

Cochin University of Science & Technology

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Questions and answers of the online test conducted on 28/03/2015

The gene *cryIAB* controls:

Select one:

- ☐ a. Cotton bollworm
- ☐ b. Corn borer
- ☐ c. *Meloidegyme incognitia*
- ☐ d. *Solanum nigrum*

The correct answer is: Corn borer

Which of the following is a vaccine produced through recombinant DNA technology?

Select one:

- ☐ a. Hepatitis B vaccine and pertussis vaccine
- ☐ b. Meningitis vaccine
- ☐ c. Herpes and influenza vaccine
- ☐ d. All of these

The correct answer is: All of these

HCN occurs in

Select one:

- ☐ a. Paddy
- ☐ b. Tapioca
- ☐ c. Papaya
- ☐ d. Apple

The correct answer is: Tapioca

The half life of *Taq* polymerase enzyme at 95°C is:

Select one:

- ☐ a. 1.6 hours
- ☐ b. 7 hours
- ☐ c. 3.5 hours
- ☐ d. Not estimated

The correct answer is: 1.6 hours

Which of the following is the most advanced group of algae?

Select one:

- ☐ a. Cyanophyta
- ☐ b. Rhodophyta
- ☐ c. Phaeophyta
- ☐ d. Chlorophyta

The correct answer is: Rhodophyta

Select the right programs for phylogenetic analysis:

Select one:

- ☐ a. Mega5, ORF finder, Tree view and Tree explorer
- ☐ b. Mega5, Phylip, Phylodendron and GENSCAN
- ☐ c. Phylip, Phylodendron, Tree view Mega and GENEMARK
- ☐ d. Mega5, Phylodendron, Tree explorer and PAUP

The correct answer is: Mega5, Phylodendron, Tree explorer and PAUP

In an enzyme assay, when [S] is much less than the K_m , the rate

Select one:

- ☐ a. approaches V_m
- ☐ b. is independent of [S]
- ☐ c. is independent of [E]
- ☐ d. is proportional of [S]

The correct answer is: is proportional of [S]

called:

Select one:

- ☐ a. Recombinant protein
- ☐ b. P-protein
- ☐ c. Chaperonins
- ☐ d. None of the above

The correct answer is: Recombinant protein

The ori^{Euk} can

Select one:

- ☐ a. Function in yeast cell
- ☐ b. Having size equivalent to that of P element
- ☐ c. Function in prokaryotes and viruses
- ☐ d. Act as an expression vector

The correct answer is: Function in yeast cell

Melting temperature of a PCR reaction is calculated by the formula:

Select one:

- ☐ a. $T_m = 4(GC) + 2(CG)$
- ☐ b. $T_m = 2(GC) + 2(AT)$
- ☐ c. $T_m = 4(GC) + 2(AT)$
- ☐ d. $T_m = 4(GC) + 4(AT)$

The correct answer is: $T_m = 4(GC) + 2(AT)$

The lambda viral genome size is:

Select one:

- ☐ a. 48.5mb
- ☐ b. 4.9kb
- ☐ c. 45kb
- ☐ d. 48.5kb

The correct answer is: 48.5kb

Purity of agarose used in electrophoresis is based on:

Select one:

- ☐ a. Sulphate content
- ☐ b. Alginin content
- ☐ c. Melting point
- ☐ d. Reliquifying quality

The correct answer is: Sulphate content

The term 'embryo rescue' is used for

Select one:

- ☐ a. Embryo culture
- ☐ b. Ovary culture
- ☐ c. Ovule culture
- ☐ d. All the above

The correct answer is: All the above

A special type of tagged site from a region of DNA that is expressed by transcription into mRNA is

Select one:

- ☐ a. STS
- ☐ b. EST
- ☐ c. SST
- ☐ d. ETS

The correct answer is: EST

Hirudin is obtained from the transgenic plant

Select one:

- ☐ a. Brassica napus
- ☐ b. Hibiscus rosasinesis
- ☐ c. Raphanus sativus
- ☐ d. Vinca rosea

The correct answer is: Brassica napus

Digoxigenin obtained from *Digitaria* used in Digoxigenin labelling system is a

Select one:

- ☐ a. Adenocorticoid
- ☐ b. Chromogenic substance
- ☐ c. Cardenolide steroid
- ☐ d. Chemiluminiscent substance

The correct answer is: Cardenolide steroid

Which is not a database for comparative genomics?

