B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

PRE-BOARD-II EXAMINATION 2025-26
BIOLOGY (044)
SET-II Marking Scheme

Class: XII | Duration: 3 Hours
Date: 09/12/2025 | Max. Marks:70

SECTION-A

1.	1. Down's syndrome	1
2.	1:1	1
3.	Toxin is inactive	1
4.	Splicing	1
5.	Lactose binds to repressor	1
6.	Zygote–Suspensor–Cotyledon–Radicle	1
7.	(i), (iii) and (iv)	1
8.	280 pollen grains, 40 ovules	1
9.	Anti-parallel and complementary	1
10.	AUG	1
11.	Spleen	1
12.	Fruit Juice	1
13.	C	1
14.	A	1
15.	A	1
16.	D	1

SECTION-B

17. Attempt either option A or B. — 2

A. Mutualism (Fig tree–Wasp):
Fig wasp lays eggs in fig flowers.
Wasp pollinates fig while laying eggs.
Wasp completes life cycle inside fig.
Both species depend completely on each other.

OR

B. Pyramid of Number (Banyan tree):
Producers: 1 Banyan tree
Primary consumers: 20 insects
Secondary consumers: 32 birds
Inverted pyramid of numbers.

18. Criteria for genetic material (any four): — 2
Ability to replicate
Chemical stability
Ability to mutate
Ability to express information

19. Structure of antibody: 2
Y-shaped glycoprotein
Two heavy chains and two light chains
Variable region binds antigen
Constant region determines antibody class

20. A. Curd easier to digest: 2
Lactobacillus converts lactose to lactic acid
Proteins partially digested
Reduced lactose intolerance
OR
B. Blue and colourless colonies:
Blue-white screening
Functional lacZ → blue colonies
Recombinant plasmid → colourless colonies

21. Attempt either option A or B. 2
A. Entry of pollen tube:
Enters through micropylar end
Guided by synergids via filiform apparatus
OR
B. Fate of male nuclei:
One fuses with egg → zygote (syngamy)
Other fuses with polar nuclei → endosperm (triple fusion)

SECTION-C

22. Parturition: 3
Fully developed foetus induces uterine contractions
Foetal oxytocin signal → maternal oxytocin release
Positive feedback → strong uterine contractions
Baby expelled through birth canal

23. (i) IVF: Fertilisation outside the body 3
Importance: Helps infertile couples
(ii) Difference:

GIFT	ZIFT
Gametes transferred	Zygote transferred
Fertilisation in body	Fertilisation in lab

24. Turner's syndrome (XO): Short stature 3
Sterile female / underdeveloped ovaries

25. (i) Oparin–Haldane hypothesis: 3
Life originated from non-living organic molecules under primitive Earth conditions.
(ii) Miller's experiment: Simulated early Earth atmosphere
Produced amino acids experimentally

26. Transgenic animals: Animals carrying foreign genes 3
Uses (any two): Study of diseases,Production of therapeutic proteins

27. (i) Microbe: *Trichoderma polysporum* 3
(ii) Role: Immunosuppressant
(iii) Aspergillus niger: Citric acid production

28. Habitat loss & fragmentation: 3

Destruction of tropical rain forests
Example: Amazon rainforest
Fragmentation → small isolated populations
Leads to reduced gene flow and extinction

SECTION-D

29. A. Embryo sac per ovule: 1 4
Egg per embryo sac: 1
B.(i) Fruit P – Polyembryony
Embryos from nucellus → no variation
(ii) Ploidy: Diploid (2n)
C. Fruit Q – Parthenocarpic , Fruit formed without fertilisation
OR
D. Fruit S – True fruit.Ovary develops into fruit after fertilisation

30. *(Malaria)* 4
A. Temperature pattern: Rupture of RBCs releasing toxins
B. Multiplication: Asexual reproduction in RBCs
C. Transmission: Female *Anopheles* mosquito bite
D. Stages in mosquito gut: Gametocytes → gametes → zygote → ookinete

SECTION-E

31. A. Exponential growth 5
J-shaped curve, Equation: dN/dt = rN
Unlimited resources
OR
B. Humboldt's conclusion: Species richness increases with area
Equation: $S = CA^z$. Log–log straight line graph

32. A. (i) Yes 5
(ii) Shaded – Introns; Unshaded – Exons
(iii) Transcription → splicing → translation
(iv) Eukaryotes have introns; prokaryotes do not
OR
B. (i) Regulatory gene: i gene
(ii) Repressor inhibits transcription
(iii) Inducer: Allolactose , z → β-galactosidase, y → permease

33. A. (i) PCR: DNA amplification using primers, Taq polymerase 5
Applications: Diagnosis, forensics
(ii) Insulin: Two chains (A & B) linked by disulfide bonds
Advantage: No allergic reaction
OR
B. (i) Gene therapy: Treatment by replacing faulty genes. Example: ADA deficiency
(ii) Protection: Legal patents, Biodiversity conservation laws