#### **SLR-MM - 72**

Seat	
No.	

## M.Sc. (Biotechnology) (Part – I) (Semester – I) Examination, 2015 (New CBCS)

Paper - I: MICROBIOLOGY

Day and Date: Monday, 16-11-2015	Total Marks : 70
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Time: 10.30 a.m. to 1.00 p.m.

Note: 1) Section I compulsory.

2) Answer any four questions from Section II.

#### SECTION-I

1.	A) Re	write following sentence by using o	correct option.
i) Staphylococcus aureuscan be isolated by using medium.			olated by using medium.
		a) Chocolate agar	b) Mannitol salt agar
		c) Wilson and Blair's agar	d) Sabouraud's agar
	ii)	Corpophilous fungi grow on	
		a) Tree	b) Hairs
		c) Dung	d) Wood
	iii)	Which of the following is not an a	noxygenic photosynthetic bacterium?
		a) Rhodospirillium	b) Cyanobacterium
		c) Chromatium	d) Chloroflexus
	iv)	Ability of a bacterium to produce	H <sub>2</sub> S can be detected by using
		a) Acid base indicator	b) Lead acetate paper
		c) Both a) and b)	d) None of these
	v)	For sterilization of a room, which effective?	h of the following method will be more
		a) Spraying phenol	b) Gaseous formaldehyde
		c) UV radiation	d) Using betapropiolactone

vi) HIV has \_\_\_\_\_ as its genome. a) + ve sense SS RNA b) - ve sense SS RNA c) + ve sense SS DNA d) - vesense SS DNA vii) \_\_\_\_\_ cannot be used for vaccine preparation. a) Embryonated chicken egg b) Primary cell culture c) Secondary cell culture d) Continuous cell culture B) Define the following terms: 7 i) Axenic culture ii) Strain iii) Morphovar iv) Lysogeny v) Mycorrhiza vi) Retrovirus vii) Archaebacteria. SECTION - II 2. Write a brief account of characteristics, habitat, molecular adaptations and applications of extremophiles inextreme conditions of temperature. 14 14 3. Describe in detail about a technique used to observe viruses. 4. Explain different methods to carry out sterilization process. 14 5. Write short notes on **any two** of the following: 14 i) Barophiles ii) HIV multiplication iii) Lichens. 6. Write short notes on any two of the following: 14 i) Acid fast staining ii) Numerical taxonomy iii) Preservation of cultu.

**SLR-MM - 72** 



Seat	
No.	

### M.Sc. - I (Semester - I) Examination, 2015 (New - CBCS) BIOTECHNOLOGY

	I	Paper – II:Concep	t of Biochemist	ry
-	nd Date : Wedne 10.30 a.m. to 1.	esday, 18-11-2015 .00 p.m.		Total Marks : 70
		) Section <b>I</b> is <b>compuls</b> ) Answer <b>any four</b> que	•	on <b>II</b> .
		SECTION	ON-I	
1.A) M	ultiple choice qu	uestion :		7
1)	•	e of iron containing hem ion in visible range.	e prosthetic groups	protein
	a) Porins	b) Cytochromes	c) Ubiquinone	d) Coenzyme Q
2)	S	ugar is not capable of re	educing ferric or cu	ıpric ion.
	a) Lactose	b) Sucrose	c) Maltose	d) Glucose
3)	The first law of	thermodynamics is bas	sed on	_ principle.
	a) Conservation	on of energy	b) Conservation	of mass
	c) Reaction ar	nd action	d) The entropy-t	emperation reaction
4)		romotes reversible rem cerate to yield phospho		of water from
	a) Mutase	b) Enolase	c) Kinase	d) Transferase
5)	The energy of a	single photon is greater	at the	end of the spectrum.
	a) Violet	b) Blue	c) Red	d) Green
6)	<ul><li>a) Avena curv</li><li>b) Split pea st</li></ul>	llowing bioassays are us ature test and tobacco em curvature test and t ature test and split pea th culture only	pith culture obacco pith cultur	re