Select one:

- ☐ a. PEDAT
- ☐ b. MBGD
- ☐ c. KEGG
- ☐ d. SAGE

The correct answer is: SAGE

Most commonly used bioreactor is

Select one:

- ☐ a. Stirred tank reactor
- ☐ b. Air-lift tank reactor
- ☐ c. Bubble column reactor
- ☐ d. All of these

The correct answer is: Stirred tank reactor

In screening for recombinants, the substrate 'Xgal' turns blue when *Lac Z* gene is:

Select one:

- ☐ a. Intact
- ☐ b. Mutated
- ☐ c. Modified
- ☐ d. Inserted

The correct answer is: Intact

Vent polymerase has been isolated from:

Select one:

- ☐ a. *Thermophilus*
- ☐ b. pGEMT vector
- ☐ c. T₄ bacteriophage
- ☐ d. *Thermococcus littoralis*

The correct answer is: *Thermococcus littoralis*

RT-PCR based technique that generates the complete 5' or 3' end of a cDNA sequence from a partial sequence is

Select one:

- ☐ a. SAGE
- ☐ b. TIGR
- ☐ c. RACE
- ☐ d. SCAR

The correct answer is: RACE

CRISPR-cas9 is an example for

Select one:

- ☐ a. Nuclease
- ☐ b. Endonuclease
- ☐ c. Nickase
- ☐ d. Topoisomerase

The correct answer is: Nickase

EcoRI causes:

Select one:

- ☐ a. Blunt ends
- ☐ b. Sticky end
- ☐ c. Unpredictable end
- ☐ d. Methylated, reactive end

The correct answer is: Sticky end

21st Human artificial chromosome (21HAC) has truncated from

Select one:

- ☐ a. Chromosome 20
- ☐ b. Chromosome 21
- ☐ c. Chromosome 42
- ☐ d. Chromosome 40

The correct answer is: Chromosome 21

Which of the following is a tool for studying transcriptome?

Select one:

- ☐ a. Sequencers
- ☐ b. Microarrays
- ☐ c. 2D gels
- ☐ d. Morphology

The correct answer is: Microarrays

Baculoviruses are useful in:

Select one:

- ☐ a. Pest control
- ☐ b. Gene therapy
- ☐ c. Vaccine production
- ☐ d. GMO production

The correct answer is: Pest control

Which one of the following plants have relatively larger sized chloroplast genome?

Select one:

- ☐ a. *Pisum sativum*
- ☐ b. *Marchantia polymorpha*
- ☐ c. *Oryza sativa*
- ☐ d. *Chlamydomonas reinhardtii*

The correct answer is: *Chlamydomonas reinhardtii*

Plasmids which can replicate independently of the chromosomal DNA will present in:

Select one:

- ☐ a. Hundreds of copies per cell
- ☐ b. 1000 to 1 lakh copies per cell
- ☐ c. 1 or 2 copies per cell
- ☐ d. Strictly, 1 per cell

The correct answer is: Hundreds of copies per cell

The process of transfer of foreign DNA into cultured host cells mediated through chemicals is called

Select one:

- ☐ a. Transformation
- ☐ b. Transduction
- ☐ c. Transfection
- ☐ d. *In vitro* translation

The correct answer is: Transfection

Trypsinization in animal cell culture experiments is a process for

Select one:

- ☐ a. Aggregation of tissue
- ☐ b. Disaggregation of tissue
- ☐ c. Inducing cell growth
- ☐ d. Repeated sterilization

The correct answer is: Disaggregation of tissue

Which of the following is a plasmid of larger size?

