BIOLOGY

BOOKS - XII BOARDS PREVIOUS YEAR

QUESTION PAPER 2022 TERM 1 SET 1

Section A

1. The hilum in a typical angiospermic ovule represents the junction between -

A. Integuments and the embryo sac.

B. Embryo sac and the nucellus

C. Body of the ovule and the funicle

D. Nucellus and the funicle

Answer:

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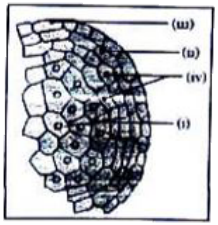
2. In the given diagram of a transverse section of a young anther. Choose the labellings showing the correct placement of the wall

layers from the table given below:



	(i)	(ii)	(iii)	(iv)
(a)	Epidermis	Middle layers	Tapetum	Endothecium
(b)	Tapetum	Endothecium	Epidermis	Middle layers
(c)	Endothecium	Tapetum	Middle layers	Epidermis
(d)	Middle layers	Epidermis	Endothecium	Tapetum

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3. The term used for the embryo entering into the state of inactivity as the seed mature is -

A. Quiescent

B. Parthenogenesis

C. Parthenocarpy

D. Doremancy

Answer:

4. The ploidy of the apomictic embryo developed from the integument cells and megaspore mother cell without reduction division respectively will be -

A. 2n and 2n

B. n and n

C. 2n and n

D. 3n and 2n

Answer:

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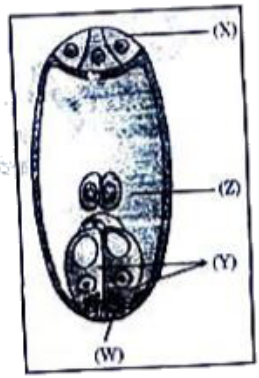
5. Given below is a diagrammatic representation of a mature embryo sac of a typical angiosperm plant.

Choose the option showing the correct labellings for the parts W X Y and Z from the table given below.



	W	X	Y	Z
(a)	Micropylar end	Antipodals	Synergids	Central cell
(b)	Chalazal end	Antipodals	Central cell	Synergids
(c)	Micropylar end	Synergids	Central cell	Antipodals
(d)	Chalazal end	Synergids	Central cell	Antipodals

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6. Breast-feeding the baby acts as a natural contraceptive for the mother because it prevents.

(i) Ovulation

(ii) Menstruation

(iii) Insemination

(iv) Fertilisation

Choose the correct option:

A. (ii) and (iv)

B. (i) and (iii)

C. (i) and (iv)

D. (i) and (ii)

Answer:

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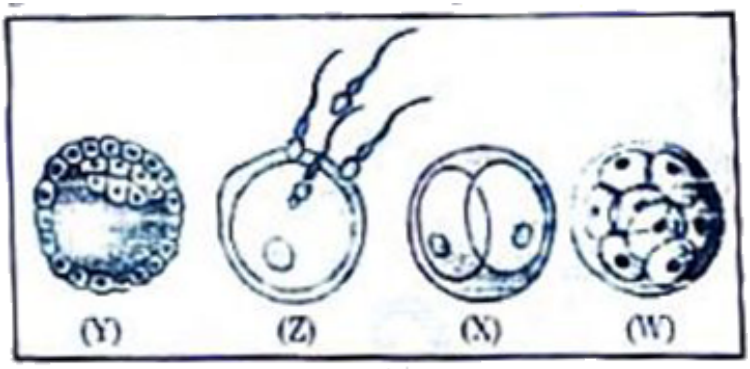
7. The given figure shows the different stages of human embryo:



Identify the correct labellings for W, X, Y and Z

and choose the correct option from the table below:

	W	X	Y	Z
(a)	Cleavage	Blastocyst	Morula	Fetilisation
(b)	Blastocyst	Morula	Cleavage	Fetilisation
(c)	Morula	Cleavage	Blastocyst	Fetilisation
(d)	Morula	Blastocyst	Cleavage	Fetilisation