	7)	Quantitative expression for the rando is	mness or disorderness in a system	
		a) Entropy	b) Enthalpy	
		c) Electromotive forced)Standard free	e energy change	
	B) De	efine the following terms :		7
	i)	Phytohormones		
	ii)	Thermodynamics		
	iii)	Carbohydrate		
	iv)	Metabolism		
	v)	Oxidative phosphorylation		
	vi)	Enzyme inhibitors		
	vii)	Oxidation.		
		SECTIO	DN – II	
2.	Expla	in in details the light dependent reactio	n of photosynthesis.	14
3.		the general classification of hormone of dd a note on receptors of hormones.	n bases of their structure and action	14
4.		ss the reaction steps for oxidative and phogluconate pathway.	non oxidative phase of	14
5.	Answ	er <b>any two</b> of the following :		14
	i) Cl	assify the carbohydrates with at least t	wo examples of each.	
	ii) IIIu	ıstrate in detail the fatty acid biosynthe	esis.	
	iii) Ex	plain the laws of thermodynamics and	give its biological applications.	
6.	Write	short notes on <b>any two</b> of the followin	g:	14
	i) Se	econdary messengers of hormone signa	aling.	
	ii) Vit	amin C an antiageing Vitamin.		
	iii) Re	edox reactions and redox potential.		
		<u></u>		



Seat	
No.	

## M.Sc. (Part – I) (Semester – I) Examination, 2015 BIOTECHNOLOGY Inheritance Biology (New) Paper – III: (CBCS)

Day and Date: Friday, 20-11-2015 Total Marks: 70

Time: 10.30 a.m. to 1.00 p.m.

Note: Section – I compulsory.

Answer any four questions from Section – II.

#### SECTION-I

1.	A) Rewrite the sentence using correct alternative given below:			7
	i)	are 100-400 bp sec	uences which do not contain any gene.	
		a) SINES	b) Alu sequences	
		c) Both a) and b)	d) LINES	
	ii)	Different forms of a gene that	exist within a population are termed as	
		a) Pairs	b) Alleles	
		c) Hybrids	d) Genotype	
	iii)	inheritance is contro	olled by non nuclear genomes.	
		a) Maternal	b) Chromosomal	
		c) Cytoplasmic	d) All of the above	
	iv)	Balbiani rings are found in	Chromosomes.	
		a) Polytene	b) Lampbrush	
		c) Cytoplasmic	d) Heterozygous	
	v)	occurs in two patte	erns; specialized and generalized.	
		a) Conjugation	b) Transformation	
		c) Transduction	d) All of the above	

SL	R-MM	<b>-74</b>	1 100 100 100 100 100 100 100 100 100 1	
	vi)	LINES and SINES are the nonvi	ral retrotransposons found in	
		a) Invertebrates	b) Protozoa	
		c) Bacteria	d) Vertebrates	
	vii)	The ABO blood group type lo and dominance.	cus in human beings is an example of	
		a) Multiple alleles	b) Co-dominance	
		c) Recessive	d) Seggregation	
	B) De	efine the following terms:		7
	i)	Allele		
	ii)	Conjugation		
	iii)	Genetic polymorphism		
	iv)	C-value paradox		
	v)	Genetic Linkage		
	vi)	Transposons		
	vii)	Aneuploidy.		
		SEC	TION – II	
2.	Desc	ribe the methods of gene transfe	r techniques.	14
3.	What	are chromosomal aberrations?	Comment on its types.	14
4.	Expla	in why Mendel used pea plant as	s an experimental material.	14
5.	Answ	er <b>any two</b> of the following :		14
	i) W	hat is the significance of study o	f population genetics ?	
	ii) W	rite a note on the SINES and its	relationship with Alu sequences.	
	iii) W	hat is gene mapping ? Explain.		
6.	Write	short notes on <b>any two</b> of the fo	llowing:	14
	i) D	escribe in detail microsateallites	and minisatellites.	
	ii) La	ampbrush chromosome.		
	iii) Te	est cross.		



Seat	
No.	

#### M.Sc. (Part – I) (Semester – I) Examination, 2015 BIOTECHNOLOGY (CBCS)

Paper – IV: Biostatistics and Bioinformatics (New)

Day and Date : Monday, 23-11-2015 Total Marks : 70 Time : 10.30 a.m. to 1.00 p.m.

*Instructions*: 1) Part – I, Question 1 is compulsory.

- 2) Attempt any four questions from Part II.
- 3) Figures to the right indicate full marks.
- 4) Answers to the Part I and Part II are to be written in same answer booklet only.

			PA	NRT – I		
1. A	. A) Rewrite the sentence after choosing the correct answer from the given alternatives.				7	
	1)	) is on	e of the nucleot	ide database.		
	,			c) PMC	d) RCSB	
	2	) The structural da	atabase of prote	ein is		
	•		-	c) Blocks	d) PDB	
	3	) FASTA was deve	eloped by			
		a) Needleman ar	nd Wunch	b) Smith and Wa	aterman	
		c) Lipman and P	earson	d) None		
	4	)is on	e of the homolo	gy modeling tool		
				c) Swiss model		
	5)	) Statistical results	s are			
		a) absolutely tru	е	b) not true		
		c) true on averag	ge	d) universally tru	ue	
	6	) Frequency of the	e variable is alw	ays		
	•	a) in percentage	b) a fraction	c) an integer	d) none	
	7	)is no	ot a measure of	central tendency		
	,			c) median		

	B) Definitions:		7
	1) Transcriptomics		
	2) Alignment		
	3) Molecular dynamics		
	4) Biostatistics		
	5) Variable		
	6) Median		
	7) Chi square test.		
		PART – II	
Ar	swer <b>any four</b> of the following	<b>j</b> :	
2.	Define bioinformatics. Add a	note on its importance.	14
3.	Add a note on types of protein	n databases.	14
4.	Write a note on regression an	d correlation.	14
5.	Answer any two:		14
	a) Write a note on multiple se	equence alignment.	
	b) Add a note on phylogenetic	cs analysis softwares.	
	c) Represent the following da	ata by means of Pie-diagran	٦.
	Name of College	No. of Students	
	Engineering	440	
	Arts	220	
	Agriculture	120	
	Home Science	80	
	Fine Arts	60	
6.	Write short notes on any two	):	14
	a) Protein structure prediction	on	
	b) Advantages and disadvar	-	
	c) Applications of sampling t	echniques.	

**SLR-MM - 75** 



Seat	
No.	

#### M.Sc. Biotechnology (Part – I) (Semester – II) (CGPA) Examination, 2015 Paper – III: MOLECULAR CELL PROCESSING

	Paper –	III: MOLECULAR	CELL PROCE	SSING	
-	Date : Saturday, 2 .30 a.m. to 1.00			Total Marks : 7	70
In	2) 3)	Part – I, question 1 Attempt any four question figures to the right Answers to the Part same answer bookl	uestions from Par indicate <b>full</b> mark t – <b>I</b> and Part – <b>II</b> a	KS.	
		PART -	- I		
-	ewrite the senter ternatives :	nce after choosing the	e correct answer f	rom the given	7
1)	The amino acid structure of the a) Primary	•	eptide chain comp c) Tertiary		
2)	The common do a) Thymine din c) Guanine dim		luring DNA damag b) Adenine din d) Uracil dime	ner	
3)	Transcription to a) Rho-depend c) Sigma facto		b) Rho-indeperd) Both a and b		
4)	In eukaryotic ce a) Pol $\delta$	ells the lagging stran b) Pol $\epsilon$	· _ · .	d by d) Pol\$	
5)		unit act as a clamp			
	a) β	b) α	c) θ	d) τ	
6)	a) tRNA	A required for proteir b) mRNA	-	d) All of these	
7)	The peptide cha	ain grows on	site.		
	a) A	b) P	c) E	d) G	
				P.T	.O