Select one:

- ☐ a. pMB9
- ☐ b. pWWO
- ☐ c. pBR324
- ☐ d. pC194

The correct answer is: pWWO

Pfu DNA polymerase has been isolated from:

Select one:

- ☐ a. Pertusis
- ☐ b. *Pyricularia oryzae*
- ☐ c. *Pyrococcus furiosus*
- ☐ d. *Thermococcus litoralis*

The correct answer is: *Pyrococcus furiosus*

Genes in eukaryotes are split because of the presence of

Select one:

- ☐ a. Intron
- ☐ b. Exon
- ☐ c. Absence of plasmid
- ☐ d. Extra chromosomal DNA

The correct answer is: Intron

Mitomycin is a

Select one:

- ☐ a. Aflotoxin
- ☐ b. Bioengineered protein
- ☐ c. Biochip
- ☐ d. Immobilized enzyme

The correct answer is: Aflotoxin

Iodine is extracted from

Select one:

- ☐ a. *Ulothrix*
- ☐ b. *Ectocarpus*
- ☐ c. *Oedogonium*
- ☐ d. *Laminaria*

The correct answer is: *Laminaria*

In hybrid arrest translation, which among the following is prevented from translation

Select one:

- ☐ a. All mRNA
- ☐ b. Non hybridized mRNA
- ☐ c. Hybridized mRNA
- ☐ d. hn mRNA

The correct answer is: Hybridized mRNA

Gene recognition by using cross species sequence comparisons to identify and align relevant regions can be done using

Select one:

- ☐ a. Homology based gene prediction
- ☐ b. Gene prediction through comparison with ESTs
- ☐ c. AB Initio gene prediction
- ☐ d. Systemic gene prediction

The correct answer is: Systemic gene prediction

The retention signal of proteins of endoplasmic reticulum consists of amino acids

Select one:

- ☐ a. Gly---Asp-Glu-Leu at the N-terminus
- ☐ b. Lys---Asp-Glu-Leu at the N-terminus
- ☐ c. Gly---Asp-Glu-Leu at the C-terminus
- ☐ d. Lys---Asp-Glu-Leu at the C-terminus

The correct answer is: Lys---Asp-Glu-Leu at the C-terminus

Yeast artificial chromosome can clone very large inserts of DNA of the size:

Select one:

- ☐ a. 45kb
- ☐ b. 2.4kb
- ☐ c. 10mb
- ☐ d. 100mb

The correct answer is: 10mb

Synthesis of tryptophan in *E.coli* is inhibited by

Select one:

- ☐ a. repressor binding of tryptophan
- ☐ b. reduced levels of charged trp-tRNAs
- ☐ c. repressor release of tryptophan
- ☐ d. binding of CRP-cAMP to trp operon

The correct answer is: repressor binding of tryptophan

Vi capsular polysaccharide vaccine (or ViCPS) is a subunit vaccine for prevention of

Select one:

- ☐ a. Cholera
- ☐ b. Typhoid
- ☐ c. Tetany
- ☐ d. Syphilis

The correct answer is: Typhoid

The term cistron, muton and recon were introduced by

Select one:

- ☐ a. Watson and Crick
- ☐ b. S Benzer
- ☐ c. Meselson
- ☐ d. Morgan

The correct answer is: S Benzer

Erythropoietin- β , a product obtained from animal cell culture is used for

Select one:

- ☐ a. Anaemia secondary to kidney disease
- ☐ b. β cell lymphoma
- ☐ c. Treatment of sepsis
- ☐ d. Pulmonary embolism

The correct answer is: Anaemia secondary to kidney disease

Genome sequence projects have made clear that 2000 genes of yeast are functionally similar to the genes of

Select one:

- ☐ a. *Coenorhabditis elegans*
- ☐ b. *Pseudomonas putida*
- ☐ c. *E.coli*
- ☐ d. *Drosophila*

The correct answer is: *Coenorhabditis elegans*

ORF finder is used for gene prediction in:

Select one:

- ☐ a. Prokaryotes only
- ☐ b. Prokaryotes and eukaryotes
- ☐ c. Prokaryotes and fungi
- ☐ d. Eukaryotes only

The correct answer is: Prokaryotes only

Plants which are not differentiated into root, stem and leaves are grouped under

Select one:

- ☐ a. Gymnosperms
- ☐ b. Thallophytes
- ☐ c. Pteridophytes
- ☐ d. Spermatophytes

The correct answer is: Thallophytes

Which of the following have linear mitochondrial genome?

