

SURE SHOT QUESTION BANK

Class XII

Biology

Section - A

- 1) Where does fertilization occur in humans? (1)
Ampullary Isthmic junction.
- 2) How are cucurbita plants different from papaya plants with reference to the flowers they bear? (1)
Cucurbita flowers are unisexual monoecious and papaya flowers are unisexual dioecious.
- 3) Where is acrosome present in humans? (1)
In the sperm head region-above nucleus
- 4) What is colostrum? Name the Immunoglobulin present in it? (1)
The milk produced during initial days of lactation which contain Antibodies.
- 5) Why do some women use saheli pills? (1)
It is an oral contraceptive method.
- 6) Mention two functions of Codon AUG. (1)
It codes for Methionine and it is the Initiator codon.
- 7) State the principle on which ELISA work? (1)
Antigen antibody interaction.
- 8) Write the unit for measuring Ozone thickness. (1)
Dobson units.
- 9) An anther with malfunctioning tapetum often fails to provide viable male gametophytes. Give one reason. (1)
It cannot nourishes the developing pollen grains.
- 10) What is heterogamety? (1)
Production of two type of gametes.
- 11) Name the two semi dwarf varieties of wheat introduced into all wheat growing places of India. (1)
Sonalika, Kalyan sona

- 12) State the role of C peptide in human insulin. (1)
It makes insulin nonfunctional.
- 13) Name any two biodiversity hotspots in India. (1)
Eastern Himalayas Western Ghats.
- 14) Name the embryonic stage that gets implanted in the uterine wall of a human female. (1)
Blastocyst
- 15) Expand VNTR. (1)
Variable Number of Tandem Repeats
- 16) Name the enzymes that are used for isolation of DNA from bacterial and fungal cells for recombinant DNA technology. (1)
Lysozyme, Chitinase.
- 17) What is the significance of the milk produced by transgenic cow Rosie? (1)
Human protein enriched milk human alpha Lactalbumin.

Section - B

- 18) Why angiosperm anthers are called dithecous? (2)
Each lobe having two theca.
- 19) Why are human testis located outside the abdominal cavity? (2)
Maintaining 2-2.5 degree Celsius lower for spermatogenesis.
- 20) With the help of one example explain the phenomena of multiple allelism in human population. (2)
Human blood groups.
Three alleles governing the same character.
- 21) How are pea seeds different from castor seeds with respect to endosperm? (2)
Pea seeds are non endospermous and castor seeds are endospermous.
- 22) Write the equation in the graph showing species area relationship. (2)
 $\log S = \log C + Z \log A$
- 23) Differentiate between major structural changes in the human ovary during follicular and luteal phase of menstrual cycle. (2)

During Follicular phase the primary follicle in the ovary grow to become fully mature Graafian follicle.

Luteal phase-rupture of Graafian follicle and release of ovum.

24) Differentiate between GIFT and ZIFT. (2)

Gamete Intra Fallopian transfer of ovum collected from a donor into the fallopian tube of another female.

Zygote intra fallopian transfer. The zygotes after fertilization are introduced in to the fallopian tube.

25) How a malignant tumor is different from a benign tumor? (2)

Malignant tumors spread from one place to another. Benign tumors do not.

Malignant tumors are not localized. Benign tumors are localized.

26) How does our body adapt to low oxygen availability at high altitudes? (2)

Increase RBC production, decrease binding capacity of hemoglobin, increasing breathing rate

27) Expand GEAC. Write its rule. (2)

Genetic Engineering Approval Committee

Make decisions regarding validity of GM research and safety of introducing GM organisms in public services.

28) List four objectives that you would recommend for Bio fortification. (2)

Protein content & quality

Oil content & quality

Vitamin content

Micronutrient & mineral content

29) How the pyramid of biomass in a sea is generally inverted? (2)

Biomass of fishes is more than that of phytoplanktons.