	B) Definitions:	7
	1) Foot printing	
	2) Ubiquitination	
	3) RNA Editing	
	4) Aminoacyl tRNA synthetase	
	5) Holiday Model	
	6) SOS repair	
	7) Klenow fragment.	
	PART – II	
An	swer <b>any four</b> of the following :	
2.	What are ribosomes? Explain the process of translation in prokaryote with a neat labeled diagram.	14
3.	Explain the nucleotide excision and mismatch DNA repair mechanisms with neat labeled diagram.	14
4.	Describe the structure, assembly and function of each subunit of DNA pol III with neat labeled diagram.	14
5.	Explain the post translation modifications with examples.	14
6.	Answer any two from the following:	14
	a) Write a note on post transcription modification of eukaryotic mRNA.	
	b) Add a note on recombination process.	
	c) Write a note on different RNA polymerases.	
7.	Write short notes on (any two):	14
	a) Enzymes involved in DNA replication.	
	b) Genetic code.	
	c) rRNA.	
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**SLR-MM - 82** 



Seat	
No.	

	I	•	t – I) (Semeste BIOTE – IV : Immuno	ECHŃOLOGY	Ý	·	
-		ate : Tuesd 30 a.m. to 1	ay, 24-11-2015 .00 p.m.			Max. Marks	: 70
ı	Ins	tructions :	<ol> <li>All questions</li> <li>Answer any fo</li> <li>All questions</li> <li>Draw neat and</li> </ol>	<b>our</b> questions fi carry <b>equal</b> ma	rom Section <b>II</b> . arks.		
			SI	ECTION – I			
1. A)		ewrite the follow:	lowing sentences	by choosing th	e correct alter	native given	7
	i)		_ proteins are pre	esent on surface	sent on surface of T helper cells.		
		a) CD4	b) CD8	c) CD12	d) None	of these	
	ii)		immune response type of antibodies		ed by the prod	uction of	
		a) IgM	b) IgD	c) IgG	d) IgA		
	iii)	Antibodies	labeled with enzy	mes are used ir	n te	est.	
		a) Immuno	fluorescence	b) ELISA			
		c) Compler	nent fixation	d) Agglutina	ition		
	iv)		munization is done	•			
		a) vaccines	3	b) toxoids			
		c) immune	sera	d) toxins			
	v)	The antige	ns involved in the	rejection of grat	ft are called		
		a) Autoanti		b) Heteroph	ile antigens		
		c) MHC an	tigen	d) Proantige	en		

SLR-MM – 83

	vi)	The transfer of graft in individuals belongs to same species is called				
	vii)	, , , , , , , , , , , , , , , , , , , ,	•	) none of these		
		a) Histamine b) Pros	taglandins			
		c) Leukotrienes d) Plate	elet activati	ng factor		
	B) De	efine the following terms :			7	
	i)	Antibody				
	ii)	Anaphylaxis				
	•	Agglutination				
	•	Cytokines				
		Hapten				
	,	Antigenicity				
	VII)	Autoimmunity.				
		SECTION - I	I			
Ar	nswer <b>a</b>	any four :				
2.	Write	an account on mechanism of autoimmur	nity.		14	
3.	Write	an account mechanism of B cell mediate	ed immunity	y.	14	
4.		structural, morphological, cultural, life cy rynebacterium diphtheriae.	cle and pat	thogenecity characters	14	
5.	Expla	in mechanism of classical complement p	athway.		14	
6.	a) W	rite a note on MHC Class I molecule. rite a note on mechanism of atopy. rite note on immunofluorescence.			14	
7.	a) W	ver <b>any two</b> of the following: rite short note on structure of antibody. rite note on chemical barriers of defence rite brief account on role of immunity in tr			14	



Seat	
No.	

#### M.Sc. (Part – II) (Semester – III) Examination, 2015 BIOTECHNOLOGY (C.G.P.A.) Paper – I : Advanced Analytical Techniques

Day and Date: Monday, 16-11-2015 Max. Marks: 70

Time: 2.30 p.m. to 5.00 p.m.

