

Biology

VALUE BASED, HOTS & APPLICATION BASED QUESTION OF BIOLOGY CLASS - XII

Q1. Amit and his friend Ravi went for boating in a lake where they saw floating aquatic plant water hyacinth in many parts of the lake. Amit wanted to take this plant and introduce it in the lake of his farm house but Ravi advised him not to do so.

(i) Why did Amit want to introduce this plant in the lake of his farmhouse.

(ii) Mention any two reasons why Ravi did not like the idea.

Q2. Why are young ones of oviparous animals not ensured to survive.

Q3. Vegetative propagation is called a method as asexual multiplication. Explain why?

Q4. Why does a gardener apply hormone IAA or NAA before planting rose cuttings.

Q5. Presently, cultivation of hybrid varieties of our food and vegetable crops has increased due to their higher productivity. Still many of our farmers are not cultivating such varieties because of some problems.

(i) Mention any two problems associated with sowing of seeds of hybrid varieties of crops.

(ii) How can such problems be overcome.

Q6. Why are flowers pollinated by bees predominantly blue or yellow but not red.

Q7. Microspores are formed in multiples of four. Explain why?

Q8. Self-pollinating flowers have less chances of production of new species and varieties. Why?

Q9. What is the function of a single cotyledon in monocotyledonous seeds?

Q10. How will you explain that polyandrous flowers are more common in nature.

Q11. Cervix contains the largest and strongest sphincter in its wall. Why?

Q12. Miscarriage is more likely to occur during the first month of pregnancy. Explain.

Q13. Explain why cleavage is not typical mitosis.

Q14. A couple was unable to produce children. The woman's mother-in-law often blames her daughter-in-law for not having a child. The couple visited a doctor and it was diagnosed that the abnormality was with the husband.

(i) What could be the abnormality in the semen?

(ii) Mention the feature of sperm essential for normal fertilization.

REP- IN ANGIOSPERMIC PLANT

- Q1. Farmer cultivates sugar cane and rose by using stem cuttings. But all the cuttings did not grow. Sohan a biology student gives some points to be followed.
- Can you suggest a reason for this.
 - List the steps that Sohan must have given.
 - Name other plants that are propagated by stem cuttings.
 - What values are given by Sohan.
- Q2. Radhika and Sita compared the fruits (Mango) of their Mango trees in their respective backyards of the houses and found that there was difference in the structure and the taste of fruits. Mango bought by Radhika was not sweet and it was small and other one brought by Sita was bigger and tasty. Sita takes some branches of her mango tree to Radhika's place and Explain the procedure.
- Which method Sita has suggest for getting good quality fruits.
 - Explain the method that helped Radhika. Mention its advantages.
 - Mention the values expressed by Sita.
- Q3. While visiting an orchard Ganesh found some flowers were covered with butter paper bags. He was about to remove the bags, but the gardener did not allow him.
- Why the flowers have been covered.
 - How will Ganesh understand the need for covering flowers.
 - Is It possible that all seeds produced will grow into plants with desirable qualities? why?
- Q4. Swati had deliver a child after the completion of pregnancy period. She went to a hospital for the deliver but was not able to deliver the child as the uterine muscles did not show vigorous contractions. The doctor injected medicine into the body of Swati and she was explained why the medicine has been injected
- Why the doctor injected the medicine.
 - What medicine was injected.
 - Where do signals for delivery (parturition) begin.
 - Why did doctor explain to Swati.
 - Mention the value shown by the doctor.
- Q5. A couple married for past five years did not have a child. They visited a doctor who asked for some tests. It was found that problem was with man that was reason for not having child- But the man was reluctant to accept it

and blamed his wife not to produce a child. The doctor succeeded in convincing the man and got ready for treatment

- a) Mention the cause of infertility in man.
- b) What are possible methods for the couple to have child.
- c) Explain the values explicated by the doctor.

Q6. Due to hectic working schedule, modern women feed the powdered ,ilk to new born babies, but the elders always advise for breast feeding.