Select one:

- ☐ a. *Chlamydomonas*
- ☐ b. *Neurospora crassa*
- ☐ c. *Aspergillus nidulens*
- ☐ d. *Homo sapiens*

The correct answer is: *Chlamydomonas*

An additional gene function is established by employing one among the following experiments

Select one:

- ☐ a. Knock in
- ☐ b. Knock out
- ☐ c. Transgenic
- ☐ d. Recombined

The correct answer is: Knock in

Type IV hypersensitivity is caused by

Select one:

- ☐ a. IgE
- ☐ b. IgM
- ☐ c. Immune complex
- ☐ d. CMI

The correct answer is: CMI

GGSEARCH, a Fasta program compares:

Select one:

- ☐ a. A protein or DNA sequence to a sequence database using alignments that is global in query and local in database sequence
- ☐ b. A protein or DNA sequence to a sequence database using Needleman - Wunsch algorithm
- ☐ c. A protein or DNA sequence to a sequence database using Smith - Waterman algorithm
- ☐ d. A DNA sequence to a protein sequence database comparing the translated DNA sequence in forward and reverse frames

The correct answer is: A protein or DNA sequence to a sequence database using Needleman - Wunsch algorithm

In cDNA synthesis, the cleavage of hair pin loops are performed by

Select one:

- ☐ a. Phosphotriesters
- ☐ b. Phosphodiesterases
- ☐ c. SI nuclease
- ☐ d. Polyacrylamide

The correct answer is: SI nuclease

An entire organism can be grown from a single cell following

Select one:

- ☐ a. Cloning
- ☐ b. Genetic engineering
- ☐ c. Cell culture
- ☐ d. Transfusion

The correct answer is: Cell culture

Propellers produce

Select one:

- ☐ a. axial flows
- ☐ b. radial flows
- ☐ c. vertical flows
- ☐ d. tangential flows

The correct answer is: axial flows

Bollgard contains

Select one:

- ☐ a. Bacterial spore
- ☐ b. Bacterial cell
- ☐ c. Bacterial *cry* gene
- ☐ d. Vitamins

The correct answer is: Bacterial *cry* gene

Which of the following is a potential pathogen for bioweapon?

Select one:

- ☐ a. Small pox virus
- ☐ b. Anthrax bacterium
- ☐ c. Botulinum toxin
- ☐ d. All of the above

The correct answer is: All of the above

Enzymatic isolation of protoplast was first demonstrated by

Select one:

- ☐ a. Zimmermann
- ☐ b. Vasil
- ☐ c. Cocking
- ☐ d. Murashige

The correct answer is: Cocking

A lipid molecule in the endoplasmic reticulum upon which oligosaccharides are assembled for the glycosylation of proteins

Select one:

- ☐ a. Diacylglycerol
- ☐ b. Dihydroxyacetone phosphate
- ☐ c. Dipicolinic acid
- ☐ d. Dolichol phosphate

The correct answer is: Dolichol phosphate

Which of the following is chromogenic in blue white screening?

Select one:

- ☐ a. X - gal
- ☐ b. IPTG
- ☐ c. HAT
- ☐ d. ONTG

The correct answer is: X - gal

In the process of electrophoresis, movement of molecules is retarded by frictional force 'f', which is a measure of:

Select one:

- ☐ a. Eq
- ☐ b. v/d
- ☐ c. Structure of molecule
- ☐ d. Molecule size, pore size and viscosity of buffer

The correct answer is: Molecule size, pore size and viscosity of buffer

The phage display technique is related to the study of

Select one:

- ☐ a. Lytic cycle
- ☐ b. Transcription
- ☐ c. Protein DNA interaction
- ☐ d. Recombination

The correct answer is: Protein DNA interaction

Gorgonzola is an example of

Select one:

- ☐ a. Pasta filata - type cheese
- ☐ b. Blue - veined cheese
- ☐ c. Swiss cheese
- ☐ d. Hard cheese

