PRACTICE PAPER

12

BIOLOGY

Time allowed: 45 minutes **Maximum Marks: 200**

General Instructions: *Same as Practice Paper–1.*

Choose the correct option:

1. **Choose the correct statement from amongst the following.**
   (*a*) Dioecious (hermaphrodite) organisms are seen only in animals.
   (*b*) Dioecious organisms are seen only in plants.
   (*c*) Dioecious organisms are seen in both plants and animals.
   (*d*) Dioecious organisms are seen only in vertebrates.

2. **During microsporogenesis, meiosis occurs in**
   (*a*) endothecium (*b*) microspore mother cells
   (*c*) microspore tetrads (*d*) pollen grains

3. **Autogamy can occur in a chasmogamous flower if**
   (*a*) pollen matures before maturity of ovule. (*b*) ovules mature before maturity of pollen.
   (*c*) both pollen and ovules mature simultaneously. (*d*) both anther and stigma are of equal lengths.

4. **A particular species of plant produces light, non-sticky pollen in large numbers and its stigmas are long and feathery. These modifications facilitate pollination by**
   (*a*) insects (*b*) water (*c*) wind (*d*) animals

5. **In an embryo sac, the cells that degenerate after fertilisation are**
   (*a*) synergids and primary endosperm cell (*b*) synergids and antipodals
   (*c*) antipodals and primary endosperm cell (*d*) egg and antipodals

6. **Match the following representing parts of the sperm and their functions.**

Column I	Column II
A. Head	1. Sperm lysins
B. Middle piece	2. Sperm motility
C. Acrosome	3. Powerhouse
D. Tail	4. Genetic material

   (*a*) A—2, B—4, C—1, D—3 (*b*) A—4, B—3, C—1, D—2
   (*c*) A—4, B—1, C—2, D—3 (*d*) A—2, B—1, C—3, D—4

7. **Corpus luteum secretes**
   (*a*) progesterone (*b*) relaxin (*c*) both (*a*) and (*b*) (*d*) estrogen

8. **In an oocyte, second maturation division occurs in**
   (*a*) fallopian tube (*b*) ovary (*c*) uterus (*d*) abdominal cavity

9. How many sperms and ova will be produced from 50 primary spermatocytes and 50 primary oocytes respectively?

(*a*) 200 sperms and 200 ova (*b*) 200 sperms and 100 ova

(*c*) 200 sperms and 50 ova (*d*) 50 sperms and 50 ova

10. *In vitro* fertilisation does not occurs in which of the following ARTs?

(*a*) ZIFT (*b*) GIFT (*c*) ICSI (*d*) IVF

11. The dihybrid test cross ratio is

(*a*) 1 : 2 : 1 (*b*) 1: 1 : 1:1 (*c*) 9 : 3 : 3 : 1 (*d*) None of these

12. Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder?

(*a*) 100% (*b*) 25% (*c*) 50% (*d*) 0%

13. Which of the following is the main reason behind Mendel's success?

(*a*) He analysed the data by applying principle of probability.

(*b*) He first studied only one pair of contrasting characters at a time.

(*c*) He kept perfect pedigree record of his experiment.

(*d*) He grew different pea plants in different garden plots.

14. A couple has five daughters. The probability of 6^{th} child being son is

(*a*) 100% (*b*) 75% (*c*) 50% (*d*) 9%

15. Which of the following shows pleiotropic effect?

(*a*) Skin colour in human being (*b*) Colour blindness

(*c*) Sickle cell anaemia (*d*) Haemophilia

16. Enzyme catalysing synthesis of RNA over DNA template is

(*a*) DNA polymerase (*b*) reverse transcriptase (*c*) RNA polymerase (*d*) endonuclease

17. Which step of translation does not consume high energy phosphate bond?

(*a*) translocation (*b*) peptidyl transferase reaction

(*c*) amino acid activation (*d*) aminoacyl *t*RNA binding to A-site

18. The Watson and Crick's model of DNA is duplex with

(*a*) 10 base pairs and 34 Å distance for every turn

(*b*) 10 base pairs and 3.4 Å distance for each turn of spiral

(*c*) 20 base pairs and 34 Å for each turn

(*d*) none of the above

19. Because most of the amino acids are represented by more than one codon, the genetic code is

(*a*) overlapping (*b*) universal (*c*) degenerate (*d*) unambiguous

20. The experimental materials used by Griffith to prove that DNA is the genetic material were

(*a*) *E.coli* and *Streptococcus pneumonia* (*b*) mice, *Staphylococcus pneumonia* and *E.coli*