- a) Do you think that elders are right?
- b) Why is breast feeding important?
- c) What are problems faced by such women.

Genetics

Q1.Is it said that marriages between close relatives is fraught with danger for the next generation.

Q2.Children with thalassemia need periodic transfusions but the parents of such children do not show any such symptom of the disease.

- a) What is the genetic basis of this disease that appears in siblings or not in any of their parents.
- b) Could the parents have avoided birth of such children.
- c) How can you help the children to feel at ease.

Q3.Two couples claim for same child as their own child one of the couple is having blood groups as - Male - o and female-AB group and the other couple blood group - Man - A over to couple B by the Judge.

- a) Was it correct judgement. Justify your answer.
- b) Name the other technique that can help in solving the problem.
- c) Indicate the values exhibited by the Judge.

Q4. In a maternity clinic, two new born babies got mixed up. How can you find identity of these babies as to their real parents?

Q5.Why are marsupials found in Australia only?

Q6.How do closely related species of alligators at present occur only in South Eastern United States and Eastern China?

Q7.Rita and Sita had a heated argument whether life is still originating on Earth today. Their teacher after listening the conversation explained the matter in detail.

- a)As a biology student how can you answer?
- b)Name the products obtained in Miller's Expt that simulated primitive atmosphere? How was energy provided in the Expt.?

Q8. Anthropogenic action can hasten Evolution. Explain with the help of suitable examples.

Q9. Evolution is a change in the gene frequencies in a population in response to changes in the environment in a time scale of years and not centuries. Justify this statement with reference to DDT. How does the theory of Hugo derives support this.

Q10. Rearrange the following in an ascending order of Evolutionary Tree - reptiles, Salamander, lobefins, frogs.

a) Name two reproductive characters that make reptiles more successful than amphibians.

Q11. Fitness is the end result of the ability to adopt and get selected by nature. Explain with suitable examples.

Genetics

Q1. Some human disorders are inherited and have been prevailing in human society since long. Since the controlled crosses are not possible in case of human beings, the study of family history provides an alternative about the inheritance of such disorders.

a) Name the analysis used to study the inheritance of such a disorder.

b) Explain any two human disorders which could be traced by this analysis.

c) Explain the effects of any one of such disorder in the affected individuals.

Q2. Anita and Anil are siblings and resemble with one another in a number of phenotypic features. Still they are not the carbon copy of one another. They have a number of dissimilar features.

a) Explain what characteristics of DNA are responsible for similarities in the siblings.

b) Why do siblings show dissimilarities?

c) Explain, How does DNA make every individual unique in their phenotypic appearance.

Q3. Preeti argued with her classmates that use of antibodies or drugs to kill the microbes/Pathogens results in the development of resistant populations of microbes in a short span of time. but her friend Rohan was not convinced with her.

(i) In this situation to whom will you support justify your view giving reason.

(ii) How can the development of resistant population of microbes/pathogens be minimised?

Q4. Why Morgan observed complete linkage in male Drosophila but not in female Drosophila?

- Q5. Pure lines and clones do not exhibit genetic variations for natural selection?
- Q6. Why male sex is called homozygous in man and Drosophila?
- Q7. A child with PKU disorder, but neither parent has PKU. What is the genotype of Parents. Give reason for your answer.
- Q8. What is polyploidy? How can it be induced in flowery plants?
- Q9. Why are histone proteins are +vely charged?
- Q10. What is the role of introns in Eukaryotic genome?

