PRACTICE PAPER

19

BIOLOGY

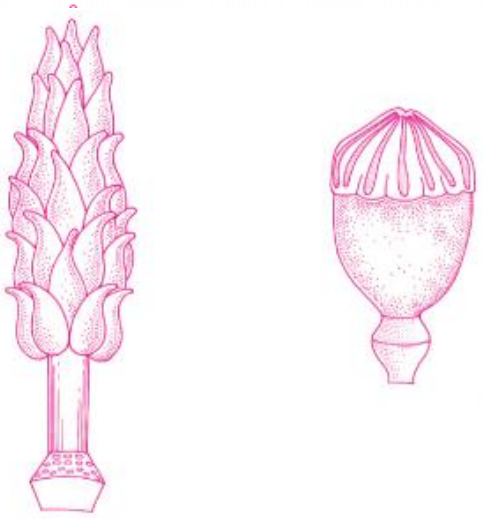
Time allowed: 45 minutes **Maximum Marks: 200**

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

Choose the correct option:

1. **Homothallism represents**
   (*a*) asexual condition (*b*) unisexual condition (*c*) bisexual condition (*d*) none of these

2. **Following are the pictures of *Michelia* flower (A) and *Papaver* (B).**
   Choose the correct option with respect to the difference in the structure of their ovaries.



A B

   (*a*) A - Apocarpous ; B - Syncarpous (*b*) A - Syncarpous; B - Apocarpous
   (*c*) A - Syncarpous; B - Multicarpellary (*d*) A - Monocarpellary; B - Apocapous

3. **The embryo of the plant is**
   (*a*) globular, heart shaped (*b*) bean shaped (*c*) amoeboid (*d*) none of these

4. **Light and non-sticky pollens support**
   (*a*) entomophily (*b*) chiropterophily (*c*) malacophily (*d*) anemophily

5. **Which of the following is the junctional region between ovule and funicle?**
   (*a*) Raphae (*b*) Placenta (*c*) Chalaza (*d*) Hilum

6. **Menstrual cycle is influenced by**
   (*a*) FSH (*b*) Estrogen (*c*) LH (*d*) All of these

7. After ovulation the remaining follicular cells are transferred into corpus luteum on influence of hormone

(*a*) FSH (*b*) estrogen (*c*) progesterone (*d*) LH

8. Match the items in column I with the items in column II.

Column I	Column II
A. Ovaries	1. Birth
B. Oviduct	2. Fertilisation
C. Vagina	3. Ovulation

(*a*) A—1, B—2, C—3 (*b*) A—3, B—2, C -1

(*c*) A—3, B—1, C—2 (*d*) A—2, B—3, C—1

9. GnRH secreted from hypothalamus acts at the anterior pituitary gland and stimulates secretion of

(*a*) FSH (*b*) LH (*c*) progesterone (*d*) both (*a*) and (*b*)

10. What is GIFT ?

(*a*) Transfer of sperms and egg into fallopian tube (*b*) Transfer of zygote into fallopian tube

(*c*) Transfer of embryo into uterus (*d*) Transfer of semen into vagina

11. Down's syndrome is due to

(*a*) non-disjunction of chromosome (*b*) sex-linked inheritance

(*c*) crossing over (*d*) linkage

12. Turner's syndrome is due to

(*a*) 21st trisomy (*b*) trisomy of X chromosome

(*c*) monosomy of X chromosome (*d*) 18th trisomy

13. Which one of the following conditions correctly describes the manner of determining the sex?

(*a*) Homozygous sex chromosomes (ZZ) determine female sex in birds.

(*b*) X0 type of sex chromosomes determine male sex in grasshopper.

(*c*) X0 condition in humans as found in Turner's syndrome, determines female sex.

(*d*) Homozygous sex chromosomes (XX) produce male in *Drosophila*.

14. Mutations can be induced with

(*a*) infrared radiations (*b*) IAA (*c*) ethylene (*d*) gamma radiations

15. Test cross in plants or in *Drosophila* involves crossing

(*a*) between two genotypes with recessive trait. (*b*) between two F_1 hybrids.

(*c*) the F_1 hybrid with a double recessive genotype. (*d*) between two genotypes with dominant trait.

16. DNA template sequence of ATGATAGC is transcribed over *m*RNA as

(*a*) GUCTUTCG (*b*) TACAUCG (*c*) GAUTATUG (*d*) UACTATCG

17. A DNA strand is directly involved in the synthesis of all the following except

(*a*) *t*RNA molecule (*b*) *m*RNA molecule

(*c*) another DNA strand (*d*) protein synthesis

18. Which one of the following is a purine ?

(*a*) Cytosine (*b*) Uracil (*c*) Thymine (*d*) Adenine

19. A bacterium containing 100% N^{15} nitrogen bases is allowed to replicate in a medium containing N^{14} bases. After one round of duplication, the result would be :

(*a*) All individuals would be identical to parents.