30) Differentiate between gametogenesis in human male and female on the basis of

a) Time of initiation of the process.

b) Products formed at the end of the process. (2)

a) Male – at puberty, four spermatids

b) Female - During embryonic stage, one ovum.

31) Mention the contribution of S.L. Miller's experiment on the origin of life. (2)

Experimental proof for chemical evolution. Created similar conditions of primitive atmosphere in a laboratory scale.

32) Unambiguous, universal, degenerate are some of the terms used for the genetic code. Explain the salient features of each one of them. (2)

Unambiguous - One codon code for one amino acid

Universal - In all lower and higher organisms codon for amino acids are same

Degenerate - Some amino acids are coded by more than one codon.

33) Why did Morgan prefer to work with Fruitflies for his experiments? (2)

Could be grown on synthetic medium in the laboratory

Complete their life cycle in two weeks.

Large no. of offsprings are produced.

Male & female can be easily identified.

34) What is mutualism? Describe the mutual relationship between fig tree and wasp? (2)

Both the interacting species are benefitted.

Female Wasp lays eggs in the fruit & uses the developing seed for nourishing the larvae.

The Wasp helps in pollination.

35) What are IUD's? Why are copper releasing IUD's act as effective contraceptives? (2)

Intra uterine devices inserted into the uterus through the vagina.

Copper ions released suppress sperm motility & fertilizing capacity of sperms.

36) Explain brood parasitism with the help of an example. (2)

A parasitic bird lays its eggs in the nest of the host & lets the host incubate them the eggs also resemble to avoid rejection. E.g. Cuckoo and Crow.

37) Explain the two different ways of biodiversity conservation. (2)

In situ conservation – Conservation in national park sanctuaries etc.

Ex situ conservation – Conservation in zoological park, botanical garden, cryopreservation, seed banks etc.

38) Explain bio magnifications of DDT in an aquatic food chain. How does it affect the bird population? (2)

Increase in concentration of toxics at successive levels.

High concentration of DDT disturb calcium metabolism in birds, which causes thinning of eggshell and their premature breaking – decrease in bird population.

39) Why is fertilization in an angiosperm referred to as double fertilization? (2)

Since two types of fusion, syngamy and triple fusion takes place in an embryo sac, the phenomenon is called double fertilization.

40) Why is CNG a better fuel? (2)
CNG burns more efficiently.
Very little of it is left unburnt.
Cheaper.
It cannot be stolen and adulterated.

41) List the ways of transmission of HIV infection in humans. (2)
Sexual contact with infected person
Transfusion of contaminated blood
Sharing infected needles
Infected mother to the child through placenta

Section - C

42) List the symptoms of Ascariasis. How does a healthy person acquire this infection? (3)
Internal bleeding
Muscular pain
Fever
Anemia
Blockage of intestinal passage
The eggs of the parasite are excreted with the faeces and contaminate soil, water, plants etc. and get into a healthy person by using contaminated water, vegetables, fruit etc.

43) Make a list of any three outbreeding devices that flowering plants have developed and explain how they help to encourage cross pollination? (3)
Pollen release and stigma receptivity are not synchronized.
Anther and stigma are at different levels.
Mismatching of gametes.
Production of unisexual flowers.

44) Write the chromosomal number of the following diseases? (3)
a) Turner's syndrome
b) Down's syndrome
c) Klinefelters syndrome
a. $45 + X0$
b. $47 (21^{st} \text{ trisomy})$
c. $47 (44 + XXY)$

45) Suggest any three assisted reproductive technologies to an infertile couple? (3)
ZIFT
GIFT

Intra cytoplasmic sperm injection

46) Explain the mechanism of sex determination in human? (3)

In female, there are two X chromosomes, while in male, there is X and Y chromosome. Male produces two types of gametes – 50% X and 50% Y. Female produces 100% gametes with X. If X chromosome of male fuses with X chromosome of female, it is a girl and if Y chromosome of male fuses with X chromosome of female, it is a boy.