BIOLOGY AND HUMAN WELFARE

- Q1. Sohan was a very active and a social child. He used to come forward for anybody help. One day he attended a blood donation camp and was ready to donate blood, but his blood test was done and he was HIV+ve. Therefore he was very upset and lost his interest in all activities and remained absent from school for long time. Rajiv, his friend met him and counselled him. He(Sohan) was back at school.
- a) What sense of responsibility did Rajiv show?
- b) A HIV+ve person should be isolated. Do you agree with this statement justify your answer.
- Q2. A complaint was lodged to MCD by residents to remove hoardings advertising the use of condoms and other things related to AIDS prevention. The children residing in the locality raised their voice against removal of those hoardings. The adults were convinced by awareness level of their children and withdraw their complaint.
- a) Why did children disagree the complaint?
- b) What value is promoted by; the children protesting against adults.
- Q3. Mule is an animal used to carry luggage. It combines the load carrying nature of donkeys and fast walking nature of horses. Man has been performing such crosses among plants and animals.
- a) Name and define the type of cross involved in the production of mules.
- b) Give reasons as to why man has been trying such crosses.
- c) Mention the values neglected in his act hybrids.
- Q4. Rohan an accountant working in an office is a chain smoker. One day he fainted in office and doctor attending him found that his blood pressure was high and he had deficiency of oxygen in body.
- a) Can you explain why there is oxygen deficiency in the body of a smoker. What lung disorder can he suffer from?
- b) How does smoking of tobacco cause high BP?
- c) How can you make a propaganda against smoking?

- Q5. Skin is called a self disinfecting organ. Why?
- Q6. Why does use of antibiotics cause diarrhoea?
- Q7. Psychotropic drugs are called mood altering drugs?
- Q8. Why is that once a person starts taking drugs or alcohol it is difficult to get rid of this habit?
- Q9. Why do X-Rays and gamma rays induce mutations?
- Q10. Why are cross breeds of cattle more advantageous than indigenous breeds?

Biology in Human Welfare (Application & VB)

- Q1. In spite of great increase in food production in the world, a large section of human population is not getting enough food. A number of individuals suffer from hidden hunger.
- What does hidden hunger mean?
 - Name the crop breeding programme undertaken with the objective of eliminating the hidden hunger.
 - Mention any three varieties of crops and their specific features that have been developed to achieve the above objectives.
- Q2. Ram and Shyam visited a village, where they saw some farmers spraying insecticides and pesticides on their crops.
- They stopped farmers' to spray such chemicals by saying these chemicals are harmful. Discuss how?
 - Suggest an alternative method of controlling pest and explain how is this method better than the chemical method of pest control.
 - Give any one example where the alternative method has been used to get rid of a pest.
- Q3. How do statins reduce the blood cholesterol level?
- Q4. Baculoviruses are excellent candidates for integrated pest management in ecologically sensitive area. Explain?
- Q5. Why is biofortification important? Does this process require genetic engineering?
- Q6. Why is suspension culture constantly agitated?
- Q7. What is the main reason for low milk production in India and how it can be improved?
- Q8. Why is the use of cattle dung for biogas plant more beneficial than dung cake?
- Q9. Why is the BOD of unrelated sewage of a city more than that of a river polluted by industrial wastes.

Q10. What would happen if a large volume of

a) Untreated sewage is discharged into a river?

b) In what way is anaerobic sludge digestion important for sewage treatment?

Q11. Why does a dish washing powder contain enzymes, amylase and lipase?

Q12. In many villages people do not go for vaccination or immunisation, they feel they are healthy and they do not have disease.

a) How can you explain them that vaccination will help to prevent disease.

b) How can this idea be made to reach them?

BIOTECHNOLOGY

Q1. Since biotech includes use of living organisms to provide products and processes for human welfare and has been found a very progressive technique and in the field of biology, microbiology and molecular biology. But today the term is used in a restricted sense for the processes that involve GMOS.

a) Give the examples of the products that are formed by old biotechnology and modern biotechnology.

b) Mention the values learnt from this.

Q2. Restriction enzymes are used for cutting and pasting. They are typically recognize a symmetrical sequence of DNA.

The top strand is same as the bottom strand but reads backward when enzyme cuts the strand between G&A it leaves overhanging chains.

a) What is this symmetrical sequence of DNA known as.

b) What is the significance of these overhanging chains?

c) Name the restriction enzyme that cuts the strand between G&A.

Q3. What will happen if a plasmid vector is digested with ECORI at a single site?

