QB365

Model Question Paper - 1

12th Standard CBSE

Biology

Reg.No. : | | | | | | |

Time : 02:00:00 Hrs

Total Marks : 100

Section - A

1) The innermost wall layer of microsporangium nourishing the developing pollen grains is known as **1**

(a) endodermis (b) endothecium (c) tapetum (d) sporogenous tissue

2) An ovule which becomes curved so that the nucellus and embryo sac lie at right angles to the funicle is **1**

(a) Campylotropous (b) Anatropous (c) Orthotropous (d) Hemitropous

3) Which one of the following is surrounded by a callose wall? **1**

(a) Male gamete (b) Egg (c) Pollen grain (d) Microspore mother cell

4) Which of the following statements true of date plam? **1**

(a) It is monoecious producing both staminate flowers and pistilate flowers in the same plant.

(b) It is monoecious producing staminate flowers in one tree and pistillate flowers in another tree.

(c) It is dioecious producing staminate flowers in one tree and pistillate flowers in another tree.

5) Male heterogamy is found in **1**

(a) Drosophila (b) Humans (c) Grasshopper (d) All of these

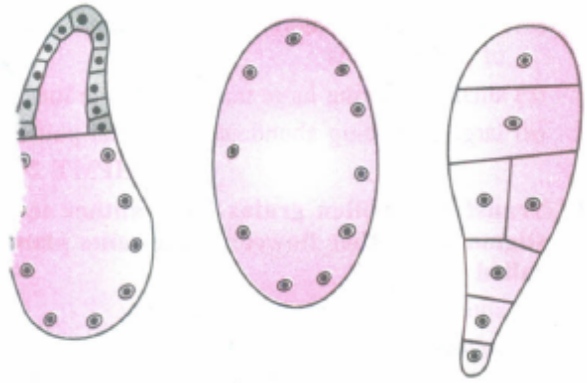
6) Which of the following statements is true of yeast?? **1**

(a) The cell divides by binary fission. One of them develops into a bud.

(b) The cell divides unequally. The smaller cell develops into a bud.

(c) The cell produces conidia, which develop into a bud.

7) Select the correct order of endosperm types **1**



(a) Cellular, helobial, free nuclear (b) Cellular, free nuclear, helobial (c) helobial, free nuclear, Cellular

(d) free nuclear, Cellular, helobial (e) free nuclear, helobial, Cellular

8) Wind-pollinated flowers are **1**

(a) small producing nectar and dry pollen

(b) small brightly colored producing a large number of pollen grains

(c) small producing large no.of pollen grains (d) ;large producing abundant nectar and pollen

9) In human beings, the eggs are: **1**

(a) Skin lecithal (b) Macrolecithal (c) Mesolecithal (d) Alecithal

10) Which one of the following is the most likely root cause why menstruation is not taking place in the regularly cycling human female? **1**

(a) retention of well-developed corpus luteum (b) fertilization of the ovum

(c) maintenance of the hypertrophical endometrial lining

(d) maintenance of high conc. of sex hormones in the blood stream

11) Which of the following statements is true of ginger? **1**

(a) Germinating bud appears from the eye of the stem tuber.

(b) Germinating bud appears from the node of the rhizome

(c) Germinating bud appears from the notch of the leaf margin.

12) In a mature embryo sac the central cell is **1**

(a) Single nucleate (b) Binucleate (c) Four nucleate (d) Eight nucleate

13) Identify the correctly matched pair/pairs of the germ layers and their derivatives. **1**

A.ectoderm-epidermis B. endoderm-dermis

C. mesoderm-muscles D. mesoderm-notochord

E. endoderm-enamel of teeth

(a) A and D only (b) A and B only (c) A, C and D only (d) A, B, C and E only

14) Devices for self-pollination are **1**

(a) Dicliny or unisexuality (b) Dichogamy (c) heterostyly (d) None of these

15) Which of the following hormones is not secreted by human placenta? **1**

(a) hCG (b) Estrogens (c) Progesterone (d) LH

16) Offspring derived by asexual reproduction are called clones. Justify giving two reasons. **1**

17) Which of the followin statements is true of Hydra? **1**

(a) It produces asexual gemmules (b) It produces unicellular bud. (c) It produces multicellur bud.