47) Why are human females rarely haemophilic? Explain. (3)

The possibility of female becoming haemophilic is very rare because mother of female should be at least carrier and father should be haemophilic. The heterozygous female transmit the diseases to sons only. It is a sex linked recessive disease.

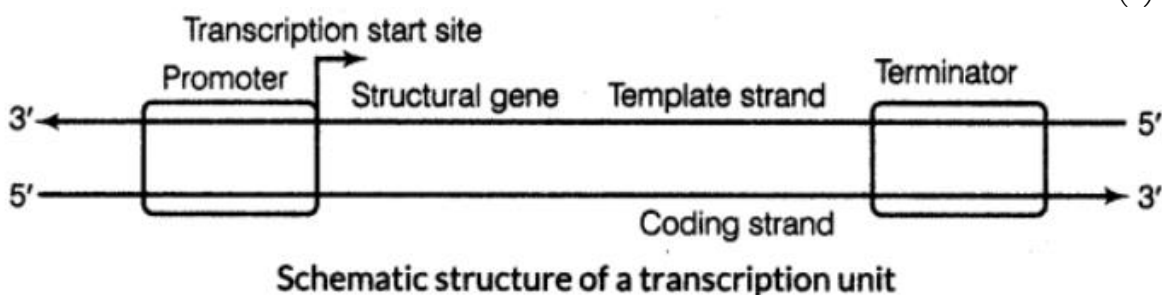
48) Explain codominance taking an example of human blood groups. (3)

In codominance, the F1 generation resembles both the parents. In AB blood group, the A gene and B gene are equally dominant and they both express the same trait.

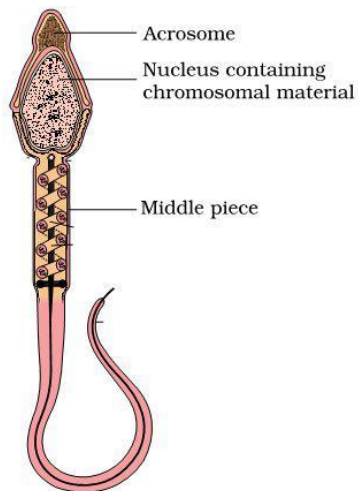
49) How is the bacterium *Thermus aquaticus* employed in recombinant DNA Technology? (3)

The thermostable DNA polymerase isolated from *Thermus Aquaticus* remain active during the high temperature induced denaturation of double stranded DNA during amplification by PCR.

50) Draw a schematic diagram representation of the structure of a transcription unit and label it. (3)



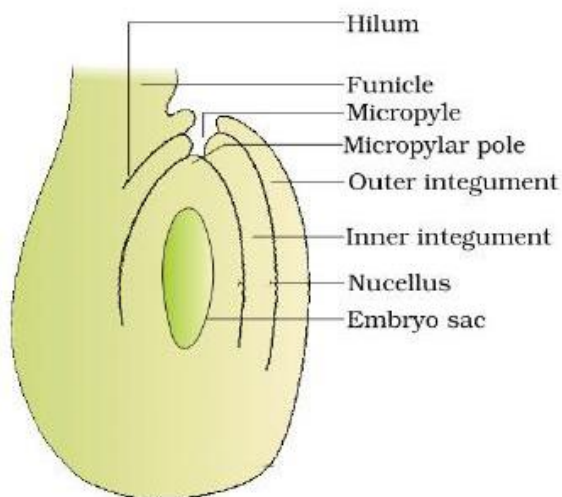
51) Draw a labelled diagram showing electron microscopic structure of human sperm. (3)



52) Alien species are a threat to native species. Justify by giving example. (3)
 When alien species are introduced, they cause decrease in indigenous species. The Nile perch introduced in Lake Victoria caused extinction of more than 200 species of Cichlid fish in the lake.

