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SESSION 2023-24

SUMMER HOLIDAY HOME WORK

CLASS- 12th BIOLOGY

1. **INVESTIGATORY PROJECT**
2. **PREPARTION OF 2D/ 3D CHART /MODEL (ART INTEGRETED) OF ANY BIOLOGICAL PROCESS/ DIAGRAM**
3. **REVISION QUESTION OF CHAPTER-**
   A. **REPRODUCTION IN FLOWERING PLANTS**
   B. **HUMAN REPRODUCTION**

1. In angiospermic plant before formation of microspore sporogenous tissue undergo cell division
   (a) Name the type of cell division.
   (b) What would be the ploidy of the cells of tetrad?
2. Outer envelop of pollen grain made of a highly resistant substance. What is that substance? At which particular point the substance is not present?
3. Fruits generally develops from ovary, but in few species thalamus contributes to fruit formation.
   (a) Name the two categories of fruits.
   (b) Give one example of each.
4. Among the animal, insects particularly bees are the dominant pollinating agents. List any four characteristic features of the insect pollinated flower.
5. Which type of pollination ensures the arrival of genetically different pollen grains to stigma?
6. Draw a diagram of L.S. of an anatropous ovule of an Angiosperm & label the following parts :-
   (i) Nucellus
   (ii) Integument
   (iii) Antipodal cells
   (iv) Secondary Nucleus.
7. Trace the development of megasporocyte into mature ovule.
8. Draw the embryo sac of a flowering plants and label :
   (a) (i) Central Cell (ii) Chalazal end (iii) Synergids

(b) Name the cell that develops into embryo sac and explain how this cell leads to formation of embryo sac.

(c) Mention the role played by various cells of embryo sac.

(d) Give the role of filiform apparatus.

9. Failure of testes to descend into scrotal sacs leads to sterility. Why?
10. Both vaccine and colostrum produce immunity. Name type of immunity produced by these.
11. How many sperms will be produced from 10 primary spermatocytes and how many eggs will be produced from 10 primary oocytes?
12. "Each and every coitus does not results in fertilisation and pregnancy". Justify the statement.
13. Give the function of

(a) Corpus luteum

(b) Endometrium

14. Give reason for the following :

(a) The first half of the menstrual cycle is called follicular phase as well as proliferative phase.

(b) The second half of the menstrual cycle is called luteal phase as well as secretory phase.

15. Describe the structure of a sperm with a diagram.
16. Draw a diagram of the T.S. of seminiferous tubule of testis of an adult human male & label any four parts in it.
17. T.S. of mammalian testis revealing seminiferous tubules show different types of cell.

(i) Name the two types of cells of germinal epithelium.

(ii) Name of cells scattered in connective tissue and lying between seminiferous tubules. Differentiate between them on the basis of their functions.

18. Describe the hormonal control of human male reproduction system with the help of a flow chart & highlight the inhibitory & stimulatory directions in it?
19. A woman has conceived & implantation has occurred within her uterus. Discuss the sequence of changes up to parturition which will take place within her body under the influence of various hormones.
20. Where oogenesis does takes place. Describe the stages of this process?

SEXUAL REPRODUCTION IN FLOWERING PLANTS

Question 1:
Why can we not use the term seed for maize grain?

Question 2:
How many meiotic divisions are required to produce 76 seeds in a guava fruit?

Question 3:
Case study-based questions: Read the given passage and answer Q3 i, ii, iii, iv & v

Pollen grains are generally spherical shaped and each is surrounded by two layers-exine and intine. Exine is made up of sporopollenin which is resistant to high temperatures and strong acids and alkali. Sporopollenin remains absent at germ pores. Pollen grains are well preserved as fossils because of the presence of sporopollenin. The inner wall of pollen grain is intine. The pollen grains are mainly shed at 2-celled stage-vegetative cell and generative cell when they are matured. Pollen grains of many species cause severe allergies and bronchial afflictions, leading to chronic respiratory disorders. It is mentioned that Parthenium or carrot grass that came into India as contaminant with imported wheat, has become ubiquitous in occurrence and causes pollen allergy. However, pollen grains are rich in nutrients which are used pollen tablets as food supplements. In western countries, large number of pollen products in the form of tablets and syrups are available in the market which are claimed to increase the performance of athletes and race horses.

(i) **Assertion**. Sporopollenin is an oxidative polymer of carotenoids which helps in fossilization.
Reason. Sporopollenin is a tough substance that provides resistant to biological decomposition, high temperature and alkali.

(a) Both assertion and reason are true, and reason is the correct explanation of assertion.
(b) Both assertion and reason are true, but reason is not the correct explanation of the assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

(ii) Which of the following statements is not appropriate for pollen grains:
(a) Pollen grains can be stored for years in liquid nitrogen and can used in crop breeding programmes.
(b) Pollen grains are rich in nutrients and can be used as pollen tablets as food supplements.

(c) Bee pollen are available in western countries in the form of tablets.
(d) Pollen consumption has potential inhibitory action which results in decreased energy in athletes and race horses.

(iii) Pollen allergy is common in many people during spring, summer and fall as plants release tiny pollen grains in tremendous quantity. Which of the following is not associated with pollen allergy?
(a) Sneezing, stuffy nose and watery eyes
(b) Asthma, bronchitis
(c) Cough, itchy nose, roof of mouth or throat
(d) Fever, diarrhoea and vomiting

(iv) Which of the following set does not cause allergy?
(a) Ragweed parthenium
(b) Sagebrush
(c) Amaranth (pigweed)
(d) Acacia

(v) The function of germ pore in pollen grain is
(a) Emergence of radicle
(c) Initiation of pollen tube
(b) Absorption of water for seed germination
(d) All of these

Question 4:

Read the following and answer questions given below from (i) to (v)
A flower of tomato plant following the process of sexual reproduction produces 240 viable seeds. The viable seeds are those which have the ability to remain alive and may develop into plants and reproduce themselves in the given appropriate conditions. This happens when one of the pollen grain reaches to the stigma by any agency at 2-celled stage vegetative cell and generative cell. The generative cell divides mitotically and forms two male gametes which enters into ovule after passing through pollen tube and undergoes the process of double fertilization in the ovule. The ovule is a large parenchymatous body formed in the ovary by megasporogenesis. The megaspore mother cell in an ovule is a diploid structure which undergoes meiotic division and forms one functional megaspore. The megaspore undergoes three subsequent divisions and forms 8 nuclei arranging themselves in 3 groups. After fertilization, the ovule converts into the seed and whole ovary develops into a complete fruit.

(i) The minimum number of pollen grains that must have been involved in the pollination of its pistil are
(a) 60
(b) 120
(c) 180
(d) 240

(ii) The minimum number of microspore mother cells must have undergone reductional division prior to dehiscence of anther are:
(a) 60
(b) 90
(c) 180
(d) 240

(iii) The male gametes that might have involved in this case are :
(a) 120
(b) 240
(c) 360
(d) 480

(iv) The minimal number of ovules present in the ovary would be:
(a) 60
(b) 120
(c) 180
(d) 240

(v) Megaspore mother cells involved in this process are:
(a) 120
(b) 180
(c) 240
(d) 360

Question 5:
Read the following and answer questions given below from i to iv

In major approaches of crop improvement programme as in crossing experiments, it is important to make sure that only the desired pollen grains are used for pollination and the stigma is protected from contamination from unwanted pollens. So, if the female parent bears bisexual flowers, removal of anthers from the flower bud before the anther dehisces is necessary (Emasculation). Emasculated flowers have to be covered with bags of suitable size to prevent contamination of their stigma with unwanted pollen-bagging When the stigma of

bagged flower attains receptivity, mature pollen grains collected from anthers of the male parent are dusted on the stigma and the flowers are rebagged and the fruits are allowed to develop. If the female parent produces unisexual flowers, there is no need for emasculation.

(i) While planning for an artificial hybridisation involving dioecious plants, which of the following steps would not be relevant?
(a) Bagging of female flower
(b) Dusting of pollen on stigma
(c) Emasculation
(d) Collection of pollen

(ii) **Assertion.** If the female parent produces unisexual flowers, there is no need of emasculation.
Reason. Emasculation is the removal of anthers from the flower bud before the anther dehisces.
(a) Both assertion and reason are true, and reason is the correct explanation of assertion.
(b) Both assertion and reason are true, but reason is not the correct explanation of the assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

(iii) Artificial hybridization denotes to:
(a)production of seedless fruits
(b) evolve seeds without fertilization
(c) crop improvement programme
(d) occurrence of more than one embryo in a seed.

(iv) The correct sequence to perform artificial hybridization is
(a) Bagging → Emasculation → Rebagging → Cross pollination
(b) Emasculation → Bagging → Cross pollination → Rebagging
(c) Cross pollination → Emasculation - Bagging → Rebagging
(d) Bagging → Rebagging → Cross pollination → Emasculation

Question 6:

Enlist the chromosome no. in ovum, first polar body and second polar body of human body.

Question 7:

Select the correct sequence for transport of sperm cells in male reproductive system:
(a) Seminiferous tubules → Vasa efferentia → Epididymis → Inguinal canal → Urethra
(b) Testis → Epididymis → Vasa efferentia →Vas deferens → Ejaculatory duct → Inguinal canal →→ Urethra → Urethral meatus.
(c) Testis → Epididymis → Vasa efferentia → Rete testis → Inguinal canal → Urethra
(d) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus

Question 8:
Directions: In the following questions A, B, C, D, E & F, a statement of Assertion is followed by a statement of Reason.

Mark the correct choice as:

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

A. **Assertion.** Only a single functional female gamete is formed from each primary oocyte cell.
Reason. Meiosis in each primary oocyte gives rise to only one cell, which function as ovum.

B. **Assertion.** Placenta, in addition to, provides connection with mother and foetus to ductless gland.
Reason. It releases human gonodotropins.

C. **Assertion.** A chemical substance fertilizing is found in the egg of animals.
Reason. It helps in the maturation of embryo after fertilization.
D. **Assertion.** The shape of the uterus is like an inverted pear.
Reason. The inner glandular layer that lines the uterine cavity is called endometrium.

E. **Assertion.** The opening of the vagina is often covered partially by a membrane called hymen.
Reason. The hymen is often torn during the first coitus-intercourse.

F. **Assertion.** Luteinising hormone (LH) acts at the sertoli cells and stimulates the synthesis and secretion of androgens.
Reason. Androgens stimulate the process of oogenesis.

Question 9:
Read the following and answer questions given below from (i) to (v)

Each month during the years between puberty and menopause, a woman's body goes through a number of changes to get it ready for possible pregnancy. During each menstrual cycle, an egg develops and is released from the ovaries. The lining of the uterus builds up. If a pregnancy does not happen, the uterine lining sheds during a menstrual period. A woman's menstrual cycle is divided into four phases: menstrual phase, follicular phase, ovulation phase and luteal phase and each phase is controlled by hormones. The ovulation phase lasts about 6 hours during which woman can get pregnant. During ovulation, a slight rise in basal body temperature and thicker discharge that has the texture of egg whites held. Ovulation happens at around 14 day of menstrual cycle. After a day, the egg will die or dissolve if it is not fertilized. Sperm can live up to 5 days and if a woman has sex as much as five days prior to ovulation, pregnancy can occur.

(i) The process of ovulation takes place on _____ day of menstrual cycle
(a) 10
(b) 12
(c) 14
(d) 16

(ii) **Assertion.** Ruptured Graafian follicles form the corpus luteum.
Reason. Ovulation takes place under the influence of hormone LH secreted by anterior pituitary.
(a) Both assertion and reason are true, and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

(iii) Which of the following statement is not appropriate for ovulation?
(a) Ovulation phase lasts for 6 hours
(b) A slight rise in basal body temperature occurs during ovulation
(c) The ovum in primary oocyte stage is released by the rupture of Graafian follicle under the influence of LH hormone
(d) No conspicuous changes occurs in the uterine endometrium.

(iv) The membranous cover of the ovum at ovulation is
(a) Corona radiata
(b) Zona pellucida
(c) Zona radiata
(d) Chorion

(v) Corpus luteum in pregnancy has _____ life.
(a) 10-12 days
(b) long
(c) 14-28 days
(d) negligible

Question 10:
Read the following and answer questions given below from (i) to (v)
The average duration of human pregnancy is about 9 months. Vigorous contractions of uterus occurs at the end of pregnancy due to foetal ejection reflex originated from fully developed foetus and placenta by releasing oxytocin from maternal pituitary. Oxytocin acts on the uterine muscle and causes strong uterine contractions leading to expulsion of the baby out of the uterus through birth canal-parturition. After parturition, lactation starts and umbilical cord and placenta comes out with the baby. The cord blood contains cells called hematopoietic stem cells. These cells can turn into any kind of blood cells and can be used for transplant that can cure diseases such as blood disorders, immune deficiencies, metabolic diseases and some kinds of cancers. Research is revealing more and more ways it can save lives. It is precious-almost magical and absolutely worth to preserve it for the family use or to donate it in blood bank, to be needed by another family.
(i) An umbilical cord is:
(a) a large artery in the womb
(b) a large vein in the womb
(c) the wall that surrounds the developing foetus
(d) a structure that connects a foetus to the mother placenta

(ii) **Assertion.** An umbilical cord is stored in developed countries as a source for Future stem cell.
Reason. An umbilical cord contains hematopoietic' stem cells and can be used for curing various acute diseases.
(a) Both assertion and reason are true, and reason is the correct explanation of assertion
(b) Both assertion and reason are true but reason is not the correct explanation.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

(iii) Blood flowing in umbilical cord is:

(a)50% maternal and 50% foetal
(b) 100% foetal
(c) 100% maternal
(d) 75% maternal and 25% foetal

(iv) The main hormone involved in parturition is:

(a) Oxytocin
(b) Prolactin
(c) hCG
(d) Progesterone

(v) Which of the following disease cannot be treated with cord blood?

(a) Lymphomas
(b) Bone marrow cancer
(c) Sickle cell disease
(d) Kwashiorkor