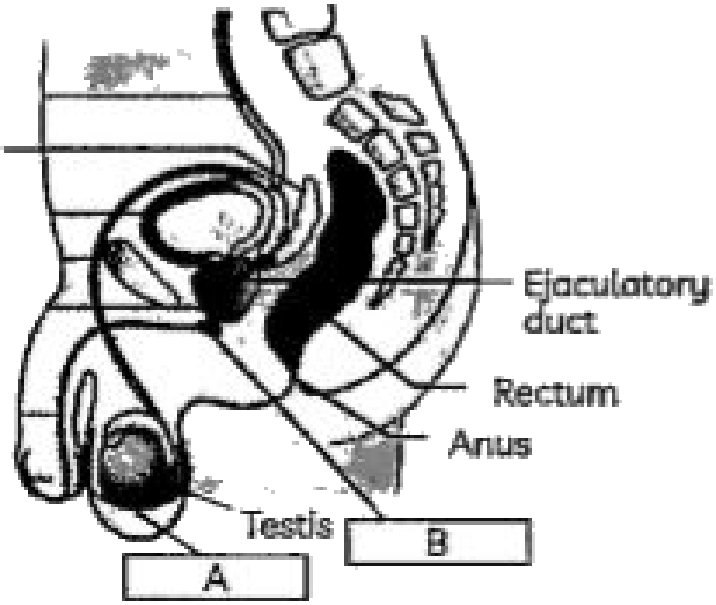
BIOLOGY

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 7

Section A

1. Identify A and B in the given figure.



A. A = Scrotum, B = Bulbourethral Glands

B. A = Urethra, B = Seminal Vesicle

C. A = Glans Penis, B = Prostate

D. A = Foreskin, B = Urinary Bladder

Answer: A

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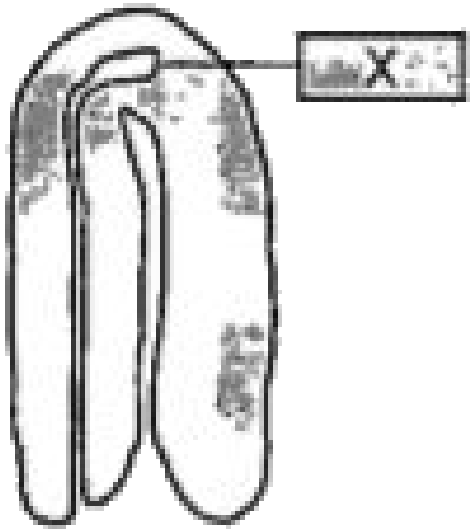
2. Identify X :



A. X = Radicle

B. X = Plumule

C. X = Hypocotyl

D. X = Root cap

Answer: A

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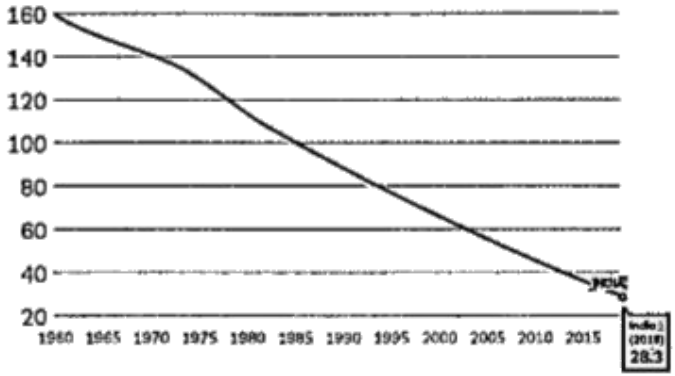
3. Read the following excerpt. On the basis of your reading, answer the given question:

The probable factors that have contributed to

population explosion in India are:



(1) Improved health facilities.

(2) A rapid decline in death rate.

(3) Decline in MMR (Maternal mortality rate) and IMR (Infant mortality rate).

(4) Longer life span.

(5) Absence of famines and epidemics.