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8. During human embryonic development the external genital organs are well developed in the foetus by the end of -

A. 6 weeks of pregnancy

B. 12 weeks of pregnancy

C. 18 weeks of pregnancy

D. 24 weeks of pregnancy

Answer:

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9. The accessory ducts in the human male reproductive system consists of -

A. Epididymis. Prostrate, Rete testis

B. Rete testis, Vas efferentia, Seminal vesicles

C. Vas efferentia, Bulbourethral, Epididymis

D. Rete testis, epididymis, Vas deferens

Answer:

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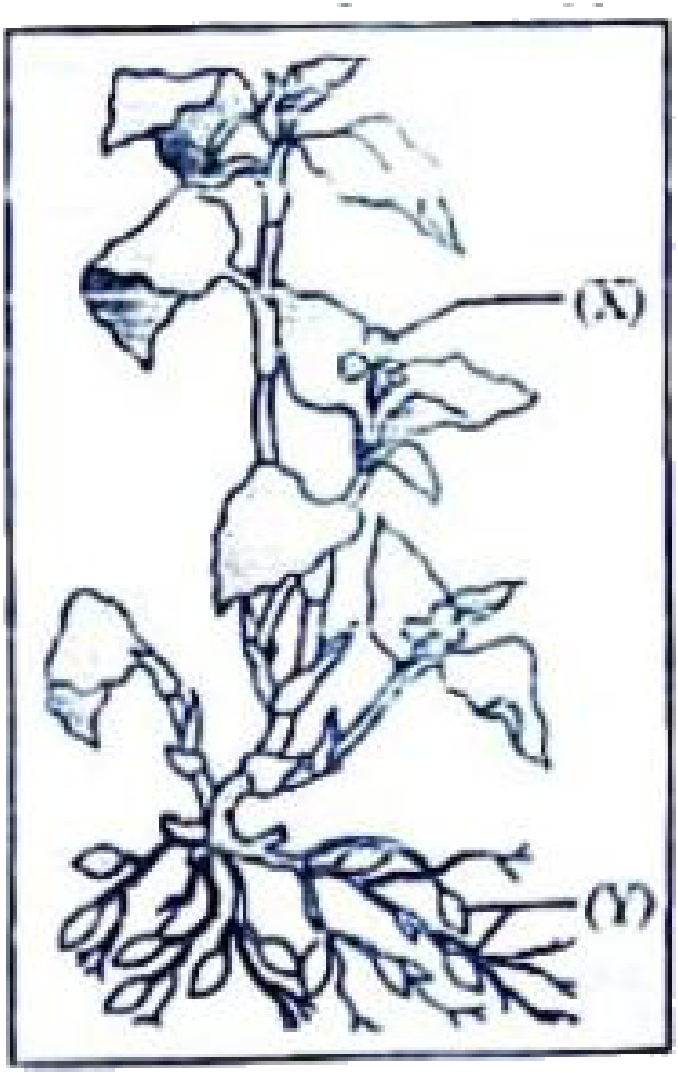
10. Given below is a figure of an angiosperm plant showing two different types of flowers 'X' and 'Y' and the possible type of pollination

in them :



Select the correct option for the flower (X) and flower (Y) and the possible type of pollination

from the given table :

	Flower X	Flower Y
(a)	Chasmogamous, assured seed set	Cleistogamous, cross pollination
(b)	Cleistogamous self/cross pollination	Chasmogamous, assured seed set
(c)	Chasmogamous, self/cross pollination	Cleistogamous, self pollination
(d)	Cleistogamous self pollination only	Chasmogamous, cross pollination only

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11. An undifferentiated sheath covering the root cap of a monocotyledonous embryo is

A. Scutellum

B. Coleorhiza

C. Coleoptile

D. Epiblast

Answer:

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12. The cause of Down's syndrome in humans is

:

A. Extra copy of an autosome

B. Extra copy of a sex chromosome

C. Absence of an autosome

D. Absence of a sex chromosome

Answer:

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13. Which of the following features show the mechanism of sex determination in honey-bee?

