

Time allowed: 45 minutes

Maximum Marks: 200

*General Instructions: Same as Practice Paper-1.***Choose the correct option:**

- A multicellular, filamentous alga exhibits a type of sexual life cycle in which the meiotic division occurs after the formation of zygote. The adult filament of this alga has**
 - haploid vegetative cells and diploid gametangia.
 - diploid vegetative cells and diploid gametangia.
 - diploid vegetative cells and haploid gametangia.
 - haploid vegetative cells and haploid gametangia.
- The coconut water from tender coconut represents**
 - endocarp
 - free nuclear endosperm
 - free nuclear embryo
 - mesocarp
- Choose the incorrect statement.**
 - The hollow foliar structure that encloses the leaf primordia in a grass embryo is called coleoptile.
 - In apple, the thalamus also contributes to fruit formation and becomes edible.
 - In *Zostera*, the pollen grains are long and ribbon-like and released inside the water.
 - Sepals and petals are concealed in entomophilous flowers.
- The meiocyte of rice has 24 chromosomes. The number of chromosomes in its endosperm is**
 - 24
 - 12
 - 48
 - 36
- Normally, one embryo develops in one seed, but when an orange seed is squeezed, many embryos of different shapes and sizes are seen. This is so because**
 - orange shows polyembryony
 - orange shows sexual reproduction
 - orange shows parthenocarpy
 - none of these
- Match between the following representing parts of the sperm and their functions and choose the correct option.**

Column I	Column II
(A) Head	(i) Enzymes
(B) Middle piece	(ii) Sperm motility
(C) Acrosome	(iii) Energy
(D) Tail	(iv) Genetic material
(a) A-(ii), B-(iv), C-(i), D-(iii)	(b) A-(iv), B-(iii), C-(i), D-(ii)
(c) A-(iv), B-(i), C-(ii), D-(iii)	(d) A-(ii), B-(i), C-(iii), D-(iv)

7. Which among the following has 23 chromosomes?
 - (a) Spermatogonia
 - (b) Zygote
 - (c) Secondary oocyte
 - (d) Oogonia
8. Morula is a developmental stage
 - (a) between the zygote and blastocyst
 - (b) between the blastocyst and gastrula
 - (c) after the implantation
 - (d) between implantation and parturition
9. The membranous cover of the ovum at ovulation is
 - (a) corona radiata
 - (b) zona radiata
 - (c) zona pellucida
 - (d) chorion
10. Which of the following is example of hormone-releasing IUDs ?
 - (a) CuT and Multiload 375
 - (b) LNG-20 and Progestasert
 - (c) Lippes loop
 - (d) Both (b) and (c)
11. Person having genotype $I^A I^B$ would show the blood group as AB. This is because of
 - (a) pleiotropy
 - (b) co-dominance
 - (c) segregation
 - (d) incomplete dominance
12. In a dihybrid cross, if you get 9:3:3:1 ratio it denotes that
 - (a) the alleles of two genes are interacting with each other.
 - (b) it is a multigenic inheritance.
 - (c) it is a case of multiple allelism.
 - (d) the alleles of two genes are segregating independently.
13. Two genes 'A' and 'B' are linked. In a dihybrid cross involving these two genes, the F_1 heterozygote is crossed with homozygous recessive parental type (aabb). What would be the phenotypic ratio of offspring in the next generation?
 - (a) 1 : 1 : 1 : 1
 - (b) 9 : 3 : 3 : 1
 - (c) 3 : 1
 - (d) 1 : 1
14. The allelic pair which does not express in the presence of other allelic pair is called as
 - (a) co-dominant
 - (b) dominant
 - (c) recessive
 - (d) complementary
15. The scientist who converted Mendel's work into laws of genetics was
 - (a) Carl Correns
 - (b) Hugo de Vries
 - (c) Tschermak
 - (d) Morgan
16. Discontinuous synthesis of DNA occurs in one strand, because
 - (a) DNA molecule being synthesised is very long.
 - (b) DNA-dependent DNA polymerase catalyses polymerisation only in one direction ($5' \rightarrow 3'$).
 - (c) it is a more efficient process.
 - (d) DNA ligase joins the short stretches of DNA.
17. Which was the last human chromosome to be completely sequenced?
 - (a) Chromosome 1
 - (b) Chromosome 11
 - (c) Chromosome 21
 - (d) Chromosome X
18. In *E.coli*, the *lac* operon gets switched on when
 - (a) lactose is present and it binds to the repressor.
 - (b) repressor binds to operator.
 - (c) RNA polymerase binds to the operator.
 - (d) lactose is present and it binds to RNA polymerase.