Which among the following has not contributed to the population explosion:

A. Improved dietary management.

B. Improvised healthcare facilities.

C. Humanitarian efforts.

D. Refugee crisis

Answer: D

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4. Find out the incorrectly matched option :

(A)	Parthenogenesis	Haplid offsprings are produced.
(B)	Parthenogenesis	Development of an unfertilised egg into a complete individual without fertilisation.
(C)	Parthenogenesis	Occurs only in plants.
(D)	Parthenogenesis	Plants like Solanum nigrum undergo it!

A. A

B. B

C. C

D. D

Answer: C

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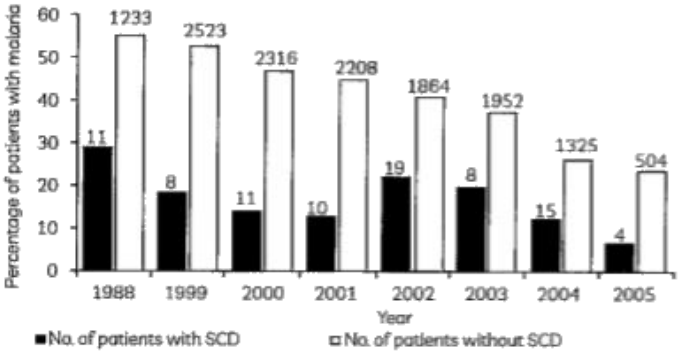
5.



The following statements are drawn as conclusions from the above data (Kenya).

(I) Patients with SCD (Sickle Cell Disease) are

less likely to be infected with malaria.

(II) Patients with SCD (Sickle Cell Disease) are more likely to be infected with malaria.

(III) Over the years the percentage of people infected with malaria has been decreasing.

(IV) Year 2000 saw the largest percentage difference between malaria patients with and without SCD.

Choose from below the correct alternative.

A. only (I) is true

B. (I) and (IV) are true

C. (III) and (II) are true

D. (I) and (III) are true

Answer: D

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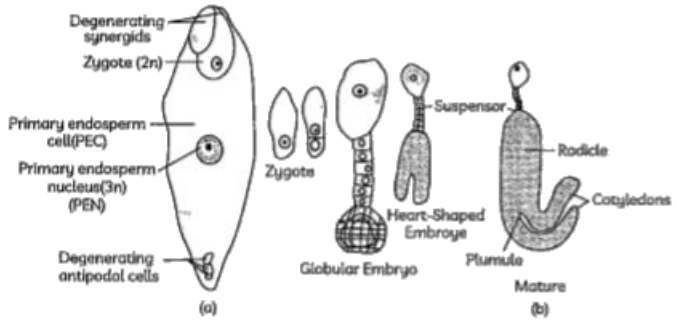
6. Embryogeny

An embryo can be called as an organized mass of cells that can give rise to a new organism on attainment of maturity. Just like zygote, embryo also develops at the micropylar end of the embryo sac.

The zygote starts dividing only after certain amount of endosperm is formed. The endosperm provides nutrition to the developing embryo.

Now, observe the diagram given below and answer the given questions catering to embryogeny in plants.



Find out the correct order of formation:

A. Heart-shaped, Globular, Proembryo and Mature embryo

B. Globular, Heart-shaped, Proembryo and Mature embryo.

C. Proembryo, Globular embryo, Heart shaped, Mature embryo

D. Heart-shaped, Proembryo, Globular and Mature embryo.

Answer: C

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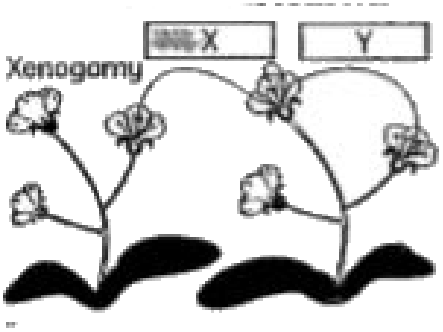
7. Observe the given diagram and the table.

Answer the question that follows:



	X	Y
(a)	Autogamy	Geitonogamy
(b)	Geitonogamy	Autogamy
(c)	Porogamy	Geitonogamy
(d)	Xempgay	Xenogamy

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8. Name the hormone which is released from Ovary, Placenta and assists in dilation of cervix, parturition:

A. Oxytocin

B. Relaxin

C. Progesterone

D. Luteinizing hormone

Answer: B

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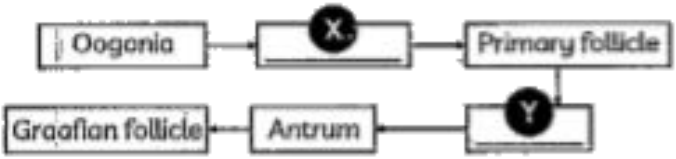
10. Which of the following statements are true related to X and Y?



(I) X is Primary oocyte

(II) Y is Secondary follicle

(III) X changes into corpus luteum

(IV) Formation of X is the final step in menstrual cycle

A. (I)

B. (III), (IV)

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

D. (I), (II)

Answer: D

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11. Adaptations synchronous with which among these mechanisms have been evolved by the plants to avoid inbreeding depression?

A. Xenogamy

B. Autogamy

C. Geitonogamy

D. Cleistogamy

Answer: A

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12. Which among these plants produce Chasmogamous flowers:

A. Oxalis

B. Pea

C. Hibiscus

D. All of these

Answer: D

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13. A couple was unsuccessful in conceiving again after having a child. Their condition could be designated as:

A. Pseudo-infertility

B. Primary infertility

C. Periodic infertility

D. Secondary infertility

Answer: D

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14. Arrange the following steps in correct order: (TRANSLATION- ELONGATION):

(I) Addition of amino acids takes place one by

one in the sequence of codons

(II) Ribosome moves from codon to codon along the mRNA in 5' $\rightarrow$ 3' direction.

(III) A peptide bond is formed by the enzyme peptidyl transferase between carboxyl group of amino acid present at P-site and amino group of amino acid present at A-site.

(IV) The amino acid-tRNA complexes, sequentially bind to the A-site of the ribosome in which the appropriate codon in mRNA bonds with the tRNA anticodon by complementary base pairing.

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. Umbilical cord helps in the transport of substances to and from the embryo. Which

among these is not a function of the umbilical cord:

A. Serves as a blood source for the foetus.

B. Supplies nutrients and oxygen to the de veloping fetus.

C. Transfer waste products and deoxygenated blood away from the Fetus to the maternal circulation.

D. Helps in regulation of blood flow from foetal heart to foetal brain.

Answer: D

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16. Name the kind of disease or disorder that is likely to occur in humans if there is a mutation in the gene that codes for an enzyme phenylalanine hydroxylase:

A. Phenylketonuria

B. Huntington's disease

C. Turner's syndrome

D. Sickle cell anaemia

Answer: A

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17. In case of no fertilisation, corpus luteum ..... .

A. Proliferates

B. Degenerates

C. Divides into half

D. Develops a fluidic cavity

Answer: B

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18. The translation process involves the following steps:

(I) Binding of ribosome and mRNA at the start codon (AUG).

(II) Recognition of start codon (AUG) by initiator tRNA.

(III) Amino acids are activated in the presence of ATP

(IV) Amino acids bind with the enzyme aminoacyl tRNA synthetase

Choose the correct sequence:

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

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

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

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

Answer: D

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19. The proof for semiconservative mode of DNA replication was first provided by

A. Watson and Crick

B. George Gamow

C. Matthew Meselson and Franklin Stahl

D. Hershey and Chase

Answer: C

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20. Select the incorrect statement with respect to enzymes used in DNA replication:

A. Topoisomerase can unwind the DNA helix.

B. Helicase joins the Okazaki fragments.

C. DNA Ligase holds the fork open and stabilizes.

D. All of the above.

Answer: D

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21. Which type of mutation is caused by deletions and insertions of base pairs of DNA?

A. Frame-shift

B. Point

C. Both (a) and (b)

D. Neither (a) nor (b)

Answer: A

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22. Pick the wrong one out:

A. AIDS (Acute Acquired Immuno Deficiency Syndrome) is caused by HIV (Human Immuno Deficiency virus).

B. Human papilloma virus is behind Gonorrhoea.

C. Genital Herpes is caused by Herpes Simplex Virus.

D. Hepatitis B is caused by Hepatitis B virus.

Answer: B

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23. The R.B.C's have ..... types of sugars.

A. One

B. Two

C. Three

D. Four

Answer: B

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24. Mendel utilised ..... in his experiments.

A. Logical deduction

B. Statistical analysis

C. Large sample size

D. All of these

Answer: D

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Section B

1. Assertion (A): Lactose is the substrate for the enzyme beta-galactosidase and it regulates switching on and off of the lac operon.

Reason (R): The lac operon consists of one regulatory gene and three structural genes.

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: B

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2. Assertion (A): Mendelian disorders are transmitted to offspring on the same lines as in the principles of inheritance.

Reason (R): The pattern of inheritance of Mendelian disorders cannot be traced in a family by the pedigree analysis.

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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3. Assertion (A): Some codons act as terminating or stop codons.

Reason (R): 3 codons do not code for any amino acids.

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): Every individual DNA has a characteristic pattern of bands which are obtained on autoradiogram, after hybridisation with VNTR probe.

Reason (R): This pattern differs from individual to individual in all members of a population.

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. In Moths, the sex-determination mechanism is of ..... type.

A. XX-XX Type

B. ZZ-ZO Type

C. XX-XY Type

D. ZZ-ZW Type

Answer: B

6. Central Drug Research Institute has developed an oral contraceptive pill known as ..... .

A. Jeevika

B. Saheli

C. Mitr

D. Simhika

Answer: B

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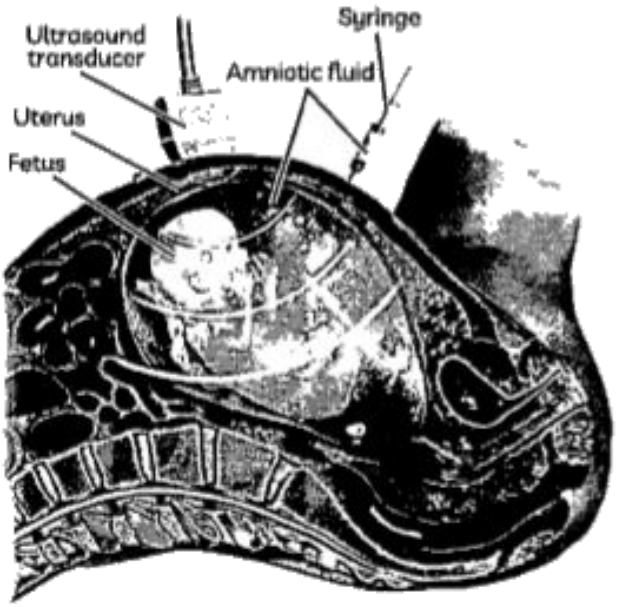

7.

Amniotic fluid is:

A. is a fluid containing cells from foetal tissue.

B. is a fluid surrounding foetus.

C. a fluid enclosed within amniotic sac

D. both (a) and (c)

Answer: D

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8. Amniocentesis was illegally utilised for ..... .

A. detection of chromosomal abnormalities

B. detection of metabolic disorders

C. detection of foetal sex

D. Both (a) and (c)

Answer: C

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

(I) They are small doses of either progestogens or progestogen - estrogen combinations.

(II) Dosage pattern these needs to be repeated after a gap of 7 days (during which menstruation occurs).

(III) They prevent conception with the help of a surgical intervention.

(IV) They are permanent contraceptives.

A. (I), (II)

B. (II), (IV)

C. (II), (III)

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

Answer: A

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10. Francois Jacob (a geneticist) and Jacque Monod (a biochemist) were the first to explain the concept of a transcriptionally regulated system. Such a system is composed of a polycistronic structural gene that is regulated by a common promoter and regulatory genes.

Such an arrangement is known as operon.

The lac operon consists of one Regulatory gene and three Structural genes.

If we consider the case of Escherichia coli, the Lac operon gets activated in case when:

A. Lactose binds to RNA polymerase.

B. The repressor binds to operator.

C. Lactose binds to the repressor.

D. RNA polymerase binds to the operator.

Answer: C

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11. ..... can terminate transcription.

A. TATA Box

B. ρ

C. σ

D. $\rho - X$

Answer: B

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12. Intra cytoplasmic sperm injection (CSI) is most beneficial in cases of .....

A. Oligospermia

B. Azoospermia

C. Oligozoospermia

D. All of these

Answer: D

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13. Acrosomal reaction of the sperm occurs due to

A. Its contact with zona pellucida of the ova.

B. Reactions within the uterine environment of the female.

C. Reactions within the epididymal environment of the male.

D. Androgens produced in the uterus.

Answer: A

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14. UGU and UGC code for:

A. Valine

B. Thymine

C. Cysteine

D. Lysine

Answer: C

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15. The existence of an adaptor molecule which reads the genetic code and binds to specific amino acids was first reported by:

A. Friedrich Griffith

B. James Watson

C. Rosalined Franklin

D. Francis Crick

Answer: D

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16. During the activation of the amino acid, amino acids bind with the enzyme ..... in the presence of ATP and Mg^{2+} and become activated.

A. aminoacyl tRNA synthetase

B. aminoacyl rRNA synthetase

C. aminoacyl mRNA synthetase

D. Both (b) and (c)

Answer: A

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17. Identify the incorrect statement:

A. The two processes-DNA replication and cell division should be 3' highly coordinated as failure in cell division after DNA replication results into chromosomal aberrations.

B. The replication of DNA in eukaryotes takes place at M-phase of the cell-cycle.

C. The replication of DNA in eukaryotes takes place in S-phase of the cell-cycle.

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

Answer: D

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18. Which among these are the objectives of increasing the awareness for reproductive health?

A. The youth become aware about sexual and reproductive health that guides them to take correct decisions.

B. Adolescents become aware of safe sexual practices that helps in preventing sexually transmitted infections and also avoiding unwanted pregnancies.

C. Females become more aware about early pregnancy, infertility, birth control

methods, pregnancy, post-childbirth care of the baby and mother.

D. All of these.

Answer: D

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19. Histones are not rich in:

A. Basic amino acids

B. Acidic amino acids

C. Lysine

D. Arginine

Answer: B

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20. Predict the number of gametes that can be produced by a diploid individual which is heterozygous for 4 loci.

A. 256

B. 16

C. 64

D. 92

Answer: A

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21. ..... transcribes rRNAs (28s, 18s, and 5.8s).

A. RNA polymerase I,

B. RNA polymerase II,

C. RNA polymerase III

D. RNA polymerase IV

Answer: B

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22. A = ... type of mechanism for sex-determination is found in insects like Drosophila melanogaster and mammals including human beings.

A. A = XX-XY

B. A = XX-XO

C. A = ZW-ZZ

D. A = XY-XY

Answer: A

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23. Loosely linked genes show ..... recombination frequency.

A. High

B. Low

C. Medium

D. Can't determine

Answer: A

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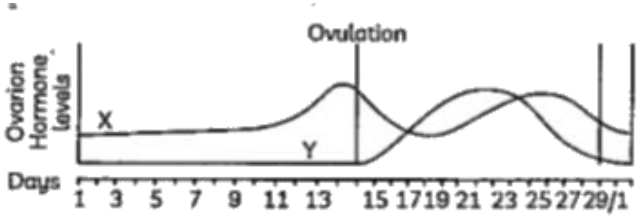
24. Based on the given graph, predict X and Y:

Study the graph given below related with menstrual cycle in females:

(A) Identify ovarian hormones X and Y mentioned in the graph and specify their source.



	X	Y
(a)	Progesterone	Estrogen
(b)	Human Chorionic Gonadotropin	Luteinizing Hormone
(c)	Estrogen	Progesterone
(d)	Oxytocin	Progesterone

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Section C

1. Chromosomal disorders are caused due to absence or excess or abnormal arrangement of one or more chromosomes. Failure of segregation of chromatids during cell division cycle results in the gain or loss of a chromosome, and is called aneuploidy. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism and, this is known as polyploidy.

There are a total number of ..... pairs of autosomes in a normal human cell.

A. 22

B. 23

C. 24

D. 25

Answer: A

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2. Chromosomal disorders are caused due to absence or excess or abnormal arrangement of one or more chromosomes. Failure of

segregation of chromatids during cell division cycle results in the gain or loss of a chromosome, and is called aneuploidy. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism and, this is known as polyploidy.

This genetic disorder called ..... is caused due to the presence of an additional copy of .....-Chromosome resulting into a karyotype of 47, XXY. Identify the disorder.

A. Down's syndrome, Y

B. Klinefelter's syndrome, X

C. Turner's syndrome, X

D. Phenylketoneuria, Y

Answer: B

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3. Chromosomal disorders are caused due to absence or excess or abnormal arrangement of one or more chromosomes. Failure of segregation of chromatids during cell division

cycle results in the gain or loss of a chromosome, and is called aneuploidy. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism and, this is known as polyploidy.

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

A. Presence

B. Excess

C. Absence

D. Both (a) and (b)

Answer: C

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4. Chromosomal disorders are caused due to absence or excess or abnormal arrangement of one or more chromosomes. Failure of segregation of chromatids during cell division cycle results in the gain or loss of a chromosome, and is called aneuploidy. Failure

of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism and, this is known as polyploidy.

Short stature, rounded head, furrowed tongue could be a result of ..... .

A. Down's syndrome

B. Klinefelter's syndrome

C. Turner's syndrome

D. Phenylketoneuria

Answer: A

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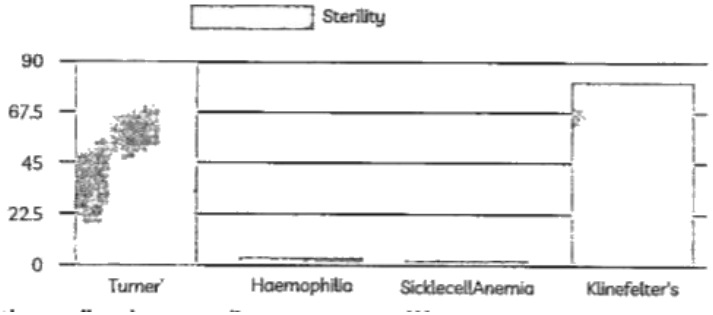
5. Chromosomal disorders are caused due to absence or excess or abnormal arrangement of one or more chromosomes. Failure of segregation of chromatids during cell division cycle results in the gain or loss of a chromosome, and is called aneuploidy. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism and, this is known as polyploidy.

Based on your observation of the chart open below, answer the following question:



Which of these disorders or diseases results in higher percentage of sterile individuals?

A. Turner's syndrome and Sickle cell anaemia

B. Turner's syndrome and Haemophilia

C. Turner's, Klinefelter's syndrome and Haemophilia

D. Turner's and Klinefelter's syndrome

Answer: D

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6. Chromosomal disorders are caused due to absence or excess or abnormal arrangement of one or more chromosomes. Failure of segregation of chromatids during cell division

cycle results in the gain or loss of a chromosome, and is called aneuploidy. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism and, this is known as polyploidy.

The risk of developing congenital heart diseases more in case of :

A. Down's syndrome

B. Turner's syndrome

C. Klinefelter's syndrome

D. All of these

Answer: A

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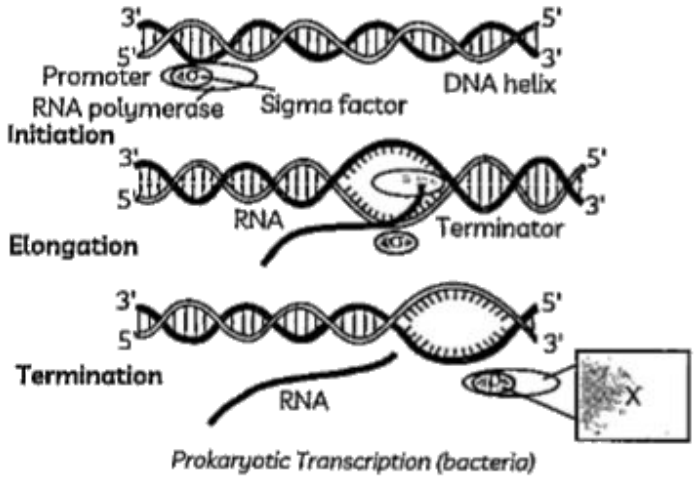

Prokaryotic Transcription (bacteria)

7.