18) Apomictic embryos in Citrus arise from **1**

(a) diploid egg (b) synergids (c) maternal sporophytic tissue (d) antipodal cells

19) In the embryos of a typical dicot and grass, true homologous structures are **1**

(a) Coleorhiza and Coleoptile (b) Coleoptile and Scutellum (c) Cotyledons and Scutellum

(d) hypocotyl and Radical

20) In which of the following organism, self-fertilization is seen? **1**

(a) Fish (b) Roundworm (c) Earthworm (d) Liver fluke

Section - B

21) In general, the male gametes are motile while the female gametes are stationary. Mention two types of exceptions to this, with an example for each. **2**

22) Examine a few flowers of any cucurbit plant and try to identify the staminate and pistillate flowers. Do you know any other plant that bears unisexual flowers? **2**

23) Defferentiates between tropoblast and inner cell mass. **2**

24) Not all hydrophytes are pollinated by water. Justify by giving two examples. **2**

25) Mention the life span of: (a) Crocodile (b) Crow (c) parrot and (d) butterfly. **2**

26) (a) Explain triple fusion in angiosperms. **2**
(b) Write the fate of the product of this fusion in the mature fruit of coconut.

27) In an angiosperm, the embryo sac is haploid, zygote is diploid and endosperm is triploid. Justify giving reasons for each stage. **2**

28) Select out any four animals to demonstrate examples of bisexual organism: **2**
Frog, Earthworm, Cockroach, Spider, Sponge, tapeworm, leech, honey, bee, Rat, Rabbit, House fly.

29) Why are MTPs carried out? **2**

30) What are (a) continuous breeders and (b) seasonal breeders? **2**

31) Differentiate between primary and secondary follicles. **2**

32) How does the progeny form from asexual reproduction differs from those formed by sexual reproduction? **2**

33) (a) In which part of the human female reproductive system do the following events takes place? I-Release of 1st polar body. II-Release of 2nd polar body. III-Fertilisation IV-Implantation (b) From where do signals for parturition originate and what does maternal pituitary release for stimulating uterine contractions for childbirth? **2**

34) Mention the adaptions the plants have, to ensure self-pollination/autogamy. **2**

35) Why does deletion or insertion of a segment of DNA result in alteration of chromosomes (also called chromosomal aberration)? **2**

36) Explain the role of tapetum in the pollen grain wall formation. **2**

37) Mention the principle behind each of the following natural methods of contraception. (i)Periodic abstinence. (ii)Lactation for 6 months. **2**

38) Name the source of gonadotropins in human females.Explain the changes brought about in the ovary by these hormones during menstrual cycle. **2**

39) Name the organisms with respect to their diverse sexuality **2**
1. Bisexual flower
2.Monoecious plant
3. Dioecious plant
4. Bisexual animal
5. Unisexual animal

40) Explain the pattern of inheritance of haemophilia in humans. Why is the possibility of a human female becoming a haemophilic extremely rare? Explain. **2**

Section - C

41) What exactly is dominance? Why are some alleles dominant and some recessive? **5**

42) Differentiate: (a)hypocotyl and epicotyl **5**

(b) Coleoptile and coleorhiza

(c) Integument and testa

(d) Perispern and pericarp.

43) Jagan has two mango trees in the backyard of his house, which yielded fruits for the first time during this summer. The fruits were small, fibrous and not so sweet. In the next house, where his friend Ajay livers, there is a mango tree, which yields fruits that are fleshy/juicy, very sweet and bigger in size. Ajay, a student of B.sc. (Botany) comes out with an idea and takes some branches from the jagan's garden to his garden and explains the procedure. **5**

(a) What method do you think Ajay has suggested for getting good quality fruits, on the trees of Jagan's house in a short period of time, i.e. during the next season?

(b) Describe how it is carried out to help japan.

(c) What are its advantages over growing a mango tree with the seeds obtained from Ajay's garden?

(d) Mention the values expressed by Ajay in this case.

44) Differentiate between the following **5**

(i) Dominance and Recessive.

(ii) Homozygous and Heterozygous

(iii) Monohybrid and dihybrid

45) You must have seen your mother adding 3-4 globules of yeast to the idli paste she has prepared. Similarly, brewing industry uses yeast in the manufacture of alcohol. **5**

(a) How does such a small amount of yeast added help to produce thousands of litres of alcohol? Explain how yeast multiples so fast.

(b) Name the process carried out by yeast in these cases.

(c) What value is learnt from these?