Q4. Fill the gaps in the following table

a) _____ B Now coding sequence in Eukaryotic DNA.

b) _____ technique used in solving paternity.

c) Restriction and nucleases _____

d) Plasmids _____

e) Transgenic _____

f) _____ nucleotide sequence with single base difference.

Q5. A multinational company (XYZ) marketed a medicine extracted from medicinal herbs grown in the sprawling fields in a foreign country. The herb

is found in that country and no compensation was paid or permission taken from relevant authority.

a) What is the term used to refer such an act?

b) Justify the meaning of term.

c) What has our Government done to prevent such deeds?

Q6.You have developed a GMO. Which government organisation will you approach to obtain clearance for its mass production. Why is such a body necessary? Give two reasons.

Q7.In order to regulate the activities in the biological world we need a set of standards. Since use of Biotechnology has exploited the biological world for human use. It is branded as unnatural to biodiversity.

a) What are the major concerns (bioethical) that have been neglected?

b) As a student of biotechnology how can you satisfy people that biotech is useful and it should not be treated in an unnatural way.

Unit 5 ECOLOGY

Q1.'Be a vegetarian' is the slogan seen and heard in many advertisements these days.

a)Can you help the common people of your village to understand and follow this with more biological reasons?

b)Explain how this will save the environment also.

Q2.Bacteria do not multiply well in the soil although they are pathogenic in humans.

Q3.Why do birds and mammals not hibernate during winter as is seen in most animals?

Q4.Why do we use the term "cycle" for the movement of matter and "flow" for movement of energy?

Q5. Smaller food chain is said to be more efficient than a larger one. Why?

Q6.Nutrients can be retained in an ecosystem. Discuss how and name the process.

Q7.Why is Productivity of Tundra biome very low?

Q8.Rohit and Mohit visited Rohtang Pass near Manali. There, they felt nausea, fatigue and heart palpitation. Gradually these symptoms disappeared with time.

a) Why did they feel such symptoms?

b) What is the condition called?

c) How did the symptoms disappear?

Q9. Biosphere reserves are more important than natural parks and the sanctuaries. Discuss how?

Q10. Why is wild life conservation not possible by merely preventing hunting?

Q11. a) How is genetic diversity different from species diversity?

b) Choose the correct one

(1) Indian Rhinoceros a) extinct b) endangered c) girforest

(2) The 1st biosphere reserve is _____ is situated in three states _____ Kerala and Tamilnadu

(Nandadevi, Nilgiri, Karnatka, Maharashtra)

Q12. Suneeta a class XII student was taught by her Biology teacher that biodiversity is important and communities with more species are more stable than those with less species.

a) What does stability mean for a biological community?

b) Explain how Tilman's Expt supported teacher's view.

c) What value does it teach?

Q13. Why ozone hole forms over Antarctica? How will enhanced ultraviolet radiation affect us?

Q14. Discuss the role of women and communities in protection and conservation of forests?

Q15. People have been actively participating in the efforts for the conservation of forests.

a) Name the award instituted in respect of Amrita Devi to promote such efforts.

b) Name the movement launched to protect the trees by hugging them.

c) Name the step, govt of India has undertaken in 1980's to work closely for management of forests.

Q16. Jatin and his classmates went on an educational tour to North East states of India. There they found that some farmers clearing the forest and burning the plant remains.

a) Why were they doing so what is this practice called?

b) Why didn't this practice cause harm to forests earlier?

c) What will be the consequences of farmer's act?

d) Suggest a measure of restoration of forested area.

Q17. An ornithologist went to a river side for some studies on birds. He noticed that populations of many birds have been declined drastically during the last few decades. He discovered that the use of a particular agrochemical was responsible for the decline of bird population.

- a) Name the agrochemical that had resulted in decline in population of birds.
- b) How did this chemical decline the populations?
- c) What other harms it could have caused to the farms?

Q18. Excess CO_2 is liable to warm troposphere what will be its effect on stratosphere and mesosphere.