The correct answer is: Blue - veined cheese

Forensically, the DNA from a single hair, sperm or drop of blood can be used to identify by the analysis of:

Select one:

- ☐ a. Short tandem repeats
- ☐ b. ESTs
- ☐ c. UTRs
- ☐ d. Macrosatellites

The correct answer is: Short tandem repeats

Argonaute is associated with

Select one:

- ☐ a. RNA i
- ☐ b. Footprinting
- ☐ c. Endocytosis
- ☐ d. Chromosome remodeling

The correct answer is: RNA i

Southern blotting technique could not be applied directly to the blot transfer of mRNA separated by gel electrophoresis because

Select one:

- ☐ a. RNA is more stickier than DNA with nitrocellulose filter
- ☐ b. Once attached, RNA cannot be separated out from nitrocellulose filter
- ☐ c. RNA forms in bulk and sticks on nitrocellulose filter
- ☐ d. RNA bands do not binds with nitrocellulose filter

The correct answer is: RNA bands do not binds with nitrocellulose filter

Pyrosequencing of DNA detects the release of

Select one:

- ☐ a. Adenine
- ☐ b. Pentose sugar
- ☐ c. Phosphate
- ☐ d. Cytosine

The correct answer is: Phosphate

For lysis of cell wall in bacteria, sodium dodecyl sulphate is used in combination with lysozyme and proteinase K. It binds to:

Select one:

- ☐ a. Disulphide bonds
- ☐ b. Protein
- ☐ c. Weak bonds

☐ d. Anionic bonds

The correct answer is: Protein

ORF does not contain:

Select one:

- ☐ a. Codon for methionine
- ☐ b. Stop codon
- ☐ c. UUU codon
- ☐ d. Any of these

The correct answer is: Stop codon

A cloning vector that has natural existence in mammalian cells

Select one:

- ☐ a. pJC74
- ☐ b. Xba-1
- ☐ c. SV-40
- ☐ d. None

The correct answer is: SV-40

According to the signal hypothesis, the signal peptide for secretory protein is

Select one:

- ☐ a. rich in hydrophobic amino acids at the centre of the signal peptide and is attached to the N-terminus of the protein
- ☐ b. rich in hydrophilic amino acids at the centre of the signal peptide and is attached to the N-terminus of the protein
- ☐ c. rich in hydrophobic amino acids at the centre of the signal peptide and is attached to the C-terminus of the protein
- ☐ d. rich in sulphur containing amino acids at the centre of the signal peptide and is attached to the N-terminus of the protein

The correct answer is: rich in hydrophobic amino acids at the centre of the signal peptide and is attached to the N-terminus of the protein

Fosmids can hold DNA inserts upto

- ☐ a. 20 kb
- ☐ b. 60 kb
- ☐ c. 40 kb
- ☐ d. 10 kb

The correct answer is: 40 kb

Fugu poisoning is due to

Select one:

- ☐ a. Tetrodotoxin
- ☐ b. Maitotoxin
- ☐ c. Saxitoxin
- ☐ d. Ciguatoxin

The correct answer is: Tetrodotoxin

Hairy root disease in plants is caused by

Select one:

- ☐ a. *Agrobacterium tumefaciens*
- ☐ b. *E.coli*
- ☐ c. *Agrobacterium rhizogenes*
- ☐ d. *Pseudomonas* sp.

The correct answer is: *Agrobacterium rhizogenes*

The process by which metals are dissolved from ore bearing rocks using microorganisms is called

Select one:

- ☐ a. Microbial leaching
- ☐ b. Xenobiotics
- ☐ c. Bioremediation
- ☐ d. Biofilter

The correct answer is: Microbial leaching

In glycerol production, the inhibitor effect occurs when

Select one:

- ☐ a. glycerol -3-phosphate production is repressed
- ☐ b. conversion of glycerol -3-phosphate to glycerol is repressed
- ☐ c. conversion of glycerol -3-phosphate to DHAP is repressed
- ☐ d. acetaldehyde production is repressed

The correct answer is: acetaldehyde production is repressed

Which of the following is not a soil DNA purification method?