46) How can education help in building up a socially responsible and reproductively. **5**

47) Explain double fertilisation and trace the post-fertilisation events in sequential order leading to seed formation in a typical dicotyledonous plant. **5**

48) Mention the different ways in which people are made aware of the significance of reproductive health and a reproductively healthy society. **5**

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Section - A

1) (b) The cell divides unequally. The smaller cell develops into a bud. **1**

2) (c) It produces multicellur bud. **1**

3) (b) Germinating bud appears from the node of the rhizome **1**

4) (c) It is dioecious producing staminate flowers in one tree and pistillate flowers in another tree. **1**

5) (d) Liver fluke **1**

6) (d) None of these **1**

7) (d) Hemitropous 1

8) (d) Microspore mother cell 1

9) (c) helobial, free nuclear, Cellular 1

10) (b) Binucleate 1

11) (c) Cotyledons and Scutellum 1

12) (c) maternal sporophytic tissue 1

13) (c) small producing large no.of pollen grains 1

14) (c) tapetum 1

15) (d) Alecithal 1

16) (c) A, C and D only 1

17) (d) maintenance of high conc. of sex hormones in the blood stream 1

18) (d) LH 1

19) (d) All of these 1

20) They are genetically and morphologically identical among themselves and identical to the parent. 1

Section - B

21) (a) 60 years (b) 15 years (c) 140 years (d) 1-2 weeks 2

22) 2

(a) Those mammals which are reproductively active throughout their reproductive phase, are called continuous breeders.

(b) Those mammals which are living in natural/wild conditions and exhibit the reproductive cycles only under favourable seasons during their reproductive phase, are called seasonal breeders.

23) (i) Both male and female gametes are non-motile, eg. certain algae and few fungi. 2

(ii) In seed plants, the male gametes are non-motile and are carried in the pollen tube to the egg.

24) 2

Adaptations for self-pollination.

(i) There is synchromy between pollen release and stigma-receptivity; i.e. the anthers and pistil mature simultaneously.

(ii) The anthers and stigma lie close to each other in such a way that pollen from the anther can fall on the stigma.

25) 2

Those hydrophytes whose flowers emerge above the surface of water, are pollinated by insects or wind, e.g. water hyacinth and waterlily are pollinated by insects.

26) 2

Primary follicle	Secondary follicle
It is the structure that is formed when the primary oocyte is surrounded by a layer of granulosa cells.	When the primary follicle becomes surruonded by more layers of granulosa cells and a thecal layer,it is called secondary follicle.
Many primary follicles degenerate before puberty.	There is no degeneration of secondary follicles.

27) 2

Trophoblast	Inner cell mass
This is the outermost layer of cells of the blastocyst	This an inner group of cells attached to trophoblast at one end.
Trophoblast gets attached to the endormetrium and forms the foetal part of placenta.	It forms the germ layers and the embryo proper.

28) 2

(i)In this method,the couples avoid or abstain from coitus from day 10 to 17 of the menstrual cycle,when ovulation occurs and the chances of fertilisation are very high. (ii)During the period of intense lactation, ovulation does not occur and hence chances of conception are almost nil.

29) 2

MTPs are performed to remove unwanted pregnancies as in the following cases, (i)where the foetus is suffering from an incurable disease (ii)where pregnancy has occured due to unwanted events like rapes. (iii)that has occured due to unprotected sexual intercourse. (iv)where countinuation of pregnancy will be harmfull to the mother and/or foetus.

30) 2

-Since DNA helix runs continuously for one end to the other in a chromatid in a highly coiled manner, any deletion

or duplication / insertion of a segment of DNA can alter the chromosome.

- Since genes are present in the chromosomes, such alteration(s) in the chromosomes lead(s) to abnormalities or aberrations.

31) 2

Role of tapetum in the pollen grain wall formation

During microsporogenesis, the cells of tapetum provide various enzymes, hormones, amino acids and other nutritive materials to the dividing microsporocytes. The main functions of tapetum are:

1. Transportation of nutrients into anther locule at the time of meiosis in spore mother cells.
2. Secretion of enzymes and hormones.
3. Production of Ubisch bodies which are coated with sporopollenin to cause thickening of exine.
4. Secretion of any oily material (pollen kit) over outerside of mature pollen.
5. Secretion of special proteins for pollen to recognise compatibility.