53) Name the source organism and use of following bioactive molecules. (3)
 Statins, Cyclosporin A, Streptokinase
 Statin – *Monascus purpureus* – Blood cholesterol lowering agent.
 Cyclosporin A – *Trichoderma polysporum* – Immunosuppressive agent
 Streptokinase – *Streptococcus* – Removing clots from blood vessels of patient undergone heart attack.

54) Draw a sectional view of a typical anatropous ovule. (3)



Section - E

55) Describe the various steps of Griffith's experiment that led to the conclusion of the Transforming Principle. (5)

(i) Frederick Griffith (1928) carried out a series of experiments with *Streptococcus pneumoniae* (bacterium causing pneumonia).

(ii) According to him, when the bacteria are grown on a culture plate, some produce smooth shiny colonies (S), while others produce rough (R) colonies.

(iii) This is because the S-strain bacteria have a mucous (polysaccharide) coat, while R-strain does not.

(iv) Mice infected with S-strain (virulent) die from pneumonia but mice infected with R-strain do not develop pneumonia.

S-strain $\xrightarrow{\text{Injection}}$ Mice \longrightarrow Mice die

R-strain $\xrightarrow{\text{Injection}}$ Mice \longrightarrow Mice live

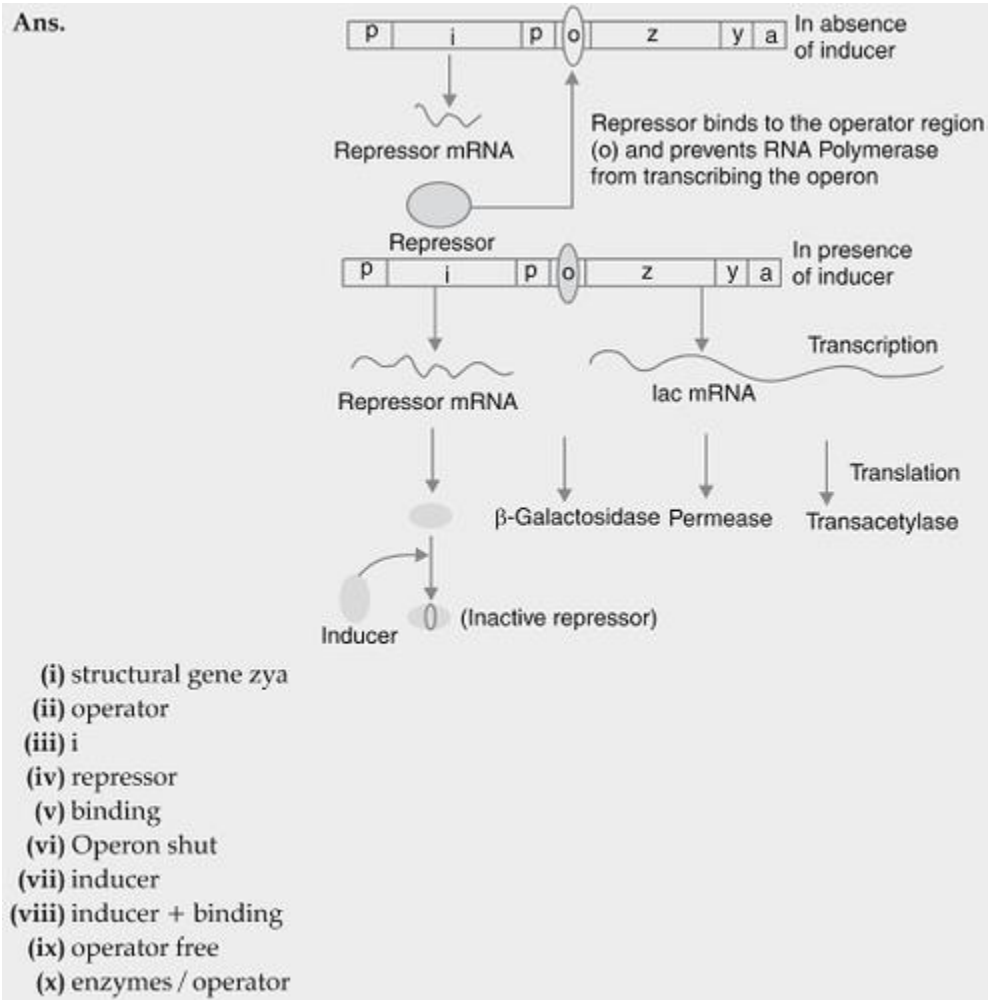
(v) Griffith killed bacteria by heating and observed that heat-killed S-strain bacteria injected into mice did not kill them. On injecting mixture of heat-killed S and live R bacteria, the mice died. He recovered living S-bacteria from dead mice.