Q19. Why is oxygen depletion in Eutrophicated water faster at night than during the day?

Q20. Muscle fibres and neurons of body are less sensitive to the radiations. Why?

Q21. Why in recent years there is a sharp increase in the frequency of magnitude of algal bloom in fresh as well as coastal waters?

Q22. Why do environmentalists recommend reduced use of fossil fuels?

Q23. How much fresh water is available to us on earth and in earth form?

Q24. On seeing bad state of roads as a student you recommend to MCD to use polyblend.

i) What is polyblend?

ii) Point out its raw materials mention its advantages.

ASSIGNMENT
CLASS-XII
BIOLOGY

Chapter-I: Reproduction in Organisms.

- (1) A moss plant is unable to complete its life cycle in a dry environment. State two reasons.
- (2) Why are the plants raised through micropropagation termed as somaclones. Mention two advantages of this technique.
- (3) With which type of reproduction do we associate the reduction division. Analyse the reasons for it.
- (4) What will you do to convert a bisexual flower into a female flower so that it is cross pollinated artificially by the pollens of some other plant.
- (5) In an experiment, Mr. John dissected a large potato tubers into several small pieces & then placed each piece in a separate pot for germination. After few days, he observed that a few pieces germinated & developed new-plants. The others did not germinate at all. Give possible reasons.
- (6) a) What is common between vegetative reproduction & apomixis.
b) Name the organisms in which external fertilization takes place.
- (7) One day, Ramesh was standing in the kitchen with his mother who was cutting onions for making vegetables. He observed that in some of onion bulbs, green leaves appeared on upper end & roots on the lower end. In the evening, he shared his observations and discussed with his father, a Botany teacher. His father explained that in case of onion, new plants develop through asexual reproduction.

Read the above passage and answer the following questions:-

- i) What is the name of this type of Propagation?
- ii) Can this method be used for raising onion plants at home also.

- iii) Name some other vegetables which are propagated by using bulbs.
- iv) What value is displayed by Ramesh's father?

Chapter 2- Sexual Reproduction in Flowering Plants

- (1) Name the pollinating agent of flowers like salvia, sunflower. Give two favourable features of such a flower for pollination.
- (2) Give characteristics of insect pollinated flowers.
- (3) Name the pollinating agents of flowers like maize and wheat. Give any two characteristic features of such a flower.
- (4) An anther with malfunctioning tapetum often fails to produce viable male gametophytes. Give any one reason.
- (5) Name the following structures
 - a) Single cotyledon of the monocotyledonous embryo of grass family.
 - b) The portion of embryonal axis above the level of cotyledons in dicot embryo.
 - c) Occurrence of more than one embryo in a seed.
 - d) Seedless fruits produced without fertilization.
- (6) Is it possible to store pollen grains. What do we call the process of pollination using pollen grains of desired plant.
- (7) Do you think that microspores & pollen grains are the same structures. If they are different then what is the basic difference between them.
- (8) Each pollen grain produces two male gametes. How many pollen grains will be required to fertilize 4 ovules present in a particular carpel. Give reasons.
- (9) A flower of tomato plant, following the process of sexual reproduction, produces 200 viable seeds.

Answer the following question giving reasons:-

- a) What would have been the minimum no. of ovules present in per-pollinated pistil.
- b) How many microspore mother cells would minimally be required to produce requisite no. of pollen grains.
- c) How many pollen grains must have minimally pollinated the carpel.
- d) How many male gametes would have used to produce these 200 viable seeds.
- e) How many megaspore mother cells were required in this process.

Chapter-3: Sexual Reproduction in Humans.

1. Mention the target cells of LH in human males & females. Explain the effect of the changes which the hormone induces in each case.
2. What are the major functions of male accessory ducts and glands.
3. Note the relationship between first two words and suggest suitable word/words for the fourth place.
 - i) Testis: Spermatogenesis, ovary -----.
 - ii) Male: Penis, female -----.
 - iii) Ovary: Mesovarium, uterus -----.
 - iv) Man: Vasectomy, woman -----.
 - v) Interstitial cells: Testosterone, graafianfollicle cells -----.
 - vi) Menstrual Cycle: human female oestrous cycle-----.
4. Explain the following-
 - a) Failure of testes to descend into the scrotum produces sterility.
 - b) Spermatids possess a haploid chromosome number.
 - c) The 1st half of menstrual cycle is called the proliferative phase as well as the follicular phase.