- **N.B.**: 1) Section I is compulsory.
  - 2) From Section II attempt any four.
  - 3) All questions carry equal marks.
  - 4) Figures to right indicate full marks.
  - 5) Draw neat and labelled diagram.

SECTION	I <b>–</b> I
A) Complete the sentences by selecting co	rrect answer from given alternatives : <b>7</b>
<ul> <li>i) The highest frequency of electroma field.</li> </ul>	gnetic spectrum lies in the
a) Cosmic rays b) Gamma rays	c) X-rays d) UV rays
<ul><li>ii) The discovery of the structure of availability of data from</li></ul>	the DNA was possible due to the
a) CD and ORD	b) X-ray crystallography
c) IR spectrum	d) Visible spectrum
iii) The sedimentation coefficient S is id	dentified by the name of
a) Sorenson b) Svedberg	c) Sutton d) Stern
iv) In type of chromatogra based on charge.	phy the separation of biomolecules is
a) HPLC	b) GC-MS
c) Ion exchange	d) Electrophoresis
<ul><li>v) The separation of proteins in 2D-PA0 followed by SDS-PAGE.</li></ul>	GE involves the technique of
a) Denaturation	b) Renaturation
<ul><li>c) Isoelectric focusing</li></ul>	d) Migration

**SLR-MM – 84** vi) Gamma radiations have \_\_\_\_\_ nature. a) Particle b) Wave c) Photon d) Electron vii) The lenses in an electron microscope are made of \_\_\_ a) Glass b) Metal c) Electromagnet d) Magnet B) Define the following: 7 i) Specific activity. ii) Fluorimetry. iii) Biosensor. iv) Radioactive dosimetry. v) Focal length. vi) Photon. vii) Chromatofocusing. SECTION - II Attempt any four: 2. State the principle, working, instrumentation and applications of NMR. 14 3. Define half life of a radioisotope and explain what role does it play in the study of 14 radio tracer techniques. 4. What are the different types of electrophoresis used in the determination of proteins? 14 5. State the principle, working and applications of Affinity chromatography. 14 6. Write short notes on (any two): 14 A) Types of rotors of a centrifuge. B) Gel filtration chromatography. C) Western Blotting. 7. Answer any two: 14 A) Liquid scintillation counter. B) Turbidometry. C) Clarks oxygen electrode.



Seat	
No.	

# M.Sc. (Part – II) (Semester – III) Examination, 2015 (C.G.P.A.) BIOTECHNOLOGY Fermentation Technology (Paper– II)

Day and Date: Wednesday, 18-11-2015 Max. Marks: 70

Time: 2.30 p.m. to 5.00 p.m.

Instructions: 1) All questions of Section I are compulsory.

- 2) Answer any four questions from Section II.
- 3) All questions carry equal marks.
- 4) Draw neat and labelled diagrams wherever necessary.

	SECTION	DN-I
1. A	Rewrite the following sentences by chelow.	noosing the correct alternative given
	1) In a bioreactor baffles are incorpor	rated
	A) Prevent vortex and to improve	aeration efficiency
	B) Maintain uniform suspension	cell
	C) Minimise the size of air bubble	for get aeration
	D) Maintain uniform nutrient medi	um
	2) The large scale fermentation proc	ess air is sterilized by
	A) Jute fiber	B) Membrane
	C) Cotton fiber	D) Glass wool fiber
	3) Gas bubbles the den	sity of the fluid.
	A) Increase	B) Decrease
	C) First decrease than increase	D) None of the above
	4) Corn steep liquor is the product of	
	A) Corn Starch	B) Sucrose
	C) Dairy industry	D) None of these