S-strain $\xrightarrow{\text{Injection}}$ Mice \longrightarrow Mice live
(Heat-killed)

S-strain $\xrightarrow{\text{Injection}}$ Mice \longrightarrow Mice die
(Heat-killed)
+
R-strain
(live)

(vi) From this experiment, he concluded that the 'R-strain bacteria' had been transformed by the heat-killed S-strain bacteria. Some transforming principle transferred from heat-killed S-strain, had enabled the R-strain to synthesise a smooth polysaccharide coat and become virulent. This must be due to transfer of the genetic material.

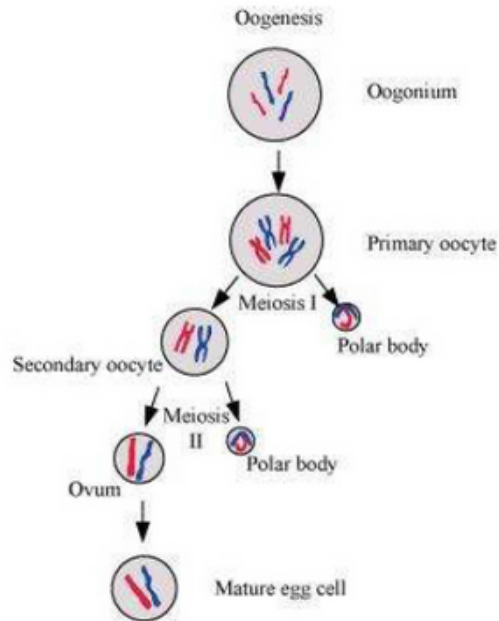
56) Describe how Lac operon operates both in the presence and absence of an inducer in E.Coli. (5)



57) Explain the steps in the formation of an ovum from an oogonium in humans.

(5)

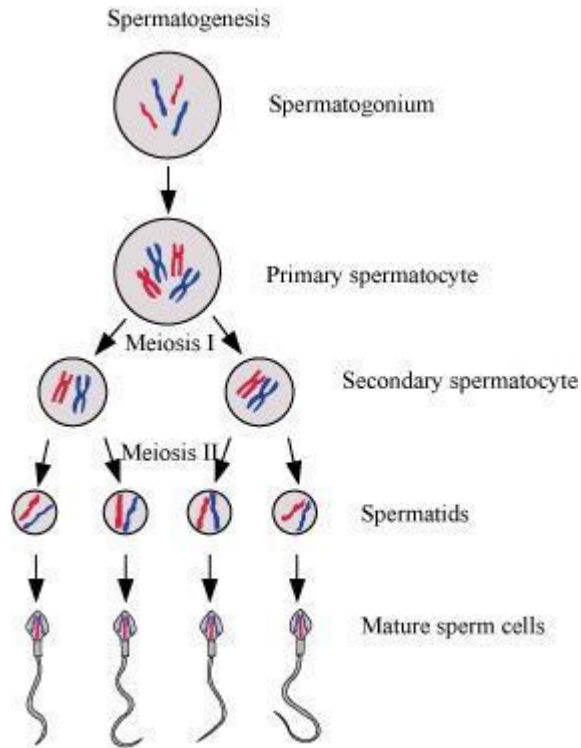
Answer Oogenesis is the process of the formation of a mature ovum from the oogonia in females. It takes place in the ovaries. During oogenesis, a diploid oogonium or egg mother cell increases in size and gets transformed into a diploid primary oocyte. This diploid primary oocyte undergoes first meiotic division i.e., meiosis I or reductional division to form two unequal haploid cells. The smaller cell is known as the first polar body, while the larger cell is known as the secondary oocyte. This secondary oocyte undergoes second meiotic division i.e., meiosis II or equational division and gives rise to a second polar body and an ovum. Hence, in the process of oogenesis, a diploid oogonium produces a single haploid ovum while two or three polar bodies are produced.