(1) An offspring formed from the union of a sperm and egg develops as a male.

(ii) Males have half the number of

chromosomes than that of female.

(iii) The females are diploid having 32 chromosomes.

(iv) Males have father and can produce sons.

A. (i) and (ii)

B. (ii) and (iii)

C. (i) and (iv)

D. (ii) and (iv)

Answer:

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14. Select the pair that is incorrect :

A. Sickle-cell anemia Autosome linked recessive trait

B. Haemophilia: Autosome linked recessive trait

C. Colour blindness: Sex linked recessive trait

D. Thalassemia : Autosome linked recessive trait

Answer:

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15. An example of a human trait where a single gene can exhibit multiple phenotypic expression is -

A. Phenyl ketonuria

B. Cystic fibrosis

C. Thalassemia

D. Haemophilia

Answer:

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16. Life cycle of Drosophila melanogaster is completed in -

A. 7 days

B. 14 days

C. 21 days

D. 28 days

Answer:

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17. How many types of gametes would develop by an organism with genotype AaBBCcDD?

A. 1

B. 2

C. 3

D. 4

Answer:

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18. Given below are the observations drawn in HGP Select the option that shows the correct observations.

(i) The human genome contains 3164.7 billion base pairs.

(ii) The average gene consists of 3000 bases.

(iii) Less than 2% of the genome codes for

proteins.

(iv) Chromosome one has most genes (2698).

A. (i) and (ii)

B. (ii) and (iii)

C. (iii) and (iv)

D. (i) and (iii)

Answer:

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19. The phosphoester linkage in the formation of a nucleotide involves the bonding between

A. Phosphate group and OH of 3'C of a nucleoside

B. Phosphate group and OH of 5'C of a nucleoside

C. Phosphate group and H of 3'C of a nucleoside

D. Phosphate group and H of 5'C of a nucleoside

Answer:

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20. The switching 'on' and 'off of the lac operon in prokaryotes is regulated by

A. Glucose

B. Galactose

C. Lactose

D. Fructose

Answer:

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21. For 'in-vitro' DNA replication, which one of the following substrates need to be added along with the necessary enzymes, the DNA template and specific conditions ?

A. Ribonucleotide triphosphate

B. Deoxyribonucleoside triphosphate

C. Deoxyribonucleotide triphosphate

D. Ribonucleoside triphosphate

Answer:

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22. Which one of the following factor will associate transiently with RNA polymerase to terminate transcription in prokaryotes?

A. sigma factor

B. RHO factor

C. delta factor

D. theta factor

Answer:

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23. Choose the correct pair of codon with its corresponding amino acid from the following list:

A. UAG : Glycine

B. AUG : Arginine

C. UUU: Phenylalanine

D. UGA: Methionine

Answer:

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24. During elongation process of translation, the peptide bond formation between amino acids is catalysed by -

A. ribosomal RNA

B. protein in small subunit of ribosome

C. protein in large subunit of ribosome

D. transfer RNA

Answer:

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Section B

1. Assertion (A): Through Reproductive and Child Health (RCH) programmes in India, we could bring down the population growth rate.
Reason (R): A rapid increase in MMR and IMR were the reasons, along other reasons for this.

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:

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2. Assertion (A) : Sterilisation methods are generally advised for male/female partner as a terminal method to prevent any more pregnancies.

Reason (R): These techniques are less effective and have high reversibility.

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:

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3. Assertion (A): The inner cell mass of blastocyst gets attached to the endometrium during embryonic developed in humans

Reason (R): The blastomeres in the blastocyst gets arranged into trophoblast and inner cell mass.