	5)	Physical component of the biosenso	or c	ontains	
		A) Processor	B)	Analyte	
		C) Enzyme	D)	Active surface	
	6)	is the following non med	hai	nical method for cell disruption.	
		A) Thermolysis	B)	Impingement	
		C) Ultrasonication	D)	Milling	
	7)	Industrial production of citric acid re	qui	res	
		A) Oxygen sugars and Saccharom	усє	es cerevisiae	
		B) Oxygen sugars and Escherichia	a co	li	
		C) Oxygen sugars and Aspergillus	nig	er	
		D) Oxygen sugars and Acetobacte	<i>r</i> su	boxydane	
	B) De	fine the following terms :			7
	1)	Baffles			
	2)	Ion exchange resin			
	3)	Crude media			
	4)	Ultrafiltration			
	5)	Effluent treatment			
	Í	Fermentor			
	7)	Growth kinetics.			
		SECTION	<b>V</b> –	II	
An	swer <b>a</b>	iny four.			
2.		ibe production of primary and secon organisms.	dar	y metabolites from	14
		-			
3.	Give a	an account on product recovery by u	sin	g centrifugation.	14
4.	Give a	an account on raw materials used for	fer	mentation media.	14
5.	Give a	an account on Fed batch culture cult	ivat	ion systems.	14



6.	Answer <b>any two</b> of the following.	14
	a) Write an short note on biosensors.	
	b) Write an short note on methods and instruments used in fermentation gas analysis.	
	c) Give an account on methods of enzyme immobilization.	
7.	Answer any two of the following:	14
	a) Short note on ideal characteristics of fermentor	
	b) Short note on crowded plate technique	
	c) Short note on process validation.	



Seat	
No.	

## M.Sc (Biotechnology) (Part – II) (Semester – III) (CGPA) Examination, 2015 Paper – III: RESEARCH METHODOLOGY AND IPR

Day and Date: Friday, 20-11-2015 Total Marks: 70

Time: 2.30 p.m. to 5.00 p.m.

Instructions: 1) Section – I is compulsory.

- 2) From Section II attempt any four.
- 3) All questions carry equal marks.
- 4) Figures to right indicate full marks.
- 5) **Draw** neat and labeled diagrams.

#### SECTION-I

			SECTIO	– אוי	- 1		
1. A	•	mplete the sentenernatives:	ices by selecting (	corr	ect answer fron	n the given	7
	1)	Patent office pres	ent in India				
		a) Mumbai	b) Chennai	c)	Kolkata	d) All	
	2)		of the following is	not	a type of copyr	ight work.	
		a) Literary works	3	b)	Furniture		
		c) Sculpture		d)	Musical works		
	3)		are geographical i	ndi	cations in India.		
		a) Kolhapuri cha	opal	b)	Solapur Chadd	ar	
		c) Mysore Sanda	al Soap	d)	All of these		
	4)	Sampling theory	nelps us to estima	te_		population.	
		a) Unknown	b) Known	c)	Particular	d) Universal	
	5)	For preparation o	f power point		rule is	used.	
		a) 5 × 5	b) 3 × 3	c)	4 × 4	d) None of these	
	6)	World Intellectual	Property Organiza	ation	n was created in	year.	
		a) 1967	b) 1960	c)	1957	d) 1980	

**SLR-MM-86** 



	<ol><li>When referencing other work you have cited within the text of the report you should</li></ol>	
	a) State the first and the last name of the author	
	b) Use the authors, date citation method	
	c) Use an asterisk and a footnote	
	d) Insert the complete citation in parenthesis	
	B) Define the following:	7
	i) ISSN	
	ii) Sample size	
	iii) Chi square test	
	iv) Regression	
	v) Copyright	
	vi) Geographical indication	
	vii) Qualitative research.	
	SECTION-II	
At	tempt any four :	
2.	Explain in detail the author instructions required for preparing manuscript in IJBT.	14
3.	What is data collection? Explain in detail the different methods of data collection.	14
4.	Explain patenting of biological materials with examples.	14
5.	What is the research problem? Explain in detail the selection of research problem.	14
6.	Answer any two:	14
	a) Write a note on advantages and disadvantages of Plant breeder right.	
	b) Explain types of technology transfer.	
	c) Give a detailed account on review of literature.	
7.	Write short notes on (any two):	14
	a) Industrial designs	
	b) Copyright	
	c) Audio-Visual aids in Presentation.	



