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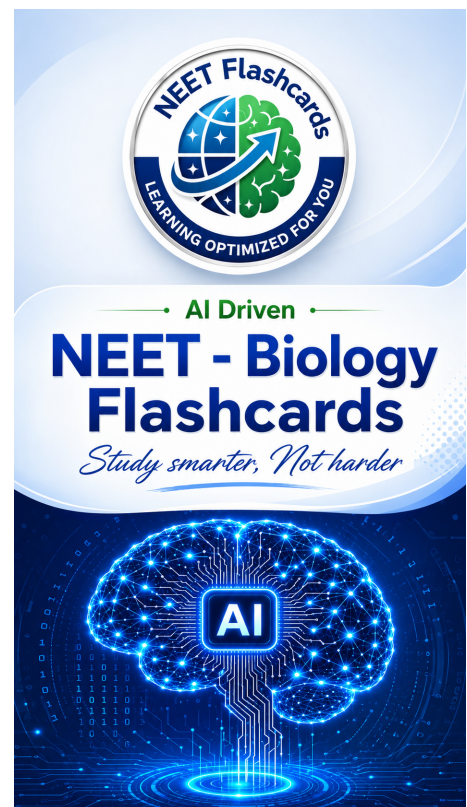
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Question	Answer
Amino acids are substituted forms of which compound?	Methane.
At which site can foreign DNA be ligated in vector pBR322?	BamHI site of the tetracycline resistance gene.
By approximately how many times does carbonic anhydrase accelerate the reaction?	About 10 million times.
How are amino acids classified based on the number of amino and carboxyl groups?	Acidic, basic and neutral amino acids.
How are restriction enzymes named?	The first letter comes from the genus and the next two letters from the species of the prokaryotic cell.
How do enzymes catalyse reactions?	Through their active sites.
How does genetic engineering overcome the limitation of traditional hybridisation?	It allows isolation and introduction of only desirable genes without introducing undesirable genes.
How many subunits are present in adult human haemoglobin?	Four subunits.
How many types of amino acids occur in proteins?	20 types.
Into how many major classes are enzymes divided?	Six classes.
On what basis are DNA fragments separated in agarose gel electrophoresis?	According to their size.
What are cloning vectors?	DNA molecules like plasmids and bacteriophages used to multiply alien DNA inside bacterial cells.
What are fats and oils chemically called?	Glycerides (monoglycerides, diglycerides, and triglycerides) in which fatty acids are esterified to glycerol.
What are isomerases?	Enzymes catalysing interconversion of optical, geometric or positional isomers.
What are micromolecules?	Biomolecules with molecular weights less than one thousand daltons.
What are nucleosides?	Nitrogen bases attached to a sugar.
What are phospholipids?	Lipids containing phosphorus and a phosphorylated organic compound.
What are plant cell walls mainly made of?	Cellulose.
What are prosthetic groups?	Organic compounds tightly bound to the apoenzyme.
What are proteins made of?	Amino acids.
What are sticky ends?	Single-stranded overhanging stretches formed at the ends of DNA after restriction enzyme cutting.