X is a :

A. Initiation factor

B. Rho factor

C. Elongation factor

D. None of these

Answer: B

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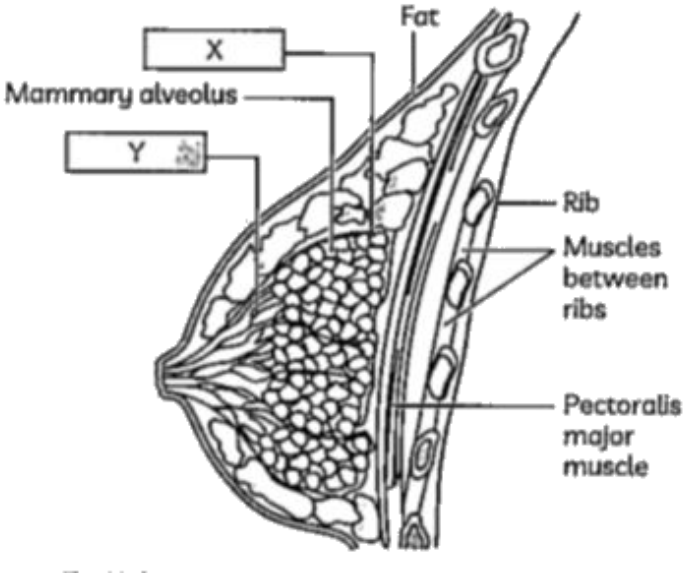
8. Observe the given diagram and find out the correct statement:



(I) X has mammary tubules which join to form Y.

(II) Y has mammary tubules which join to form X.

(III) X has mammary ampulla which join to form Y.

(IV) X has mammary duct which join to form Y.

A. (I), (II)

B. (II)

C. (III)

D. (III), (IV)

Answer: C

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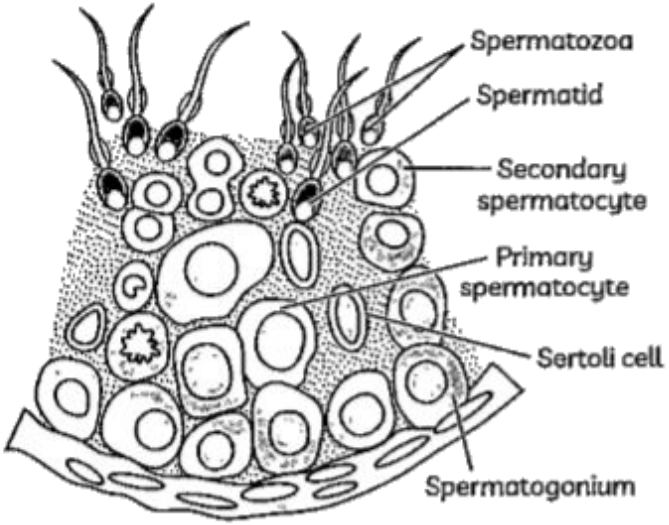
9. Observe the given figure and answer :



Diagrammatic Sectional View of a Seminiferous Tubule (Enlarged)

In Differentiation phase sperm heads become embedded in the :

A. Leydig cells

B. Sertoli cells

C. R.B.C.'s

D. None of these

Answer: B

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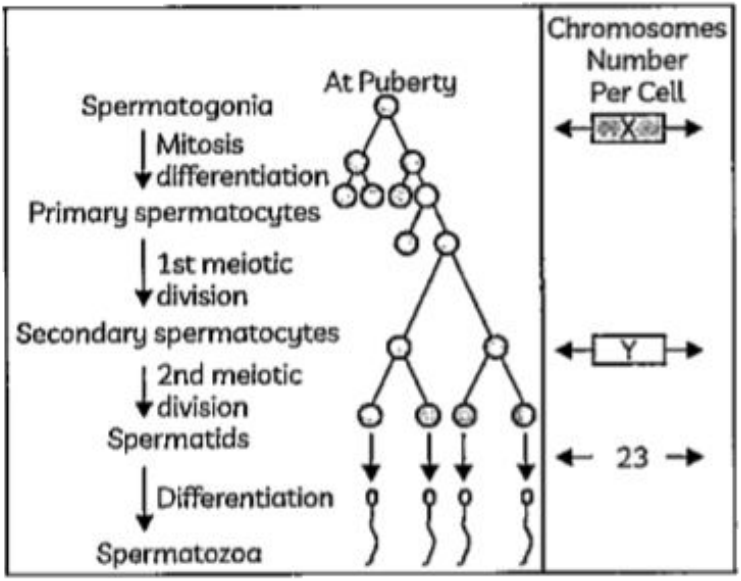
10. Observe the diagram given below and answer the question that follows:



What would be the chromosomal number per cell at X and Y?

A. X = 46, Y = 26

B. X = 23, Y = 23

C. X = 23, Y = 46

D. X = 21, Y = 23

Answer: A

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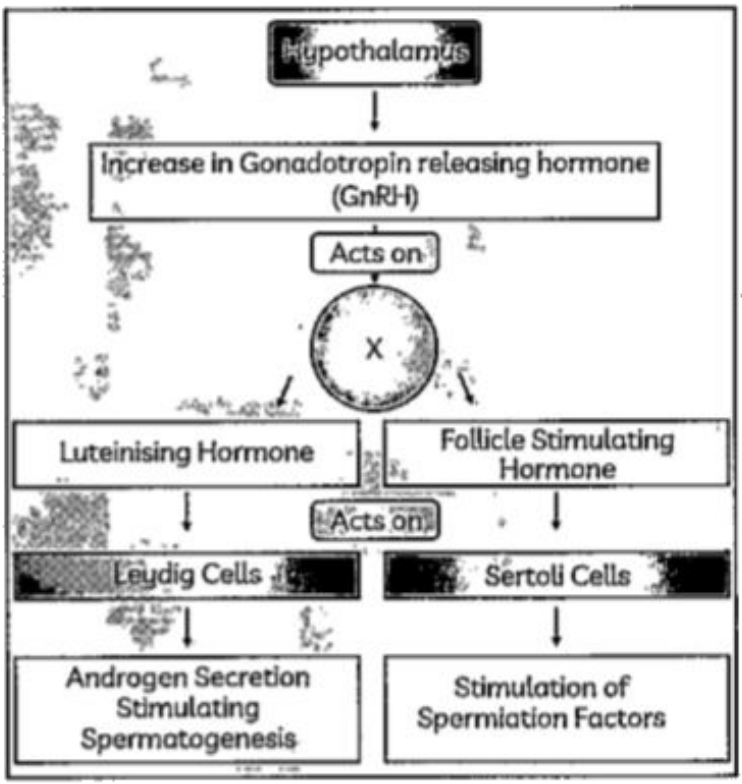
11.



Find X in the figure given above :

A. Posterior pituitary

B. Anterior pituitary

C. Medulla ablongata

D. Anterior and Posterior pituitary

Answer: B

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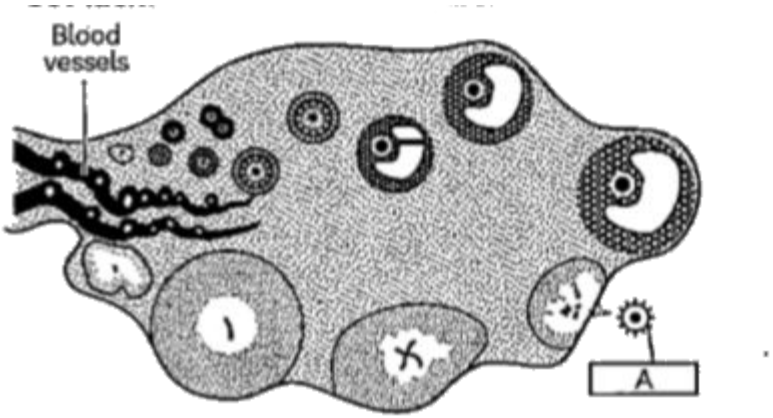
12. Identify A in the given figure :



A. Corpus luteum

B. Ovum

C. Antrum

D. Polar body

Answer: B

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