Select one:

- ☐ a. Filtration column
- ☐ b. Microwave heating
- ☐ c. Chemical flocculation
- ☐ d. Agarose gel purification

The correct answer is: Microwave heating

The first brand of DNA chip was made by

Select one:

- ☐ a. Cetus
- ☐ b. Monsanto
- ☐ c. Affymetrix
- ☐ d. Ranbaxy

The correct answer is: Affymetrix

Fishiness in butter is caused by

Select one:

- ☐ a. *Aeromonas hydrophila*
- ☐ b. *Pseudomonas fragi*
- ☐ c. *Fusarium culmorum*
- ☐ d. *Alternaria* sp.

The correct answer is: *Aeromonas hydrophila*

One allele induces a heritable change in the other allele at a single locus is called

Select one:

- ☐ a. Dominance
- ☐ b. Paramutation
- ☐ c. Point mutation
- ☐ d. Incomplete dominance

The correct answer is: Paramutation

Advantage of trickling filters is because

Select one:

- ☐ a. Ponding occurs
- ☐ b. Bio-coenoses develops within the reactor
- ☐ c. Specific area of voidage is less
- ☐ d. The action is not filtration

The correct answer is: Bio-coenoses develops within the reactor

Which of the following is associated with protein engineering?

Select one:

- ☐ a. Hybridisation
- ☐ b. DNA shuffling
- ☐ c. DNA blotting
- ☐ d. Gel shift assay

The correct answer is: DNA shuffling

The average size of plasmid vector is:

Select one:

- ☐ a. $\approx 1-5\text{kb}$
- ☐ b. $\approx 0.2-2.3\text{kb}$
- ☐ c. $\approx 1.2-2.3\text{kb}$
- ☐ d. $\approx 1.2\text{kb}-3.2\text{mb}$

The correct answer is: $\approx 1.2-2.3\text{kb}$

Methylated DNA has not been observed in one of the organisms

below

Select one:

- ☐ a. *E.coli*
- ☐ b. *Homo sapiens*
- ☐ c. *Arabidopsis thaliana*
- ☐ d. *Drosophila*

The correct answer is: *Drosophila*

BLAST is tool for

Select one:

- ☐ a. Local Alignment
- ☐ b. Global alignment
- ☐ c. Both (A) and (B)
- ☐ d. None of the above

The correct answer is: Local Alignment

The *in situ* cell cultures can be observed using

Select one:

- ☐ a. Phase contrast microscope
- ☐ b. Bright field microscope
- ☐ c. Inverted micrioscope
- ☐ d. Electron microscope

The correct answer is: Inverted micrioscope

The process of separation and purification, after the biosynthetic stage, is referred as:

Select one:

- ☐ a. Processing
- ☐ b. Upstreaming process
- ☐ c. Downhill process
- ☐ d. Downstream processing

The correct answer is: Downstream processing

Green fodder stored under anaerobic condition is known as

Select one:

- ☐ a. Hay
- ☐ b. Silage
- ☐ c. Straw
- ☐ d. Roughage

The correct answer is: Silage

Which of the following is not a character of shuttle vectors?

Select one:

- ☐ a. They must be able to replicate in different organisms
- ☐ b. They should not be recognised by selectable markers
- ☐ c. They should be small in size to accomodate DNA inserts
- ☐ d. They must be non-pathogenic and non-stress inducing

The correct answer is: They should not be recognised by selectable markers

The PCR type which allows simultaneous amplification of many sequences and also can detect different pathogens in a single sample is:

Select one:

- ☐ a. Real time PCR
- ☐ b. Multiplex PCR
- ☐ c. Nested PCR
- ☐ d. Semi quantitative PCR

The correct answer is: Multiplex PCR

Which of the following is a serum-free medium for endothelium cell culture?

Select one:

- ☐ a. MCDB110
- ☐ b. F12
- ☐ c. CMRL
- ☐ d. MCDB130

The correct answer is: MCDB130

Cryoprotectant that is used in cryopreservation studies is

Select one:

- ☐ a. Methanol
- ☐ b. Glycerol
- ☐ c. Absolute alcohol
- ☐ d. Isopropyl alcohol

The correct answer is: Glycerol