5. When and where are primary oocytes formed in a human female. Trace the development of these oocytes till ovulation (in menstrual cycle) how do gonadotropins influence this developmental process.
6. In which part of the human female reproductive system do the following events take place.
 - a)
 - i. Release of 1st polar body
 - ii. Release of 2nd polar body
 - iii. Fertilization
 - iv. Implantation
 - b) From where do signals for parturition originate & what does maternal pituitary release for stimulating uterine contractions for child birth.
7. Give reasons for following statements-
 - a) Parturition is also termed labour.
 - b) Early secretions from mammary glands of mother are very useful to newly born baby.
 - c) Testes in males are lodged in scrotum so as to lie outside abdominal cavity.

Human Reproduction

1. Cleavage of mammalian egg is _____ type and 16 celled stage is called as _____.
2. Study the flow chart given. Name the hormones involved at each stage and explain their role.

Ovulation → pregnancy → placenta → foetal growth → parturition → lactation.
3. Role of placenta is to
 - (A) Provide nutrition to developing embryo
 - (B) Protect embryo from shock
 - (C) Act as a storage organ

- (D) Convey nerve impulses
4. Gastrulation involves the differentiation of
- Ectoderm & endoderm
 - Ecto, endo & meso derm
 - Mesoderm & endoderm
 - ectoderm & mesoderm
5. Gestation period in humans is
- A) 10 weeks B) 25 weeks C) 7 months D) 9 months
6. Amniotic fluid protects the foetus from
- i) Shock ii) encystment iii) Degeneration iv) diseases
7. Allantosis of mammalian embryo helps in
- A) Respiration B) Excretion C) Protection D) Nutrition
8. How many sperms are formed from a secondary spermatocyte –
- A) 4 B) 8 C)2 & D) 1
9. Site of fertilization in a mammal is
- Ovary c) Vagina
 - Uterus d) fallopian tube
10. Withdrawl of which of following hormones is the immediate cause of menstruation.
- a) Estrogen b) FSH c) FSH – RH d) Progesterone
10. Capacitation of sperms occurs in
- Vas deferentia
 - Vas efferens
 - Female genital tracts
 - Vagina.
11. Which of the following hormones is not a secretion product of human placenta
- a) HCG b) Prolactin c) Oestrogen d) Progesteron
12. Cowper's glands secrete a substance to
- Nourish sperms

- b) Neutralize the acidity
- c) Kills pathogens
- d) Lubricate female vagina to facilitate copulation (Tick correct options)

13. Accessory sexual characters in female is provided by

- i) Androgens ii) Progesterone iii) Estrogens iv) Testosterone

14. Which part of ovary in mammals act as an endocrine gland after ovulation-

- a) Vitelline membrane
- b) Graffian follicle
- c) Stroma
- d) Germinal epithelium

