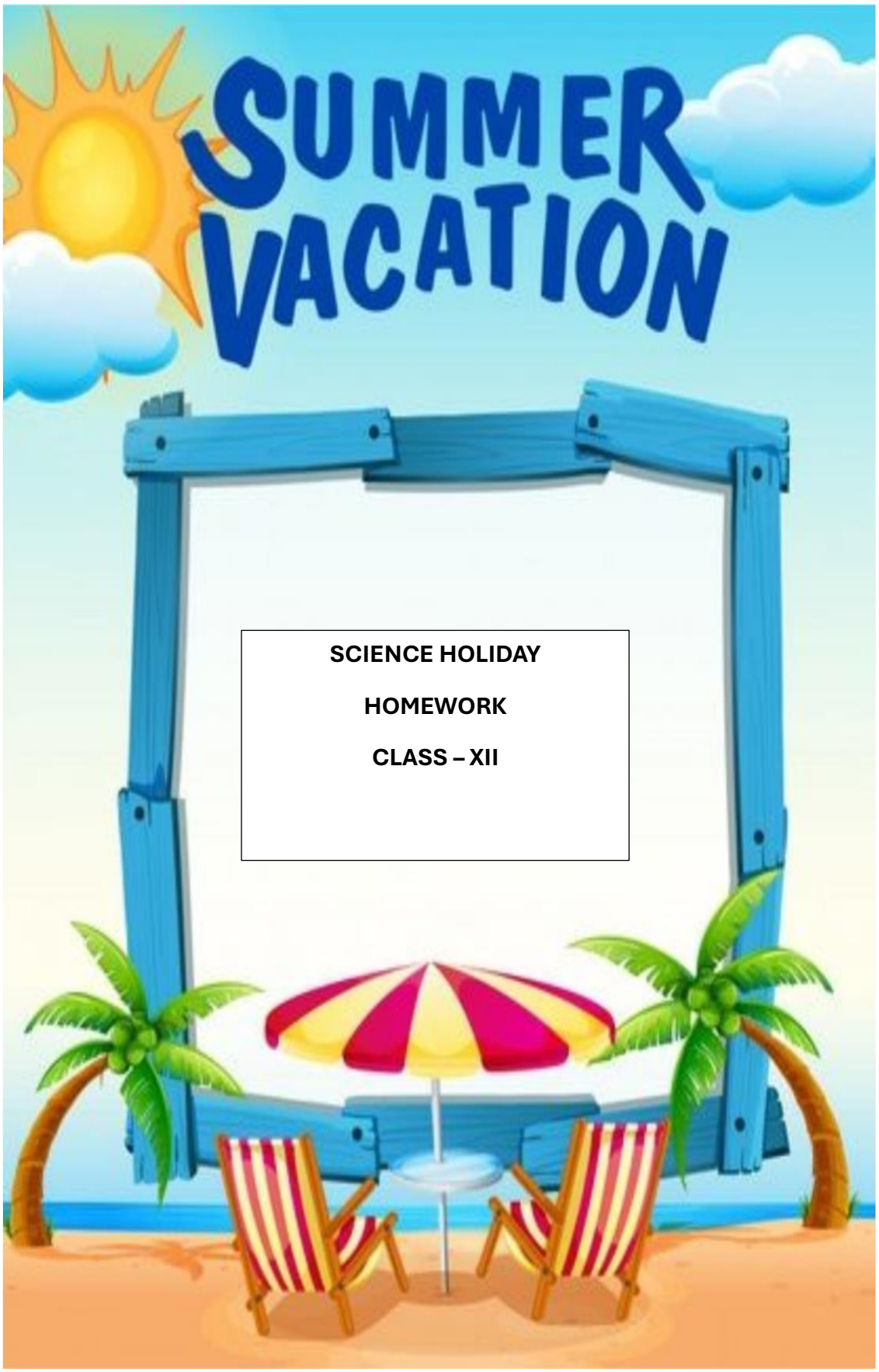


SCIENCE HOLIDAY

HOMEWORK

CLASS – XII

Dear Parents

We wish you and your child a very happy summer holidays . It's time to enjoy and create a bond with family, friends and relatives. To utilize this time in the most constructive way we have prepared Holiday Homework for the students on the principle of 'learning by doing' for their holistic development.

So here we start.....

Morning Blessings

Help your child inculcate good habits like doing ''Surya Namaskar'' and encourage him/her to wish all elders in the morning. If possible, visit a temple or any other religious place of your choice.

Physical Development

- Take the child with you for morning/evening walk.
- Play different games like hide and seek, football, ludo, chess, snakes and ladders, carrom board etc. with your child.

Language Development

- Encourage your child to converse in English.
- Choose any 1 object from your surroundings every day. Let the child speak few lines on it.

Being Good

- Help your child inculcate good habits like doing 'Surya Pranam' & encourage him / her to greet all elders in the morning.
- Help your child to use 4 magical words : PLEASE, SORRY, THANK YOU, EXCUSE ME as the part of basics of good manners.
- Encourage your child to listen.
- Gently care for animals. Encourage your child to be empathetic towards animals.
- Involve your child to sow a plant in a pot and give water. Give knowledge about plants and trees. Explain to them that they are an integral part of their growing
- Have at least two meals together with your children. Teach them the importance and hard work of the farmer and ask them not to waste their food.
- Let them take their own plates after every meal . Children learn dignity of labour from such activities.

Health and Hygiene

"Healthy mind resides in a healthy body." So start your day early and set a routine even during vacations. In addition you and your little one can spend some quality time playing, cycling, swimming to keep yourself fit and healthy. Encourage your child to take care of personal hygiene by inculcating the habits like washing hands, practicing yoga, eating healthy food etc.

General instructions:-

1. Attempt your work neatly.
2. Use Biology register to write answers.
3. Write your Name, Class-section and Roll number.

Revise all the explained chapters and learn question and answers.

1
(a) Name the metabolism or enzyme that is impaired in phynylketonuria.
(b) Name one sex-linked and one autosomal bloodrelated Mendelian disorders in humans.

2

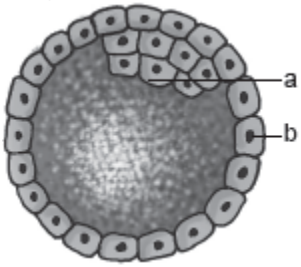
2
(a) What is meant by chromosomal mutation?
(b) Name the event during cell division cycle that results in the gain or loss of chromosomes.

2

3
How many haploid cells are present in an unfertilised mature embryo sac of a flowering plant? Name them.

2

4
(a) Name the human embryonic stage shown below. Identify 'a' and 'b' in it.



(b) Mention the part of the above embryonic stage that forms the foetus.

2

5
Match the items of column A with those in column B.

Column A	Column B
(a) Reproductive gland	1. Testis
(b) Primary sex organ	2. Penis
(c) External genitalia	3. Epididymis
(d) Duct system	4. Prostate.

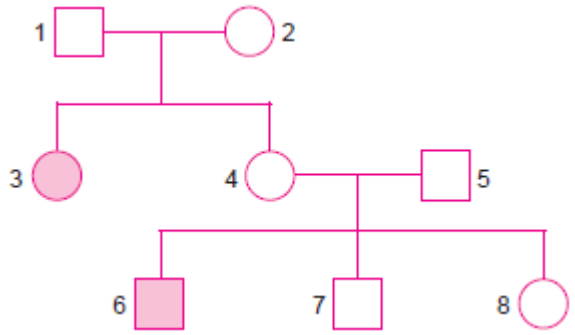
2

6
Given below is an enlarged view of one microsporangium of a mature anther.

(i) Name ‘a’, ‘b’ and ‘c’ wall layers.
(ii) Mention the characteristics and function of the cells forming the wall layer ‘c’.

3

7
Study the pedigree chart of a family given below and answer the questions that follow:



(a) Is the disease in this pedigree chart a recessive or dominant disorder? Give reason.

(b) Identify the female individual in this family, who for sure is homozygous.
(c) Genotype of which one individual cannot be identified in this pedigree chart?
(d) Identify a male, who is definitely heterozygous.
(e) Is this disease a sex-linked or an autosomal disorder?

3

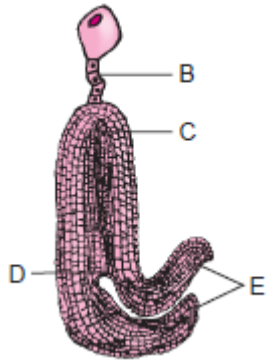
8
(a) Give one example each of albuminous and non-albuminous seeds.
(b) Name the parts of the ovule and the embryo sac of an angiosperm that develop into
(i) perisperm, (ii) seed coat,
(iii) endosperm, and (iv) embryonal axis.

3

9
A woman has certain queries as listed below, before starting with contraceptive pills. Answer Them.
(a) What do contraceptive pills contain? How do they act as contraceptives?
(b) What schedule should be followed for taking these pills?

3

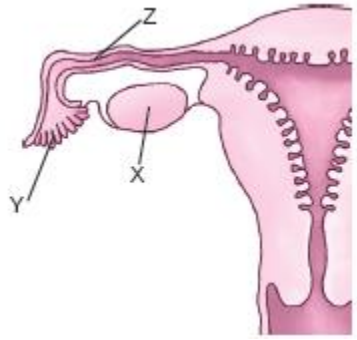
10
Identify the figure given below and also identify



(b) State the function of E.

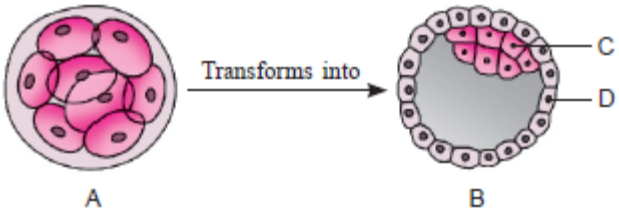
3

11
The diagram shows a part of the human female reproductive system.
(a) Name the gamete cells that would be present in 'X', if taken from a newborn baby.
(b) Name 'Y' and write its function.
(c) Name 'Z' and write the events that take place here.



3

12
Study the given diagram



A is an embryonic stage that gets transformed into B, which in turn gets implanted in the endometrium in human females.
(a) Identify A, B and its parts C and D.
(b) State the fate of C and D in the course of embryonic development in humans.

3

13

Given below is a table showing the genotypes and the phenotypes of blood groups in the human population.

Sr. No.	Genotype	Phenotype
1.	(W)	A
2.	I^Bi	(Y)
3.	I^AI^B	(Z)
4.	(X)	O

(i) Identify the genotypes (W) and (X) and the phenotypes (Y) and (Z).
(ii) How is codominance different from incomplete dominance and dominance?
(iii) Name the pattern of inheritance exhibited by the phenotypes (Y) and (Z) in the table.

5

14
Let us assume in a given pea plant, the genotype symbol 'Y' stands for dominant yellow seed colour and 'y' for recessive green seed colour, symbol 'R' for round seed shape and 'r' for wrinkled seeds. Two homozygous parents (plants) with genotypes, 'RRYY' and 'rryy' are crossed and their F_1 generation progeny is selfed.
What shall be the
(a) Phenotype of F_1 progeny.
(b) Genotype of F_1 progeny.
(c) Gamete genotypes of F_1 progeny.
(d) Phenotypic ratio of F_2 population.
(e) Phenotypic ratio of yellow seeds to green seeds and round seeds to wrinkled seeds in F_2 population.

5

15
(a) Why is haemophilia generally observed in human males? Explain the conditions under which a human female can be haemophilic.
(b) A pregnant human female was advised to undergo MTP. It was diagnosed by her doctor that the foetus she is carrying has developed from a zygote formed by an XX-egg fertilised by Y-carrying sperm. Why was she advised to undergo MTP?

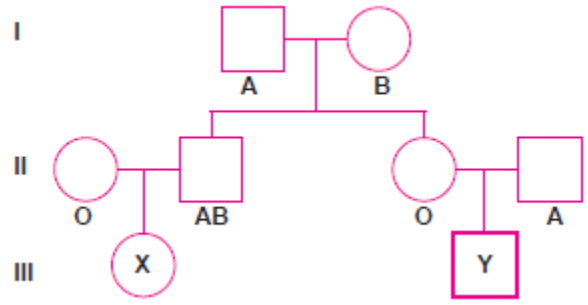
5

16
(a) Expand the abbreviations given below, used for the different modes of assisted reproductive technologies:
(i) ZIFT
(ii) ICSI
(iii) IUT
(iv) GIFT
(b) Which one of them cannot be considered as a procedure of IVF? Give reasons in support of your answer.

5

17

Study the given pedigree chart showing the pattern of inheritance of blood group character in a family and answer the questions that follow:



(a) Give the genotypes of the parents in generation I.

(b) Write the possible genotypes and phenotypes of the individuals X and Y in generation III. Justify your answer.

5

18

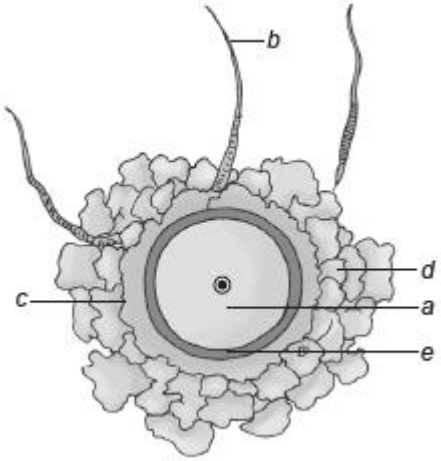
(a) Name the structures which the parts 'A' and 'B' shown in the diagram below respectively develop into.

(b) Explain the process of development which 'B' undergoes in albuminous and exalbuminous seeds. Give one example of each of these seeds.

5

19

Study the illustration given below and answer the questions that follow:



(i) Identify 'a'.

(ii) Name and state the function of 'c'.

(iii) Identify 'd'.

(iv) Explain the role of hormones in the formation and release of 'a'.

(v) Draw a diagram of 'b' separately and label the parts:
— that helps its entry into 'a';
— that carry genetic material;
— that helps in its movement.

5

20
Autogamy can occur in a chasmogamous flower if [NCERT Exemplar Problems]
(a) pollen matures before maturity of ovule.
(b) ovules mature before maturity of pollen.
(c) both pollen and ovules mature simultaneously.
(d) both anther and stigma are of equal lengths.

1

21
In a dihybrid Mendelian cross, garden pea plants heterozygous for yellow flowers and round seeds are crossed with homozygous white flowers and wrinkled seeds. The genotypic and phenotypic ratio of F_1 progeny would be:

[CBSE 2022]

(a) 9 : 3 : 3 : 1
(b) 1 : 2 : 2 : 1
(c) 1 : 1 : 1 : 1
(d) 3 : 1

1

22
From among the situations given below, choose the one that prevents both autogamy and geitonogamy. [NCERT Exemplar Problems]
(a) Monoecious plant bearing unisexual flowers.
(b) Dioecious plant bearing only male or female flowers.
(c) Monoecious plant with bisexual flowers.
(d) Dioecious plant with bisexual flowers.

1

23
How many types of gametes would develop in an organism with the genotype, AaBBCcDD?

[CBSE 2022]

(a) 1
(b) 2
(c) 3
(d) 4

1

24
Match the terms in Column I with the descriptions in Column II

Column I	Column II
A. Pericarp	1. Cotyledon in the seeds of grasses
B. Pollen grains of Vallisneria	2. Remains of nucellus in a seed.
C. Perisperm	3. Mucilaginous covering
D. Scutellum	4. Wall of the true fruit

(a) A – 3, B – 4, C – 2, D – 1
(b) A – 4, B – 3, C – 2, D – 1
(c) A – 3, B – 4, C – 1, D – 2
(d) A – 2, B – 3, C – 4, D – 1

1

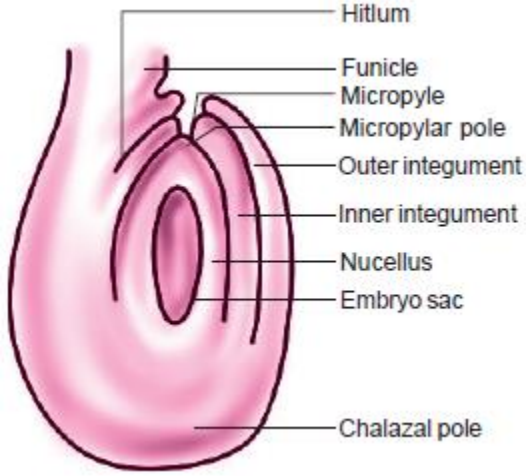
25
The chromosomal theory of inheritance was put forth by

[CBSE 2022]

(a) Gregor Mendel and Tschermak
(b) Walter Sutton and Theodore Boveri
(c) Thomas Hunt Morgan and Alfred Sturtevant
(d) De Vries and Correns

1

26
In the figure of anatropous ovule given below, choose the correct option for the characteristic distribution of cells within the typical embryo sac.



	Number of cells at chalazal end	Number of cells at micropylar end	Number of nuclei left in central cell
(a)	3	2	3

(b)	3	3	2
(c)	2	3	3
(d)	2	2	4

1

27

In which of the following organisms is male heterogamety observed ?

(i) Grasshopper

(ii) Honey bee

(iii) Fowl

(iv) Fruit fly

Choose the correct option: **[CBSE 2022]**

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (i) and (iv)

(d) (iii) and (iv)

1

28

Which of the following combination of chromosome numbers represents the correct sex determination pattern in honey bees? **[CBSE Sample Paper 2022]**

(a) Male 32, Female 16

(b) Male 16, Female 32

(c) Male 31, Female 32

(d) Female 32, Male 31

1

29

Figure (i) and Figure (ii) given below are showing two stages of megasporogenesis in a typical angiosperm plant.

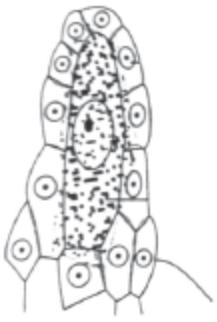


Fig. (*i*)

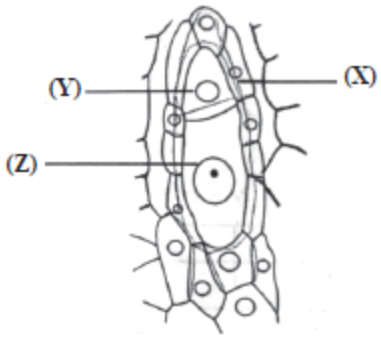


Fig. (*ii*)

Choose the option showing the correct ploidy of X, Y and Z in the table given below:

	X	Y	Z
(a)	2n	n	2n

(b)	2n	n	n
(c)	2n	3n	n
(d)	3n	2n	n

1

30

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

[CBSE 2022]

	Mother	**Father**	**Daughter**	**Son**
(a)	XX	X^cY	XX^c	XY
(b)	X^cX^c	X^cY	X^cX^c	X^cY
(c)	XX^c	XY	XX^c	XY
(d)	X^cX^c	XY	XX^c	X^cY

1

31

In a breeding experiment, the selected male parent is diploid and the female parent is tetraploid. What will be the ploidy level of the endosperm that will develop after double fertilisation? **[HOTS]**

(a) Diploid (2n)

(b) Triploid (3n)

(c) Tetraploid (4n)

(d) Pentaploid (5n)

1

32

In which of the following combinations of seeds/grains of different plants, residual endosperm will be present at maturity? **[CBSE 2022]**

(a) Groundnut, Barley, Beans.

(b) Castor, Groundnut, Maize.

(c) Wheat, Maize, Barley.

(d) Pea, Groundnut, Beans.

1

33

Select the option that shows the correctly identified 'U', 'X', 'Y' and 'Z' in a developing dicot embryo. **[Delhi 2023]**

(a) X-Plumule (2n), Y-Suspensor (n), Z-Cotyledon don (2n), U-Radicle (2n)

(b) X-Plumule (2n), Y-Suspensor (2n), Z-Radicle (2n), U-Cotyledon (2n)

(c) X-Suspensor (2n), Y-Cotyledon (2n), Z-Radicle (2n), U-Plumule (2n)

(d) X-Cotyledon (2n), Y-Radicle (n), Z-Plumule (n), U-Suspensor (n)

1

34

Instruction: Following question consists of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option given below:
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Assertion is False but reason is true.
Assertion: The human blood group AB exemplifies codominance.
Reason: The gene for human blood group trait exists in three allelic forms, I^A, I^B and i.

1

35

Instruction: Following question consists of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option given below:
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Assertion is False but reason is true.
Assertion: The number of chromosomes in male grasshopper is less than that of females.
Reason: Grasshoppers show XO–XX sex determination, where males are XO and females are XX.

1

36

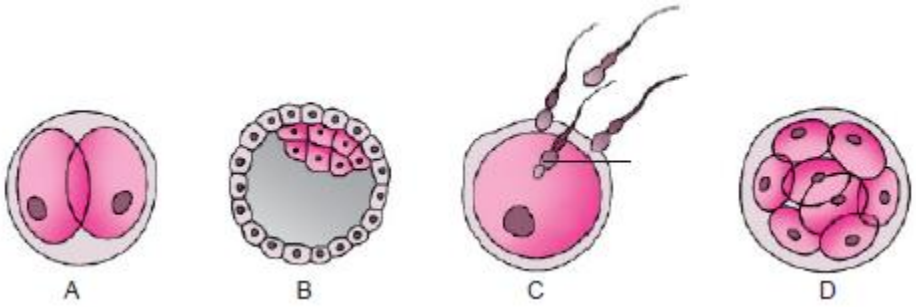
Instruction: Following question consists of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option given below:
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.

(d) Assertion is False but reason is true.
Assertion: A quantitative character is controlled by three or more genes; hence, it is also known as polygenic inheritance.
Reason: In pleiotropy, a single gene manifests multiple phenotypes.

1

37

The figure given below shows the different stages of development of human embryo.



Identify the correct labelling for A, B, C and D and select the correct option from the table given below:

	A	B	C	D
(a)	Fertilisation	Cleavage	Morula	Blastocyst
(b)	Morula	Cleavage	Fertilisation	Blastocyst
(c)	Cleavage	Blastocyst	Fertilisation	Morula
(d)	Morula	Blastocyst	Fertilisation	Cleavage

1

38

Which of the following are true in respect of chorionic villi in humans? **[CBSE 2022]**

(i) It appears after implantation of human embryo in the uterus.

(ii) It becomes interdigitated with cervical tissue of the female reproductive tract.

(iii) It increases the surface area for exchange of materials.

(iv) It develops from the inner cell mass of the blastocyst.

Choose the correct option:

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (i) and (iv)

(d) (i) and (iii)

1

39

Hormones released in human females only during pregnancy are **[AI 2020]**

(a) hCG, hPL, Progesterone

(b) Relaxin, hCG, hPL

(c) hCG, hPL, Oxytocin

(d) hPL, Thyroxine, hCG

1

40

During embryonic development the limbs and digits are formed in the human foetus by the end of **[CBSE 2022]**

(a) 15 days of pregnancy.
(b) 30 days of pregnancy.
(c) 45 days of pregnancy.
(d) 60 days of pregnancy.

1

41
Select the correct option for human chorionic gonadotropin (hCG), produced during embryonic development in a human female.
1. It causes strong uterine contractions during parturition.
2. It helps in maintenance of pregnancy.
3. It leads to rupture of Graafian follicle.
4. It effects the metabolic changes in the mother.
(a) 1 and 2
(b) 2 and 3
(c) 1 and 4
(d) 2 and 4

1

42
Read the following statements—Assertion (A) and Reason (R), and choose the correct answer from the alternatives given below:
Assertion: A species of wasp and a fig species cannot complete their life cycle without each other.
Reason: While the visiting wasp comes to lay eggs in the fig inflorescence, the flower of fig gets pollinated in return.
Alternatives:
(a) Both assertion and reason are true and reason is the correct explanation of assertion
(b) Both assertion and reason are true and reason is not the correct explanation of assertion
(c) Assertion is true but reason is false
(d) Assertion is false but reason is true **[All India 2023]**

1

43
Read the following statements—Assertion (A) and Reason (R), and choose the correct answer from the alternatives given below:
Assertion: Apomictic embryos are genetically identical to the parent plant.
Reason: Apomixis is the production of seeds without fertilization.
Alternatives:
(a) Both assertion and reason are true and reason is the correct explanation of assertion

(b) Both assertion and reason are true and reason is not the correct explanation of assertion
(c) Assertion is true but reason is false
(d) Assertion is false but reason is true **[CBSE Sample Paper 2023]**

1

44
During parturition, a pregnant woman is having prolonged labour pains and child birth has to be hastened. It is advisable to administer a hormone that can **[CBSE Sample Paper 2022]**
(a) increase the metabolic rate.
(b) release glucose in the blood.
(c) stimulate the ovary.
(d) activate smooth muscles.

1

45
Read the following statements—Assertion (A) and Reason (R), and choose the correct answer from the alternatives given below:
Assertion: Only one female gametophyte develops from a megaspore mother cell in the ovule, but four male gametophytes are formed from a microspore mother cell in the anther.
Reason: Three of the four megaspores formed after meiosis in a megaspore mother cell degenerate, whereas all the four microspores formed by a microspore mother cell develop into pollen grains.
Alternatives:
(a) Both assertion and reason are true and reason is the correct explanation of assertion
(b) Both assertion and reason are true and reason is not the correct explanation of assertion
(c) Assertion is true but reason is false
(d) Assertion is false but reason is true

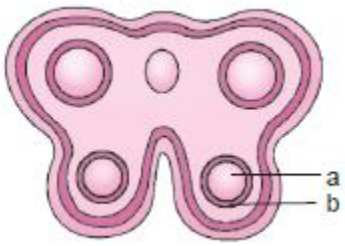
1

46
Instruction: Following question consists of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:
(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Assertion is False but reason is true.
Assertion: Cyclical menstruation is an indicator of normal reproductive phase and extends between menarche and menopause.
Reason: One ovum is released (ovulation) during the middle of each menstrual cycle.

1

47
In the T.S. of a mature anther given below, identify 'a' and 'b' and mention their functions. [All India 2019]



2

48
Instruction: Following question consists of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Assertion is False but reason is true.
Assertion: Parturition is induced by a complex neuro endocrine mechanism. **[CBSE Sample Paper 2022]**
Reason: At the end of gestation period, the maternal pituitary releases prolactin which causes uterine contractions.

1

49
Why do species with abiotic mode pollination produce larger number of pollen grains, when compared to those with biotic pollination?

2

50
(a) From which end of the ovule and how does the pollen tube gain entry into the embryo sac of a Hibiscus flower?
(b) State the fate of the male nuclei present in the pollen tube.

2

51
An IUD that is recommended to suppress sperm motility and the fertilising capacity of sperm is **[CBSE 2022]**
(a) Lippe's loop
(b) LNG - 20
(c) Progestasert
(d) Multiload 375

1

52
Given below are two columns. In column I, the names of four contraceptive devices are given and in column II, the modes of action of contraceptives are given. Select the option, where the contraceptive devices are correctly matched with their respective mode of action.

Column I (Contraceptive devices)	**Column II (Modes of action)**
P. Lippes loop	(i) Inhibition of ovulation
Q. Multiload 375	(ii) Phagocytosis of sperms in the uterus
R. Subcutaneous	(iii) Causes thickening of cervical mucus
S. Saheli	(iv) Makes cervix hostile to sperms.

[AI 2023]

(a) P – (ii), Q – (iv), R – (iii), S – (i)
(b) P – (i), Q – (ii), R – (iii), S – (iv)
(c) P – (iii), Q – (i), R – (iv), S – (ii)
(d) P – (iv), Q – (ii), R – (iii), S – (i)

1

53
The mode of action of the copper ions in an IUD is to **[CBSE Sample Paper 2022]**
(a) increase the movement of sperms.
(b) decrease the movement of the sperms.
(c) make the uterus unsuitable for implantation.
(d) make the cervix hostile to the sperms.

1

54
In *Pisum sativum*, the pod colour may be green (G) or yellow (g). What percentage of offsprings with green pod colour trait would be obtained in a cross of Gg × Gg? **[CBSE 2022]**
(a) 25%
(b) 50%

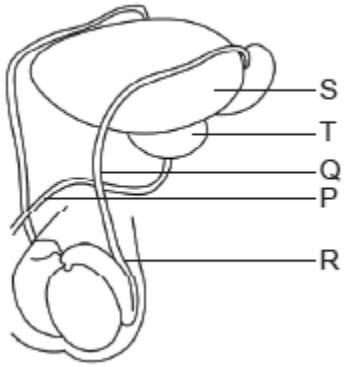
(c) 75%
(d) 90%

1

55
In Pisum sativum, the flower colour may be Violet (V) or White (v). What proportion of the offspring in a cross of V V × v v would be expected to be violet? **[CBSE 2022]**
(a) 25%
(b) 50%
(c) 75%
(d) 100%

1

56
A human male decides to adopt a surgical method for contraception. Identify the point in the diagram where a cut would be made and tied. **[AI 2023]**



(a) Point S
(b) Point R
(c) Point Q
(d) Point P

1

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What would be the genotype of the parents if the offspring have the phenotypes in 1:1 proportion? **[CBSE Sample Paper 2022]**
(a) Aa × Aa
(b) AA × AA
(c) Aa × AA
(d) Aa × aa

1

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Given below are four contraceptive methods and their modes of action. Select the correct match:

S.No.	Method	S.No	Mode of action

A	Condom	(i)	Ovum not able to reach Fallopian tube
B	Vasectomy	(ii)	Prevents ovulation
C	Pill	(iii)	Prevents sperm reaching the cervix
D	Tubectomy	(iv)	Semen contains no sperms

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(a) A–(i), B–(ii), C–(iii), D–(iv)
(b) A–(ii), B–(iii), C–(iv), D–(i)
(c) A–(iii), B–(iv), C–(ii), D–(i)
(d) A–(iv), B–(i), C–(iii), D–(ii)

1

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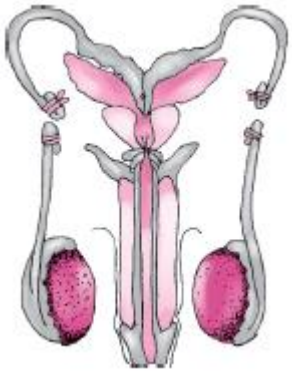

Shown above is the surgical method of contraception in human males.
Answer the following questions:
(a) Give the technical term for the process shown above.
(b) What is the principle behind it as a contraceptive method?
(c) How is the process carried out? Mention one disadvantage of this method.

Or

(c) What term is given to an equivalent procedure in females? How is it carried out?

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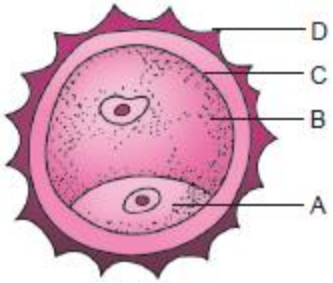
Read the following passage and answer the questions that follow:
The pollen grains represent the partially developed male gametophyte of angiosperms. They show an amazing variety of architecture, when observed under a microscope. They are generally spherical and measure about 25-50 micrometres in diameter. Each pollen grain has a prominent two-layered wall. Pollen grains are well-preserved as fossils.
(a) How many pollen grains are formed from a pollen mother cell?
(b) What are germ pores in a pollen grain?

(c) How many cells are present in a pollen grain, at the time of its release from the anther? Name them.

Or

(c) Refer to the figure given and match the parts (with their names) labelled with their characteristics mentioned.



1. It is made of a highly-resistant organic material.
2. It is spindle-shaped in outline and has dense cytoplasm with a prominent nucleus.
3. It has vacuolated cytoplasm and an irregularly-shaped nucleus.
4. It is made of pectin and cellulose.

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