(*c*) mice and *Streptococcus pneumonia* (*d*) none of these

21. Adaptive radiation refers to

(*a*) evolution of different species from a common ancestor

(*b*) migration of members of a species to different geographical areas

(*c*) power of adaptation in an individual to a variety of environments

(*d*) adaptation due to geographical isolation

22. Which one of the following scientist's name is correctly matched with the theory put forth by him?

(*a*) de Vries – Natural selection (*b*) Mendel – Theory of Pangenesis

(*c*) Weismann – Theory of continuity of germplasm (*d*) Pasteur – Inheritance of acquired characters

23. Which one of the following is incorrect about the characteristics of protobionts (coacervates and microspheres) as envisaged in the abiogenic origin of life?

(*a*) They were partially isolated from the surroundings.

(*b*) They could maintain an internal environment.

(*c*) They were able to reproduce.

(*d*) They could separate combinations of molecules from the surroundings.

24. Malaria is spread by

(*a*) *Culex* mosquito (*b*) *Tse-tse* fly (*c*) *Aedes* mosquito (*d*) *Anopheles* mosquito

25. Lysozyme is

(*a*) anti-allergic (*b*) anti-bacterial (*c*) anti-viral (*d*) anti-toxic

26. Which of the following provides second line of defence?

(*a*) HCl (*b*) T-lymphocytes and B-lymphocytes

(*c*) PMNL (*d*) None of these

27. Which one of the following is the correct statement?

(*a*) Barbiturates cause relaxation and temporary euphoria.

(*b*) Hashish alters thoughts, perceptions and hallucinations.

(*c*) Opium stimulates nervous system and causes hallucinations.

(*d*) Morphine leads to delusions and disturbed emotions.

28. Which one of the following is the most suitable medium for culture of *Drosophila melanogaster*?

(*a*) cow dung (*b*) moist bread (*c*) agar agar (*d*) ripe banana

29. Probiotics are

(*a*) cancer inducing microbes (*b*) new kind of food allergens

(*c*) live microbial food supplement (*d*) safe antibiotics

30. In cloning of cattle a fertilised egg is taken out of the mother's womb

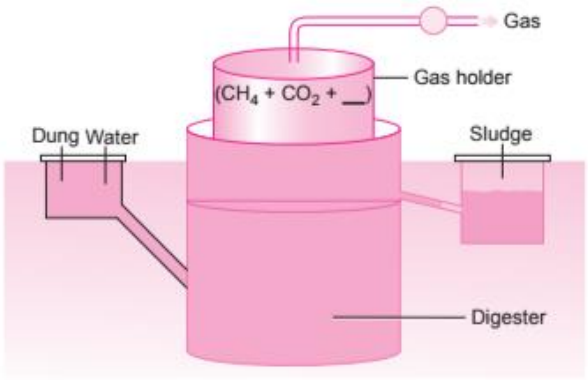
(*a*) in the eight-cell stage, cells are separated and cultured until small embryos are formed which are implanted into the womb of other cows.

(*b*) in the eight-cell stage and the individual cells are separated under electrical field for further development in culture media.

(*c*) and from this upto eight identical twins can be produced.

(*d*) and the egg is divided into 4 pairs of cells which are implanted into the womb of other cows.

31. In the following diagram of a typical biogas plant, identify the missing gas.



(*a*) Nitrous oxide (*b*) Sulphur dioxide

(*c*) Hydrogen sulphide (*d*) Ammonia

32. _____ helps in absorption of phosphorous from soil by plants.

(*a*) *Anabaena* (*b*) *Nostoc*

(*c*) *Frankia* (*d*) *Glomus*

33. LAB refers to

(*a*) culture laboratory (*b*) bacteria converting milk to curd

(*c*) lactic acid bacteria (*d*) both (*b*) and (*c*)

34. The foreign gene product is called

(*a*) amino acid (*b*) protein

(*c*) recombinant protein (*d*) vectors

35. The role of ethidium bromide during agarose-gel electrophoresis of DNA fragments is:

(*a*) It is used to view the separated DNA bands when exposed to UV light.

(*b*) It provides the sieving effect for the DNA to resolve according to their size.

(*c*) It acts as molecular scissors to cut DNA at specific locations.

