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#### B.Sc. – I (Biotechnology) (Semester – I) (CBCS Pattern) Examination, 2018 ENGLISH COMPULSORY Golden Petals

•	d Date : Mond 2.30 p.m. to 5.	ay, 29-10-2018 00 p.m.			Max. Marks: 70
		1) <b>All</b> questions are 2) Figures to the <b>rig</b>	-	-	rks.
1. Fill	in the blanks o	hoosing the correct a	answer	from the alte	ernatives given below. 14
1)	Charlie Chapl	in was born in			
	a) London		b)	Paris	
	c) Scotland		d)	America	
2)	Charlie Chapl	in did his first film wi	th	cor	npany.
	a) FOX		b)	20th century	1
	c) Sony		d)	Keystone	
3)	Shanti Tigga	was the mother of $\_$		childre	en.
	a) one	b) three	c)	two	d) five
4)	During the tra handling		impres	sed the inst	ructor with her skill in
	a) gun	b) sword	c)	rifle	d) AK-47
5)	Shanti Tigga j	oined army at the aç	ge of _		
	a) 25	b) 27	c)	35	d) 37
6)	\	was Charlie Chaplin'	s midd	le name.	
	a) William		b)	Spencer	
	c) John		d)	Albert	
7)		was the father of Na	achiket	a.	
	a) Vajasrawa	as	b)	Vijayaraj	
	c) Vijayakam	nal	d)	Vijay	

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8)	Nachiketa decided to meet the god of	f	
	a) Water	b) Fire	
	c) Death	d) Air	
9)	The theme of the poem 'I Find No Pe	ace' is	
	a) Peace	b) Love	
	c) Hateful nature	d) Beauty	
10)	The poem 'Success is counted sweet	est' is written by	
	a) Emily Dickenson	b) John Dickenson	
	c) John Milton	d) John Abraham	
11)	A reporter from was as first film.	ssigned to write a review of Charlie's	
	a) Washington	b) London	
	c) New York	d) Paris	
12)	Ranjit $\underline{\text{wrote}}$ a story; the underlined w	ord 'wrote' is	
	a) verb	b) adverb	
	c) adjective	d) pronoun	
13)	She had written all answers in her bo is	ok. The tense of this given sentence	
	a) Present perfect tense	b) Past perfect tense	
	c) Past tense	d) Past continuous tense	
14)	Rani is going to her village to attend t	he village	
	a) Fair	b) Fare	
	c) Fairie	d) Fer	
An	swer any four of the following questio	ns in brief :	16
1)	Describe the get up of Charlie Chapli	n.	
2)	How did Charlie Chaplin get his first r	ole in films ?	
3)	Describe the character of Shanti Tigg	a.	
4)	What did Shanti Tigga's relative feel a	after her death ?	
5)	Why did Nachiketa feel troubled?		
6)	What did Nachiketa hope to achieve to	from his journey?	



3. Answer any two of the following	3.	Answer	any	two	of the	following	
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- 1) Describe the theme of the poem 'I Find No Peace'.
- 2) Comment on the use of contrast in the poem 'Success is counted sweetest'.
- 3) Write in detail what is communication.
- 4) State the possible causes when you missed a lecture because you did not know that the lecture was scheduled at that particular time.

#### 4. Answer any one of the following:

14

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- 1) Explain where and why e-mail, video calls, mobile phones, radio and movie these channels of communication are used in particular communication.
- 2) Why do you think we need language and vocabulary?
- 5. What is the difference between one way and two way communication? Write in detail.

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### B.Sc. – I (Semester – I) (CBCS) Examination, 2018 BIOTECHNOLÓGY **Ecology and Microbiology**

		Paper – I : E	C	ology			
-	d Date : Tuesday, 30-1 10.30 a.m. to 1.00 p.m.					Max. Marks :	70
	write the sentence usin Ecology is study of a) Only living things b) Only non living thin c) Both living and non d) Living things and ne	gs living things				een them	14
2)	beneficial. a) Commensalism c) Protocooperation	k	0)	rspecific interac Mutualism Social parasitis		that is strongly	
3)	Environment is a) German b)	word.	c)	Latin	d)	Spanish	
4)	Lightning occurs in a) Troposphere b)			Mesosphere	d)	Ionospheres	
5)	The state of India with ra) Rajasthan c) Bihar	k	0)	age of its area co Karnataka Madhya Prades		ed by forest is	
6)	The term ecosystem wa) Carl Mobius b)			E.Odum	d)	E.Clement	
7)	The final stable comm a) Final community c) Climax community						
8)	The consumers feed of a) Producer c) Secondary consum	·	၁)	called as Primary consur Carnivores	ner		
9)	The environmental day a) 12 March b)	•	c)	10 May	d)	4 Jan	
10)	Crop plant ecosystem a) Natural b)		-	pe of ecosysten Marine		Limnic	

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#### B.Sc. – I (Semester – I) Biotechnology (CBCS) Examination, 2018 ECOLOGY AND MICROBIOLOGY Paper – II: Microbiology

Day ar	nd Date: Wednesday, 31-10-2018	Max. Marks: 70
Time :	10.30 a.m. to 1.00 p.m.	
Ins	structions: 1) <b>All</b> questions are <b>c</b> o 2) Figures to the <b>right</b> 3) Draw <b>neat</b> labeled	
1. Re	ewrite the sentences by choosing th	ne correct alternative given below: 14
1)	microbes have ability a) Viruses c) Rickettsia	to survive in extreme environmental habitat. b) Archaebacteria d) Mycoplasma
2)	M-ring of flagellum present in a) periplasmic space c) peptidoglycan layer	b) cell membrane
3)	Pilus is made up of  a) lipopolysaccharide c) pilin	<ul><li>b) carbohydrate</li><li>d) fagellin</li></ul>
4)	Parrot disease is caused bya) Rickettsia c) Mycoplasma	b) Chlamydia d) Actinomycetes
5)	Tobacco mosaic virus shows a) complex c) icosahedral	type of morphology. b) enveloped d) helical
6)	Bacterial ribosomes are ofa) 80 S b) 70 S	types. c) 60 S d) 40 S
7)	microbes show characters a) Actinomycetes c) Archaebacteria	s similar to bacteria and viruses. b) Rickettsia d) Mycoplasma

8)	Crystallization of vi a) Beijerinck c) Loeffler	ruses was invente	b)	oy Ivanovski Stanley	_•		
9)	Cell wall of Gram na) 90	egative bacteria o b) 60		tains 30			glycan.
10)	Chlorophycophyta a) Brown	is also known as <sub>.</sub> b) Red			d)	Golden	
11)	'Swan necked flask a) Louis Pasteur c) Edward Jenner		b)	scientist Robert Koch Joseph Lister		·	
12)	Chitin containing coa) Viruses				d)	Protozoa	
13)	Father of Medical Na) Pasteur				d)	Hock	
14)	Algae area) Chemoautotroph		b)	Chemohetero Photochemot		-	
2. A)	Answer any four of 1) Sewage 2) Protozoa 3) Bacterial Endos 4) Geomicrobiolog 5) Alexander Flem	pore y					(4×2=8)
B)	Write short note on 1) Arrangement of 2) Cell membrane 3) Mesosomes.		ollo	wing :			(3×2=6)
3. A)	Answer <b>any two</b> of  1) Write in detail co  2) Explain in detail example.  3) Explain difference	ontribution of Loui ail size, shape	and	d arrangeme	nt (	of bacteria	<b>(4×2=8)</b> with

- 1) Write in details general characteristics, classification and cultivation of algae.
- 2) Describe in detail structure and function of bacterial ribosome.
- 4. A) Answer any two of the following:

B) Answer **any one** of the following:

 $(5 \times 2 = 10)$ 

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 $(6 \times 1 = 6)$ 

- 1) Explain difference between prokaryotic cell and eukaryotic cell.
- 2) Write in detail different branches of microbiology.
- 3) Write in detail contribution of Robert Hook and Winogradsky in the microbiology.
- B) Answer any one of the following:

 $(4 \times 1 = 4)$ 

- 1) Write in detail general characteristics of Mycoplasma.
- 2) Explain difference between capsule and slime layer.
- 5. Answer any two of the following:

 $(7 \times 2 = 14)$ 

- 1) Describe in detail distribution, beneficial and harmful activities of Microbes.
- 2) Write an essay on structure and functions of bacterial cell wall.
- 3) Explain in detail general characteristics of Rickettsia.



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## B.Sc. I Semester – I Biotechnology (CBCS) Examination, 2018 INTRODUCTION TO BIOSCIENCES Paper – I: Animal Sciences

	Paper – I : Anir		
•	d Date : Thursday, 1-11-2018 10.30 a.m. to 1.00 p.m.		Max. Marks: 70
1	Instructions : 1) All questions are co 2) Figures to the right 3) Draw neat labelled	inc	
1. Re	write the following sentences by choo	sin	g the correct alternative : 14
1)	used in deep sea fisher	ry.	
	a) Trawlers	b)	Fishing Net
	c) Mechanized nets	d)	Aquarium
2)	Artificial cultivation of fishes is known	n as	8
	a) Sericulture	b)	Apiculture
	c) Pisciculture	d)	Lact culture
3)	Brain originates from		
	a) Mesoderm	b)	Endoderm
	c) Ectoderm	d)	Ecto-mesoderm
4)	In mammals, Ureter opens into		
	a) Vestibule	b)	Urethea
	c) Urinary bladder	d)	Uterus
5)	Structural and functional unit of testi	S	
	a) Seminiferous Tubule	b)	Uriniferous Tubule
	c) Sarcomere	d)	Haversian System
6)	Rearing of earthworm for production	of	vermicompost is called
	a) Apiculture	b)	Vermiculture
	c) Sericulture	d)	Aquaculture

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7)	ADH is also known as		
	a) Stress hormone	b)	Dark hormone
	c) Vasopressin	d)	ANF
8)	Paludrine drug is used to treat		
	a) Malaria	b)	Amoebic dysentery
	c) Schistosomiasis	d)	Ascariasis
9)	Common name of Ascaris lumbricoid	des	
	a) Roundworm b) Hookworm	c)	Whipworm d) Threadworm
10)	Osmoregulation is carried out by		
	a) Insulin b) FSH	c)	ACTH d) ADH
11)	Role of leydig cells is		
	a) Nourishment of sperm		
	b) Maturation of Egg		
	c) Synthesis of testosterone hormon	e	
	d) Undergo Oogenesis		
12)	is causative agent of N	Mal	aria.
	a) <i>Taenia solium</i>	b)	Plasmodium vivax
	c) Entamoeba histolytica	d)	Fasciola hepatica
13)	Taenia solium is belongs to		_ phylum.
	a) Platyhelminthes	b)	Nemathelminthes
	c) Coelenterata	d)	Taeniidae
14)	is also known as ro	ck l	pee.
	a) Apis dorsata	b)	Apis indica
	c) Apis mellifera	d)	Apis florae
A)	Define and explain any four of the fo	llov	ving:
	1) Define and explain Mimicay.		
	2) Define and explain Honeybee com	nb.	
	3) Explain Adenohypopysis.		
	4) Define Sericulture and explain imp	ort	ance of sericulture.
	5) Define aniculture and explain its ty	/ne	S

	<ul> <li>B) Write short note on any two of the following:</li> <li>1) Describe in short importance of Vermicompost.</li> <li>2) Write a detailed note on Spinal cord.</li> <li>3) Explain Courtship behavior in birds.</li> </ul>	6
3.	<ol> <li>A) Answer any two of the following:</li> <li>Explain construction and maintains of Glass Aquarium.</li> <li>Explain life cycle of tapeworm.</li> <li>Write a brief note on connective tissue.</li> </ol>	8
	<ul><li>B) Answer any one of the following:</li><li>1) Add a detail note on parasite and host interaction.</li><li>2) Explain in detail functions of Muscular tissue.</li></ul>	6
4.	<ol> <li>A) Answer any two of the following:</li> <li>Write in brief about salivary gland.</li> <li>Describe life cycle, types and economic importance of Honey bee</li> <li>Write a note on Camouflage with suitable example.</li> </ol>	<b>10</b>
	<ul><li>B) Answer any one of the following:</li><li>1) Write a brief note on Nauptial flight and communication.</li><li>2) Define Vermiwash and explain its economic importance.</li></ul>	4
5.	<ol> <li>Answer any two of the following:</li> <li>Describe life cycle of Schistosoma.</li> <li>Describe in detail structure and function of Salivary Gland.</li> <li>Give the location, structure and function of Simple Epithelial Tissue.</li> </ol>	14



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### B.Sc. – I Biotechnology (Semester – I) (CBCS) Examination, 2018 INTRODUCTION TO BIOSCIENCES Paper – II : Plant Sciences

-	nd Date : Friday, 2-11-2018 10.30 a.m. to 1.00 p.m.			Max. Marks :	70
1. Mı	ultiple choice questions :				14
1)	is type of lichen where the leaf like.	nallus is flat, horizon	tally	spreading and	
	A) Crustose B) Foliose	C) Fruticose	D)	Filamentous	
2)	tissues are present only tips.	at growing regions	of	shoot and root	
		C) Meristematic	D)	Vascular	
3)	After fertilization the zygote of a set A) Fruit B) Embryo	eed plant becomes C) Seed	D)	Ovule	
4)	Algae having oil as reserve food bo A) Xanthophyceae C) Chlorophyceae	elongs to B) Rhodophyceae D) Pheophyceae	е		
5)	Presence of casparian strips is cha A) Endodermis B) Exodermis	aracteristic feature of C) Epdermis		Pericycle	
6)	A simple mechanical tissue devoid A) Parenchyma C) Collenchyma	I of lignin is B) Sclerenchyma D) Cholerenchym			
7)	Which of the following give rise to A) Phellogen B) Periblem	the cork tissue ? C) Periderm	D)	Phelloderm	
8)	The exine of pollen grain is made of A) Pectin B) Cellulose	of C) Sporopollenin	D)	Lignocellulose	
9)	Pollination which occurs in closed A) Allogamy B) Cleistogamy	flower is known as  / C) Autogamy	D)	Hydridism	
10)	Overy wall gives rise to  A) Fruit wall  B) Seed coat	C) Mesocarp	D)	Endocarp	
11)	Development of fruits without fertili  A) Apospory  B) Allospory		/ D)	Polygamy	
12)	Tunica corpus theory is related wit A) Root apex C) Shoot apex	h B) Root cap D) Secondary gro	wth	1	

4. A) Answer the following (any two):

Write a note on normal secondary growth and annual rings.
Explain development of male gametophyte.
Describe types and functions of complex tissues.

B) Answer the following (any one).

Write a note on origin of food crops.
Explain histogen theory of structural development.

5. Answer the following (any two):

Write a note on internal organization of dicot stem.
Explain types of pollination with advantages of each type.
Give the morphological characters of algae.

14

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### B.Sc. – I (Semester – I) (CBCS) Examination, 2018 BIOTECHNOLOGY

#### Fundamentals of Chemistry and Biophysics Paper – I : Chemical Sciences

	•	арс с				
•	d Date : Saturday, 0.30 a.m. to 1.00					Max. Marks: 70
	2)	<b>All</b> questions are Use of log tables. Figures to the <b>rig</b>	/ca	lculators is <b>allo</b> t		
1. Sele	ect the most correct	alternative from th	e fo	llowing and rew	rite	the sentences. 14
1)	a) min <sup>2</sup> is unit of	rate constant for t b) S <sup>-1</sup>	first c)	order reaction. S		min
2)	NaCl containsa) covalent	bond. b) metallic	c)	ionic	d)	hydrogen
3)	In sp <sup>2</sup> hybridizational 120°		c)	109°	d)	180°
4)	is univer	sal solvent. b) Acetone	c)	Water	d)	Ester
5)	Positive Catalyst i a) decreases	s the r b) increases			d)	reduced
6)	orbita a) s	has square shape b) p		d	d)	f
7)	a) Atomic weight c) Atomic mass n		b)	and Acidity/Ba Molecular weig Equivalent wei	jht	
8)	a) Cl <sub>2</sub> is polar	molecule. b) Br	c)	HCI	d)	H <sub>2</sub>
9)	A + B = P is a) unimolecular c) tetramolecular		b)	bimolecular none of these		_

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	10)	Range of pH is				
		a) 0 – 14	b) 1 – 14	c) 14	d) above 14	
	11)	Molecularity of rea	ction never be			
		a) zero	b) 3/2	c) 2	d) 3	
	12)	is exam	ple of colligative p	oroperty.		
		a) mass		b) volume		
		c) osmotic pressu		d) pressure		
	13)	Molality is		a) \//\/	٠, ١/٨٨/	
	4.4	a) W/V	•	•	d) V/W	
	14)	pH value depends a) H <sup>+</sup>	on ion b) OH <sup>-</sup>	с) СI <sup>-</sup>	d) Br <sup>-</sup>	
		a) 11	b) OH	c) Ci	u) bi	
2.	A) /	Answer <b>any four</b> o	f the following.			8
		1) Give any two g	eneral characteris	stics of ionic solids.		
		2) What is catalys	t ? Give one exan	nple.		
		3) Define pH and	рОН.			
		4) Define bond lea	ngth and bond and	gle.		
		5) Prepared 0.25	N (100 ml) KCI sol	lution.		
	В) \	Write notes on <b>any</b>	two of the followi	ng.		6
		1) Dipole moment	1.			
		2) Catalysis.				
		3) Common ion e	ffect.			
3	A) /	Answer <b>any two</b> of	the following			8
0.	, , ,	1) Explain VBT po	_			
		2) Define-Normali		lity and nom		
		<ul><li>3) Explain factors</li></ul>				
	D)			Jinty .		6
	D) /	Answer <b>any one</b> of	trie following.			6

osmosis.

1) What is osmotic pressure ? Explain concept of osmosis and reverse

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#### B.Sc. I (Semester – I) (Biotechnology) (CBCS Pattern) Examination, 2018 Fundamentals of Chemistry and Biophysics BIOPHYSICS (Paper – II)

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-	d Date : Monday, 12-11-2018 0.30 a.m. to 1.00 p.m.		Max. Marks : 70
1. Mul	tiple Choice Questions.		14
1)	The matter which remains in its defo	rm	ed condition is called
	a) Rubber	b)	Paper
	c) Plastic material	d)	None of these
2)	The cgs unit of stress is		
	a) dyne/cm <sup>2</sup> b) cm <sup>2</sup> /dyne	c)	$\Delta I/\Delta L$ d) n/s
3)	Hook's law is		
	a) Stress $\alpha$ strain	b)	Stress $\alpha$ 1/strain
	c) Strain/Stress	d)	All of the above
4)	The substance is highly soluble in a	liq	uid then the surface tension of liquid
	a) Increases	b)	Decreases
	c) Does not change	d)	Either decrease or increase
5)	The actual path taken by the particle	e of	fluid is
	a) Streamline	b)	Parallel
	c) Randomly	d)	Interrupted
6)	The tangential force opposing the relayers is	ela	tive motion between the adjacent
	a) Magnetic force	b)	Mechanical force
	c) Viscous force	d)	Force of attraction
7)	SI units of viscocity		
	a) Newton.second/m <sup>2</sup>	b)	m/s
	c) N/sec <sup>2</sup>	d)	s/m
8)	The force of attraction between mole	ecu	lles of different substances is
	a) Attraction force	b)	Collision force
	c) Electronic force	d)	Adhesive force P.T.O.

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9)	Molecular range of solids and liquids	s, it is the order of		
	a) $10^{-2}$ b) $10^{-9}$	c) 10 <sup>-7</sup>	d) $10^{-6}$	
10)	For propagation of mat	erial medium is re	quired.	
	a) Mechanical waves	b) $\alpha$ -rays		
	c) Light waves	d) X-rays		
11)	Surface tension of liquids	_ with rise in temp	erature.	
	a) Increases	b) May increases	or decreases	
	c) Decreases	d) Does not chan	ge	
12)	Electromagnetic waves are waves when a standard and a standard and a standard are standard are standard and a standard are stan	nich can travel thro	ugh the	
	of outer space.	h) Propouro		
	a) Vacuum	b) Pressure	_	
10\	c) Vacuum and pressure	•		
13)	Ultrasonic wave is a sound wave tra	_		
4.4	a) 20 hz b) 20 khz	•	d) 2 hz	
14)	Reflection is the of a w different media.	avefront at an inte	erface between two	
	a) Equal in direction	b) Same direction	1	
	c) Change in direction	d) Parallel in direct	ction	
A) A	Answer the following (any four).			8
	1) Define Young's modulus.			
	2) What do you mean by Hooks law	?		
	3) What is meant by Surface Tension	on and Surface En	ergy?	
	4) State the principle of superposition	on of waves.		
	5) What is meant by ultrasonic and	infrasonic waves?		
В) \	Write a note on <b>(any two)</b> .			6
	1) Elasticity			
	2) Nicol prism			
	3) Applications of laser.			

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3.	A) A	Answer the following.		8
		1) Explain the term stress strain	curve	
		<ol><li>Give an explanation on Effect of liquids.</li></ol>	of temperature and pressure on	viscosity
		3) Explain the terms :		
		a) Streamline		
		b) Turbulent Flow.		
	B) A	Answer the following (any one).		6
		1) With a neat diagram explain v	working of Veturimeter.	
		2) Define capillary action. What	are the applications of capillary a	action ?
4.	A) A	Answer the following (any two).		10
		1) Discuss the factors affecting	surface tension.	
		2) What are transverse and I characteristics.	ongitudinal waves ? State an	ıy three
		3) Define beat and explain any t	hree applications of beat.	
	B) <i>A</i>	Answer the following (any one).		4
		1) Explain any two applications	of ultrasonic waves.	
		2) Explain the terms reflection a	nd refraction.	
5.	Ans	swer the following (any two).		14
	1) E	Explain the working of Pitot's tube	<b>;</b> .	

2) Describe Jaegers method for measurement of Surface tension.

3) With a neat diagram explain working of Helium-Neon Laser.

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# B.Sc. I (Biotechnology) (Semester – I) (CBCS) Examination, 2018 CELL BIOLOGY AND BIOSTATISTICS Paper – I: Cell Biology

	Paper – I. C	ell blology	
Day and Date: Tuesday Time: 10.30 a.m. to 1.0			Total Marks : 70
ŕ	) <b>All</b> questions are ) Draw <b>neat</b> and lal	<b>compulsory</b> . beled diagram <b>wher</b> d	ever necessary.
,	) Figures to <b>right</b> in	•	Ž
1. Rewrite the following	g sentences by usi	ng <b>correct</b> alternativ	e. <b>14</b>
1) Mitochondria ar	e known as	of the cell.	
a) Protein facto	ory	b) Suicide bags	3
c) Heart		d) Power house	e
2)	_ play important role	e in apoptosis.	
a) Caspases	b) Pectinase	c) Nuclease	d) Ribonuclease
3)	genes responsib	le for causing cance	r.
a) Proto-oncog	enes	b) Oncogenes	
c) Tumor supp	ressor	d) Luxury gene	S
4) In prokaryotes,	initiation codon AU0	G codes for	
a) Valine		b) Methionine	
c) Formylated I	Methionine	d) Methylated N	Methionine
5) Microtubules are	e polymer of		
a) Tubulin dime	er	b) Globular acti	in
c) Keratin		d) Lamin	
6) Plasma membra	ane is act as		
a) Impermeable	е	b) Selectively p	ermeable
c) Freely perme	eable	d) Transparent	

7)	In typical eukary	otic chromosomes, sis	ster	chromatids are h	reld	together by
	a) Centromere		b)	Chromomere		
	c) Telomere		d)	Chromocentre		
8)		a structure by which tw ques in the cell membr		=		
	a) Desmosome	S	b)	Hemi-desmosor	nes	
	c) Gap junction		d)	Tight junctions		
9)		are known as primary	/ me	essenger molecul	le.	
		b) IP3		cAMP		Hormones
10)	Lampbrush chro	mosomes are found ir	1 00	cvtes of		
,	•	b) Chironomus		-		
11)		he process by which so a cell membrane.	lute	s are moved along	ja c	oncentration
	a) Simple diffus	ion	b)	Active transport		
	c) Proton pump		d)	Na-K ATPase p	ump	)
12)	Synapsis is occu	ır in	pha	ase of prophase -	– I ir	n meiosis.
	a) Diplotene		b)	Zygotene		
	c) Leptotene		d)	Pachytene		
13)	Signal sequence	e is required for				
	a) Protein degra	adation				
	b) Localization	proteins in different co	mpa	artments of the co	ell	
	c) Protein lysis					
	d) Prevention of	f degradation of protei	ns			
14)	is	main component of ba	acte	rial cell wall.		
	a) Glycogen	b) Cellulose	c)	Collagen	d)	Peptidoglycan
2. A		owing questions (any	<b>4)</b> .			8
	i) What is cell			- 12 -		
	III Detine euch	romatin and heteroch	rom	atin		



iii) What are PPLOs? iv) What is cell synchrony? v) What are F-actin? vi) Distinguish between equational and reductional division. B) Answer the following questions (any 2). 6 i) What are tight junctions? ii) Write note on polyribosomes. iii) What is facilitated diffusion? 3. A) Answer the following questions (any 2). 8 i) Describe structure giant chromosomes. ii) Describe ultra structure of animal cell. iii) Explain properties of cancer cell. B) Answer the following (any 1). 6 i) Describe different types of cell signaling. ii) Explain fluid mosaic model of plasma membrane. 4. A) Answer the following questions (any 2). 10 i) Describe ultra structure of nucleus. ii) Describe structure and functions of microtubules. iii) Describe active transport with suitable examples. 4 B) Answer the following (any 1). i) Describe process of mitosis. ii) Define genetic code and give its properties. 5. Answer the following questions (any 2). 14 i) Describe process of apoptosis. ii) Explain different types of cell organelles, chloroplast and Golgi bodies. iii) Describe process of protein trafficking in endoplasmic reticulum and mitochondria.

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## B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2018 Cell Biology and Biostatistics Paper – II: BIOSTATISTICS

		Paper – II : BIOST	TATISTICS	
-	d Date : Wedneso 0.30 a.m. to 1.00	•		Total Marks : 70
ı	2)	All questions are con Figures to right indica	ate <b>full</b> marks.	
	,	Use of basic calculate Use graph paper whe		
1. Re	write the following	g sentences by using <b>c</b>	correct alternative.	14
1)	Total angles in Fa) 270°	Pie chart are b) 720°	c) 360°	d) 180°
2)	Less than type of a) Fixed	cumulative frequency is b) Decreasing		d) One
3)	value of the coef	tribution is 14 and the s		
	a) 60.4%	,	c) 35.7%	,
4)		edistribution is 23, the r hat the distribution is	median is 24 and th	e mode is 25.5.
	<ul><li>a) Positively Sk</li><li>c) Asymptotic</li></ul>		<ul><li>b) Symmetrical</li><li>d) Negatively Ske</li></ul>	wed
5)	Variance is alwa	ys calculated from		
	a) Mode	b) Mean	c) Median	d) Range
6)	In a week the pr The range is	rices of a bag of rice w	ere 350, 280, 340,	290, 320, 310, 300.
	a) 60	b) 90	c) 70	d) 100

7) A coefficient of correlation is computed to be -0.95 means that



ŕ	<ul> <li>a) The relationship between two variables is weak</li> <li>b) The relationship between two variables is strong and positive</li> <li>c) The relationship between two variables is strong and but negative</li> <li>d) Correlation coefficient cannot have this value</li> </ul>							
8)	If $r = 0.6$ and $b_{xy}$ a) 0.3	= 1.2 then b	,	c)	0.72	d)	0.40	
9)	If the occurrence events are a) Independent c) Bayesian	of one ever	1	b)	another cannot ha Mutually Exclusi Empirical		en, then the	
10)	A fair coin is toss a) 1/4	sed four time b) 1/2	-		ility of getting fou 1/16	r he		
11)	Let A be event of $A \cap B$ is a) $\{2, 3, 5\}$	-			nt of an even prim	e n		
12)	The sum of the post be equal to a) 0	orobabilities of b) -1		е е с)			space must	
ŕ	In hypothesis tes is called a) Correct hypo c) Alternate hyp	thesis	1	b)	is tentatively assi Null hypothesis Level of significa			
14)	A Type II error is a) Accepting $H_0$ c) Rejecting $H_0$	when it is fa	alse		Accepting $H_0$ whose of the above		it is true	
2. A	-	ss Mark' and	l give an ex 8 students		nple. e 67, 49, 73, 64,	57,	66, 71, 75.	8
	Jaiodiate II	io modifimal	ino.				Se	t P



- 3) If  $b_{yx} = 0.2$  and  $b_{xy} = 0.8$ , then find r.
- 4) What is the probability of getting "an odd number" in single throw with die?
- 5) If Standard Deviation of 5 observations is 5.2, find standard error.
- B) Write notes on the following (any two).

6

- 1) Demerits of "Mean".
- 2) Perfect positive correlation.
- 3) Independent events.
- 3. A) Answer the following (any two).

8

1) Calculate mode marks from the following data.

Х	10-20	20-30	30-40	40-50	50-60
F	7	14	26	16	7

2) Find the Mean Deviation from the following data.

X	10	11	12	13	14
F	3	12	18	12	5

- 3) A single card is drawn from a pack of 20 cards, numbered from 1 to 20. Find the probability that it is a multiple of 2 or a multiple of 3.
- B) Answer the following (any one).

6

1) Find the mean using step deviation method for the following data

X	10-20	20-30	30-40	40-50	50-60
F	15	16	34	22	13

- 2) A coin is tossed 50 times of which head comes 32 times. Use chi-square test to test the hypothesis that the coin is normal, having no bias for either head or tail. (Table value : 3.84).
- 4. A) Answer the following (any two).

10

1) Find median for the following data.

X	10-20	20-30	30-40	40-50	50-60
F	18	21	36	25	20



2) Find the coefficient of correlation (r) from the following data.

X	6	7	8	9	10
Υ	8	9	10	11	12

3) Find the Standard Deviation ( $\sigma$ ) from the following data :

Class	7	8	9	10	11
Frequency	9	12	8	6	5

B) Answer the following (any one).

4

1) Draw histogram for the following data.

X	0-100	100-200	200-300	300-400	400-500	500-600
F	9	19	27	22	26	7

2) For the two events A and B, P(A) = 0.5, P(B) = 0.6 and  $P(A \cup B) = 0.8$ . Find  $P(A \mid B)$  and  $P(B \mid A)$ .

5. Answer the following (any two).

14

1) Draw less than and more than type Ogives for the following data.

X	5-10	10-15	15-20	20-25	25-30
F	8	11	16	15	10

2) Find the regression equation X on Y from the following data.

X	5	3	7	4	8	2	10	6	8	7
Υ	8	6	8	5	9	6	8	5	11	4

3) Write the properties of the normal distribution.



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#### B.Sc. – I (Biotechnology) (Semester – II) (Old CBCS) Examination, 2018 ENGLISH (Compulsory) On Track – English Skills for Success

-	nd Date : Saturday, 10.30 a.m. to 1.00 p			Max. Marks :	70
1. Re	ewrite the following s	sentences by choo	osing correct alterna	ative.	14
1)	The first V2 missile a) May 1942		ccessfully in c) August 1942	d) Sept. 1942	
2)	is the women, according a) wealth		_	iccessful men and	
	c) knowledge		d) total commitme	ent	
3)	Wernher Von Braumissile.	ın was	_ scientist who pro	oduced the Jupiter	
	a) An American	b) A German	c) A Russian	d) A Roman	
4)	The First Session of		•		
	a) 11 July 1993	b) 31 May 1993	c) 31 April 1993	d) 11 Sept. 1993	
5)	What is the vanishi	•			
	,		<ul><li>b) the disappeara</li><li>d) the disappeara</li></ul>		
6)	The primary idea of			ince of dissertiers	
0)	a) rights of the gov	•	oives		
	b) rights for the go				
	c) rights formulate	, ,			
	d) rights to operate	e against the gove	ernment		
7)	is the s	•			
	<ul><li>a) Ralph Waldo E</li><li>c) Slayer</li></ul>	merson	<ul><li>b) Branma</li><li>d) Vanished Gods</li></ul>		
0)	, ,		•	5	
8)	is the co	-		ما (ام	
	a) black	DI WAITE	CI VEIIOW	a) rea	

_		_			
$\sim$ 1		$\sim$		4	$\mathbf{\cap}$
-	н.	->-	_		(I
		Ou	,		u

-2-



	9)	is th	ne godesses in the	e poem full moon.			
		a) moon		b) mother goose			
		c) gethsmane		d) pierced			
1	0)	She borrowed Pen drive (belonging to Manas).					
		a) Manas'		b) Manas			
		c) Manases		d) None of the above			
1	1)	The birds flew i	nto ne	ests.			
		a) them	b) these	c) their d) there			
1	2)	Mother is	singer tha	n me. (good)			
		a) good	b) better	c) best d) all			
1	3)	She	_ (rarely) plays the	violin now.			
		a) rarely	b) seldomly	c) carefully d) forcefu	lly		
1	4)	Write antonyms	s of the following.				
		a) acquit	b) clockwise				
2.	An	swer <b>any sever</b>	n of the following i	n <b>two</b> or <b>three</b> lines.	14		
	1)	What was the n	notivating solgan	of the American Civil War?			
	2)	What has cause	ed more deaths the	an all the weapons of mass destru	ction ?		
;	3)	Who were other	r Indians present	he Parliament of Religion?			
	4)	What is the con	nplex than Von Br	aun attributed to Americans?			
	,		•	le when it was first test ?			
	,	• • • • • • • • • • • • • • • • • • • •		ed for the weather conditions in Chi	cago ?		
					cago :		
			in of the poem Bra				
	8)	Why is the moor	n a brilliant challen	ger of rocket experts?			
3.	A)	Write short note	e on <b>any two</b> of th	e following.	8		
		1) Palkhiwala's	s view about huma	an rights.			
		2) Parliament	of Religion.				
		3) Dr. Kalam's	attitude on work.				

6

B) Answer any three of the following in 30 to 40 words.



	<ol> <li>What is the origin and background of the poem Brahma?</li> <li>Who does the speaker address at the end of the poem Brahma?</li> <li>Who were the watchers of the moon? What happened to them?</li> <li>How was the moon's light made holy in Gethsemane?</li> </ol>	
4.	You are the secretary of the Bharat Sport Clubin your town. The meeting of the office bearer of the club is scheduled on 15 of the next month prepare an agenda and minutes for the meeting.  OR	14
	Write an email forwarding job application for the post of software developer in Patel IT Solutions.	14
5.	Prepare a curriculum vitae to apply for the post of software developer.	14



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#### B.Sc. – I (Biotechnology) (Semester – II) Examination, 2018 ENGLISH (Compulsory) (New) (CBCS) Golden Petals

-	d Date : Saturda 10.30 a.m. to 1.	-		Max. Marks :	70
	N.B.:	1) <b>All</b> questions are <b>c</b> (2) Figures to the <b>right</b>	•	(S.	
1. Re	write the followin	ig sentences by using	the correct option	ons:	14
1)	Letter to a Teac	her exposes the class	bias of the	system.	
	a) political		b) cultural		
	c) educational		d) social		
2)	The claims that	men and women mak	ke on us are bey	ond	
	a) imagination		b) enumeration	1	
	c) expectations	<b>3</b>	d) evaluation		
3)	Jim Corbett was India.	s a colonel with the	British Army duri	ing the	
	a) colonial		b) postcolonial		
	c) neocolonial		d) free		
4)	The gymnastics	teacher wanted the p	oor boys to play		
	a) cricket	b) rugby	c) football	d) basketball	
5)	Social service in	n the modern times is	nei	ghbours' aspirations.	
	a) criticizing		b) understandir	ng	
	c) evaluating		d) underestima	ting	
6)	After having hur ac	nted the man-eater, Co hance.	orbett felt that he o	didn't give the animal	
	a) spiteful	b) sporting	c) spiriting	d) spiritual	

2.



7)	7) At the break of day, the weavers wove a gay garment for a new-born						
	a) puppy	b) monster	c)	baby	d) pet		
8)	Maya Angelou was worried about the death of her						
	a) enemies		b)	critics			
	c) rivals		d)	near and dea	r ones		
9)	The moonlight chill	is paralleled with		by Sa	arojini Naidu.		
	a) birth		b)	death			
	c) regeneration		d)	salvation			
10)	When I think of dea	ath is					
	a) a sonnet		b)	a lyric			
	c) a free verse		d)	an ode			
11)	He was sanctioned	aof	10 la	akh rupees.			
	a) lone	b) loan	c)	loun	d) loen		
12)	We celebrate Maha	atma Gandhi's		Anniver	sary on 2 <sup>nd</sup> October.		
	a) berth	b) barth	c)	birth	d) breath		
13)	She runs a	shop.					
	a) stationary		b)	stationer			
	c) stationery		d)	stationory			
14)	The to	oday is quite pleas	ant.				
	a) wither	b) weather	c)	whether	d) whather		
An	swer the following b	its in <b>two</b> to <b>three</b>	ser	itences <b>each</b> (	(any seven) :	14	
1)	Why did the studen	ts feel that their tea	ach	er would forge	t them?		
2)	Describe the two types of neighbours according to Ernest Barker.						
3)	How did Jim Corbett suppress his cough ?						
4)	) Why did the poor children fail the gymnastics examination?						
5)	What are the natura	al claims of our nei	ghb	ours?			
6)	What was the tiger	doing when Corbe	tt w	ent near it ?			
7)	What were the poor boys good at ?						
8)	What is the meal of a fully grown tiger?						



3.	A) .	Answer the following questions in about <b>50</b> words <b>each (any two)</b> :	8
		<ol> <li>What are the qualities of a good email?</li> <li>What is the format of a formal email?</li> <li>What is the process of writing a blog?</li> </ol>	
	B)	Explain with reference to the context (any two):  1) "Weavers, weaving at fall of night, Why do you weave a garment so bright? Like the plumes of a peacock, purple and green, We weave the marriage-veils of a queen".	6
		2) "I find it impossible to let a friend or relative Go into that country of no return".	
		3) "Weavers, weaving solemn and still, What do you weave in the moonlight chill? White as a feather and white as a cloud, We weave a dead man's funeral shroud".	
4.	,	What is an interview ? Write a detailed note on the objectives of interview and the types of interview.  OR	
	,	Write the script of a group discussion on the topic "Corruption: A Monster" discussed by Amit, Deepika, Saleem and Mohan.	14
5.		nat is the importance of Minutes? Bring out the types of Minutes along h its features.	14


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#### B.Sc. I (Semester – II) Biotechnology (CBCS) Examination, 2018 Environmental Pollution and Environmental Pollution Techniques Paper – I: ENVIRONMENTAL POLLUTION

Total Marks : 70
<b>pulsory</b> . licate <b>full</b> marks. grams <b>wherever</b> necessary.
the sentences again. 14
ergy do not produce carbon
) Geothermal energy
I) All of the above
) Carbonic Oxygen Desert
I) None of these
) Ecological change
I) None of the above
as.
) Methane
l) Carbon monoxide
n) World science day
l) Tree plantation day

vi)	Acid rain is re	elated with				
	a) Taj Maha	al	b) Aerosols			
	c) Bhopal G	as Tragedy	d) London S	Smog		
vii)	India has the					
	a) Mangane	ese	b) Mica			
	c) Copper		d) Diamond			
viii)	The most h	armful environme	ntal pollution fro	om nuclear reactor is		
	a) Radioact	- :ivity	b) Particulat	e formation		
	c) Thermal	pollution	d) Noise po	llution		
ix)		is not a primary	pollutant.			
	a) SO <sub>2</sub>		b) Volcanic	ash		
	c) O <sub>3</sub>		d) CO <sub>2</sub>			
x)	) Of the total water on the Earth, fresh water reserves constitute approximately					
	a) 70%	b) 2.7%	c) 10%	d) 8.9%		
xi)	i) Minamata disease was caused by consumption of fish containing					
	a) Mercury		b) Lead			
	c) Zinc		d) Sulphur			
xii)		is not long range	e effect caused d	ue to radiation.		
	a) Genetic	change	b) Anaemia			
	c) Immediate death		d) Loss of v	d) Loss of vitality		
xiii)	Chernobyl nu	ıclear disaster take	place on			
	a) 1980	b) 1986	c) 1982	d) 1983		
xiv)		gas is mainly pr	oduced due to the	e incomplete burning of		
	wood.					
	a) CO	b) SO <sub>2</sub>	c) NO <sub>2</sub>	d) NO <sub>3</sub>		



2.	De	efine and explain <b>any seven</b> of the following:	14
	i)	Marine pollution.	
	ii)	Acid rain.	
	iii)	Draw diagram of cyclone chamber.	
	iv)	Thermal pollution.	
	v)	Pollutant with two example.	
	vi)	Isotopes.	
	vii)	Soil pollution.	
	viii)	Non Conventional Energy.	
	ix)	Pyrolisis.	
3.	A)	Answer any two of the following:	10
		i) Write a note on Green house effect.	
		ii) Explain in brief the air pollution.	
		iii) Explain in short the solar energy.	
	B)	Explain in short adverse effect of noise pollution.	4
4.	An	swer <b>any two</b> of the following:	14
	i)	Give a detailed account on effect of water pollution on human and environment.	
	ii)	Explain in detail the molasses fermentation for alcohol production.	
	iii)	Describe in detail conventional energy sources.	
5.	Ar	swer <b>any two</b> of the following :	14
	i)	Explain in detail treatment on nuclear waste.	
	ii)	Write an essay on impact of pollution.	
	iii)	Explain in detail land pollution.	



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## B.Sc. – I (Semester – II) (Biotechnology) Examination, 2018 (CBCS)

## Environmental Pollution and Environmental Pollution Techniques Paper – II: MICROBIAL TECHNIQUES

Day and Date Time: 10.30	Total Marks	: 70		
Instruct	ions: 1) All questions are compu		-	
1. Choose	the <b>correct</b> alternative and rewrite the	ne s	sentences.	14
,	echanism of Gram's staining can beory.	е е	explained by	
a)	Lipid content	b)	Peptidoglycan	
c)	Mg-ribonucleate	d)	All of these	
II)	is technique used for is	olat	tion of bacteria.	
	Serial dilution		Inoculation	
c)	Incineration	d)	Sterilization	
III)	) is example of Neutral stain.			
,	Methylene blue		Giemsas stain	
c)	Crystal violet	d)	Nigrosin	
IV)	IV) is method used for capsule staining.			
,	Manvel's		Grams	
c)	Albert's	ď)	Ziehl-Neelsen	
V)	is used as nitrogen sou	ırce	in media preparation.	
,	Agar agar		Peptone	
,	Beef extract	,	Yeast extract	
VI) So	oil is used for preservation of			
,	Bacteria	b)	Viruses	
,	Fungi	,	Algae	



VII)	Autoclave is based on principle of					
	a) Boiling	b) Dry heat				
	c) Disinfection	d) Moist heat				
VIII)	The organism that uses CO <sub>2</sub> as carbon s belongs to	source and light as energy source				
	a) Chemoheterotrophs	b) Photoautotrophs				
	c) Photoheterotrophs	d) None of the above				
IX)	growth is character consisting of two log phases separated	terized by a double growth cycle by distinct lag phase.				
	a) Diauxic	b) Synchronous				
	c) Continuous	d) None of these				
X)	Gas pack is used for culturing					
,	a) Anaerobic bacteria	b) Algae				
	c) Fungi	d) Aerobic bacteria				
XI)	is the most germicidal wavelength of U.V. rays.					
,	a) 150 nm	b) 390 nm				
	c) 260 nm	d) None of these				
XII) Coliform were differentiated from noncoliforms by using medium.						
	a) Blood agar	b) Nutrient agar				
	c) Eosin Methylene Blue agar	d) Azide blood agar				
XIII)	Serial dilution technique was first introd	luced by				
,	a) Robert Koch	b) Alexander Fleming				
	c) Joseph Lister	d) Tyndall				
XIV)	In LTH, pasteurization is achieved at _					
/(i v )	a) 145°F for 30 min	b) 161°F for 15 sec				
	c) 300°F for 1 or 2 Sec	d) None of these				
	,	,	_			
	wer <b>any seven</b> (out of nine) of the follow		ļ			
i)	Give function of agar and meat extract					
ii)	In which media it is used and give its si	gnificance-Neutral red ?				
iii)	Use of Reducing agents.					
iv)	Define Lyophilization.					



	vi) vii)	Define Diauxic growth.  Give any two examples of differential media.  Define dye and stain.	
	viii)	Define sterilization.	
	ix)	Give different methods of maintenance of pure culture.	
3.	A)	Answer <b>any two</b> (out of three) of the following.  i) Explain classification of stains.  ii) Give any two methods used for cultivation of anaerobic bacteria.  iii) Acid fast staining.	10
	B)	Synchronous growth.	4
4.	An: i) ii) iii)	swer <b>any two</b> of the following.  Explain different phases of growth of bacteria.  Give methods of sterilization.  Explain mechanism of Gram staining.	14
5.	An	swer any two of the following.	14
	i)	Give Nutritional requirements of bacteria.	
	ii)	Give methods of isolation of pure culture of bacteria.	

iii) Explain living media and its function.



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Seat No.

## B.Sc. Biotechnology – I (Semester – II) Examination, 2018 Taxonomy (CBCS) (Paper – I) TAXONOMY AND TISSUE CULTURE

-	Date : Thursday, 22-11-2018 .30 a.m. to 1.00 p.m.		Total Marks : 70
1. Multip	ple choice questions.		14
1)	Frog belongs to class		
	a) Pisces	b)	Aves
	c) Arthropoda	d)	Amphibia
2)	Agar agar is manufactured from		
	a) Ectocarpus	b)	Polysiphonia
	c) Spirogyra	d)	Gelidium
3)	Cryophytes are found in	_	
	a) Deep sea	b)	One sea shore
	c) On ice and snow	d)	On humous soil
4)	Fungi exhibit mode of n	utri	tion.
	a) Autotrophic	b)	Heterotrophic
	c) Phototrophic	d)	Holozoic
5)	Egg apparatus consist of	_	
	a) Egg and antipodals	b)	Polar nuclei
	c) Egg and synergids	d)	Egg
6)	The physiological properties of a cell characteristics.	ca	n be studied by analysis of
	a) Morphological	b)	Cultural
	c) Biochemical	d)	Numerical



7)	<ul> <li>The motility in bacteria is due to a specific organ called as</li> </ul>					
	a) Flagella	b)	Pili			
	c) Pseudopodia	d)	Cilia			
8)	Edible part of ripe ma	ango is morphological	ly			
	a) Epicarp	b)	Mesocarp			
	c) Pericarp	d)	Endocarp			
9)	Out of the following _		is prokaryotic.			
	a) Fungi	b)	Yeast			
	c) Bacteria	d)	Viruses			
10)	A.P. de Candolle coi	ned the term				
	a) Taxonomy	b)	Physiology			
	c) Morphology	d)	Endocrinology			
11)	In which of the follow	ring animal bilateral sy	mmetry is absent?			
	a) Scoliodon	b)	Toad			
	c) Starfish	d)	Pigeon			
12)	Insecta is a class of		phylum.			
	a) Annilida	b)	Mollusca			
	c) Arthropoda	d)	Echinodermata			
13)	The	is example of dicot pl	ant.			
	a) Bengal gram	b)	Jowar			
	c) Maize	d)	Rice			
14)	Which of the followin	g is an example of Co	elenterata ?			
	a) Hydra	b)	Frog			
	c) Starfish	d)	Fish			



2.	Ans	wer any seven of the following:	14
	i)	Give the characteristics of Mollusca.	
	ii)	Define Mycotoxins.	
	iii)	Write a note on Numerical Taxonomy.	
	iv)	Distinguish between Monocot and Dicot.	
	v)	Give the economic importance of Bryophytes.	
	vi)	Linnaeus Hierarchy of classification.	
	vii)	Fragmentation reproduction.	
	viii)	Lichens.	
	ix)	Draw a neat and labelled diagram of Liver fluke.	
3.	A)	Answer any two of the following:	10
		i) Explain in detail general characters Pisces.	
		ii) Describe in detail Three kingdom classification.	
		iii) Give the general characteristics of thallophyte.	
	B)	Explain the salient features of Aves with proper example.	4
4.	An	swer any two of the following:	14
	i)	Describe microbial phenetic and phylogenetic taxonomy.	
	ii)	Discuss in detail Sporne classification of Gymnosperm.	
	iii)	Explain in detail sexual and asexual reproduction in plants with example.	
5.	An	swer any two of the following:	14
	i)	Explain in detail general characteristics and classification fungi.	
	ii)	Describe in detail Platyhelminthes with example.	
	iii)	Give detail account on Reptiles.	



Seat	Set P	
No.	Set F	

## B.Sc. Biotechnology (Semester – II) (CBCS) Examination, 2018 TAXONOMY AND TISSUE CULTURE Paper – II: Tissue Culture

	Paper – II : Tissue Culture	
Day and Date : Saturday, 2 Time : 10.30 a.m. to 1.00 p		Total Marks : 70
2) Fig	I questions are compulsory. Tures to the right indicate full marks. Taw neat and labeled diagrams where	
1. Rewrite the following s	sentences by choosing <b>correct</b> al	ternatives. 14
1) The part of a plant u	used for culturing is called	
a) Callus	b) Cell Wall	
c) Stock	d) Explant	
The fusion of nucle form	ated cell with enucleated cell lead	ds to
a) Chromosome	b) Symmetric Hybrid	
c) Hybrid	d) Cybrid	
<ol><li>Stomata were more concentration.</li></ol>	e open in plants grown in presence	of higher
a) Calcium	b) Potassium	
c) Sodium	d) Magnesium	
4)is	the largest organ in human body	
a) Skin	b) Lungs	
c) Intestine Lungs	d) Heart	

5)	m	ethod is quick and cheap method of cell
-	separation.	·
	a) Laboratory	b) Physical
	c) Enzymatical	d) Clinical
6)	descr	ibed procedure to obtain passaged monolayer.
	a) Haberlandt	b) Dulbecco
	c) Carrel	d) Eagle
7)	is a	a vitamin used in PTC media.
	a) Inositol	b) Cysteine
	c) Biotin	d) Glycine
8)	is a	culture without foreign or undesired life forms.
	a) Septic Culture	b) New Culture
	c) Axenic Culture	d) Novel Culture
9)	is the	e liquid endosperm from immature coconuts, usec
	as a supplement in the o	culture medium.
	a) Agar	b) Casein
	c) Juice	d) Coconut Milk
0)	Highest concentration	of auxin exist at the
	a) Base of any plant o	rgan b) Leaves
	c) In Xylem	d) Growing tips of plants
1)	Most common measure	ement of viability is based on
	a) Membrane Integrity	b) Dye uptake assay
	c) Dye exclusion assa	y d) Metabolic assay
2)	cells ha	ave finite life span on artificial medium.
	a) Normal	b) Tumor
	c) Cancerous	d) Defected



	13)	Microelements are essential reactions.	as	for many biochemical	
		a) Enzymes	b)	Catalysts	
		c) Co-factor	d)	Nitrogen source	
	14)	•		ffling and cell motility when cells are in complete ls is termed as	
		a) Hybridization	b)	Contact Inhibition	
		c) Fusion	d)	Suspension	
2.	An	swer the following (any seve	n)	:	14
	1)	Describe in brief gelling age	nt.		
	2)	Define continuous cell line.			
	3)	Wrote a short note on Natura	al r	media.	
	4)	Write a note on growth room	in	PTC.	
	5)	Write a note on stage I of mi	cro	propagation.	
	6)	Write a short note on microp	ipe	ettes.	
	7)	Write a note on history of an	im	al tissue culture.	
	8)	Define Totipotency.			
	9)	Write a note on role of invert	ted	microscope.	
3.	A)		plo on	id plants by anther culture ? in cold condition by using trypsin.	10
	B)	Define cytotoxicity and expla	ain	MTT assay.	4



4. Answer the following (any two):

14

- 1) Discuss the role of different components of serum.
- 2) Explain in detail callus culture.
- 3) Describe in detail suspension culture.
- 5. Answer the following (any two):

14

- 1) Define viability and explain membrane integrity and Dye exclusion assay.
- 2) Give details of instruments used in ATC laboratory.
- 3) Explain laboratory design for plant tissue culture.

Set P



Seat	Set	D
No.	Set	

# B.Sc. – I (Biotechnology) (Semester – II) (CBCS) Examination, 2018 BIOCHEMISTRY AND CELL PHYSIOLOGY Paper – I: Biochemistry

		Paper – I : Biocl	nen	nistry			
•	ate : Monday, 26- 30 a.m. to 1.00 p.n				Т	otal Marks :	70
	2) Fig 3) Dra	questions carry edures to right indicate aw neat and labele tences by using co	ate ed d	<b>full</b> marks. liagrams .			14
1) Nu	umber of carbon at	toms in cholestero	is				
	17	b) 19				30	
2) Vit	tamin K is found in	1					
	Green leafy plan			Meat			
c)	Fish		d)	Milk			
3) Pr	imary structure of	proteins involves _		1	type of	bond.	
a)	Peptide	b) Hydrogen	c)	Disulfide	d)	Glycosidic	
4)	opt	ically inactive amir	o a	cid.			
		b) Glycine			d)	Leucine	
5)	is	an example of ald	ose	sugar.			
a)	Glycerose		b)	Ribulose			
c)	Erythrulose		d)	Dihydroxyac	etone		
6) An	nylose is constitue	ent of		carbohydrate	€.		
a)	Glycogen		b)	Cellulose			
c)	Inulin		d)	Starch			

7)	Liver oils of various fishes are the rich	est	sources of			
	a) Retinol	b)	Riboflavin			
	c) Thiamine	d)	Niacin			
8)	oxygen carrying prote	ein iı	n human beings.			
,	a) Insulin		Haemoglobin			
	c) Oxytocin	,	Albumin			
9)	Lysine is example of	a	mino acid.			
	a) Basic b) Acidic			d)	Aliphatic	
10)	Deficiency of retinol causes		disease.			
	a) Berry berry		Diabetes			
	c) Keratomalacia	d)	Scurvy			
11)	Nucleotides consist of					
	a) Pentose sugar					
	b) Pentose sugar, phosphate					
	c) Pentose sugar, phosphoric acid ar	nd ni	trogen base			
	d) Phosphate and nitrogen base					
12)	sugar is present in r	milk.				
	a) Glucose b) Galactose			d)	Ribose	
13)	carbohydrate is not for	urthe	er hydrolised.			
	a) Monosaccharide	b)	Disaccharide			
	c) Oligosaccharide	d)	Polysaccharide			
14)	m-RNA is also known as					
	a) hn-RNA	b)	Soluble RNA			
	c) Supernatant RNA	d)	Adaptor RNA			
2. A	nswer the following (any 7).					14
	i) Define phospholipids.					
i	i) What is Isomerization?					
ii	<ul> <li>Draw the structure of glycine and ala</li> </ul>	anin	Э.			



3.

4.

iv)	Write a note on peptide bond.	
v)	Draw the neat labeled diagram of t-RNA.	
vi)	Write biochemical role of thiamine and riboflavin.	
vii)	Give the function of triglycerides and phospholipids.	
viii)	Write a note on water soluble vitamins.	
ix)	Define zwitterions and isoelectric point.	
A)	Answer the following (any 2):	10
	i) Explain forces involved in protein structure.	
	ii) Distinguish between DNA and RNA.	
	iii) Write a note on monosaccharides derivatives.	
B)	Explain fluid mosaic model of plasma membrane.	4
Ans	swer <b>any two</b> of the following:	14
i)	Describe classification of amino acids with examples and structures.	
ii)	Write a note on Watson and Crick model of DNA.	

14

i) Explain components of nucleic acids with primary structure of nucleic acids.

iii) Define carbohydrates and write in detail classification of carbohydrates.

- ii) Write a note on structural levels of proteins with examples.
- iii) Write source, requirement and biochemical role of niacin and thiamine.

Seat	Set P
No.	Jet F

## B.Sc. – I (Biotechnology) (Semester – II) (CBCS) Examination, 2018 Biochemistry and Cell Physiology Paper – II: CELL PHYSIOLOGY

		Paper – II : CELI			
•	Date : Tuesda 0.30 a.m. to 1.0	y, 27-11-2018 00 p.m.		Total Marks :	70
Instr	2) 3)	All questions are c Draw neat and labe Figures to right ind Use of calculator is	eled diagrams <b>where</b> licates <b>full</b> marks.	<b>ver</b> necessary.	
I. Rew	rite the followi	ng sentences by usi	ng <b>correct</b> alternative	э.	14
1)	The percenta	age of water in Wate	rmelon is		
	a) 90%	b) 92%	c) 95%	d) 94%	
2)	The process	of absorption of wat	er by seeds is called		
	a) Transpira	ation	b) Translocat	ion	
	c) Imbibition	า	d) Plasmolys	is	
3)	Root nodules	s of leguminous plar	nts appear pink due to	the presence of	
	a) Haemogl	obin	b) Iron haem	oglobin	
	c) Zinc hae	moglobin	d) Leg haemo	oglobin	
4)	Zeatin the na	aturally occurring cyt	okinin was isolated fr	om	
	a) Corn Ker	nel	b) Apple		
	c) Sugarcar	ne	d) Grapes		
5)	Human adult	t has	permanent teeth.		
	a) 36	b) 23	c) 46	d) 32	

6)	The principal organ for absorption of nutrient isa) Small intestine						
	b) Stomach						
	c) Large intestine						
	d) Both small intesti	ne and stomach					
7)	The life span of RBC	ie					
,,	a) 120 days b)				d)	90 days	
8)	Three chambered He	eart is found in			_		
	a) Vertebrates b)	Fishes	c)	Amphibians	d)	Birds	
9)	are the excretory structure in crustaceans.						
	a) Kidney		b)	Green gland			
	c) Nephridia		d)	Malphigian tu	bule	es	
10)	Normal Blood Pressu	ire of a healthy ad	dult is				
	a) 120/80 b)	110/70	c)	120/70	d)	110/80	
11)	Cerebrum consists of	f	_ pa	ırt of the brain.			
	a) Midbrain		b)	Forebrain			
	c) Hindbrain		d)	All of these			
12)		provides the acid	lic F	PH to gastric ju	ice.		
	a) HCI		b)	NaCl			
	c) KCI		d)	All of these			
13)	The Nitrogen fixing m	nicrobe in soil is					
	a) Bacillus		b)	E.Coli			
	c) Rhizobium		d)	Salmonella			
14)	Loss of water by plan	its in the leaves is	thro	ough the			
	a) Guard cells		b)	Xylem			
	c) Stomata		d)	Phloem			



II.	Ans	wer the following (Any 7).	14
	1)	Define Transpiration.	
	2)	Define Plasmolysis.	
	3)	Define Neurons.	
	4)	Define Alveoli.	
	5)	What are long day plants?	
	6)	Name two uricotelic animals.	
	7)	What are Schwann cells ?	
	8)	Write the difference Actin and Myosin.	
	9)	Write the two sets of bones composed in the Skull.	
III.	A)	Answer any two of the following.	10
		1) Discuss the factors responsible for ascent of Xylem sap in plants.	
		2) Write in detail about the Nitrogen Fixation in plants.	
		3) Discuss in detail about photoperiodism.	
	B)	Solve :	4
		Describe human respiratory system with neat labelled diagram.	
V.	Ans	wer <b>any two</b> of the following.	14
	1)	Describe types, phases and factors affecting seed dormancy.	
	2)	Explain different types of transpiration.	
	3)	Explain structure, synthesis and functions of Gibberellins.	
٧.	Ans	wer any two of the following.	14
	1)	Describe human Nervous system with neat labelled diagram.	
	2)	Describe mechanism of urine formation with neat labelled diagram.	
	3)	Describe structure of human heart with neat labelled diagram.	



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Total Marks: 70

14

#### B.Sc. – I Biotechnology (Semester – II) (CBCS) Examination, 2018 **BIOMETRY AND COMPUTER SCIENCE** Paper – I : Biometry

Day and Date: Wednesday, 28-11-2018

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

**Instructions**: 1) **All** questions are **compulsory**.

- 2) Figures to the **right** indicate **full** marks.
- 3) Use of basic calculator is allowed.
- 4) **Use** graph paper **wherever** necessary.

<ol> <li>Rewrite the following sentences by using correct alternate</li> </ol>
--

- 1) The solution of the equation 3x + 6 = 0 is \_\_\_\_\_
  - a) A natural number b) An integer
- - c) A whole number d) An irrational number
- 2) The square of the complex number 4i 3 is \_\_\_\_\_\_

d) 
$$-7 - 24i$$

3) If  $A = \{4, 5, 6, 7\}$  and  $B = \{4, 7, 8, 9\}$  then A - B =

b) 
$$\{0, -2\}$$

d) 
$$\{4, 7\}$$

4) A function f is said to be an even function if

a) 
$$f(x) = f(-x)$$

b) 
$$f(-z) = -f(x)$$

c) 
$$f(x^2) = [f(x)]^2$$
 d)  $f(2x) = 2 f(x)$ 

d) 
$$f(2x) = 2 f(x)$$



- d) Clinical
- 6)  $f(x) = \frac{5}{x+3}$  is discontinuous at x =

- b) 3 c) -3
- d) -5
- 7) If  $f(x) = 9 \tan x$ , then f'(0) is \_\_\_\_\_
  - a) 9

- b) 0 c) -9

d) 81

- 8) A function f is increasing at x = a, if
  - a) f'(a) > 0 b) f(a) > 0 c) f(a) < 0

- d) f'(a) > 0

- 9) If  $\int f dx = g + c$  then
- a) f = g b) f' = g c) f = g'
  - d) g = c

- 10)  $\int_{1}^{2} 6x^{2} dx =$ \_\_\_\_\_
  - a) 6
- b) 14 c) 12

- d) 2
- 11) If f (x, y) = 5x + 4y then  $\frac{\partial f}{\partial v}$  = \_\_\_\_\_
  - a) 9

- b) 4
- c) 5

- d) 0
- 12) Order of the differential equation  $\left(\frac{3d^2y}{dx^2}\right)^2 5\left(\frac{dy}{dx}\right)^3 + 6x = 8$  is
  - a) 1

- b) 2
- c) 3

- d) 6
- 13) If A is matrix of order  $2 \times 4$ , B is matrix of order  $3 \times 4$ , then order of AB is
  - a)  $2 \times 4$
- b)  $4 \times 2$  c)  $2 \times 2$
- d)  $3 \times 3$

- 14)  $D = \begin{bmatrix} 0 & 1 & 0 \\ -1 & 0 & -1 \\ 0 & 1 & 0 \end{bmatrix}$  is \_\_\_\_\_\_
  - a) Scalar Matrix
- b) Rectangular Matrix
- c) Symmetric Matrix d) Skew-symmetric Matrix

#### 2. Attempt any seven of the following:

14

- 1) Find the value of  $i^{14} + i^5 i^{16} i^7$ .
- 2) If  $X = \{2, 9\}$  then find Power set P(X) of X.
- 3) If f(x) = 7x + 1 and g(x) = 5x 2 then find f o g.
- 4) If  $\lim_{x\to p} \frac{x^4 p^4}{x p} = 108$ , find p.
- 5) If  $f(x) = \begin{cases} 7 + 3x & \text{for } x \neq 2 \\ 8 & \text{for } x = 2 \end{cases}$ , then examine the continuity of function at x = 2.
- 6) If y = x35x, then find  $\frac{dy}{dx}$ .
- Evaluate ∫3sec²x-4cossec²xdx.
- 8) Evaluate  $\int_0^1 5^{2x} dx$ .
- 9) Solve differential equation  $2y + 3x \frac{dy}{dx} = 0$ .

#### 3. A) Attempt any two of the following:

10

- 1) Evaluate  $\lim_{\to 5} \frac{2x^2 18x + 40}{2x^2 12x + 10}$
- 2) Differentiate  $\frac{\sin^2 x}{x^2 + 3}$  with respect to x.
- 3) Evaluate  $\int 2x^2 \sin x dx$ .
- B) Solve the following:

4

If 
$$A = \begin{bmatrix} 4 & 2 & -1 \\ -1 & 1 & 0 \end{bmatrix}$$
 and  $B = \begin{bmatrix} 1 & 1 \\ 2 & -3 \\ 2 & -2 \end{bmatrix}$  then find AB.



4. Attempt any two of the following:

14

1) If 
$$z_1 = 2 - 3i$$
,  $z_2 = 1 + 3i$ ,  $z_3 = 8 + 3i$  and  $z_4 = 7 - 9i$  find  $\frac{z_1 + z_2}{z_4 - z_3}$ 

- 2) If  $X = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $A = \{2, 3, 4, 5, 6\}$ ,  $B = \{2, 3, 4\}$ ,  $C = \{6, 7, 8, 9\}$  then verify  $A \cap (B' \cup C) = (A \cap B') \cup (A \cap C)$ .
- 3) Find the maximum and minimum value of the function  $f(x) = 2x^3 + 6x^2 18x + 7$
- 5. Attempt any two of the following:

14

- 1) Draw the graph of linear function y = f(x) = 2x 1.
- 2) If  $f(x) = \begin{cases} \frac{e^{3x} 1}{x} + a & \text{for } x > 0\\ \frac{\tan 2x}{2} + 4 b & \text{for } x < 0 \text{ is continuous at } x = 0 \text{ then find a, b} \\ 5 & \text{for } x = 0 \end{cases}$
- 3) Solve the equations x + y + z = 3, x + 2y + 3z = 6, x + 3y + 4z = 8 using reduction method or Gaussian Elimination method of matrix.



Seat		
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## B.Sc. – I (Semester – II) (Biotechnology) (CBCS Pattern) Fyamination 2018

D.3C 1 (	, ,	and Comp	uter	Science (Pape SCIENCE	er – II)
-	ate : Thursday, 29 30 a.m. to 1.00 p.r				Total Marks : 70
	Note: 1) All	questions are	com	pulsory.	
	2) Figu	res to the <b>rig</b>	g <b>ht</b> in	dicate <b>full</b> mark	(S.
1. Choose	e the <b>correct</b> alte	rnative from	the fo	ollowing and rev	vrite the sentence. 14
1)	topolog	gy has centra	ıl con	troller point.	
	Bus				d) Square
2) The	protocol that is u	sed to transf	er file	e is	
-	FTP				d) SMTP
3) For	DBMS	softwai	re is u	sed.	
a)	MS Word			b) MS Excel	
c)	MS PowerPoint			d) MS Access	
4) Rea	rranging the data	in a sequenc	ce is	called	
a)	Updating			b) Editing	
c)	Batching			d) Sorting	
5) E-m	ail stands for				
a)	Electronic mail			b) Electronicall	y mail
c)	Exchange mail		1	d) None	
6) 1 by	te is equal to	k	oits.		
a)	4	b) 8		c) 32	d) 64

7)	The protocol that web servers and clients used to communicate with each other is called						
	a)	HTTP	b) HTML	c)	SMTP	d) URL	
8)	-		is a step by step	instrud	ctions which a	re written for solving	
	a pro	oblem.					
	a)	Algorithm		b)	Flow chart		
	c)	Picture chart		d)	Picture code		
9)	Тос	cut, the shortcu	t key is				
	a)	Ctrl + X	b) Ctrl + P	c)	Ctrl + V	d) Ctrl + C	
10)		is a	a default file name	e of ex	cel.		
	a)	Book 1		b)	Document 1		
	c)	Presentation	1	d)	Table 1		
11)	RON	M stands for					
	a)	Read OMR m	emory	b)	Read Only M	lemory	
	c)	Random Ope	rating Memory	d)	None		
12)		device	es accepts data f	rom th	ne end user.		
	a)	Output	b) Input	c)	Storage	d) Utility	
13)	The	processed dat	a is called				
	a)	Data		b)	Software		
	c)	Information		d)	Operating sy	rstem	
14)		t	opology has com	ımon (	cable.		
		Ring				d) Hybrid	
2. <i>A</i>	Answ	er <b>any seven</b> o	of the following:				14
	i) E	Explain applicat	ion software with	exam	nple.		
	ii) E	Explain how you	u will change font	and f	ont size in wo	ord.	
	iii) E	Enlist any four o	output devices.				



	iv) Explain ALU and Control unit.	
	v) Define the following terms	
	1) Information 2) Data	
	vi) Explain use of Modem in networking.	
	vii) Explain Medium sized Area Network.	
	viii) Explain the importance of database.	
	ix) Explain any two methods to calculate average in excel.	
3.	A) Write short notes on <b>any two</b> of the following:	10
	i) Explain the use of internet.	
	ii) Explain how will you prepare chart in excel.	
	iii) Explain Basic Components of Digital Computer.	
	B) Write a note on Operating System.	4
4.	Answer any two of the following:	14
	i) What is Computer? Explain different units of computer.	
	ii) Explain page formatting in word document.	
	iii) Explain Intranet and Extranet.	
5.	Answer any two of the following:	14
	i) Explain the elements of communication with diagram.	
	ii) Explain modem and its types.	
	iii) Define the term Flow chart and explain different symbols of flow chart.	


Seat	
No.	

Set P

### B.Sc. – II (Biotechnology) (Semester – III) (CBCS) Examination, 2018 INHERITANCE BIOLOGY

-		d Date : Friday, 30-11-2018 2.30 p.m. to 5.00 p.m.	Max. Marks	s : 70
		Instructions : 1) All questions carry 2) Figures to right in 3) Draw neat and lab	dicate <b>full</b> marks.	
1.	Re	write the following sentences by using	ng correct alternative :	14
	1)	<ul><li>plays important ro</li><li>a) lysosomes and chloroplast</li><li>c) ribosomes and chloroplast</li></ul>	b) lysosomes and plasmids	
	2)	In linkage mapping, the distance be terms of	tween two genes is measured in	
		a) Centimorgan	b) Base pairs	
		c) Metre	d) Nanometer	
	3)	Typical dihybrid test cross ratio is _		
	ŕ	a) 9:3:3:1	b) 1:1	
		c) 9:3:4	d) 1:1:1:1	
	4)	is not a dominant	rait.	
	,	a) Round seeds		
		c) Yellow pods	d) Inflated pods	
	5)	The XX-XY sex determination systematical	m is occurred in	
	,	a) Grasshoppers	b) Birds	
		c) Human	d) Honeybee	
	6)	Eye color in Drosophila is an examp	ole of	
	,		b) Multiple alleles	
		c) Incomplete dominance	d) Complementation	
	7)			
	,	a) Thomas Sech	b) Mendel	
		c) T. H. Morgan	d) Karl Landsteiner	

2.



8)	In h	noneybees, drones are	_		
	a)	diploid fertile males	b)	haploid fertile females	
		diploid sterile males			
9)	In _	the typical Mendelia	an c	dihybrid ratio is changed to 13 : 3.	
		Complementary gene action			
	-	Inhibitory gene action	-		
10)		in the <i>Saccharo</i>	my	ces cereviviae were first discovered	
		Ephrussi.	h)	Potito mutants	
	-	Auxotrophic mutants Lac mutants	-	Ara mutants	
11)	,	is not a X-linked dise	,		
·					
		Hemophilia Hypertrichosis	d)	Night blindness	
12)	In _			n natural transformation is absent.	
·	a)	B. subtilis	b)	H. influenzae	
	,	D. pneumoniae	,	E. coli	
13)		he fertility p			
	•			Conjugation	
	,	Transduction	•	Transfection	
14)		e process of transduction was disc	COV	rered by in bacteria.	
	•	A. Hershey and M. Chase J. Lederberg and E. Tatum			
	•	J. Lederberg and N. Zinder			
	•	Avery MacLeod and McCarthy			
A)	Ans	swer the following questions (any	<b>4)</b> :		8
	i)	What is epistatic gene?			
	-	Write significance of linkage			
	,	Define multiple alleles.			
	•	Write a note on colorblindness.			
	-	Write a note on inhibitory genes.			
B)		swer the following questions (any	2) ·		6
ט)			-		U
	,	What are notite mutants in vesst			
	-	What are petite mutants in yeast	!		
	III)	Genetic system in plasmids.			

suitable example.

|--|--|

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### B.Sc. – II (Biotechnology) (Semester – III) (CBCS) Examination, 2018 BASICS OF MOLECULAR BIOLOGY

Day and Date: Saturday, 1-12-2018	Max. Marks : 70
Time: 2.30 p.m. to 5.00 p.m.	
Instructions : 1) All questions are of	compulsory.
2) Figures to the <b>rig</b> h	nt indicate full marks.
3) Draw <b>neat</b> labelled	d diagram <b>wherever</b> necessary.
Multiple choice questions :	14
Central Dogma was proposed by	,
a) T.H. Morgan	b) Gregor Mendel
c) Francis Crick	d) J. D. Watson
2) The enzyme which regulates the	level of super coiling of DNA molecule is
a) DNA Ligase	b) DNA Polymerase
c) Topoisomerase	d) DNA Helicase
3) Large Cot values indicates prese	ence of sequences
a) Highly repeated sequences	b) Moderately repeated sequences
c) Unique sequences	d) All of these
4) The bases in DNA are joined to t	he pentose sugar bybond.
a) Glycosidic	b) Covalent
c) Ionic	d) Hydrogen
5) repeats of Telome	res protect free chromosome ends from
degradation.	
a) TTAGGGG	b) TTACCCC
c) TTAAAAA	d) TTAATTT
<ol><li>The relaxed state of DNA is</li></ol>	
<ul> <li>a) Covalent closed DsDNA</li> </ul>	b) Closed circular DsDNA
c) Covalent circular Ds DNA	d) Linear DsDNA
7) is act as initation cod	lon in genetic code of eukaryotes.
a) AAA	b) AUA
c) AUG	d) AAG

		-3- SL	R-SJ - 22
3.	A)	Answer the following ( <b>any two</b> ):  1) Explain clover leaf model of tRNA with neat diagram.  2) Explain mitochondrial DNA and write its importance.  3) Write in detail about topoisomerases.	8
	B)	Answer the following (any one):  1) Discuss the different types of DNA.  2) Explain SOS repair Mechanism in DNA.	6
4.	A)	<ol> <li>Answer the following (any two):</li> <li>Explain properties of double helix of DNA with neat labelled diagram:</li> <li>Describe Meselson and Stahls experiment of DNA replication with labelled diagram.</li> <li>Explain the molecular nature of gene.</li> </ol>	
	B)	<ul><li>Answer the following (any one):</li><li>1) Write about the mismatch repair mechanism of DNA with neat lab diagram.</li><li>2) Write about the process of denaturation of DNA and its important</li></ul>	
5.	Ar	swer the following (any two):	14

1) Describe the organization of DNA in Eukaryotes with a neat labelled

3) Describe D loop model of replication in mitochondria with a neat labelled diagram.



Seat	Set	В
No.	Set	

### B.Sc. II Biotechnology (Semester – III) (CBCS) Examination, 2018 BIOPHYSICAL INSTRUMENTS

	DIOI III OIOAL	INOTITOMENTO	
-	nd Date : Monday, 3-12-2018 2.30 p.m. to 5.00 p.m.	Max. Marks :	70
	, ,	earry <b>equal</b> marks. It indicate full marks. I labeled diagrams.	
1. Re	write the following sentences by us	ing correct alternative.	14
1	) The first working microscope was	designed by	
	a) Robert Hook	b) Kepler	
	c) Leeuwenhoek	d) Watson	
2	A protein solution shows maxi electromagnetic wavelength.	mum absorption in range of	
	a) UV	b) Visible	
	c) IR	d) Microwave	
3)	The pH electrode can be calibrate which resists the change in pH.	d by using a standard solution	
	a) inorganic	b) organic	
	c) salt	d) buffer	
4	Pulses of light generated due to ic	onization of a material by are detected in	
	a) X ray diffraction	b) Flow cytometry	
	c) GM counter	d) Scintillation counter	
5)	) In UV visible spectroscopy, the _ as a source for generation of UV r	filament lamp is generally used radiations.	
	a) xenon	b) tungsten	
	c) deuterium	d) hydrogen	
6	<ul> <li>Molecules can be separated based centrifugation.</li> </ul>	on their buoyant density by using	
	a) ion exchange	b) rate zonal	
	c) isopycnic	d) two dimensional	



	7)	Phase contrast mid in contrast.	croscopy can show	v the differences in	nas difference	
		a) Darkness		b) Brightness		
		c) Numerical ape	erture	d) Refractive in	ndex	
	8)	In circular dichoris	sm, the differentia	l absorption of	light is analyze	d.
	,	a) Polarized		-	-	
	9)	In tec passed through e	-	-	a stream of fluid and etection.	
		a) Nephlometry		b) Flow cytome	etry	
		c) NMR		d) AAS		
	10)	The ray power.	s emitted by radio	oactive isotopes l	have least penetrating	
		a) alpha	b) beta	c) UV	d) gama	
	11)	The frequency of		•		
		a) $10^5$ to $10^8$ Hz		b) 10 <sup>8</sup> to 10 <sup>11</sup>		
		c) 10 <sup>12</sup> to 10 <sup>14</sup> H	Z	d) 10 <sup>6</sup> to 10 <sup>9</sup> H	łz	
	12)	The pH meter mea	•		een pH glass electrode	
		a) zinc	b) cadmium	c) cobalt	d) calomel	
	13)	The Geiger Muller radiation.	tube is used as a s	sensing element f	or detection of	
		a) mutagenic	b) emerging	c) ionizing	d) scintillating	
	14)	The pH indicator to pink, as the pH		shows the color of	change from colorless	
		a) decreases		b) increases		
		c) remains consta	ant	d) suddenly ch	nanges	
2.	A) /	Answer <b>any four</b> t	he following.			8
		1) What is rate zo	onal centrifugation	ı ?		
		2) What are safet	ty measures while	handling radiois	sotopes?	
		3) Differentiate be	etween dark field	and bright field n	nicroscopy.	
		4) State different	wavelength range	es of electromag	netic spectrum.	
		5) Draw a neat la			•	
		o, Diaw a near la	boloa alagiaili ol	pri motor.		



	B) Write a note on <b>any two</b> of the following.	6
	1) Write about sedimentation and RCF. State relationship between them.	
	<ol><li>Explain principle of fluorescence microscopy. Give examples of fluorescent stains.</li></ol>	
	3) Write principle and instrumentation of IR spectroscopy.	
3.	A) Answer <b>any two</b> of the following.	8
	Describe errors in pH measurement.	
	2) Describe instrumentation and application of colorimeter.	
	3) Describe the nature of radioactivity.	
	B) Descrie in detail any one of the following techniques.	6
	1) Scintillation counter.	
	2) X ray differaction.	
4.	A) Describe in detail <b>any two</b> of the following.	10
	1) Ultracentrifugation.	
	2) Radioactive decay and its types.	
	3) Applications and biohazards of radioisotopes.	
	B) Describe any one of the following:	4
	1) Molecular energy levels.	
	2) Types of rotors for centrifugation.	
5.	Write a detailed account on any two of the following.	14
	1) Electron microscopy and its types.	
	2) Principle, instrumentation and applications of UV-Visible spectroscopy.	
	3) Principle working and applications of circular dichorism.	

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### B.Sc. II (Semester – III) (CBCS) Examination, 2018 BIOTECHNOLOGY Animal Tissue Culture

		Animai iissi	ue	Culture		
•	d Date : Tuesday, e 2.30 p.m. to 5.00 p				Total Marks :	70
1. Rev	vrite the sentence	using correct alter	nat	ive given below	<i>'</i> .	14
1)		concentration of CC b) $1 - 10\%$	_			
2)		main constituent o	b)	Growth factor	al cell growth.	
3)	a) Stable primary	last cell is example cell line ell line	b)	Established ce	ell line I line	
4)		al cell culture is cor	ntro b)			
5)	carrie	s DNA into the hos	st c	ell.	ما\ «DNIA	
6)	In year ca	arrel designed suita b) 1923	ble	flask for routine	animal cell culture.	
7)		of cells is often indic b) Capacity				
8)	The termsupplements adde	implies a med ed and is sufficient	iun foi b)	n that has all it the use specifi	es constituents and ied.	
9)	A cell line can be for anti	•	f flu	iorescent labele	ed antibody specific	
		b) Protein	c)	Lipid	d) Internal	

	10) The most sensitive assay used for protein determination is						
		a) Biuret assa	ay		b) BCA assay		
		c) Lowry assa	ау		d) Nicolson's as	ssay	
	11)	seru lower level of	•		kely to metaboliz	e polyamines due to	
		a) Camel	b)	Bovine	c) Horse	d) Goat	
	12)	a) EDTA			cell in S phase to g c) Tetracyclin		
	13)	a) Trypsinizat	ion	•	o form secondary of b) Sub culturing d) Mechanical of	•	
	14)	process.			ve different type  n c) Cultivation	of cells by  d) Initiation	
2	۸)	Answer the foll	owina (s	any four)			8
۷.	<b>^</b> )		• •				O
		<ol> <li>Define orga</li> </ol>					
		2) Define feed	-				
		3) Define inter					
		4) Define cell s	•				
		5) Define natu	ral medi	a.			
	B)	Write notes on	(any tw	<b>o</b> ).			6
	1) What is meant by genetic engineering?						
		2) Explain cen	trifugatio	on.			
		3) Define prima	ary cultu	ire.			
2			-				0
S.	,	Answer the foll	• •				8
		1) Explain met		_			
		•		• •	ed for animal tiss	ue culture.	
		<ol><li>Define vacc</li></ol>	ine and	explain viral v	accine.		
	B)	Answer the foll	owing ( <b>a</b>	ny one).			6
		1) Write a note	on tran	sfer of naked	DNA in mammali	an cells.	
		2) Write detaile	ed accou	unt on synthet	tic media.		

4. A) Answer the following (any two).

10

- 1) Define serum and its importance.
- 2) Explain anchorage dependent cell.
- 3) Write account on standard culture condition for animal tissue culture.
- B) Answer the following (any one).

4

- 1) Explain cell hybridization.
- 2) Write an account on DNA fingerprinting method.
- 5. Answer the following (any two).

14

- 1) Give detailed account on methods involved in analysis of cell cycle.
- 2) Explain laboratory design for animal tissue culture.
- 3) Define sterilization and techniques used in sterilization of apparatus and media.

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### B.Sc. – II (Biotechnology) (Semester – III) (CBCS) Examination, 2018 BIOENERGETICS AND ENZYMOLOGY

	_					
Day and Date: Wednesday, 5-12-2018 Max. Max. Max. Max. Max. Max. Max. Max.						
Tillie .	2.50 p.m. to 5.0	ю р.пп.				
Ins	2)	<b>All</b> questions carry Figures to <b>right</b> ind Draw <b>neat</b> and labe	cate <b>full</b> marks.			
1. Re	write the follow	ing sentences by u	ing correct alternative :	14		
1)	The term enzy	mes are coined by				
·	a) Pasteur	-	c) Urey Miller d) Kul	nne		
2)		strate molecules co site per unit time is	nverted into product by one called	e molecule of		
	a) Turnover no	umber	b) Substrate number			
	c) Reaction		d) None of these			
3)	In uncompetitive inhibition inhibitors binds only to					
	a) Enzyme		b) Substrate			
	c) ES-comple	X	d) Active site			
4)	Succinate thio	kinase is an examp	e of class of enz	zyme.		
	a) ligase	b) lyase	c) isomerase d) oxi	doreductase		
5)	Ribozymes are	e the catalytic	molecules.			
	a) RNA	b) DNA	c) Antibody d) Vita	amin		
6)	Thei to lower its cat		es not bind with the active s	ite of enzyme		
	a) catalytic	b) allosteric	c) reversible d) irre	versible		
7)	Entropy of a sy	ystem is measure o	its			
	a) hardness		b) softness			
	c) randomnes	S	d) spontaneity			

8)	The carbon carbo strong base is	n bond forming re	eaction among es	ters in presence of a		
	a) Isomerization		b) Claisen cond	densation		
	c) Elimination		d) Aldol conder	nsation		
9)	The nonprotein pa	art cavalently bour	nd to the enzyme	is the		
	a) Holoenzyme		b) Apoenzyme			
	c) Prosthetic grou	ab	d) Ribozyme			
10)	At optimum temperal Maximum	erature or pH, the b) Minimum	-	an enzymatic reaction d) Constant	n is	
11)	Km of an enzyma enzyme shows ha		e concentration of	of at which		
	a) Enzyme	b) Substrate	c) ES complex	d) Product		
12)	The free energy of KJ/mol.	of ATP hydrolysis (	under standard co	onditions is		
	a) -2.303	b) -51.8	c) -8.314	d) none of these		
13)	The reaction's ratio is the ratio of product concentrations to reactant concentrations at one given time which may be at equilibrium or not.					
	a) Velocity	b) Mass action	c) Kinetic	d) Catalytic		
14)	Reduction potentia	al is the tendency	of a chemical spe	ecies to acquire		
	a) Electrons	b) Protons	c) lons	d) Neutrons		
2. A)	Answer any four of	of the following:			8	
ŕ	1) Give significance of Vmax and Km.					
	2) State features of active site of an enzyme.					
	3) What is redox potential? State its unit.					
	4) Define enzyme activity.					
	5) What is the effe	ect of temperature	e on enzyme activ	rity?		
B)	Write a note on ar	ny two of the follo	wing:		6	
	1) Lock and key r	nodel.				
	2) Thermodynam	-				
	3) Biological stand	dard state.				



3.	A)	Answer any two of the following:	8
		Explain induced fit mechanism.	
		2) Write a note on abzymes.	
		3) Describe biological role of enzymes.	
	B)	Answer any one of the following:	6
		1) Describe types of enzyme inhibition.	
		2) Illustrate free energy of hydrolysis of ATP and its role as an universal currency of free energy in biological systems.	
4.	A)	Answer <b>any two</b> of the following:	10
		Describe types of enzyme specificity.	
		2) Describe redox reactions. Add a note on redox potential.	
		3) Describe modes of enzyme regulation in living system.	
	B)	Answer <b>any one</b> of the following :	4
	,	Describe clinical significance LDH isoenzymes.	
		2) Explain the concept of activation energy of enzyme.	
5.	Wr	ite a detailed account on <b>any two</b> of the following:	14
	1)	Write in detail classification of enzyme with two examples of each.	
	2)	Derive Michalis Menten equation. Give significance of Vmax and Km.	
	3)	Describe in detail the factors affecting enzyme activity.	

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### B.Sc. – II (Semester – III) (Biotechnology) (CBCS) Examination, 2018 FUNDAMENTALS OF IMMUNOLOGY

-	te : Thursday, 6-12-2018 p.m. to 5.00 p.m.	Total Marks : 7	<b>'</b> 0	
Instruc	tions: 1) All questions a 2) Draw neat lab	re <b>compulsory</b> . eled diagram <b>wherever</b> necessary.		
1. A) Cho	1. A) Choose the <b>correct</b> alternative and rewrite the sentences.			
i)	MHC genes in human are a) 14 c) 12	present on chromosome.  b) 7 d) 6		
ii)	Tritium is used in a) Radioimmunoassay c) ELISA			
iii)	Administration of vaccine <ul> <li>a) Artificial passive immunity</li> <li>b) Artificial active immunity</li> <li>c) Natural active immunity</li> <li>d) Natural passive immunity</li> </ul>	ization zation		
iv)		s called as reagin antibody. c) IgA d) IgE		
v)	a) Spleen c) Peyer's patch	lymphoid organ. b) Bone marrow d) Lymphnode		
vi)	a) Forssmann c) Hapten	-		
vii)	Widal test is an example of a) Agglutination c) Precipitation	b) Flocculation d) Complement fixation		



viii)	a) Tc	_ cells are called b) TH		r third popul Dendritic		
ix)	a) VDRL	_ test is used in	b)	Widal		
x)	c) Tuberculir The signal trai	nsduction from c	-	Montoux neighboring	cell is o	alled
	<ul><li>a) Autocrine</li><li>c) Endocrine</li></ul>		,	Paracrine Synergism		
xi)	immune respo					
	a) IgG	b) IgM	c)	IgA	d) lg	дD
xii)	a) Prostaglar		b)	alamus and i Histamine Thromboxa		ever.
xiii)	Antigenicity is a) Epitope c) Hapten	enhanced by ac	b)	Adjuvant Antibody		
xiv)	Example of mage a) Thymus c) Payer's pa	ucosa associate atch	b)	d tissue is Spleen Lymphnode		
,	) Enlist factors ) Isoantigen ar	redundancy. ary lymphoid org affecting innate ad autoantigens.	immunity			8
1	) TH cells and	ting antigenicity.				6 Set P



3.	i) Explai ii) Explai	ne following ( <b>any two)</b> . In structure and function of MHC class I molecule. In mechanism of phagocytosis. In structure and function of antibody molecule.	8
	i) Physic	ne following (any one). cal barriers of Innate Immunity. an essay on principle of antigen and antibody interaction.	6
4.	i) Explai ii) Explai	ne following ( <b>any two)</b> . In any two antigen and antibody reactions by precipitation. In properties of cytokines. In Radioimmunoassay.	10
	i) Explai	ne following <b>(any one)</b> . In structure and function of cytokine receptors. In B cells.	4
5.	i) Explain s ii) Explain E	e following ( <b>any two</b> ). Structure and function of primary lymphoid organs. ELISA. med cell death.	14



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No.	Set	

## B.Sc. – II (Biotechnology) (Semester – IV) (CBCS) (New) Examination, 2018 CYTOGENETICS AND POPULATION GENETICS

CYTOG	ENETICS AND PO	PULATION GENE	TICS		
Day and Date: Friday, 7 Time: 10.30 a.m. to 1.0			Т	otal Marks :	70
2	) <b>All</b> questions are <b>c</b> ) Figures to <b>right</b> ind ) Draw <b>neat</b> and labe	dicate <b>full</b> marks.	ever ı	necessary.	
1. Rewrite the following	ng sentences by using	g <b>correct</b> alternative.			14
<ul><li>1) Chromosome n</li><li>a) Centromere</li><li>c) Centrosome</li></ul>	novement during cell	division is brought b b) Chromomere d) None of these			
2) Facultative Hete a) 2.5%	erochromatin compris b) 3.5%	se about c) 4.5%		_	e.
3) Number of Barr	bodies present in the	e nucleus of females	is		
a) 2	b) 1	c) 3	d)	0	
<ul><li>4) Polytene Chron</li><li>a) Telophase</li><li>c) Prophase</li></ul>	nosome are the perm	b) Anaphase d) Metaphase	_ chr	omosome.	
5) Aneuploidy was	discovered by				
a) Fleming	b) Balbiani	c) Buckert	d)	Bridges	
6) Thymine dimme	ers are caused by				
a) UV rays	b) X rays	c) Alpha rays	d)	Beta rays	
7) The number of a) 4	chromosomes in Pea b) 23	Plant is c) 7	— d)	8	



8) Chromonemal Fibrils which can be easily separable from their coil is			oil is called				
	a) Paranemic		b)	Plectonemic			
	c) Supercoil		d)	Double Helix C	oil		
9)	Trisomy of Chromos	some 13 results in		syndr	ome		
	a) Down's		b)	Edward's			
	c) Patau's		d)	Klienfelter's			
10)	Slave genes increas	se the rate of		synthesis.			
	a) DNA		b)	RNA			
	c) Proteins		d)	cDNA			
11)	The "Y" chromosom	e is placed in		of a huma	n ka	ryotype.	
	a) Group B	b) Group E	c)	Group G	d)	Group D	
12)	Transposons insert	themselves at cert	ain	positions called			
	a) Target Site		b)	Parent Site			
	c) Hot Spots		d)	Direct Repeats			
13)	Sister chromatids ar	e held together at tl	heir	centromeres by	a pro	otein called	
	a) Securin	b) Auxin	c)	Cytokinin	d)	Cohesion	
14)	Gametic Meiosis oc	curs at the time of	gan	netes formation i	n		
	a) Animals and Ma	n	b)	Fungi and Alga	е		
	c) Some Algae		d)	Some Fungi			
2. S	olve <b>any seven</b> of th	ne following:					14
	i) Define Mutagen.	-					
İ	ii) Define Meiosis.						
i	ii) Define Aneuploidy	<b>/</b> .					
i	v) Define Mitotic Ind	ex.					
•	v) Define Gene Fred	luency.					
V	ri) What are Sex Chi	romosomes?					
	ii) What are Barr Bo						
	ii) What are Microsa						
į.	<ul><li>x) What are Insertion</li></ul>	n Sequences ?					



3.	A)	Attempt any two of the following:	10
		1) Describe the structure of chromosome with a neat labeled diagram.	
		2) Explain in detail types of Mutagenic agents and its effects.	
		3) Explain in detail mini-satellite DNA.	
	B)	Write in detail about the process of Meiosis and add a note on its	
		significance.	4
4.	Atte	empt <b>any two</b> of the following :	14
	1)	Write in detail about the numerical changes in chromosome with its application.	
	2)	Write in detail about the different types of bacterial transposons.	
	3)	Write in detail about giant chromosomes with neat labeled diagram.	
5.	Att	empt any two of the following:	14
	1)	Write in detail Hardy-Weinberg law and its application.	
	2)	Describe multiple factor hypothesis with suitable examples.	
	3)	Describe the genetic basis of evolution in Brassica and Wheat.	



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### B.Sc. – II Biotechnology (Semester – IV) (CBCS) (New) Examination, 2018 MECHANISMS IN MOLECULAR BIOLOGY

•	d Date : Saturday, 8-12-2018 10.30 a.m. to 1.00 p.m.	Total Marks : 70				
lı	nstructions : 1) All questions are co	•				
	<ol> <li>Figures to right indic</li> <li>Draw neat and label</li> </ol>	ed diagrams <b>wherever</b> necessary.				
1. Re	write the following sentences by using	g <b>correct</b> alternative. 14				
1)	are added to specific lys					
	a) Acetyl groups	b) Formyl groups				
	c) Ethyl groups	d) Methyl groups				
2)	In lactose operon, β-Galactosidase e	nzyme is encoded by gene.				
	a) lac 'a' b) lac 'i'	c) lac 'z' d) lac 'y'				
3)	In prokaryotes directly bind initiation of translation process.	ds to 'P' site of ribosomes during				
	a) tRNA <sup>met</sup>	b) tRNA <sup>fmet</sup>				
	c) tRNA <sup>pro</sup>	d) tRNA <sup>val</sup>				
4)	enzymes required for charging of tRNA molecule.					
	a) Aminoacyl tRNA synthetase	b) DNA glycosylase				
	c) Peptidyl di-sulphide isomerase	d) Peptidyl transferase				
5)	T ψ C loop of tRNA helpful for binding	g to				
	a) Amino acids	b) Ribosomes				
	c) tRNA	d) Aminoacyl tRNA synthetase				



6)	Formulated methionine amino acid specified by codon in prokaryotes.					
	a) AGU	b) AUG	c) UAG	d) GUG		
7)	are	expressed from he	eat shock genes	in response to elevated		
	temperatures in	E.coli.				
	a) Chaperons		b) DNA methy	ylases		
	c) Histone meth	nylases	d) Histone me	ethyltransferases		
8)	In eukaryotes, 5	S rRNA is transcrib	ed by			
	a) RNA Polyme	rase $\alpha$	b) RNA polyn	nerase II		
	c) RNA polyme	rase III	d) RNA polyn	nerase I		
9)		equired for termina	tion of transcripti	on process in		
	prokaryotes.					
	a) Sigma factor		b) Rho factor			
	c) Pol-α		d) Core enzyı	me		
10)	During mRNA pr transcripts.	ocessing	is required fo	or capping of primary		
	a) Poly 'A' poly	nerase	b) snRNPs			
	c) RNA Polyme	rase III	d) RNA polym	nerase I		
11)	Shine-Dalgarno	sequences are				
	a) AGGAGGU	b) TTAGGG	c) CAAT	d) TATA		
12)	Robert Holly pro	posed				
	a) Clover leaf m	nodel of tRNA	b) Double hel	ical structure of DNA		
	c) Hairpin loop	model of tRNA	d) Operon mo	odel		
13)	is resilicing process.	esponsible for prop	er recognition of	3' splice site during		
	a) SR proteins	and U2AF	b) Polyriboso	mes		
	c) Enhanceoso	me	d) Replisome	•		
14)	,		, .	ted primary transcript		
	a) mRNA	b) snRNA	c) miRNA	d) gRNA		



0	Λ	ower the following (any 7):	4.4
2.		swer the following (any 7):	14
	i)	What is promoter sequence?	
	ii)	Write a note on regulatory gene in operon.	
	iii)	What are split genes?	
	iv)	What are introns?	
	v)	What are translational repressors?	
	vi)	What is TBP ?	
	vii)	What is exon shuffling?	
	viii)	Write a note on polyribosomes.	
	ix)	What are General Transcription Factors?	
3.	A)	Answer the following (any 2):	10
		i) Explain RNA editing with suitable examples.	
		ii) Describe mechanism of intron splicing in eukaryotes.	
		iii) Describe regulation of translation in eukaryotes with suitable examples.	
	B)	Describe structure, function and assembly of prokaryotic RNA polymerase.	4
4.	Ans	swer <b>any two</b> of the following:	14
		i) Describe regulation of transcription in eukaryotes with any two suitable examples.	
		ii) Describe regulation of <i>trp</i> operon in bacteria.	
		iii) Explain post-translational modifications in proteins.	
5.	Ans	swer <b>any two</b> of the following:	14
	i)	Explain mechanism of translation in eukaryotes.	
	ii)	Describe structure and regulation of lactose operon in bacteria.	
	iii)	Describe mechanism of transcription in prokaryotes.	
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### B.Sc. (Biotechnology) (Part – II) (Semester – IV) (New CBCS) Examination, 2018 PLANT TISSUE CULTURE

		FLANT 1100	OL COLIONE	
-	d Date : Monday 10.30 a.m. to 1.0			Total Marks : 70
	Instructions: 1	) <b>All</b> questions are	e compulsory.	
	2	?) Figures to <b>right</b>	indicate <b>full</b> mai	rks.
	3	B) Draw <b>neat</b> and I	abelled diagram	s <b>wherever</b> necessary.
1. Ch	oose <b>one</b> of the	correct alternative	es from the follow	wing: <b>14</b>
1)	cells.	was the first pe	rson to culture is	olated, fully differentiated
	a) Murashige	b) Cocking	c) Skoog	d) Haberlandt
2)	The temperatu		r sterilization of	media is maintained at
	a) 37	b) 25	c) 121	d) 4
3)	Culture of 'hairy with		duced by transfo	rmation of legume plants
	a) Agrobacteri	ium tumifesiens	b) <i>Agroba</i>	acterium rhizogens
	c) Bacillus thu	ringensis	d) <i>Escher</i>	rischia coli
4)	i	s used for surface	sterilization of ex	kplant.
	a) Sterile wate			n hypochlorite
	c) Teepol		d) Bavisti	n
5)	Highest concer	ntration of ethylene	exists at the	
	a) Growing tips	s of plants	b) Leaves	}
	c) In xylem		d) Ripenir	ng stage of fruits
6)	plants.	culture techniq	ue is used for o	btaining clonally propagated
	a) Micropropa	gation	b) Callus	
	c) Anther		d) Protop	ast
				P.T.O.

7)	7) Somatic embryo encapsulated in an artificial endosperm is known as seed.					
	a) Synthetic	b)	Natural			
	c) Zygotic	d)	Parthenocarpic			
8)	culture is a type of culturare cultured in liquid medium.	ire in	which cells or o	cell aggregates		
	a) Suspension b) Root	c) (	Callus	d) Embryo		
9)	Heritable differences observed among culture of a single mother plant is know	-		through tissue		
	a) Somaclonal generation	b) 3	Somaclonal vari	ation		
	c) Somatic hybridization	d) .	Transformation			
10)	Cryopreservation is preservation and s by immersion into	stora	ge of cells, tissu	ies and organs		
	a) Culture media	b) .	Autoclave			
	c) Liquid nitrogen	d) '	Water			
11)	In plant tissue culture, a morphogenetic r of new organ, embryo or whole plant fro as					
	a) Recombination	b) .	Apoptosis			
	c) Chlorosis	d)	Regeneration			
12)	Reversal of organized structures into a	ın ur	ndifferentiated st	ate is called as		
	a) Cytodifferentiation	b)	Dedifferentiation			
	c) Redifferentiation	d)	Nucleation			
13)	is the length of time alternating light-dark interval sequence		nts are exposed	I to light in an		
	a) Photoperiod	b)	Phototropism			
	c) Incubation	d)	Protoperiod			
14)	is a class of plant growth derivatives and cause cell division, cell etc.					
	a) Auxine b) Cytokinine	c) (	Cytokine	d) Ethylene		

-3-



2.	Ans	wer the following (any seven):	14
	1)	What is sterilization? Give the methods for sterilization of glassware.	
	2)	What is surface disinfection? Give an example of sterilant.	
	3)	Explain the levels of safety.	
	4)	Differentiate between embryo culture and embryogenesis.	
	5)	Explain the stages of plant hardening.	
	6)	What is an endosperm? Give the importance of endosperm culture.	
	7)	Explain the scope of plant tissue culture.	
	8)	What is a cryoprotectant? Give an example of it.	
	9)	Differentiate between hybrids and cybrids.	
3.	A) ,	Answer the following ( <b>any two</b> ):	10
		1) Discuss micropropagation.	
		2) Explain of Somatic embryogenesis.	
		3) Write an account on suspension culture.	
	B) I	Explain General Plant Tissue Culture Laboratory design.	4
4.	Ans	wer the following (any two):	14
	1)	Explain in detail about-isolation and culture of protoplast.	
	2)	Give a detailed account on plant tissue culture media.	
	3)	Explain in detail-different methods of cryopreservation.	
5.	Ans	wer the following <b>(any two)</b> :	14
	1)	Explain in brief-Somaclonal variation.	
	2)	Give a detailed account on somatic hybridization.	
	3)	Give a detailed account on callus culture.	

#### **SLR-SJ - 30**

Seat	Set	P
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## B.Sc. (Biotechnology – II) (Semester – IV) (New-CBCS) Examination, 2018 ANALYTICAL TECHNIQUES

	ANALYTI	CAL TECHNIQUES	
•	Date: Tuesday, 11-12-2018 0.30 a.m. to 1.00 p.m.	Total Marks :	70
I	nstructions: 1) All questions	s are <b>compulsory</b> .	
	2) Figures to <b>ri</b>	ght indicate full marks.	
	3) Draw <b>neat</b> a	nd labeled diagrams.	
1. Rev	write the following sentences b	y choosing <b>correct</b> alternatives.	14
1)	% of cellulose	is used in paper electrophoresis.	
	a) 15%	b) 45%	
	c) 95%	d) 35%	
2)	Purpose of using	gel is to Concentrate Proteins.	
	a) Starch	b) Separating	
	c) Stacking	d) Agarose	
3)	Ultrafiltration is a faster purific	ation technique than	
	a) Cell Disruption	b) Centrifugation	
	c) Immobilization	d) Dialysis	
	Salting out is the process of addition of large amount of inc	of proteins in solution by the organic salt.	
	a) Agglutination	b) Coagulation	
	c) Dilution	d) Precipitation	
5)	Usually in	_ chromatography stationary phase is water.	
	a) Paper	b) TLC	
	c) Affinity	d) Gel Permeation	

6)		romatography npounds.	is _		met	method for separation of			
		Physical			b)	Mechanical			
	-	Biological			d)	Chemical			
7)	ВС	A stands for _							
,				es Assay	b)	Bicinchoninic Acid Assa	ay		
	,	Bromide Cari		•	,	Bergmans Centrifugation	•		
8)		re	duc	es disulphide link	age i	in protein structure.			
,		Potassium ad				SDS			
	•	Urea			d)	β Mercapto ethanol			
9)	ES	I crates		by holding a	ligu	id at high potential differ	ence.		
,		Molecules				Compound			
	c)	Fragments of	f mo	lecules	d)	lons			
10)	In _		tecl	nnique pH gradie	nt in	gel is used for separation	n.		
,		SDS-PAGE				IEF .			
	c)	Sedimentatio	n		d)	PAGE			
11)					arily t	o provide an artificial repl	acement		
		lost kidney fu Dialysis	HCH	JII.	h)	Catalysis			
	-	Haemolysis			-	Cell Lysis			
		-			•	•			
						to use as a carrier gas i			
			ue			Oxygen			
	,	Helium			,	Methane			
13)				inversely proport		to Volatility of analyte in	n GLC.		
	,	Concentration			•	Partition coefficients			
	C)	Volume of sta	atior	nary phase	d)	Volume of mobile phas	е		
14)	Mig ion		ndeı	r unit potential gi	adie	nt is called as	of		
	a)	Mobility	b)	Absorptivity	c)	Resistivity d) Vis	scosity		



2.	Ans	wer the following <b>(any seven)</b> :	14
	1)	Role of homogenizerincell disruption.	
	2)	Enlist the advantages and limitations of lowry assay.	
	3)	How will you apply sample in GLC ?	
	4)	Principle of Bradford assay.	
	5)	Column used in column chromatography.	
	6)	Define blotting.	
	7)	Brief account on functional genomics.	
	8)	How will you carry out cell disruption by organic solvents?	
	9)	Write a note on introduction of proteomics.	
3.	A) .	Answer the following (any two):	10
		1) Define chromatography and describe the descending paper chromatographic technique.	
		2) Describe basic principle of electrophoresis.	
		3) Describe assay used for iodine value.	
	B)	Discuss limitations of 2-D gel electrophoresis.	4
4.	Ans	wer the following (any two):	14
	1)	In which electrophoretic technique proteins get separated by using pH gradient.	
	2)	Give details of carbohydrate estimation by DNSA method.	
	3)	Explain disc gel electrophoretic technique for protein.	
5.	Ans	wer the following (any two):	14
	1)	Describe Edman degradation for protein sequencing.	
	2)	Describe chromatographic technique which uses biological interaction between biomolecules for their separation.	
	3)	Explain DNA blotting technique.	



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# B.Sc. (Part – II) (Semester – IV) Examination, 2018 BIOTECHNOLOGY (New CBCS) Mechanisms in Immunology

•		Wednesday, 1 m. to 1.00 p.m.	2-12-2018 Total Marks : 70
	Instruc	,	questions are <b>compulsory</b> . ures to the <b>right</b> indicate <b>full</b> marks.
1. Re	write the	following sente	nces by choosing the <b>correct</b> alternative given below. 14
i)	Eyelen	s protein is an e	example of
	a) Hid	den antigen	b) Isoantigen
	c) Hap	oten	d) None of these
ii)	BCG is	an example of	vaccine.
	a) Live	e attenuated	b) Subunit
	c) Kille	ed	d) Conjugate
iii)		is organ	specific autoimmune disease.
	a) Mya	asthenia gravis	b) Systemic lupus erythrematosus
	c) Gra	ves disease	d) None of these
iv)	T cells	are matured in	
	a) Bor	ne marrow	b) Spleen
	c) Thy	rmus	d) Lymph node
v)		is prim	ary mediator of anaphylaxis.
	a) His	tamine	b) Prostaglandins
	c) Leu	ıkotrienes	d) Platelet activating factor
vi)			otein acts as antiviral agents that inhibit intracellular
		plication.	
	a) Lys		b) Interferon
	c) Fibi	ronectin	d) Lactoferrin

vii)	Endogenous antigen is presented to	o T cells by m	olecule.
	a) MHC II	b) MHC III	
	c) MHC I	d) None of these	
viii)	Blood group antigens were present	on	
	a) Neutrophils	b) Eosinophils	
	c) Basophils	d) Monocytes	
ix)	Lysozyme is present in	_ body fluids.	
	a) Saliva	b) Sweat	
	c) Cerebrospinal fluid	d) Urine	
x)	Clonal selection theory of antibody	production was proposed by	<b>'</b>
	a) Landsteiner	b) Burnett	
	c) Marrack	d) Darwin	
xi)	Secondary immune response is characteristic type of antibodies.	aracterized by the production	n of
	a) IgM	b) IgD	
	c) IgG	d) IgA	
xii)	Passive immunization is done by us	sing	
	a) Vaccines	b) Toxoids	
	c) Immune sera	d) Toxins	
xiii)	antibody predomina	antly present in mucosa.	
	a) IgM	b) IgD	
	c) IgG	d) IgA	
xiv)	discovered hybridoma production.	a technique for monoclonal a	antibody
	a) Robert Koch	b) Burnett	
	c) Kohler and Milstein	d) Marrack	
2. An	swer any seven (out of nine) of the	following:	14
ij	Function of complement componer	nts.	
ii	Define antibody and give its types.		
iii)	) Phagocytosis.		



	iv) Define atopy and anaphylaxis.	
	v) Define autoimmunity and hypersensitivity.	
	vi) Functions of T⊢and Tc cells.	
	vii) Hemolytic diseases.	
	iii) NK cells.	
	ix) Factors affecting innate immunity.	
3.	A) Answer any two (out of three) of the following:	10
	i) Physical barriers of innate immunity.	
	ii) Give difference between primary and secondary immune response.	
	iii) Explain any two organ specific autoimmune diseases.	
	3) Explain ABO blood group system.	4
4.	Answer <b>any two</b> of the following :	14
	i) Explain processing and presentation of exogenous antigen.	
	ii) Explain New trend vaccines with example.	
	iii) Explain General mechanism of autoimmunity (any 4 mechanism).	
5.	Answer any two of the following :	14
	i) Explain B cell maturation, activation and differentiation.	
	ii) Explain classical complement pathway.	
	iii) Cellular mechanism of innate immunity.	

**SLR-SJ - 32** 

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Set P

### B.Sc. – II Biotechnology (Semester – IV) (CBCS) Examination, 2018 METABOLISM (New)

•	d Date : Thursday, 10.30 a.m. to 1.00			Total Marks	s : 70
Instru	, •	estions carry <b>equ</b> s to the <b>right</b> ind <b>neat</b> and labeled	icate <b>full</b> marks.		
1. Rev	write the following s	entences by using	g <b>correct</b> alterna	tive.	14
1)	Oxidation of mala	ite to oxaloaceta	te by malate de	hydrogenase, require	S
	a) ATP	b) NADH	c) FAD	d) NAD	
2)	Under aerobic cor	nditions, pyruvate	e is converted to	acetyl COA by	
	a) Hexokinase c) Aldosale		, ,	dehydrogenase glycerate kinase	
3)	Net ATP yield of g	lycolysis is		lecules per molecule c	of
	a) Two	b) Three	c) Four	d) Six	
4)	In eukaryotes, the	citric acid cycle			
	a) Mitochondria		b) Nucleus		
	c) Cytosol		, .	mic reticulum	
5)		wing is both keto	•	genic amino acid?	
	a) Valine		b) Tryptopha	an	
<b>a</b> )	c) Lysine		d) Inulin		
6)	is ar	•		nthesis.	
	a) 2, 4 dinitrophe	enoi	b) DNSA		
	c) Tryptomycin		d) IAA		_
7)	The long chain fatty membrane by con			ted across mitochondria nolecule.	al .
	a) Chlorine		b) Citruline		
	c) Phenylalanine	Э	d) Carnitine		



8)	The site for oxidative phosphory mitochondria.	vlation is of
	a) Outer membrane	b) inner membrane
	c) Matrix	d) Inter membrane space
9)	De Novo purine necleotide synth	esis begins with
	a) PRPP b) PEP	c) GAR d) FGAR
10)	Transamination is the process w	vhere
	a) Carboxyl group is transferre	ed from amino acid
	b) Amino acid breakdown take	s place
	c) Amino acid synthesis takes	place
	d) Amino group is transferred t	from amino acid
11)	In pentose phosphate pathwayused for shunting into other sug	is the monophosphate sugar ars.
	a) Fructose 6 phosphate	
	b) Glucose 6 phosphate	
	c) Sedoheptulose 7 phosphate	e
	d) Erythrose 4 phosphate	
12)	Fatty acids are covalently linked their synthesis.	with carrier proteins during
	a) Methyl b) Ethyl	c) Butyryl d) Acyl
13)	The light reactions of photosynth	hesis occur in the
	a) Thalakoid membrane	b) Stroma
	c) Epidermis	d) Cuticle
14)	The nonprotein amino acid	acts as a carrier of amino and
	carbon atoms during urea cycle.	
	a) Aminopteridine	b) Butadiene
	c) Orthine	d) Hypoxanthine



2.	An	swer the following (any 7):	14
	i)	Write a note on reciprocal regulation of both glycolysis and gluconeogenesis.	
	ii)	Define uncouplers with one example.	
	iii)	Explain Rubisco's enzymatic activity.	
	iv)	Write the reaction for activity of Glutamate transferase enzyme.	
	v)	Which irreversible steps of glycolysis are bypassed in gluconeogenesis?	
	vi)	Draw the structure of ATP synthase enzyme.	
	vii)	How fatty acids are transported into mitochondria during their breakdown?	
3.	A)	Answer the following (any 2):	10
		i) Explain reactions of non-oxidative phase of pentose phosphate pathway.	
		ii) Write a note on inhibitors of electron transport chain and ATP synthase complex.	
		iii) Write a note on location of photosynthesis and photosystem I and II.	
	B)	Explain sources of atom in purine biosynthesis.	4
4.	An	swer any two of the following:	14
	i)	Add an account on biosynthesis of unsaturated of fatty acids.	
	ii)	Write a note on catabolism of amino acids.	
	iii)	Describe 'Calvin Cycle' of photosynthesis.	
5.	An	swer any two of the following:	14
	i)	Write a note on transfer of electrons in respiratory chain with chemiosmotic coupling hypothesis.	
	ii)	Explain metabolism of glycogen.	
	iii)	Write a note on biosynthesis of pyrimidines.	
		<del></del>	

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### B.Sc. – II (Biotechnology) (Semester – IV) (CGPA) Examination, 2018 MOLECULAR BIOLOGY – I (Old)

	MOLLOGLAN BI				
Day and Date: Frida Time: 10.30 a.m. to				Total Marks	: 70
Instructions	<ul><li>: 1) All questions are c</li><li>2) Figures to the right</li><li>3) Draw neat labelled</li></ul>	nt indicate full mark		sary.	
1. Choose and wri	te <b>correct</b> answer from	given <b>four</b> alternat	ives.		14
<ul><li>1)</li><li>a) Miesche</li><li>c) Pauling</li></ul>	demonstrated that ge r	enes are made up c b) Avery d) Martha Cha			
<ul><li>a) Only nuc</li><li>c) Both nuc</li><li>3) The total nu</li></ul>	cleus and cytoplasm mber of termination cod	b) Only cytopla d) None of the	se	e	
is a) 2		c) 4	d)	1	
	er of DNA molecule is _ b) 10A°		d)	3.4A°	
5) Bent DNA s a) Ciproflox c) Nalidixic		d by antitumor drug b) Novobiocin d) Cisplastin	9		_
6) The smalles a) Red alga c) Tobacco		found in b) Pine d) Tomato		-	



7)	Triplet code pher dye.	nomenon wa	s observed by f	F.H.C. Crick by u	sing_		
	a) Acridine	b) Feuelg	jen c)	Acetocarmine	d)	Evan's Blue	
8)	In photoreactiva	tion the enz	yme photolyas	se cleaves		dimers.	
	a) G-G	b) C-C	c)	T-T	d)	A-A	
9)	basic.	percent of	Arginine and	Lysine makes	histo	ne proteins	
	a) 10%-20%	b) 20%-3	0% c)	10%-30%	d)	10%-25%	
10)	eı	nzyme cata	lyse the format	ion of negative	supe	r coils.	
	a) DNA polyme	rase	b)	DNA Helicase			
	c) DNA ligase		d)	DNA Gyrase			
11)	Mitochondrial DI	NA mutation	n leads to the c	lecline of			
	a) Glycolysis			Photosynthesis	3		
	c) Gluconeoger	nesis	d)	Oxidative phos	phor	ylation	
12)	Genes essential	for all cell t	ypes are calle	d			
	a) Xist Gene		b)	Luxury Gene			
	c) House Keep	ing Genes	d)	Slave Gene			
13)	Rolling circle m during	-	lication occurs	s in the <i>E.coli</i> o	chron	nosome	
	a) Transformati	on	b)	Conjugation			
	c) Transduction	1	d)	Replication			
14)	The antibiotic cip	orofloxacin	inhibits	enzyme.			
	a) Bacterial gyr	ase	b)	Bacterial polym	neras	е	
	c) Bacterial liga	se	d)	Bacterial Helica	ase		
2. S	olve <b>any seven</b> o	of the follow	ving :				14
	1) Define Tetran	nucleotide H	lypothesis.				
	2) Define Bacter	riophages.					
	3) Define Soleno	oid.					
	4) Define Chard	aff's Rule					



- 5) Define Gene.
- 6) Define Central dogma.
- 7) Define Gene deserts.
- 8) Define Linking Number.
- 9) Define DNA Damage.

#### 3. A) Attempt **any two** of the following:

10

- 1) Explain about the molecular nature of Gene.
- 2) Write about the salient features of double Helix of DNA with a neat labelled diagram.
- 3) Write about Meselson and Stahl's Experiment of DNA Replication with neat labelled diagram.
- B) Explain in detail about Cot curve Analysis with neat labelled diagram.

#### 4. Attempt any two of the following:

14

4

- 1) Describe in brief the organisation of DNA in Eukaryotes with a neat labelled diagram.
- 2) Write in detail about the properties of Genetic Code.
- 3) Describe in brief the Replication of DNA in Prokaryotes with a neat and labelled diagram.

#### 5. Attempt any two of the following:

14

- 1) Describe mismatch and Excision repair mechanism of DNA with a neat labelled diagram.
- 2) Describe in detail DNA replication process in Eukaryotes with a neat labelled diagram.
- 3) Write in detail about D-loop model of Replication in Mitochondria with a neat labelled diagram.

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## B.Sc. – II (Biotechnology) (Semester – IV) (CGPA) (Old) Examination, 2018 MOLECULAR BIOLOGY – II

	MOLECULAR BIC	,
•	e : Saturday, 8-12-2018 a.m. to 1.00 p.m.	Total Marks: 70
	,	ate <b>full</b> marks. ed diagrams <b>wherever</b> necessary.
1. Rewrite	the following sentences by using <b>c</b>	orrect alternative. 14
a) F	• •	b) RNA polymerase III d) Poly 'A' polymerase
of pr a) T	omoter.	b) TF-IID d) RNA polymerase II
end a	of mRNA molecule.	b) Both 5' and 3' d) None of these
a) A	e-Dalgarno sequences are AGGAGGU AGGAGGAU	b) AGGUGGU d) UCCAUCC
gene	-	b) lac 'b'
·	ac 'z'	d) lac 'y'

6)	is not a termination codon.					
	a) UAA	b) UGA				
	c) AUG	d) UAG				
7)	is known as translocase.					
,	a) eEF1	b) Release factor				
	c) EF-Tu	d) EF-G				
8)	of tRNA molecule is call	,				
O)	a) Anticodon b) ТҰС	c) CCA site d) DHU				
9)	One of the following is not a characteri	istic of genetic code				
- /	a) Non-ambiguous	b) Degeneracy				
	c) Non-overlapping	d) Ambiguous				
10)	,	, -				
10)	is responsible for protein					
	a) Lysosome	b) Proteosome				
	C) Pernyisome	d) RER				
	c) Peroxisome	d) HEH				
11)	In trp operon model tryptophan is act a	,				
11)	,	,				
11)	In trp operon model tryptophan is act a	as molecule.				
11) 12)	In trp operon model tryptophan is act a a) Repressor c) Co-repressor	b) Apo-repressor d) Inducer				
·	In trp operon model tryptophan is act a a) Repressor	b) Apo-repressor d) Inducer				
·	In trp operon model tryptophan is act a a) Repressor c) Co-repressor is an activator require	b) Apo-repressor d) Inducer red for high level transcription of the				
·	In trp operon model tryptophan is act a a) Repressor c) Co-repressor is an activator required activator required activator.	b) Apo-repressor d) Inducer red for high level transcription of the b) Glucose				
12)	In trp operon model tryptophan is act a a) Repressor c) Co-repressor is an activator required activator protein c) Regulatory protein	b) Apo-repressor d) Inducer red for high level transcription of the b) Glucose d) Galactose				
12)	In trp operon model tryptophan is act a a) Repressor c) Co-repressor is an activator required activator protein	b) Apo-repressor d) Inducer red for high level transcription of the b) Glucose d) Galactose				
12)	In trp operon model tryptophan is act a a) Repressor c) Co-repressor is an activator required activator protein a) Catabolite activator protein c) Regulatory protein is binds to Exonic Splice	b) Apo-repressor d) Inducer red for high level transcription of the b) Glucose d) Galactose				
12)	In trp operon model tryptophan is act a a) Repressor c) Co-repressor is an activator requir lac operon. a) Catabolite activator protein c) Regulatory protein is binds to Exonic Splic of introns from pre-mRNA molecule.	b) Apo-repressor d) Inducer red for high level transcription of the b) Glucose d) Galactose cing Enhancers (ESE) during removal				
12)	In trp operon model tryptophan is act a a) Repressor c) Co-repressor is an activator required activator protein a) Catabolite activator protein c) Regulatory protein is binds to Exonic Splice of introns from pre-mRNA molecule. a) SR proteins	b) Apo-repressor d) Inducer red for high level transcription of the b) Glucose d) Galactose cing Enhancers (ESE) during removal b) U2 snRNP d) U2AF				
12)	In trp operon model tryptophan is act a a) Repressor c) Co-repressor is an activator required activator protein a) Catabolite activator protein c) Regulatory protein is binds to Exonic Splice of introns from pre-mRNA molecule. a) SR proteins c) U6 snRNP	b) Apo-repressor d) Inducer red for high level transcription of the b) Glucose d) Galactose cing Enhancers (ESE) during removal b) U2 snRNP d) U2AF				

-3-



2.	Ans	wer the following (any 7):	14
	i)	What is abortive transcription?	
	ii)	Write a note on Fidelity of translation.	
	iii)	What is TFIIH ?	
	iv)	What are exon shuffling?	
	v)	What is informosomes ?	
	vi)	What are transcriptional activators?	
	vii)	Write a note on mRNA transport.	
	viii)	Write a note anti-termination.	
	ix)	What are introns?	
3.	A) /	Answer the following (any 2):	10
		i) Explain mechanism of translation in prokaryotes.	
		ii) Describe the process of alternative splicing mechanisms.	
	i	ii) Describe process of mRNA processing in eukaryotes.	
	B) I	Explain Clover leaf model of tRNA.	4
4.	Ans	wer <b>any two</b> of the following :	14
	i)	Explain post-translational modifications in proteins.	
	ii)	Explain signal transduction in gene regulation with suitable examples.	
	iii)	Describe process of transcription in eukaryotes.	
5.	Ans	wer <b>any two</b> of the following:	14
	i)	Explain in detail regulation of lac operon in bacteria.	
	ii)	Describe process of transcription in prokaryotes.	
	iii)	Describe signal integration in gene regulation with suitable example.	



Seat	
No.	

## B.Sc. – II (Semester – IV) (Old CGPA) Examination, 2018 BIOTECHNOLOGY Plant Tissue Culture

•		ate : Monday, 30 a.m. to 1.00			Total Marks :	70
		<b>N.B.</b> : 1)	All questions are	e <b>compulso</b> i	y.	
		2)	Figures to the <b>ri</b>	ght indicate i	iull marks.	
		3)	Draw <b>neat</b> label	ed diagram <b>v</b>	herever necessary.	
1. Re	writ	te the following	sentences by ch	oosing most (	correct alternative.	14
i)			nas a number of s umber of		notors to blow air which	
	a)	HPLC	b) HP-TLC	c) HEPA	d) NFT	
ii)	Tis	sue culture roc	om can be fumiga	ted overnight	and sterilized with	
	a)	Potassium pe	rmanganate and f	ormaldehyde	,	
	b)	70% ethanol				
	c)	Steam				
	d)	Oxygen				
iii)	sei		essels have been ous build up withir	•	riments with plant materials vials.	3
	a)	Fluoro carbon	ate	b) Polyca	rbonate	
	c)	Polypropylene	e	d) Metalio	;	
iv)			s a polysaccharid as a gelling agent		m certain algae and ure media.	
	a)	Sucrose		b) Macro	nutrients	
	c)	Micronutrients	8	d) Agar		



v)	Culture of excised anthers, to obtain haploids is termed as culture.			
	a) Anther	b) Pollen		
	c) Callus	d) Haploid		
vi)	is an asexual plant r	nultiplication starting from a single		
,	individual.			
	a) Clonal propagation	b) Cultivation		
	c) Clonal variation	d) Callus		
vii)	Preservation and storage of cells, tis around – 190°C or by immersion into			
	a) Preservation	b) Cryopreservation		
	c) Attenuation	d) Hardening		
viii)	is a culture of suspe			
	a) Continuous suspension culture	b) Continuous callus culture		
	c) Continuous anther culture	d) Continuous micropropagation		
ix)		s that produces a bipolar embryo with a c tissue of a plant is called		
	a) embryo culture	b) Somatic embryogenesis		
	c) Somaclonal variation	d) Organogenesis		
x)	is a chemical used for	r induction of protoplast fusion.		
	a) Mutagen b) Fusagen	c) Indugen d) Osmoticum		
xi)	is the differentiation	of organs from cultured cells or tissue.		
	a) Collagenesis	b) Organogenesis		
	c) Regeneration	d) Embryogenesis		
xii)	is one of the macro	nutrients which is also a component of		
-	chlorophyll.			
	a) Magnesium	b) Zinc		
	c) Copper	d) Boron		



xiii)		enzyme/s is/are used for isolation of protoplast by enzymati						
	m	ethod.						
	a)	Celluloses	b) Hemicelluloses					
	c)	Pectinases	d) All of these					
xiv)		climatization or control contr	of micropropagated plants on a large scale is generally					
	a)	Polyhouse	b) Refrigerator					
	c)	Soil	d) Water					
2. 5	Solv	e <b>any seven</b>	of the following:	14				
	i)	Explain the rollaboratory.	ples of media room and growth room in plant tissue culture					
	ii)	What is totipo tissue culture	tency? How is the concept of totipotency important in plant?					
	iii)	Explain the m	nethods of sterilization by heat.					
	iv)	What is callus	s? How did callus produce by process of differentiation?					
	v)	What is plan components	t tissue culture medium ? Explain the role of any two of it.					
	vi)	Explain in bri	ef – clonal propagation and clonal variation.					
,	vii)	What is an os	smoticum ? