PRACTICE PAPER

9

BIOLOGY

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

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

Choose the correct option:

1. **Appearance of vegetative propagules from the nodes of plants such as sugarcane and ginger is mainly because**
   (*a*) nodes are shorter than internodes.
   (*b*) nodes have meristematic cells.
   (*c*) nodes are located near the soil.
   (*d*) nodes have non-photosynthetic cells.

2. **Large, colourful and nectarious flowers are adaptations for**
   (*a*) anemophily
   (*b*) entomophily
   (*c*) zoophily
   (*d*) hydrophily

3. **Artificial removal of _____ is called emasculation in case of plants.**
   (*a*) placenta
   (*b*) stigma
   (*c*) anthers
   (*d*) style

4. **The typical matured embryo sac of a flowering plant is**
   (*a*) 7 celled, 8 nucleated
   (*b*) 8 celled, 7 nucleated
   (*c*) 7 celled, 7 nucleated
   (*d*) 8 celled, 8 nucleated

5. **Which of the following statements is true about vegetative cell in a pollen?**
   (*a*) Vegetative cell is smaller than generative cell.
   (*b*) It has abundant food reserve.
   (*c*) It is spindle shaped.
   (*d*) It has a small circular nucleus.

6. **Hormones produced only during pregnancy is/are:**
   (*a*) human chorionic gonadotropin
   (*b*) human placental lactogen
   (*c*) relaxin
   (*d*) all of these

7. **Match the number of chromosomes in column I with the cells of human female in column II.**

Column I	Column II
1. 46	A. Secondary oocyte
2. 23	B. Primary oocyte
3. 46	C. Follicles

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

8. **_____ is the outermost layer of a blastocyst.**

(*a*) Ectoderm (*b*) Mesoderm

(*c*) Trophoblast (*d*) Endoderm

9. **Choose the incorrect statement.**

(*a*) Sertoli cells nourish the germ cells in the testes.

(*b*) The finger-like projection, fimbriae, help in the collection of ovum into the fallopian tube.

(*c*) Leydig cells are a source of androgen.

(*d*) Morula is the developmental stage between the blastocyst and gastrula.

10. **Match the items of column I with suitable items of column II.**

Column I	**Column II**
A. Barrier method	**(*i*) Condoms**
B. IUD	**(*ii*) Multiload 375**
C. Surgical technique	**(*iii*) Tubectomy**
D. Hormone administration	**(*iv*) Implants**

(*a*) A—(*i*), B—(*ii*), C—(*iv*), D—(*iii*) (*b*) A—(*i*), B—(*ii*), C—(*iii*), D—(*iv*)

(*c*) A—(*i*), B—(*iv*), C—(*ii*), D—(*iii*) (*d*) None of these

11. **In biparental reproduction, the offspring**

(*a*) differs from both the parents

(*b*) shows no change from the maternal parent

(*c*) shows no change from the paternal parent

(*d*) shows mixtures of characters from both parents

12. **In a cross YYRr × YyRR, the offspring will show the genotypic ratio**

(*a*) 2 YyRR : 2 YYRR (*b*) 1 YYRR : 3 YyRR

(*c*) 4 YYRR : 0 yyRR (*d*) None of the above

13. **What blood group found in offspring in a marriage between blood group A man and blood group AB woman will prove man to be heterozygous?**

(*a*) Blood group A (*b*) Blood group B

(c) Blood group AB (*d*) Blood group O

14. **Klinefelter's syndrome is due to**

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

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

15. **Son receives X-chromosome from**

(*a*) father (*b*) mother

(*c*) both (*a*) and (*b*) (*d*) none of these

16. **Genes are made up of**

(*a*) DNA (*b*) RNA

(*c*) DNA and RNA (*d*) proteins

17. **The usual method of DNA replication is**

(*a*) conservative (*b*) dispersive

(*c*) non-conservative (*d*) semi-conservative

18. **The modern concept of gene is that it is**

(*a*) a segment of DNA capable of crossing over (*b*) a functional unit of DNA

(*c*) a segment of DNA (*d*) a segment of chromosome

19. What is the length of DNA having 75 base pairs?
(*a*) 255 Å (*b*) 112.5 Å (*c*) 750 Å (*d*) 421 Å

20. The *m*RNA is formed
(*a*) in the nucleus
(*b*) by free ribosomes
(*c*) from the ribosomes on endoplasmic reticulum
(*d*) from DNA in nucleus

21. In 1953, S. L. Miller created primitive earth conditions in the laboratory and gave experimental evidence for origin of first form of life from pre-existing non-living organic molecules. The primitive earth conditions created include
(*a*) low temperature, volcanic storms, atmosphere rich in oxygen
(*b*) low temperature, volcanic storms, reducing atmosphere
(*c*) high temperature, volcanic storms, non-reducing atmosphere
(*d*) high temperature, volcanic storms, reducing atmosphere containing CH_4, NH_3, etc.

22. Which is correct formula of Hardy—Weinberg's law?
(*a*) $p^2 + pq + q^2 = 0$
(*b*) $p^2 + pq + q^2 = 1$
(*c*) $p^2 + pq + q^2 =$ infinity
(*d*) $p^2 + 2pq + q^2 = 1$

23. Which of the following scientists disproved spontaneous generation theory?
(*a*) Louis Pasteur (*b*) Oparin and Haldane (*c*) Charles Darwin (*d*) Hugo de Vries

24. Typhoid is caused by
(*a*) *P. vivax* (*b*) *Salmonella typhi* (*c*) Rhinovirus (*d*) *Haemophilus influenzae*

25. Which of the following properties of acquired immunity is the basis of vaccination?
(*a*) Diversity
(*b*) Memory
(*c*) Discrimination between self and non-self
(*d*) Specificity

26. Migration of cancerous cells to different parts of the body through body fluid is called
(*a*) mobility (*b*) metastasis (*c*) homeostasis (*d*) myosis

27. The condition in vertebrates where the body attacks self-cells is
(*a*) apoptosis (*b*) auto-immunity (*c*) necrosis (*d*) contact inhibition

28. 33 percent of India's Gross Domestic Product comes from
(*a*) industry
(*b*) agriculture
(*c*) export
(*d*) small-scale cottage industries

29. A collection of all the alleles of all the genes of a crop plant is called
(*a*) germplasm collection
(*b*) protoplasm collection
(*c*) herbarium
(*d*) somaclonal collection

30. When a cross is made between two species of the same genus, then the cross is known as
(*a*) Intraspecific hybridisation
(*b*) Interspecific hybridisation
(*c*) Inbreeding
(*d*) Outcrossing

31. Methanogens do not produce
(*a*) oxygen
(*b*) methane
(*c*) hydrogen sulfide
(*d*) carbon dioxide

32. Choose the incorrect statement.
(*a*) *Bacillus thuringiensis* is used to control insect pests.
(*b*) Cheese is a product of fermentation.
(*c*) The majority of baculoviruses used as biological control agents are in the genus *Nucleopolyhedrovirus*.
(*d*) *Propionibacterium* produces large holes in Swiss cheese due to the process of oxidation of the dough.

33. Suspended solids are removed in which of the following?

(*a*) Primary treatment (*b*) Secondary treatment

(*c*) Tertiary treatment (*d*) Both (*b*) and (*c*)

34. Which of the following is a true statement regarding DNA polymerase used in PCR?

(*a*) It is used to ligate introduced DNA in recipients cells.

(*b*) It serves as a selectable marker.

(*c*) It is isolated from a virus.

(*d*) It remains active at high temperature.

35. Match the following:

Column I	Column II
A. Competent host	(*i*) Source of agarose
B. PCR	(*ii*) *Taq* polymerase
C. Sea weeds	(*iii*) Divalent cation (Ca^{2+})

(*a*) A—(*i*), B—(*ii*), C—(*iii*) (*b*) A—(*iii*) , B—(*ii*) , C—(*i*)

(*c*) A—(*iii*), B—(*i*), C—(*ii*) (*d*) A—(*ii*), B—(*i*) ,C—(*iii*)

36. Choose the correct statement.

(*a*) Since DNA fragments are positively charged they move towards the anode.

(*b*) The cloning vector pBR322 has four antibiotic-resistance genes.

(*c*) The vector DNA and foreign DNA are cut by the same restriction endonuclease.

(*d*) Agarose, the most commonly used matrix in gel electrophoresis is obtained from fungi.

37. Which gene in the *E.coli* vector pBR322 codes for the proteins involved in the replication of the plasmid?

(*a*) *ori* (*b*) amp^R (*c*) tet^R (*d*) *rop*

38. Transgenic plants are the ones

(*a*) generated by introducing foreign DNA into a cell and regenerating a plant from the cell

(*b*) produced after protoplast fusion in artificial medium

(*c*) grown in artificial medium after hybridization in the field

(*d*) produced by a somatic embryo in artificial medium

39. The transgenic cow (Rosie) produced milk that

(*a*) is protein enriched (*b*) is fat free

(*c*) contains beta-lactalbumin (*d*) contains alpha 1-antitrypsin

40. The new variety of rice by American company is made by

(*a*) crossing tall variety with American rice. (*b*) crossing semi dwarf variety with Indian Basmati rice.

