

अमर उजाला
मॉडल पेपर
 केवल प्रश्न-पत्र-2017 **कक्षा-12**
BIOTECHNOLOGY सीबीएसई बोर्ड

Time allowed- 3 hrs. MM: 70
General instructions:
 This paper is divided into four section A, B, C, D. All questions are compulsory.
 There is no overall choice. However an internal choice has been provided in one question of three marks and two question of five marks.
 Question no 1 to 6 are very short answer questions carry 1 mark each.
 Question no 7 to 14 are very short answer questions carry 2 mark each.
 Question no 15 to 25 are very short answer questions carry 3 mark each.
 Question no 26 to 28 are very short answer questions carry 5 mark each.
 Use of calculators is not permitted. However, you may use log table if necessary.

- Section (A)**
- Q.1 Presence of selectable marker is an essential feature of an ideal cloning vehicle. Give reason. (1)
 Q.2 A, B and C are type I, type II and type III enzymes respectively. Which of these is mostly used in recombinant DNA technology and why? (1)
 Q.3 Give the sequence of the 2 primers (5-nucleotides long) required to amplify the following DNA sequence by PCR: (1)
 5' A T G C C T A G G A T C A T G C 3'
 Q.4 A soil microorganism produces a novel metabolite in Nano molar concentration (nM). Suggest a way to increase its production in quantities that are economically viable. (1)
 Q.5 In assessing the effect of growth factor on animal cell culture, which phase of growth is more suitable and why? (1)
 Q.6 Given below is a list of the first 8 residues of the β -helix in myoglobin from different organisms. Based on this information, identify the amino acids which are most conserved (1)
 (a) Conserved
 (b) Variable

Population/Organism	1	2	3	4	5	6	7	8
Rabbit	A	L	R	L	M	G	P	E
Dog	A	L	D	L	M	E	F	E
Sea	K	I	D	L	H	C	H	E
Anemone	A	I	D	L	H	C	Q	E
Cod	A	I	D	L	H	C	Q	E
Robin	A	R	R	L	M	C	Q	E
Whale	A	F	E	L	T	G	G	E

- SECTION (B)**
- Q.7 Ovalbumin is the major protein of egg white. The chicken ovalbumin gene contains 8 exons separated by 7 introns. Should one use ovalbumin cDNA or genomic DNA to express the protein in E. coli and why? (2)
 Q.8 American scientists have developed a formulation based on whey proteins for reducing the viral load in Hepatitis patients. What could be the possible scientific explanation for this therapeutic effect? (2)
 Q.9 pUC19 and a linear DNA (both of same size) have two sites for the same restriction-endonuclease. When cleaved and separated on an agarose gel electrophoresis, how many bands will be visualized in each case and why? (2)
 Q.10 Which type of DNA library would you prefer for liver cells? Give proper explanation for making such library? (2)
 Q.11 What are SNPs and indicate one use of these. (2)
 Q.12 Which of the following proteins would be expected to migrate fastest through SDS-PAGE gel, and why? (2)

Protein	MW (Daltons)
Transferrin	90,000
Cytochrome c	13,400
α -antitrypsin	45,000
Myoglobin	17,000
Serum albumin	69,000

- Q.13 What is organogenesis? In this process, what would happen if either auxin or cytokinin are high in the medium? (2)
 Q.14 Why are serum and antibiotics essential as growth supplement for animal cell in culture? (2)

- Section (c)**
- Q.15 The composition of buffalo milk is 8% fat and casein. How will you separate fat from casein in milk? How many grams of fat and casein can be obtained from 1 Lakh liter of milk? (3)
 Q.16 What are RFLPs and indicates how these can be used in DNA fingerprinting? (3)
 Q.17 Determine the no of generation and generation time of bacterial culture containing 100 cell increased its population to one billion in 10 hours? (3)
 Q.18 What are the principles between isoelectric focusing and SDS PAGE technique? Why is two dimensional electrophoresis better than one dimension? (3)
 OR
 What is gene prediction and gene counting? Write its significance in vector less gene delivery process?
 Q.19 Explain any three methods used for selecting transformed cell in an rDNA experiment? (3)
 Q.20 What are edible vaccines? How are they better than conventional vaccines? Give suitable reason? (3)
 Q.21 What is the principal of MALDI-TOF? What is its mean use in protein studies? (3)
 Q.22 Schematically depict the step in fluorescence's in situ hybridization? (3)
 Q.23 State the following enzyme purification table and answer the following question that follow: (3)


Steps	Procedure	Total protein(mg)	Activity(units)
1	Crude extract	10,000	1,00,000
2	Salt fraction	3000	96,000
3	Ion exchange chromatography	400	80,000
4	Size exclusive chromatography	330	60,000
5	Affinity chromatography	3	45,000

- (a) Which steps is the purification is most effective and why?
 (b) Which of the procedure is least reactive and why?
 Q.24 What is the molecular farming? Suggest any three advantages of expressing transgenic protein in the milk? (3)
 Q.25 Antibodies generated from hybridoma technology differ in their specificity from antibodies raised in animals against antigen immunization. Explain? (3)

- Section D**
- Q.26 Describe SNPs. Describe the possible use of this technique in medicine? Name any two disease which can be diagnosed by this technique? (5)
 OR
 What are the advantages of whole genome sequencing project? How is the gene prediction carried out in such projects using computational tool?
 Q.27 Explain how cDNA microarray technique can be used to study cellular response to the environment? Support your answer with a flowchart for the same. (5)
 OR
 What is meant by term genomics? Differentiate between structural and functional genomics?
 Q.28 Explain NCB1. What are the possible use (any two) of database available in NCB1? How can tools available in these database be used to retrieve and compare genetic information? (5)

TIPS

- Read NCERT books regularly. CBSE board exam question papers are completely based on this book.
- Draw the diagram neatly as per requirement.
- Don't waste your time for the question you are unable to answer, proceed another question. Revise as many times you can.
- Keep yourself stress free
- Solve previous year papers to get familiar with the questioning pattern



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नोट- यह बीटैरो प्रश्न पत्र है जल्दी नहीं है यदि प्रश्न परिवर्तित होती है तो।