Question	Answer
What are the essential chemical components of many co-enzymes?	Vitamins.
What conditions are required for maximal enzyme activity?	Optimum temperature and optimum pH.
What conditions does a bioreactor provide?	Optimum growth conditions such as temperature, pH, substrate, salts, vitamins, and oxygen.
What does biotechnology deal with according to the summary?	Large-scale production and marketing of products and processes using live organisms, cells, or enzymes.
What does biotechnology deal with?	Biotechnology deals with techniques of using live organisms or enzymes from organisms to produce products and processes useful to humans.
What happens after foreign DNA enters the host organism?	The foreign gene is expressed and the functional protein is purified.
What happens to reaction velocity with increase in substrate concentration?	Reaction velocity initially rises.
What happens to the enzyme shape after substrate binding?	The enzyme alters its shape to fit more tightly around the substrate.
What happens when recombinant DNA carrying ampicillin resistance is transferred into *E. coli*?	The host cells become transformed into ampicillin-resistant cells.
What is a chemical reaction?	A process in which bonds are broken and new bonds are formed.
What is a competitive inhibitor?	An inhibitor that resembles the substrate structurally and competes for the substrate-binding site.
What is a recombinant protein?	A protein produced when a protein-encoding gene is expressed in a heterologous host.
What is activation energy?	The difference in average energy content of substrate and transition state.
What is downstream processing?	The series of processes a product undergoes after the biosynthetic stage before marketing as a finished product.
What is formed under normal aerobic conditions?	Pyruvic acid.
What is found in the acid-soluble pool?	Thousands of organic compounds.
What is genetic engineering?	Techniques to alter the chemistry of genetic material (DNA and RNA), introduce these into host organisms, and change the phenotype of the host organism.
What is glycerol chemically known as?	Trihydroxy propane.
What is glycogen?	A polysaccharide variant found in animals for storage.

Question	Answer
What is micro-injection?	A method in which recombinant DNA is directly injected into the nucleus of an animal cell.
What is optimum temperature?	The temperature at which an enzyme shows highest activity.
What is recombinant DNA?	A new combination of circular autonomously replicating DNA created in vitro.
What is RNA?	A nucleic acid containing ribose sugar.
What is the function of exonucleases?	They remove nucleotides from the ends of DNA.
What is the importance of sticky ends?	Sticky ends made pasting together pieces of DNA a precise exercise.
What is the major difference between primary and secondary metabolites?	Primary metabolites have identifiable functions in physiological processes, whereas functions of many secondary metabolites are not fully understood.
What is the most abundant chemical in living organisms?	Water.
What is the origin of replication (ori)?	It is a sequence from where replication starts.
What is the purpose of PCR?	To synthesise multiple copies of the gene or DNA of interest in vitro.
What is the role of Ti plasmid in biotechnology?	Modified Ti plasmid acts as a cloning vector for delivering genes into plants.
What is the structure of a fatty acid?	A carboxyl group attached to an R group.
What is the transition state structure?	The new structure formed when the substrate is bound to the enzyme active site.
What is transformation?	A procedure through which a piece of DNA is introduced into a host bacterium.
What led to the construction of the first recombinant DNA molecule?	Linking a gene encoding antibiotic resistance with a native plasmid of *Salmonella typhimurium*.
What percentage of cellular mass is nucleic acids?	5 - 7%.
Which amino acid is an example of an acidic amino acid?	Glutamic acid.
Which chemical is the most abundant in living organisms?	Water.
Which enzyme gene is commonly inactivated for colour-based selection?	$\beta$ -galactosidase gene.
Which enzyme removes RNA during DNA purification?	Ribonuclease.
Which inorganic compounds are found in the acid-soluble fraction?	Sulphates and phosphates.

Question	Answer
Which macromolecule is another major component of the acid-insoluble pellet?	Polysaccharides (carbohydrates).
Which macromolecules are released along with DNA when a cell is broken open?	RNA, proteins, polysaccharides, and lipids.
Which macromolecules together form the true macromolecular fraction of living tissue?	Polynucleotides, polysaccharides and polypeptides.
Which nucleic acids function as genetic material?	DNA and RNA.
Which polysaccharides serve as storage forms of energy?	Starch and glycogen.
Which technique is used for separation of DNA fragments?	Gel electrophoresis.
Which two enzymes restricting bacteriophage growth in *E. coli* were isolated in 1963?	One enzyme added methyl groups to DNA, while the other cut DNA (restriction endonuclease).
Which type of DNA polymerase is used in PCR?	Thermostable DNA polymerase.
Which type of helices are observed in proteins?	Right-handed helices.
Who was Rene Descartes?	Rene Descartes was a French philosopher, mathematician, and biologist of the seventeenth century.
Why are bioreactors important in biotechnology?	They are used for large-scale production.
Why is agarose gel electrophoresis used during restriction digestion?	To check the progression of restriction enzyme digestion.



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