Chapter-4 Reproductive Health Assignment

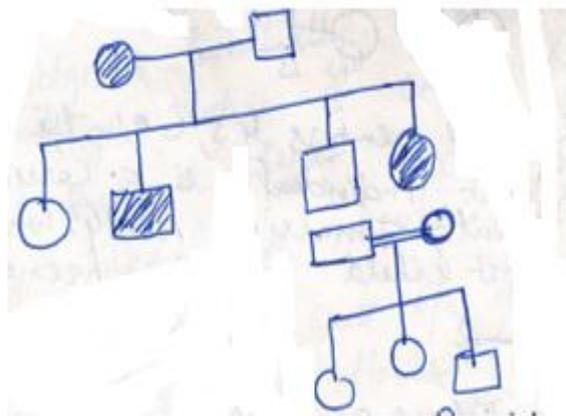
1. Name the most recent and improved programme in operation in India in reproduction related areas & what is its aim.
2. What is the chemical constituent of oral contraceptive pills.
3. Why has amniocentesis been banned?
4. Give the causal organism of following STDs (1) Syphilis (2) Genital Herpes.
5. a) Expand IUD
b) Why is hormone releasing IUD considered a good contraceptive to space children.
6. A mother of one year old daughter wanted to space her second child. Her doctor suggested CuT. Explain its contraceptive actions.
7. Why is MTP done- Is it legalized in India.
8. Discuss the problems and strategies of reproductive health in Human beings.
9. Removal of gonads can not be considered as contraceptive options. Why?
10. What are the measures one has to take to prevent from contacting STDS.

11. List the ill effects of over population.
12. What are implants. How do they help in preventing the fertilization.
13. Describe the methods of birth control by which fertilization of ovum by sperm is prevented.
14. Define infertility. List some causes of infertility. Name some assisted reproductive technologies (ART) to check the problems of infertility.
15. In the table given below select and enter one correct device out of the following oral pill, condom, copper T, Saheli, Vasectomy, Diaphragm, Tubectomy, Cervical Cap.

Method of birth control	Device
1. Barrier 2. IUD 3. Surgical Technique 4. Administering Hormone	

16. MCQ-
 - a) Contraceptive oral pills help in birth control by
 - A) Killing of ova B) Preventing Ovulation C) Killing the Sperms D) Forming barriers between sperms & ova.
 - b) Most important component of oral contraceptive is
 - A) Thyroxine B) LH C) progesterone D) GH
 - c) Which of the following is mechanical barrier used in birth control
 - A) Cu-T B) Diaphragm C) Tubectomy D) Loop
 - d) The Technique called GIFT is recommended for those females
 - A) Whose cervical canal is too narrow to allow passage of sperms
 - B) Who can not produce an ovum
 - C) Who cannot retain the foetus inside uterus

- 1) Name the cross where a heterozygous F1 is crossed with the parent of recessive trait.
- 2) When a cross is made between tall plant with yellow seeds and tall plant with green seeds what proportion of phenotype in offspring could be expected to be (a) tall & green (b) dwarf & Green
- 3) Work out the genotypes of parents & other possible genotypes in case of father is having A blood group, Mother-B group & child with O blood group.
- 4) Who proposed the chromosomal theory of inheritance?
- 5) Name three kinds of mutagens.
- 6) In the following pedigree chart, state if the trait is autosomal dominant, autosomal recessive or sex-linked. Give a reason for answer.

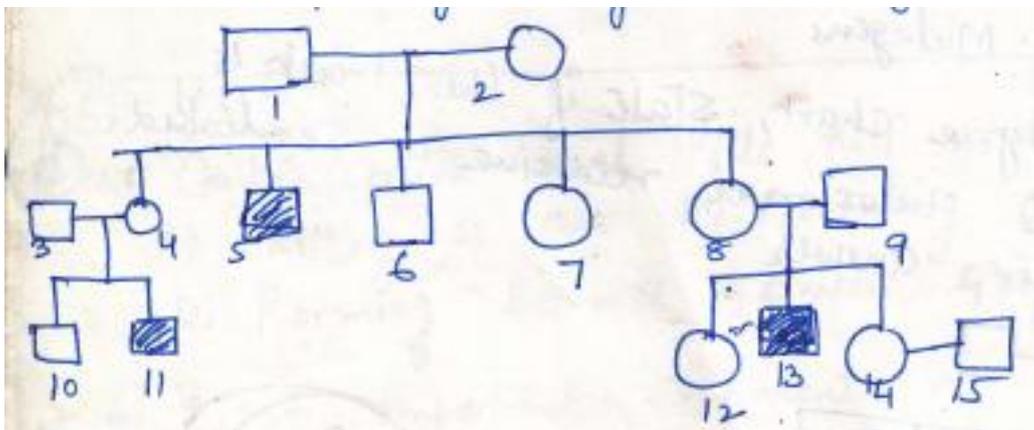


- 7) What is an allelomorphic pair.
- 8) Why is human male referred to a heterogametic.
- 9) What are linked genes. How can a pair of linked genes be identified.
- 10) Name the type of inheritance in which genotypic ratio is same as the phenotypic ratio.
- 10) The male fruit fly & female fowl are heterogametic while female fruit fly & male fowl are homogametic. Why are they called so.
- 11) A) How does a haemophilic patient suffer.