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:

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4. Assertion (A): There is expression of only one gene of the parental character in a Mendelian Monohybrid cross in F_1 generation. Reason (R): In a dissimilar pair of factors one member of the pair dominates the other.

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:

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5. Select the correct option for Human Chorionic Gonadotropin (HCG) released during embryonic development in humans.

(i) Helps in maintenance of pregnancy

(ii) Leads to rupture of Graafian follicle.

(iii) Cause strong uterine contraction during childbirth.

(iv) Brings metabolic changes in the mother.

A. (i) and (ii)

B. (i) and (iv)

C. (ii) and (iii)

D. (ii) and (iv)

Answer:

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6. Residual persistent nucellus in black pepper is known as

A. Perisperm

B. Pericarp

C. Pulvinus

D. Perianth

Answer:

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7. Amongst the insects the dominant biotic pollinating agents are -

A. Ants

B. Wasps

C. Beetles

D. Bees

Answer:

8. The source of gonadotropin LH and its corresponding function is

A. Anterior pituitary, ovulation

B. Anterior pituitary, Graafian follicle formation

C. Hypothalamus, Ovulation

D. Hypothalamus, Graafian follicle formation

Answer:

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9. A specialized procedure to form an embryo in the laboratory in which sperm is directly, injected into the ovum is

A. IUT

B. IUI

C. ICSI s

D. ZIFT

Answer:

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10. Listed below are all reproductive tract infections except

A. Genital herpes

B. Filariasis

C. Trichomoniasis

D. Syphilis

Answer:

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11. A genetic mechanism which prevents inbreeding depression in majority of angiospermic plants is

A. Parthenogenesis

B. Parthenocarpy

C. Mutation

D. Self-incompatability

Answer:

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12. In Pisum sativum the flower colour may be Violet (V) or White (v) . What proportion of the

offsprings in a cross of VV $\times$ vv would be expected to be violet ?

A. 25%

B. 50%

C. 75%

D. 100%

Answer:

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13. Which one of the gene pair is expected to give a ratio of 1:1:1:1 in the progeny of a Mendelian Dihybrid cross ?

A. AaBb $\times$ AaBb

B. AABB $\times$ AaBb

C. AaBb $\times$ aabb

D. AABB $\times$ aabb

Answer:

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14. The progency of a cross between two snap-dragon plants , heterozygous for flower colour, bearing different coloured flower would be :

A. $50\ \%$ pink, 50% white

B. 25% red, 50% pink, 25% white

C. 50% red, 50% white

D. 75% red, 25% white

Answer:

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15. Study the given pedigree of a family and select the trait that shows this pattern of inheritance :

A. Autosomal recessive, Phenylketonuria

B. Sex-linked recessive , Colour-blindness

C. Autosomal dominant , Myotonic dystrophy

D. Sex-linked dominant , Vitamin-D resistant rickets

Answer:

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16. A child with blood Group A has father with blood group B and mother with blood group AB . What would be the possible genotypes of

parents and the child ? Choose the correct option :

	Father	Mother	Child
(a)	$I^{\cdot}i$	$I^{\cdot}i$	$I^{\cdot}i$
(b)	$I^{A}I^{B}$	$I^{A}i$	$I^{A}I^{A}$
(c)	$I^{B}i$	$I^{A}I^{B}$	$I^{A}i$
(d)	$I^{B}I^{B}$	$I^{A}I^{B}$	$I^{A}I^{A}$

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17. In a dihybrid Mendelian cross , garden pea plants heterozygous for violet flowers and round seeds are crossed with homozygous white flowers and wrinkled seeds. The

genotypic and phenotypic ratio of F_1 progeny would be

A. $9:3:3:1$

B. $1:2:2:1$

C. $1:1:1:1$

D. $3:1$

Answer:

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18. A region of coding strand of DNA has the following nucleotide sequence :

5'-TGCGCCA-3'

A. 3'-ACGCGGT-5'

B. 5'-ACGCGGT-3'

C. 5'-UGCGCCA-3'

D. 3'-UGCGCCA-5'

Answer:

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19. A DNA molecule is 160 base pairs long. It has 20% adenine. How many cytosine bases are present in this DNA molecule ?