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#### M.Sc. – II (Semester – III) (CGPA) Examination, 2015 BIOTECHNOLOGY (Paper – IV) Plant Biotechnology

Day and Date : Monday, 23-11-2015	Max. Marks: 70
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Time: 2.30 p.m. to 5.00 p.m.

Instructions: 1) Section I is compulsory.

- 2) From Section II attempt any four.
- 3) All questions carry equal marks.
- 4) Figures to **right** indicate **full** marks.
- 5) Draw neat and labelled diagrams.

#### SECTION-I

1. /	4) R	ewrite the following sentences by	y using correct alternative :	7
	1)	For protoplast culture	is medium is used.	
		a) Murashig and Skoog	b) Nagata and Takebe	
		c) Larkin	d) White	
	2)	is the variation occ	curs during the plant tissue culture technique.	
		a) Somaclonal variation		
		b) Somatic embryogenesis		
		c) Protoplast culture		
		d) Callus culture		
	3)	is the most comm	nonly used as solidifying agent in media.	
		a) Auxins	b) Agar	
		c) Sodium	d) Antibiotic	
	4)	Transfer of gene in plant cell with technique.	the help of gene gun is known as	
		a) Electroporation	b) Transformation	
		c) Microinjection	d) Biolistic	



Seat	
No.	

#### M.Sc. (Part – II) (Semester – IV) Examination, 2015 BIOTECHNOLOGY (C.G.P.A.) Genetic Engineering (Paper – IV)

Day and Date: Tuesday, 24-11-2015 Total Marks: 70

Time: 2.30 p.m. to 5.00 p.m.

*Instructions*: 1) Part – I, Question 1 is compulsory.

- 2) Attempt any four questions from Part II.
- 3) Figures to the **right** indicate **full** marks.
- 4) Answers to the Part I and Part II are to be written in same answer booklet only.

#### PART-I

	ternatives. ·and _		scientists d	iscov	ered exonuc	clease III.	•
,	a) Skoog, Roger		•		oger, Weiss		
	c) Smith, Skoog			d) W	eiss, Skoog		
ii)	Ligase enzyme w	as first time	e isolated in				
	a) 1926	b) 1946		c) 19	966	d) 1986	
iii)		_cloning ved	ctor has CO	S site	of lambda p	hage.	
	a) Plasmid	b) Phage		c) Pl	nagemid	d) Cosmid	
iv		vector is	used in both	prok	aryotes and	eukaryotes.	
	a) Shuttle vector			b) M	13 vector		
	c) Cosmid vecto	r		d) Pl	nasmid vect	or	
V	Sequencing of	will give	answer to m	nost of	fthe fundam	ental questions.	
	a) DNA	b) RNA		c) Aı	mino acid	d) Proteins	



	vi)	Lac Z gene encodes for	_ e	nzyme.	
		a) Galactisidase	b)	Gluconas	
		c) B-galactosidase	d)	Glucoronidase	
	vii)	In colony hybridization method		memberane is used to	
		blot transfer the colonies from master pl			
		a) DBM paper	•	Whatsman filter paper	
		c) Nitrocellulose paper	d)	All of these	
	B) De	efine :			7
	a)	Microarray			
	•	DNA Sequencing			
	•	Western Blotting			
	•	Electroporation			
	•	Restriction Enzymes Microinjection			
	•	DNA Chips.			
	9/	2.0.10.mps.			
		PART – II			
An	ıswer <b>a</b>	any four of the following :			
2.	Expla	in in detail the DNA joining enzymes.			14
3.	Give	details of DNA manipulating enzymes.			14
4.	Discu	ss in detail DNA blotting technique.			14
5.	Expla	in in detail Endonucleases used in geneti	c er	ngineering.	14
6.	Answ	er any two of the following:			14
	a) W	rite a short note on Baculovirus as expre	essi	on vector.	
	b) De	escribe DNA transfer method with respec	t to	Microinjection.	
	•	rite note on transgenic animals.		•	
7	•	•			14
7.		short notes on (any two):			14
		netically engineered biotherapeutics.			
	-	ppharming			
	c) co	lony hybridization.			