- 19. Base pairing rule of DNA was proposed by**
 (a) Griffith (b) Erwin Chargaff
 (c) Baltimore (d) Francis Crick
- 20. Purpose of deoxyribonucleoside triphosphate is**
 (a) it acts as substrate (b) it provides energy for polymerisation reaction
 (c) both (a) and (b) (d) it joins the two fragments of DNA
- 21. Evolution of life shows that lifeforms had a trend of moving from**
 (a) land to water (b) dryland to wet land
 (c) freshwater to sea water (d) water to land
- 22. Viviparity is considered to be more evolved because**
 (a) the young ones are left on their own.
 (b) the young ones are protected by a thick shell.
 (c) the young ones are protected inside the mother's body and are looked after they are born leading to more chances of survival.
 (d) the embryo takes a long time to develop.
- 23. Fossils are generally found in**
 (a) sedimentary rocks (b) igneous rocks
 (c) metamorphic rocks (d) any type of rock
- 24. Which of the following are the reason(s) for rheumatoid arthritis? Choose the correct option.**
 (i) The ability to differentiate pathogens or foreign molecules from self cells increases.
 (ii) Body attacks self cells
 (iii) More antibodies are produced in the body
 (iv) The ability to differentiate pathogens or foreign molecules from self cells is lost
 (a) (i) and (ii) (b) (ii) and (iv)
 (c) (iii) and (iv) (d) (i) and (iii)
- 25. Tobacco consumption is known to stimulate secretion of adrenaline and nor-adrenaline. The component causing this could be**
 (a) nicotine (b) tannic acid
 (c) curamin (d) catechin
- 26. Which of the following is not the causal organism for ringworm?**
 (a) *Microsporum* (b) *Trichophyton*
 (c) *Epidermophyton* (d) *Macrosporum*
- 27. Which of the following is a part of the innate (non-specific) immunity?**
 (a) Lysozymes (b) B-cells
 (c) T-cells (d) Antigen presenting cells
- 28. Which one of the following combination would a sugarcane farmer look for in the sugarcane crop?**
 (a) Thick stem, long internodes, high sugar content and disease resistance
 (b) Thick stem, high sugar content and profuse flowering
 (c) Thick stem, short internodes, high sugar content, disease resistance
 (d) Thick stem, low sugar content, disease resistance
- 29. Fungicides and antibiotics are chemicals that**
 (a) enhance yield and disease resistance. (b) kill pathogenic fungi and bacteria, respectively.
 (c) kill all pathogenic microbes. (d) kill pathogenic bacteria and fungi respectively.

- 30. Superovulation is induced by**
 (a) artificial insemination (b) more mating
 (c) hormonal injection (d) Any of these
- 31. BOD of waste water is estimated by measuring the amount of**
 (a) total organic matter (b) biodegradable organic matter
 (c) oxygen evolution (d) oxygen consumption
- 32. Mycorrhiza does not help the host plant in**
 (a) enhancing its phosphorus uptake capacity.
 (b) increasing its tolerance to drought.
 (c) enhancing its resistance to root pathogens.
 (d) increasing its resistance to insects.
- 33. Which of the following statements is true about 'biofertilisers'?**
 1. It is a crop which shows rapid growth.
 2. It refers to cow dung and agricultural waste.
 3. It is prepared by *Anabaena* and *Nostoc*.
 (a) 1 and 2 (b) Only 1
 (c) 1 and 3 (d) Only 3
- 34. Restriction enzymes are used for _____ in genetic experiments.**
 (a) any type of DNA (b) bacterial DNA
 (c) viral DNA (d) eukaryotic DNA
- 35. Until a host cell has been made competent, it does not take up foreign DNA normally because**
 (a) DNA is a very large molecule. (b) DNA is hydrophobic molecule.
 (c) DNA is hydrophilic molecule. (d) DNA is an inactive molecule.
- 36. Which of the following is an endonuclease?**
 (a) Protease (b) DNase I
 (c) RNase restriction (d) *Hind* II
- 37. Which of the following growth condition is provided by a bioreactor for achieving the desired product?**
 (a) pH (b) Oxygen
 (c) Salts (d) All of the above
- 38. ADA is an enzyme which is deficient in a genetic disorder SCID. What is the full form of ADA?**
 (a) Adenosine deoxyaminase (b) Adenosine deaminase
 (c) Aspartate deaminase (d) Arginine deaminase
- 39. The introduction of T-DNA into plants involves**
 (a) infection of the plant by *Agrobacterium tumefaciens* (b) altering the pH of the soil
 (c) heat shocking the plants (d) exposing the plants to cold weather
- 40. Golden rice is a transgenic crop of the future with which of the following improved trait?**
 (a) Insect resistance (b) High lysine content
 (c) High protein content (d) High vitamin-A content
- 41. _____ is the maximum possible number of individuals that a habitat can support.**
 (a) Maxima (b) Surviving ability
 (c) Carrying capacity (d) Biotic capacity
- 42. Which living organism is seen in the hot water spring having temperature more than 100 degree celsius?**
 (a) Methanogens (b) Archaeobacteria
 (c) *Amoeba* (d) *S. typhi*