(*d*) It helps in the process of extraction of DNA from the separated bands of DNA in agarose gel.

36. In which method of gene transfer the recombinant DNA is directly injected into the nucleus of an animal cell?

(*a*) Biolistics (*b*) Micro-injection (*c*) Heat shock (*d*) Electroporation

37. In the screening process during rDNA experiments clones that metabolize β-galactosidase turn _____.

(*a*) blue (*b*) colorless (*c*) orange (*d*) purple

38. Plants are genetically engineered with novel genes by

(*a*) embryo rescue technique (*b*) recombination breeding

(*c*) protoplast fusion (*d*) recombinant DNA technology

39. Some regulations are mandatory in the process of genetic modifications as

(*a*) genetic modification of organisms can have unpredicatable results when such organisms are introduced into the ecosystem

(*b*) in order to study the predictable results of genetic modification of organisms, regulations are important

(*c*) to control the population of GMO

(*d*) none of the above

40. The transgenic animals are used as a model for human diseases so that

(*a*) early detection of diseases is possible.

(*b*) investigation of new treatments for diseases is made possible.

(*c*) way of spread of diseases can be investigated.

(*d*) prophylactic measures can be investigated.

41. If the stressful external conditions are localised or remains only for short duration the organisms has the alternatives

(*a*) migrate and regulate (*b*) migrate and suspend

(*c*) suspend and conform (*d*) suspend and regulate

42. In an area, if there are 200 *Parthenium* plants but only a huge banyan tree with a large canopy, the population density is measured in terms of

(*a*) biomass or percent cover (*b*) indirect count

(*c*) relative densities (*d*) total number

43. If two species compete for the same resources, they could avoid competition by

(*a*) choosing different times for feeding (*b*) different foraging pattern

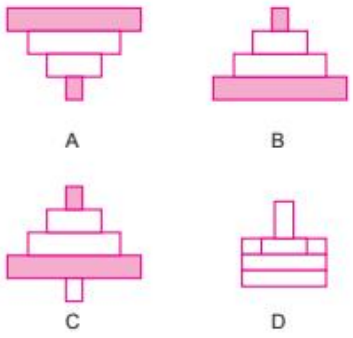
(*c*) behavioural differences in their foraging activities (*d*) all of these

44. The biomass available for consumption by the herbivores and the decomposers is called

(*a*) net primary productivity (*b*) secondary productivity

(*c*) standing crop (*d*) gross primary productivity

45. Which of the following representations shows the pyramid of numbers in a forest ecosystem?



(*a*) D (*b*) A (*c*) B (*d*) C

46. Mass of living matter at a trophic level in an area of any time is called

(*a*) standing crop (*b*) detritus (*c*) humus (*d*) standing state

47. Which of the following is best method of germplasm conservation?

(*a*) Herbarium (*b*) Botanical garden (*c*) Seed bank (*d*) Zoological park

48. Alexander Von Humboldt determined relationship between species richness and area. On a logarithmic scale the relationship is a straight line described by the equation

(*a*) $\log S = \log C + Z \log A$ (*b*) $S = C A^Z$

(*c*) $\log C = \log A + Z \log S$ (*d*) $C = S A^Z$

49. Nuisance growth of aquatic plants and bloom-forming algae in natural waters is generally due to high concentrations of

(*a*) carbon (*b*) sulphur (*c*) calcium (*d*) phosphorus

50. In the textbook you came across "Three Mile Island and Chernobyl disasters associated with accidental leakage of radioactive wastes." In India we had Bhopal gas tragedy. It is associated with which of the following?

(*a*) CO_2 (*b*) Methyl Isocyanate (*c*) CFC (*d*) Methyl Cyanate

Answers

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

Explanations

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9. (*c*) A primary spermatocyte completes first meiotic division and forms two secondary spermatocytes. The secondary spermatocytes undergo meiotic II to produce four spermatids. The spermatids are then transformed into spermatozoa. Thus, 50 primary spermatocytes will produce = 50 × 4 = 200 sperms.

The primary oocyte completes meoisis I and forms secondary oocyte. It is then released on maturation. It then undergoes meiosis II and form ovum. Thus, 50 primary oocytes produces 50 ova.

12. (*c*) Down's syndrome is an autosomal disorder caused by an extra 21st chromosome. The genotype of affected mother would be 45+XX and that of normal father would be 44+XY.