32) 1. Sweet potato 2. Chara 3. Marchantia 4. Tapeworm 5. Rabbit. 2

33) Earthworm, Sponge, Tapeworm, Leech. **2**

34) **2**

In cucurbits, flowers are unisexual, i.e. they bear two types of flowers (staminate and pistillate flowers).Staminate flowers bear bright yellow colored petals with stamens.These are male flowers. On the other hand, pistillate flower pistil.They represent female flowers.

other plans which bear unisexual flowers are papaya, watermelon, sunflower, rice wheat, etc

35) **2**

progeny from asexual reproduction	progeny from sexual reproduction
the progenies have a similar genetic make-up	the progenies have a different genetic make-up
The progenies are identical to one another and are exact copies of their parent, i.e. clone of the parent.	The progenies are different from each other and dissimilar to the parent
Variation is absent. Progeny is less adaptable to changes in environment.	Variation is a common phenomenon. Progeny is more adaptable to changes in the environment.

36) **2**

(a) - In the mature embryo sac of an angiosperm, two polar nuclei in the central cell fuse to form a diploid secondary nucleus.

- During fertilisation, one of the male gametes fuses with the secondary nucleus to form a triploid primary endosperm nucleus (PEN); the central cell is now called primary endosperm cell (PEC).
- Since, three nuclei triple fusion.

(b) - The primary endosperm nucleus of the primary endosperm cell undergoes repeated mitotic divisions, to give rise to a number of free nuclei; at this stage, the endosperm is called free nuclear endosperm.

- subsequently, cell wall formation starts from the periphery and the endosperm becomes cellular.
- The water in the tender coconut represents the nuclear endosperm, while the white kernel represents the cellular endosperm.

37) **2**

- Embryo sac develops from a megaspore, which is formed after meiosis in a megaspore mother cell; so it is haploid.
- Zygote is formed by the fusion of two haploid gametes (a male and a female); hence it is diploid.
- Endosperm is formed by triple fusion, i.e. fusion of two haploid polar male gamete; hence it if trloid.

38) **2**

Gondotropins are secreted by the anterior pituitary. Follicle stimulating hormone (FSH) and luteinising hormone (LH) are the gonadotropins. FSH stimulates follicular development and secretion of estrogens by the follicle cells. Both FSH and LH attain a peak level around the middle of the cycle(about 14th day).

The maximum level of LH (also called LH surge) induces ovulation,i.e.,rupture of the mature follicle and release of ovum/secondary oocyte. LH stimulates the formation of corpus luteum from the ruptured follicle and secretion of progesterone from the corpus luteum.

39) **2**

(a) (i) In the ovary. (ii) In the fallopian tube (iii) Ampulla-isthmic junction of fallopian tube. (iv) Uterus. (b) (i) Fully developed foetus. (ii) Oxytocin hormone is released by maternal pituitary.

40) **2**

- The gene for haemophilia is present on the X chromosome, i.e. sex-linked.
- The disorder is due to a recessive mutant allele; hence a female with XX sex chromosomes, must be homozygous to produce the disease.
- She must receive one of the defective alleles from her haemophilic father and the other X-chromosome with the defective allele from her mother; who is also haemophilic or at least a carrier (heterozygous for the trait, XXh).
- The cross is as follows.

Section - C

41) **5**

(a) Yeast multiplies by budding very fast In yeast, the cell division is unequal and results in a large cell and a small cell, called bud which remains attached to the large cell; the bud gets separated and grows into an adult yeast.

- The yeast cells secrete enzymes to produce alcohol.

(b) It carries out the process of fermentation.

(c) Mother shows how to make use of the natural processes and to live with nature and to appreciated how such microbes are useful to us; try to help others.

42) **5**

(a) Grafting a branch from the tree of Ajay's house on a tree of Jagan's garden can be done.

(b) - The part of the graft that forms the upper part is called scion and the part of the graft that becomes the supporting portion (the root and base), is called stock.

- The scion is selected from a superior quality plant (juicy, larger mango fruits) while the stock belongs to the plant to be improved.
- The scion and stock should be of same diameter and slant cuts are made on both the branches.
- The scion is kept on the stock, covered with grafting clay and polythene; it is tied well and arrangement of water supply/ moisturising is made.
- After a few weeks, you will see buds and leaves appearing on scion.

(c) - The mango tree will start producing flowers and fruits very early, may be in the next season itself. - Many branches can be grafted on the tree with poor quality mangoes.

- When grown from a seed it takes many years for the tree to produce fruits. - Sometimes the plant produced from the seed may not be of the same quality, as sexual reproduction results in variation.

(d) Values for friendship and generosity.