A. 192

B. 96

C. 64

D. 42

Answer:

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20. A template strand in a bacterial DNA has the following base sequence :

5'-TITAACGAGG-3'

A. 5'-AAATTGCTCC-3'

B. 3'-AAATTGCTCC-5'

C. 3'-AAAUUGCUCC-3'

D. 5'-CCUCGUUAAA-3'

Answer:

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21. Colour-blindness is a sex linked recessive trait in humans. A man with normal colour vision marries a women who is colourblind. What would be the possible genotypes of the parents, the son and the daughter of this couple ?

	Mother	Father	Daughter	Son
(a)	XX	X^CY	X^CX	XY
(b)	X^CX^C	X^CY	X^CX^C	X^CY
(c)	X^CX	XY	X^CX	XY
(d)	X^CX^C	XY	X^CX	X^CY

A.

Mother	Father	Daughter	Son
XX	X^CY	X^CX	XY

B.

Mother	Father	Daughter	Son
X^CX^C	X^CY	X^CX^C	X^CY

C.

Mother	Father	Daughter	Son
X^CX	XY	X^CX	XY

D.

Mother	Father	Daughter	Son
X^CX^C	XY	X^CX	X^CY

Answer:

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22. tRNA has an _____that has bases complementary to the codon. Its actual structure is a compact molecule which looks like _____.

Select the option that has correct choices for the two 'blanks'.

A. amino acid acceptor end, clover-leaf

B. anticodon loop, clover-leaf

C. amino acid acceptor end, inverted L

D. anticodon loop, inverted L

Answer:

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23. Which type of RNA is correctly paired with its function ?

A. small nuclear RNA. Processes rRNA

B. transfer RNA: attaches to amino acid

C. ribosomal RNA : involved in transcription

D. micro RNA: involved in translation

Answer:

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24. Given below are the pairs of contrasting traits in Pisum sativuma as studied by Mendel. Select the incorrectly mentioned option from the table given below:

Character	Dominant	Recessive
Flower position	Terminal	Axial
Seeds shape	Round	Wrinkled
Pod colour	Green	Yellow
Pod shape	Constricted	Inflated

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Section C

1. A women of 35 years age with a married life of eight years and having normal reproductive cycles visits a doctor along with her husband for consultation for infertility. They were using any contraceptive methods. They have no child. The doctor advises them after a detailed physical examination of both of them to undergo following investigations :

Seminal analysis of the husband

- Follicular study of the wife

- Blood test for Follicle Stimulating Hormone (FSH) estimation for both

With your basic knowledge of human embryology and the case given above, answer the following questions

Seminal analysis of the husband was done for determining

(i) Sperm morphology and sperm count

(ii) Quantity and pH of semen

(iii) Rate of sperm release into the Vagina

A. (i) only

B. (i) and (ii)

C. (ii) and (iii)

D. (ii) only

Answer:

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2. A women of 35 years age with a married life of eight years and having normal reproductive cycles visits a doctor along with her husband for consultation for infertility. They were using any contraceptive methods. They have no child. The doctor advises them after a detailed

physical examination of both of them to undergo following investigations :

Seminal analysis of the husband

- Follicular study of the wife

- Blood test for Follicle Stimulating Hormone (FSH) estimation for both

With your basic knowledge of human embryology and the case given above, answer the following questions

An ultrasound - guided follicular study was done for the wife for determining the size and physical appearance of the .