(*c*) crossing semi dwarf variety with American rice. (*d*) crossing dwarf variety with American rice.

41. The population of an insect species shows an explosive increase in number during rainy season followed by its disappearance at the end of the season. What does this show?

(*a*) S-shaped or sigmoid growth of this insect.

(*b*) The food plants mature and die at the end of the rainy season.

(*c*) Its population growth is of J-type.

(*d*) The population of its predators increases enormously.

42. Ecology is basically concerned with four levels of biological organisation. Which one of the following is correct representation?

(*a*) Population, community, ecosystem, landscape (*b*) Organism, community, biome, biosphere

(*c*) Organism, population, communities, biome (*d*) Species, ecosystem, landscape, biome

43. **Desert lizards lack the physiological ability to deal with high temperature but manage to keep their body temperature constant by**

(*a*) behavioural means

(*b*) basking in sun and absorbing heat

(*c*) move into shade when ambient temperature starts increasing

(*d*) all of these

44. **Which of the following is an ecosystem service provided by a natural ecosystem?**

(*a*) Cycling of nutrients

(*b*) Prevention of soil erosion

(*c*) Pollutant absorption and reduction of the threat of global warming

(*d*) All of the above

45. **A succession of communities on barren land is known as**

(*a*) secondary succession (*b*) primary succession

(*c*) tertiary succession (*d*) none of these

46. **Niche overlap indicates**

(*a*) mutualism between two species.

(*b*) sharing of one or more resources between two species.

(*c*) cooperation between two species.

(*d*) two different parasites on same host.

47. **_____ are exotic species which when introduced to a new area, spreads rapidly and eliminates native species.**

(*a*) Immigrant species (*b*) Invasive species

(*c*) Destructive species (*d*) Noble species

48. **Choose the correct statement.**

(*a*) David Tilman confirmed communities with more species tend to be more stable than those with less species.

(*b*) River Popper hypothesis was given by Robert May.

(*c*) The historic convention on Biological Diversity held in Rio de Janeiro in 1992 is known as CITES Convention.

(*d*) Organisation responsible for maintaining Red Data Book is WWF.

49. **The major source of noise pollution world wide is due to**

(*a*) office equipment

(*b*) transport system

(*c*) sugar, textile and paper industries

(*d*) oil refineries and thermal power plants.

50. **Match the following and choose the correct option.**

Column I	**Column II**
A. Environment Protection Act	**(*i*) 1974**
B. Air Prevention & Control of Pollution Act	**(*ii*) 1987**
C. Water Act	**(*iii*) 1986**
D. Amendment of Air Act to include noise as an air pollutant	**(*iv*) 1981**

(*a*) A-(*iii*), B-(*iv*), C-(*i*), D-(*ii*) (*b*) A-(*i*), B-(*iii*), C-(*ii*), D-(*iv*)

(*c*) A-(*iv*), B-(*i*), C-(*ii*), D-(*iii*) (*d*) A-(*iii*), B-(*iv*), C-(*ii*), D-(*i*)

Answers

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

Explanations

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12. (*d*) Parents YYRr × YyRR

Gametes YR, Yr × YR, yR

Offsprings

♀ \ ♂	YR	Yr
YR	YYRR	YYRr
yR	YyRR	YyRr

Genotypic Ratio: 1YYRR : 1YYRr : 1YyRR : 1YyRr

13. (*b*) If the man is heterozygous the cross will be as follows:

Man I^Ai × Woman I^AI^B

Gametes I^A, i × I^A, I^B

Offsprings

♀ \ ♂	I^A	i
I^A	I^AI^A A	I^Ai A
I^B	I^AI^B AB	I^Bi B

Blood group B is possible only if the man is heterozygous.

15. (*b*) Parent Genotypes: Mother XX × Father XY

Gametes: X × X, Y

Offsprings: XX (Daughter), XY (Son)

Son receives X Chromosome from mother.

19. (*a*) According to the structure of DNA, distance between two base pairs is 3.4 A.

Therefore, if there are 75 base pairs, the length of DNA will be = 3.4 Å × 75

= 255 Å

32. (*d*) Large holes in Swiss cheese are due to production of carbon dioxide by the bacterium *Propionibacterium*.