

CUET PCB Quick Notes

Free notes · Class 12 NCERT · Physics, Chemistry, Biology · CUET UG

How to use these notes

★ CUET UG domain paper: 50 compulsory MCQs, 60 minutes, +5 for a correct answer, −1 for a wrong answer, 0 if left blank. Questions are based on the NCERT Class 12 syllabus. You can take up to 5 papers in total.

Biology questions in CUET come straight from NCERT lines, examples and diagrams. Read the NCERT chapter first, then use these notes to revise.

1. Biology: reproduction

- Embryo sac of angiosperms: 7-celled, 8-nucleate (egg apparatus of 3 cells, 3 antipodals, 1 central cell with 2 polar nuclei).
- Double fertilisation = syngamy (male gamete + egg → zygote) + triple fusion (male gamete + 2 polar nuclei → primary endosperm nucleus, 3n).
- Human fertilisation usually takes place in the ampullary region of the fallopian tube; the embryo implants at the blastocyst stage.
- Placental hormones: hCG, hPL, oestrogens, progesterones; relaxin is also secreted during pregnancy.
- Ovulation happens around day 14 of a 28-day cycle, triggered by the LH surge.
- MTP was legalised in India in 1971.

2. Biology: genetics and evolution

Concept	Fact
Monohybrid cross (F_2)	Phenotype 3 : 1; genotype 1 : 2 : 1
Dihybrid cross (F_2)	Phenotype 9 : 3 : 3 : 1
Incomplete dominance	Snapdragon flower colour: $F_2 = 1 : 2 : 1$
Codominance	ABO blood groups (I^A and I^B both expressed)
Sex determination	Humans XX-XY; birds ZW-ZZ; grasshopper XX-XO
Chromosomal disorders	Down syndrome: trisomy 21 · Turner: 45, XO · Klinefelter: 47, XXY
DNA structure	Double helix (Watson & Crick, 1953); 0.34 nm between base pairs; ~10 bp per turn
Replication	Semi-conservative (Meselson & Stahl, using ^{15}N)
Genetic code	64 codons; 61 code for amino acids; AUG = start; UAA, UAG, UGA = stop
Hardy-Weinberg	$p^2 + 2pq + q^2 = 1$

3. Biology: health, microbes, biotechnology, ecology

- Malaria: Plasmodium, spread by the female Anopheles mosquito. Typhoid: Salmonella typhi (confirmed by the Widal test).
- HIV is a retrovirus that attacks helper T-lymphocytes; ELISA is a common diagnostic test.
- Penicillin was discovered by Alexander Fleming (from Penicillium notatum).
- Statins come from the yeast Monascus purpureus; cyclosporin A from the fungus Trichoderma polysporum.
- Restriction enzyme EcoRI recognises the palindrome 5'-GAATTC-3'.
- PCR uses Taq polymerase, from the bacterium Thermus aquaticus.
- Bt toxin genes come from Bacillus thuringiensis (e.g. cryIAC, cryIIAb against cotton bollworm).
- Exponential growth: $dN/dt = rN$ · Logistic growth: $dN/dt = rN(K - N)/K$.
- 10% law of energy transfer between trophic levels (Lindeman).

4. Physics and Chemistry essentials

Topic	Key formula / fact
Lens power	$P = 1/f$ (f in metres), unit dioptre (D)
Photoelectric effect	$K_{\text{max}} = h\nu - \phi_0$
Ohm's law and power	$V = IR$; $P = V^2/R$
Colligative properties	$\Delta T_f = iK_f \cdot m$; $\pi = iCRT$
First-order reaction	$t_{1/2} = 0.693/k$
Biomolecules	Sucrose = glucose + fructose (non-reducing); DNA sugar = deoxyribose

Quick check

Q1. How many nuclei are there in a mature embryo sac?

Answer: 8 nuclei in 7 cells.

Q2. What is the ploidy of the primary endosperm nucleus?

Answer: Triploid (3n), formed by triple fusion.

Q3. Which disorder is caused by trisomy of chromosome 21?

Answer: Down syndrome.

Q4. Which enzyme is used in PCR and where does it come from?

Answer: Taq polymerase, from Thermus aquaticus.

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