A. Ovary

B. Oogonia

C. Antral follicles

D. Corpus Luteum

Answer:

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3. A women of 35 years age with a married life of eight years and having normal reproductive cycles visits a doctor along with her husband

for consultation for infertility. They were using any contraceptive methods. They have no child. The doctor advises them after a detailed physical examination of both of them to undergo following investigations :

Seminal analysis of the husband

- Follicular study of the wife

- Blood test for Follicle Stimulating Hormone (FSH) estimation for both

With your basic knowledge of human embryology and the case given above, answer the following questions

The blood test report of the wife showed low FSH value, which is indicative of -

A. low rate of formation of ovarian follicles

B. high rate of formation of ovarian follicles

C. low rate of maturation of ovarian follicles

D. high rate of maturation of ovarian follicles

Answer:

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4. A women of 35 years age with a married life of eight years and having normal reproductive cycles visits a doctor along with her husband for consultation for infertility. They were using any contraceptive methods. They have no child. The doctor advises them after a detailed physical examination of both of them to undergo following investigations :

Seminal analysis of the husband

- Follicular study of the wife

- Blood test for Follicle Stimulating Hormone (FSH) estimation for both

With your basic knowledge of human embryology and the case given above, answer the following questions

In the above case if the husband is found to have sperm count of less than 20 million/mL and the wife is diagnosed with blockage in the oviduct, the couple would be advised for :

(i) ZIFT

(ii) Al

(iii) IVF

(iv) ICSI

A. (i) and (iii)

B. (ii) and (iii)

C. (iii) and (iv)

D. (i) and (iv)

Answer:

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5. A women of 35 years age with a married life of eight years and having normal reproductive cycles visits a doctor along with her husband

for consultation for infertility. They were using any contraceptive methods. They have no child. The doctor advises them after a detailed physical examination of both of them to undergo following investigations :

Seminal analysis of the husband

- Follicular study of the wife

- Blood test for Follicle Stimulating Hormone (FSH) estimation for both

With your basic knowledge of human embryology and the case given above, answer the following questions

The high level of which gonadotropin/ovarian

hormone in the blood sample of the wife taken on day 20 of her reproductive (menstrual) cycle would indicate the letual phase of the ovarian cycle ?

A. FSH

B. LH

C. Estrogens

D. Progesterone

Answer:

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6. A women of 35 years age with a married life of eight years and having normal reproductive cycles visits a doctor along with her husband for consultation for infertility. They were using any contraceptive methods. They have no child. The doctor advises them after a detailed physical examination of both of them to undergo following investigations :

Seminal analysis of the husband

- Follicular study of the wife

- Blood test for Follicle Stimulating Hormone

(FSH) estimation for both

With your basic knowledge of human embryology and the case given above, answer the following questions

In which phase of the menstrual cycle is the blood sample of a women taken if, on analysis, it shows high levels of L.H. and estrogen?

A. Ovulatory phase

B. Menstrual phase

C. Secretory phase

D. Follicular phase

Answer:

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7. How many types of gametes can be produced in a diploid organism which is heterozygous for 4 loci?

A. 4

B. 8

C. 16

D. 32

Answer:

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8. Given below a karyotype obtained after analysis of foetal cell for probable genetic disorder .

Based on the above karyotype , the chromosomal disorder detected in unborn foetus and the consequent symptoms the child may suffere from are -

A. Down's syndrome : Gynaecomastia , overall masculine development

B. Down's syndrome : Furrowed tongue ,short stature

C. Klinefelter's syndrome : Gynecomastia Masculine development

D. Klinefelter's syndrome : Rudimentary ovaries short stature

Answer:

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9. The recombinant Frequency between the four linked genes in as follows :

(i) between X and Y is 40%

(ii) between Y and Z is 30%

(iii) between Z and W is 10%

(iv) between W and X is 20%.

Select the option that shows the correct order of the position of W,X,Y and Z genes on the chromosome .