B) A haemophilic son is born to a normal couple. Explain the mechanism of this inheritance. What is the probability of a haemophilic daughter being born to this couple.

12) A woman with blood group O married a man with AB group. Show the possible blood groups of progeny. List the alleles involved in this inheritance.

13) Haemophilia is a sex linked recessive disorder of humans. The pedigree chart given below shows inheritance of haemophilia in one family-study pattern of inheritance & answer the questions.



- Give all possible genotypes of members 4, 5, 6 in the pedigree chart.
- A blood test shows that individual 14 is a carrier of haemophilia individual. The individual. No.15 has recently married no. 14. What is the probability that their first child will be haemophilic male.

14) The gene I that control ABO blood grouping in human beings has three Alleles I^A , I^B , i

- How many different genotypes are possible .
- And how many phenotypes are possible .

15) Explain the law of independent assortment with the help of a cross.

16) Define point mutation. Give one example.

17) a) why genes & chromosomes both show parallel behavior.

b) Why a gamete contains single chromosome out of a pair of homologous chromosomes.

- 18) a) How many pairs of chromosomes are found in *Drosophila*.
 c) How many homologous chromosomes are present in Male *Drosophila*
- 19) Name two sex-linked diseases of human beings.
- 20) Differentiate between complete and incomplete linkage.
- 21) Describe the mechanism of sex-determination in humans.
- 22) Differentiate between a) Test cross & Back cross
 b) Co-dominance & incomplete dominance
- 23) A 45 year old woman delivered a child with flattened nasal bridge & habitually open mouth with a large protruding tongue. What is child suffering from. What has caused such a defect.
- 24) What is sex-linked inheritance. Explain with an example.
- 25) Work out a dihybrid cross between a tall *Pisum sativum* plant bearing purple coloured flowers (dominant, homozygous for both traits) & a dwarf plant bearing white flowers through F₂ gen, using punnet square.
- 26) a) Normally why females do not suffer from haemophilia. Explain.
 b) Describe the reason for birth of haemophilic son from normal couple.
- 27) Fill in the blanks. Take the help of words given in bracket (first, second, meiosis, mitosis 50%, 100%, 1:1, 1:2, gametes, Male & Female).
- a) In human beings male has xy & female has xx chromosome. The sex chromosomes segregate during
- _____ division.
 - _____ the x-chromosomes constitutes.
 - _____ % of produced sperms.
 - _____ % of egg of randomly mated, the ratio of sex expression is.
 - _____ the sex of offspring is determined by.

vi) _____ of

vii) _____

- 28) The genes for haemophilia are located on sex chromosomes of humans. It is normally impossible for a haemophilic father to pass the genes to his son. Why?
- 29) How does a chromosomal disorder differ from a mendelian disorder.
- 30) a) which of the following is not an aneuploidy
 a.i. Monoploid ii. $2n-1$ iii. trisomic iv. $2n+2$
- b) Girl of normal vision whose father was color blind marries a man of normal vision whose father was also color blind. The sons of this marriage would be i. all normal ii. All color blind iii. 50% color blind iv. 25% colour blind
- c) Complete haploid set of chromosomes of a species is
 i.genome ii. Genotype iii. Alleles
- d) Wheat plant is $6n=42$. what will be the number of chromosomes in its monosomic, haploid & monoploid
 i.43,21, 7 ii.41, 21, 7 iii. 15, 7, 7 iv. 13, 7, 7