43. Average human population in a certain time in an area is 5000 in which 2650 children are produced during an year. Find out the birth rate.
(a) 0.1111 (b) 0.53
(c) 0.22 (d) 0.45
44. Pyramid of numbers is
(a) always upright (b) always inverted
(c) either upright or inverted (d) neither upright nor inverted
45. Of the total amount of energy that passes from one trophic level to another, about 10% is
(a) respired and becomes heat. (b) passed out as faeces or urine.
(c) stored as body tissue. (d) recycled to autotrophs.
46. During the process of ecological succession the changes that take place in communities are
(a) orderly and sequential (b) random
(c) very quick (d) not influenced by the physical environment.
47. The species confined to a particular region and not found elsewhere is termed as
(a) keystone (b) endemic
(c) alien (d) rare
48. The relation between species richness and area for a wide variety of taxa on a logarithmic scale is
(a) straight line (b) S- shaped
(c) J- shaped (d) rectangular hyperbola
49. World's most problematic aquatic weed is
(a) *Azolla* (b) *Wolffia* (c) *Eichhornia* (d) *Trapa*
50. Which of the following exhibits biomagnification?
(a) SO_2 (b) Mercury (c) DDT (d) Both (b) and (c)



Answers

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- | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|
| 1. (d) | 2. (b) | 3. (d) | 4. (d) | 5. (a) | 6. (b) | 7. (c) |
| 8. (a) | 9. (a) | 10. (b) | 11. (b) | 12. (d) | 13. (a) | 14. (c) |
| 15. (a) | 16. (b) | 17. (a) | 18. (a) | 19. (b) | 20. (c) | 21. (d) |
| 22. (c) | 23. (a) | 24. (b) | 25. (a) | 26. (d) | 27. (a) | 28. (a) |
| 29. (b) | 30. (c) | 31. (d) | 32. (d) | 33. (d) | 34. (a) | 35. (c) |
| 36. (d) | 37. (d) | 38. (b) | 39. (a) | 40. (d) | 41. (c) | 42. (b) |
| 43. (b) | 44. (c) | 45. (c) | 46. (a) | 47. (b) | 48. (a) | 49. (c) |
| 50. (d) | | | | | | |

Explanations

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4. (d) Meiocytes are diploid in nature. Therefore, they have $2n = 24$ chromosomes and hence $n = 12$.
Endosperms are triploid, so it has $3n = 12 \times 3 = 36$ chromosomes.
7. (c) Secondary oocyte is haploid in nature, whereas others are diploid in nature.
8. (a) After fertilisation zygote is formed. The zygote undergoes mitotic division and forms morula (8-celled stage). Morula continues mitotic divisions to form blastocyst, which is implanted in the uterus.

13. (a) The cross would be as follows:

$AaBb \times aabb$

$\begin{matrix} \text{♀} & \text{♂} \\ \text{♀} & \end{matrix}$	AB	Ab	aB	ab
ab	AaBb	Aabb	aaBb	aabb

20. (c) Deoxyribonucleoside triphosphates are the building blocks of DNA. They provide energy in the form of ATP and GTP, and also act as substrates for polymerisation.