A. Y-X-Z-W

B. Y-W-Z-X

C. X-Y-Z-W

D. Z-X-Y-W

Answer:

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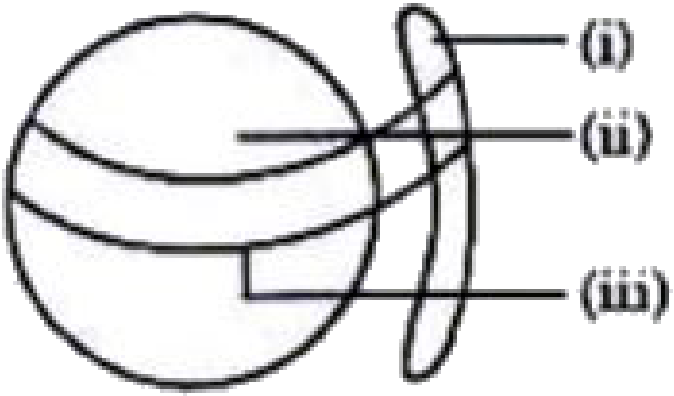
10. The figure given below has labellings (i),(ii) and (iii) which two labellings in the given figure are components of a nucleosome ? Select the correct option :



A. (i) - HI histone, (ii) - DNA

B. (i) - DNA , (ii) - Histone Octamer

C. (ii) - DNA , (iii) - HI Histone

D. (ii) - Histone octamer , (iii) - DNA

Answer:

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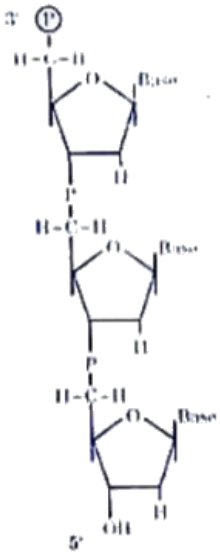
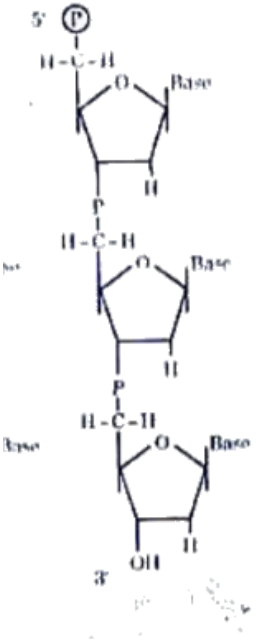
11. Which one of the following diagrams is a correct depiction of polynucleotide chain to DNA ?

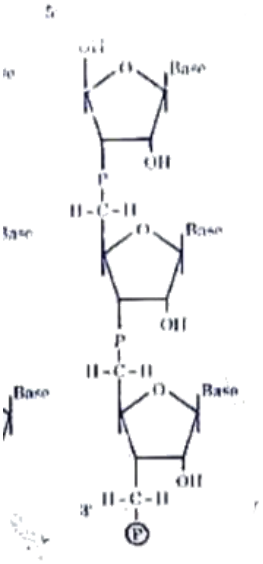

3'
P
H-C-H
O
Base
H
P
H-C-H
O
Base
H
P
H-C-H
O
Base
H
OH
5'

A. (a)

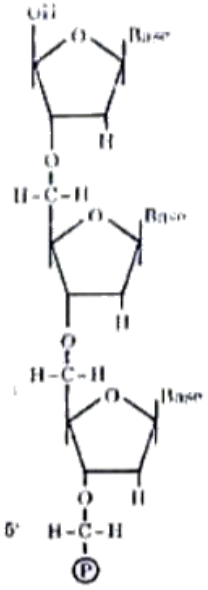

5'
P
H-C-H
O
Base
H
P
H-C-H
O
Base
H
P
H-C-H
O
Base
H
OH
3'

B.

C.



D.



Answer:

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12. In molecular biology who proposed that genetic information flows in one direction?

A. Hargobind Khorana

B. Francies Crick

C. Watson and Crick

D. Marshall Nirenberg

Answer:

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