(*b*) All individuals would be radioactive but the percentage of radioactivity in DNA would be 50%.

(*c*) Only 50% individuals would be radioactive.

(*d*) All individuals would be similar to parents but different among themselves.

20. Gene controls

(*a*) protein synthesis but not heredity (*b*) protein synthesis and heredity

(*c*) heredity but not protein synthesis (*d*) biochemical reaction of some enzymes

21. Which is the most common mechanism of genetic variation in the population of a sexually reproducing organism?

(*a*) Genetic drift (*b*) Recombination

(*c*) Transduction (*d*) Chromosomal aberrations

22. Which of the following had the smallest brain capacity?

(*a*) *Homo neanderthalensis* (*b*) *Homo habilis*

(*c*) *Homo erectus* (*d*) *Homo sapiens*

23. The wings of a bird and the wings of an insect are

(*a*) phylogenetic structure and represent divergent evolution

(*b*) homologous structures and represent convergent evolution

(*c*) homologous structure and represent divergent evolution

(*d*) analogous structures and represent convergent evolution

24. Drugs which induce dreamy state of consciousness are called

(*a*) sedative (*b*) barbiturate

(*c*) stimulant (*d*) hallucinogen

25. Which of the following provides first line of defence?

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

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

26. Which one of the following is chemically diacetylmorphine ?

(*a*) Valium (*b*) Heroin

(*c*) Cocaine (*d*) LSD

27. Choose the correct route of sporozoites when it enters the human body through the bite of female *Anopheles*, till its entry into RBCs.

(*a*) Into human blood → Liver cells → blood → RBCs (*b*) Into human blood → RBCs → blood → Liver cells

(*c*) Liver cells → into human blood → RBCs → blood (*d*) Into human blood → liver cells → RBCs → blood

28. Mating between two individuals with different genotypes to produce variation is called

(*a*) mutation (*b*) hybridisation

(*c*) domestication (*d*) selection

29. The most common cause of hybrid vigour is

(*a*) homozygosity (*b*) superiority of genes

(*c*) heterozygosity (*d*) none of the above

30. In plant tissue culture, totipotency is observed in

(*a*) xylem vessel (*b*) sieve tube

(*c*) nodal region (*d*) meristems

31. Organic farming refers to

(*a*) farming by using biofertilisers (*b*) farming by avoiding biofertilisers

(*c*) farming by using chemical fertilisers (*d*) both (*b*) and (*c*)

32. The puffed-up dough of dosa and idli is due to

(*a*) fermentation and production of O_2 (*b*) hydrolysis and production of CO_2

(*c*) fermentation and production of CO_2 (*d*) hydrolysis and production of O_2

33. Antibiotics have no effect on viruses as

(*a*) they show metabolism of their own
(*b*) they are small in size for antibiotics to act upon them
(*c*) they show no metabolism of their own
(*d*) they multiply rapidly

34. Which of the following is a cloning vector?

(*a*) DNA of *Salmonella typhimurium*
(*b*) Ti plasmid
(*c*) *ori* – pBR322
(*d*) Amp^R and Tet^R loci

35. An enzyme catalyzing the removal of nucleotides from the ends of DNA is

(*a*) endonuclease
(*b*) exonucleases
(*c*) DNA ligase
(*d*) *Hind*II

36. Stirred-tank bioreactors have been designed to

(*a*) add preservatives to the product.
(*b*) perform purification of the product.
(*c*) avail anaerobic conditions in the culture vessel.
(*d*) ensure availability of oxygen throughout the process.

37. Which of these is not correctly matched?

(*a*) Gene gun—biolistic gun
(*b*) Plasmids—extrachromosomal DNA
(*c*) DNA ligase—biological scissors
(*d*) Bacteriophages—viruses

38. α-1 antitrypsin is

(*a*) an antibiotic
(*b*) used to treat arthritis
(*c*) an enzyme
(*d*) used to treat emphysema

39. The natural genetic engineer is

(*a*) *Agrobacterium tumefaciens*
(*b*) *Meloidogyne incognita*
(*c*) *E. coli*
(*d*) Yeast

40. What is an anti-sense technology ?

(*a*) A cell displaying a foreign antigen used for synthesis of antigens.
(*b*) Production of somaclonal variants in tissue cultures.
(*c*) When a piece of RNA that is complementary in sequence is used to stop expression in a specific gene.
(*d*) RNA polymerase producing DNA.