43) 5

(a) **Hypocotyl and epicotyl.** Hypocotyl is part of **stem below cotyledons** in the embryo of a plant and epicotyl is part of **stem above cotyledons.**

(b) **Coleoptile and coleorhiza.** Coleoptile is the sheath around the plumule. **Coleorphiza** is a sheath enveloping the radicle and root cap in certain plants.

(c) **Integument and testa.** Any protective covering around **ovule** is integument and testa is outer integument of seed coat.

(d) **Perispern and pericarp.** Pericarp is **wall of ripened** ovary of fruit and **perisperm** is remnant of nucellus in a seed.

44) 5

- After entering one of the synergids,the pollen tube discharges the two male gametes into the cytoplasm of that synergid.
- One of the male gametes moves towards the female gamete/egg and fuses with it; this fusion is called syngamy and it results in the formation of a zygote.
- The second male gamete moves towards the two polar nuclei in the' central cell.
- The two polar nuclei just fuse to form' a secondary nucleus and the second male gamete fuses with the secondary nucleus in the central cell; this fusion is called triple fusion and, it results in the formation of a triploid primary endosperm nucleus.
- Since two fusions, syngamy and triple fusion occur in an ovule, the phenomenon is known as double fertilisation in angiosperms.

Post-fertilisation events:

-The central cell becomes the primary endosperm cell after triple fusion; the primary endosperm nucleus develops into the endosperm.

-Zygote develops into the embryo.

- Antipodals and synergids degenerate.
- The integuments develop into the seed coat.
- The ovule becomes transformed into a seed.

45) 5

(i) Test tube baby programme - In this method, the ovum of the woman and the sperm of her husband or a donor, are made to fuse ,under laboratory conditions; it is called in vitro fertilisation (IVF). - The zygote or early embryo is implanted in the fallopian tube or uterus respectively for further development.

(ii) Intra Cytoplasmic Sperm Injection (ICSI) - In this method, the sperm is injected directly into the ovum to form the zygote and then embryo transfer is carried out.

(iii) Gamete Intra Fallopian Transfer (GIFn - This method involves the transfer of an ovum collected from a donor female into another female for fertilisation and further development of foetus.

(iv) Artificial insemination - In this method, the semen collected from the husband or a healthy XII donor, is artificially introduced into the vagina or into the uterus (intra uterine insemination). - It is carried out when infertility is due to the inability of the male partner to inseminate the female or due to very low sperm count in the semen.

46) **5**

- Counseling and creating awareness among people about the following aspects would help in building up a reproductively healthy society

(i) Reproductive organs

(ii) Adolescence and associated changes

(iii) Safe and hygienic sexual practices and

(iv) Sexually transmitted diseases

- Educating people, especially fertile couples and those in marriageable age group about the following would help to raise a socially responsible society.

(i) Available birth control methods

(ii) Care of pregnant mothers

(iii) Importance of breast feeding and

(iv) Equal opportunities for a girl child.

47) **5**

Dominance:

- Every gene contains the information to express a particular trait.
- In a diploid organism, there are two alternate forms of a gene, or a pair of alleles.
- The two alleles may be similar (homo-zygous) or may be different (heterozygous).
- One of them may be different due to some changes that it has undergone, which modify the information of that particular allele.
- The phenotype will be dependent on the original unmodified allele.

48)

(i) Difference between dominance and Recessive are:

Dominance	Recessive
When an allele expresses itself in the presence of its recessive allele, it is called dominant trait.	It can only express in the absence of its dominant allele and remain masked in its presence.
Dominant allele forms a complete functional enzyme due to which complete polypeptide is formed to express.	Recessive allele forms incomplete polypeptide enzyme due to which non-functional polypeptide is formed and fails to express completely.

(ii) Difference between homozygous and Heterozygous are:

Homozygous	Heterozygous
Homozygous is a condition when both alleles of a gene are similar	It is a condition when both alleles of a gene are dissimilar.
The genotype is expressed as TT or tt	The genotype is expressed as Tt.
They are true breeding leading to pure lines.	They are not true breeding.
The gametes produced by them are similar in genotype.	The gametes produced by them are of two types, one with dominant allele and other with recessive allele.

Difference between monohybrid and dihybrid are:

Monohybrid	Dihybrid
It is an individual that is heterozygous for a single trait.	It is an individual that is heterozygous for two trait.
It is the hybrid produced by the cross between parents having contrast in a single character	It is the hybrid produced by the cross between parents having contrast of two characters.