58) What is spermatogenesis? Describe briefly the different stages in the process.

(5)

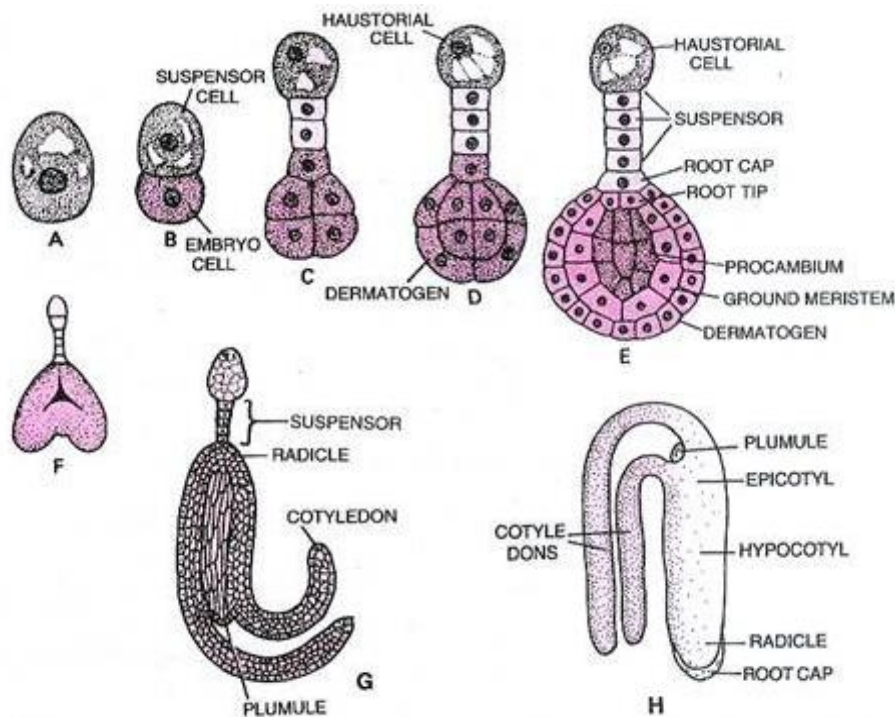
Spermatogenesis is the process of the production of sperms from the immature germ cells in males. It takes place in seminiferous tubules present inside the testes. During spermatogenesis, a diploid spermatogonium (male germ cell) increases its size to form a diploid primary spermatocyte. This diploid primary spermatocyte undergoes first meiotic division (meiosis I), which is a reductional division to form two equal haploid secondary spermatocytes. Each secondary spermatocyte then undergoes second meiotic division (meiosis II) to form two equal haploid spermatids. Hence, a diploid spermatogonium produces four haploid spermatids. These spermatids are transformed into spermatozoa (sperm) by the process called spermiogenesis.



Process of spermatogenesis

59) Explain the stages of development of embryo in an angiosperm.

(5)



60) What is ADA? What is the cause of this deficiency? How is it treated? Explain gene therapy. (5)

Adenosine Deaminase deficiency is caused due to deletion of the gene for adenosine deaminase.

It is treated by enzyme replacement therapy in which functional ADA is given to the patient by injection.

The lymphocytes from the blood of a patient are grown in a culture outside the body. A functional ADA cDNA is then introduced into the lymphocytes which are subsequently returned to the patients.