

OCR A Biology – Paper 2 (H420/02)

Top “Must-Write” Scoring Phrases (2017–2024)

Grouped by topic and based directly on recurring mark-scheme wording.

DNA, PCR & Genetic Technology

1. Polymerase chain reaction
 2. Denaturation (breaks hydrogen bonds)
 3. Annealing (primers bind)
 4. Extension / synthesis of complementary strand
 5. Taq polymerase is thermostable
 6. Amplifies small samples of DNA
 7. Restriction endonuclease
 8. DNA fragments separated by electrophoresis
 9. Fluorescent / radioactive probe
 10. Low probability of identical DNA profiles
 11. Heterozygous shows double peaks
 12. Homozygous shows single peak
 13. Loci must match
 14. Phosphodiester bond
 15. Complementary base pairing
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Mutation & Protein Structure

16. Degenerate genetic code
17. Silent mutation
18. Primary structure unchanged
19. Tertiary structure determines function
20. Substitution with similar R group
21. Mutation away from active site
22. Frameshift mutation

23. Alters triplet / codon

24. Affects transcription / gene expression

Microbiology & Aseptic Technique

25. Prevent contamination

26. Sterile / autoclaved equipment

27. Disinfect surfaces

28. Flame neck of flask

29. Serial dilution

30. Multiply by dilution factor

31. Colony forming units

32. Even distribution of cells

33. Air dry smear

34. Slide at an angle

Biodiversity & Conservation

35. Simpson's Index of Diversity

36. Species richness

37. Species evenness

38. $(1 - \sum(n/N)^2)$

39. In situ conservation

40. Ecotourism

41. Deflected succession / plagioclimax

42. Pioneer species

43. Competitive exclusion

44. Limiting factor

45. Carrying capacity

Hardy-Weinberg & Genetic Diversity

46. Random mating

47.No mutation / no selection / large population

48. $p^2 + 2pq + q^2 = 1$

49. χ^2 below critical value

50.Independent assortment (metaphase I)

51.Crossing over (prophase I)















52.Random fertilisation

53.Genetically unique gametes





Non-Scoring → Scoring Phrases

(What students write vs what actually earns marks)

DNA Profiling / PCR

-  The genes match.
 -  The DNA profiles at the tested loci are identical.
 -  They have the same DNA.
 -  The alleles at all tested loci are the same.
 -  It proves they're the same person.
 -  The probability of two unrelated individuals having identical profiles is very low.
 -  More genes were tested.
 -  A low number of loci were analysed.
 -  PCR makes more DNA.
 -  PCR amplifies a small DNA sample.
 -  The strands split.
 -  Denaturation breaks hydrogen bonds between complementary bases.
 -  The enzyme works at high temperature.
 -  Taq polymerase is thermostable and does not denature at high temperatures.
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Mutation & Protein Structure

-  The protein changes shape.
-  The tertiary structure is altered.
-  It doesn't affect the protein.
-  The primary structure is unchanged due to a silent mutation.

- It stops working.
 - The mutation alters the active site so the substrate no longer binds.
 - The genetic code changes.
 - The base sequence of the codon is altered.
 - It denatures.
 - The tertiary structure is disrupted by changes in hydrogen/ionic bonds.
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Microbiology

- To kill bacteria.
 - To prevent contamination by unwanted microorganisms.
 - Seal the flask tightly.
 - Flame the neck of the flask to prevent entry of microorganisms.
 - Multiply by 100.
 - Multiply by the dilution factor.
 - Spread the blood.
 - Use a second slide at an angle to spread the sample evenly.
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Ecology & Biodiversity

- More diverse.
 - Higher Simpson's Index of Diversity.
 - Different species.
 - Greater species richness.
 - Because of competition.
 - Increased competition for a limiting resource reduces population size.
 - It evolves.
 - Selection pressure changes allele frequency.
 - It reaches a maximum.
 - The population reaches carrying capacity due to limiting factors.
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Hardy-Weinberg & Statistics

- No difference.
- There is no significant difference because χ^2 is below the critical value.
- It proves the hypothesis.
- The null hypothesis cannot be rejected.

Small sample.

The sample size is too small to draw reliable conclusions.

Random mating happens.

The population must be randomly mating and large for Hardy–Weinberg equilibrium.