific which means a specific codon will only code for a particular amino acid.

A. (I),(II)

B. (III)

C. (II)

D. (III),(IV)

Answer: B

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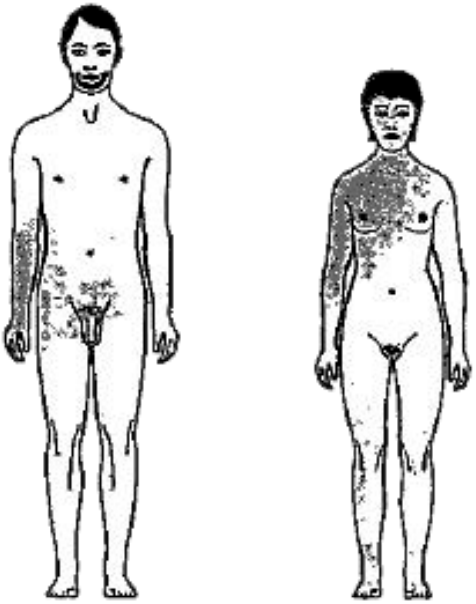
10. Observe the figure given below and answer the question that follows:



(a)
Tall stature with feminised character

(b)
Short stature and underdeveloped feminine character

The given individuals might be suffering from:

A. Klinefelter's syndrome

B. Turner's syndrome

C. Down's syndrome

D. Phenylketonuria

Answer: B

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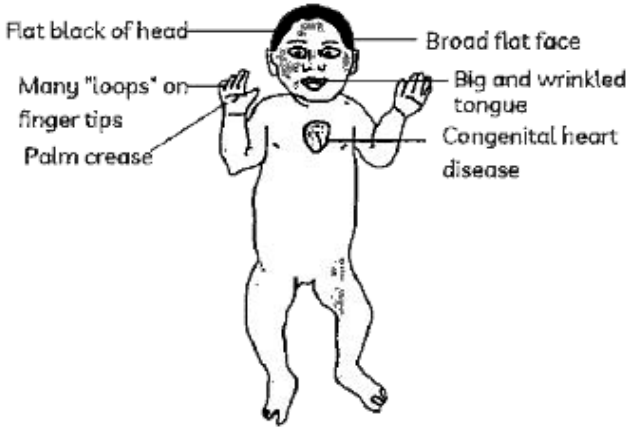
11. Observe the given figure and answer:



Which of the following might hold true for the given individual:

A. Affected individual is short statured with small round head, furrowed tongue and partially open mouth.

B. The palm of the person is broad with characteristic palm crease.

C. Retardation of physical, psychomotor and mental development.

D. All of these.

Answer: D

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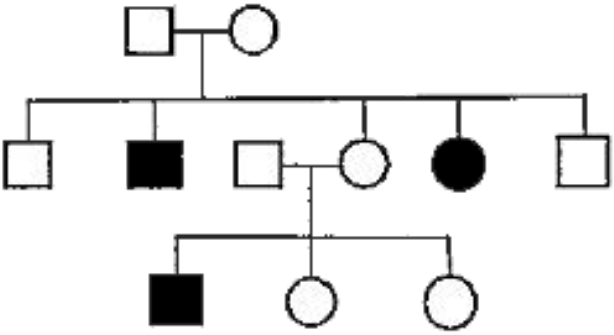
12. With reference to the pedigree analysis, answer the following question:



If the pedigree chart represents the inheritance of sickle cell anemia, then the RBCs of the parents will be:

A. Normal

B. Sickle shaped

C. Both normal and sickle shaped

D. Cannot be determined

Answer: C

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