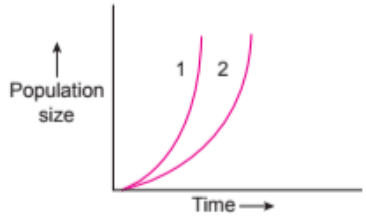
41. A population of rabbits has an annual per capita birth rate of 0.06 and annual per capita death rate of 0.02. Calculate an estimate of the number of individuals added (net) to a population of 1,000 individuals in one year.

(*a*) 400 individuals added
(*b*) 20 individuals added
(*c*) 40 individuals added
(*d*) 120 individuals added

42. Which of the following is the most accurate comment on earth's carrying capacity (K)?

(*a*) K is smaller now than it was a thousand years ago.
(*b*) The human population is still a long way from K.
(*c*) Our technology has allowed us to keep increasing K.
(*d*) When it comes to humans, the concept of K is irrelevant.

43. In the following graph, which of the expressions of the exponential growth equation should be increased in order for curve 1 to become more like curve 2 ?



(*a*) N
(*b*) D
(*c*) B
(*d*) (B-D)

44. In an ecosystem the rate of production of organic matter during photosynthesis is termed is

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

(*c*) net primary productivity (*d*) gross primary productivity

45. Most animals that live in deep oceanic waters are

(*a*) tertiary consumers (*b*) detritivores

(*c*) primary consumers (*d*) secondary consumers

46. In which of the following both pairs have correct combination?

(*a*) Gaseous nutrient cycle	Nitrogen and Sulphur
Sedimentary nutrient cycle	Carbon and Phosphorus
(*b*) Gaseous nutrient cycle	Sulphur and Phosphorus
Sedimentary nutrient cycle	Carbon and Nitrogen
(*c*) Gaseous nutrient cycle	Carbon and Nitrogen
Sedimentary nutrient cycle	Sulphur and Phosphorus
(*d*) Gaseous nutrient cycle	Carbon and Sulphur
Sedimentary nutrient cycle	Nitrogen and Phosphorus

47. The most serious consequence of a decrease in global diversity would be the

(*a*) loss of source of genetic diversity to preserve endangered species

(*b*) increase in the abundance and diversity of edge-adapted species

(*c*) potential loss of ecosystem services on which human beings depend

(*d*) increase in global warming and thinning of the ozone layer

48. Wildlife conservation aims at

1. maintaining the ecological process

2. to enrich the wildlife diversity with exotic species

3. preventing migration of species

4. maintaining the diversity of life

Choose the correct pair of statements given above.

(*a*) 1 and 4 (*b*) 2 and 4 (*c*) 3 and 4 (*d*) 1 and 2

49. Eutrophication is often seen in

(*a*) deserts (*b*) fresh water lakes (*c*) ocean (*d*) mountains

50. Which one of the following pairs of gases are the major cause of "greenhouse effect"?

(*a*) CO_2 and O_3 (*b*) CO_2 and CO (*c*) CFCs and SO_2 (*d*) CO_2 and N_2O

Answers

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

Explanations

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2. (*a*) In apocarpous flowers pistils have more than one carpel which are distinct. In syncarpous flowers pistils have more than one carpel which are fused.

10. (*d*) GIFT stands for Gamete Intrafallopian Transfer. It is the transfer of an ovum collected from a donor into the fallopian tube of another female who cannot produce one, but can provide suitable environment for fertilisation and further development of the embryo.

13. (*b*) Grasshopper exhibits XX-XO type of sex determination. The female is homogametic with XX chromosomes and males have only one X chromosome.

19. (*b*) The mode of replication of DNA is semi-conservative. In this mode one DNA stands acts as a template on which a new strand is formed with complementary bases.

22. (*b*) Brain capacity of *Homo neanderthalesis* was 1450 cc, *Homo erectus* was 900 cc, *Homo sapiens* was 1350 cc and of *Homo habilis* was 605-800 cc.

33. (*c*) Viruses do not have DNA of their own. When they enter the host cell. They use the machinery of the host to multiply.

37. (*c*) DNA ligase is an enzyme which joins two bases.

41. (*c*) Growth rate (per capita)

= Birth rate – Death rate

= 0.06 – 0.05

= 0.04

If growth rate per capita is 0.04

Individuals added to a population per 1000

= 0.04 × 1000 = 40

43. (*b*) Exponential growth rate is represented as

$\frac{dN}{dt} = rN$ or $\frac{dN}{dt} = (b - d)N$

where, b = birth rate, d = death rate and N = population size

When b > d, population will increase.

and when d > b, population will decrease.

For curve 1 to become more like curve 2 population should decrease.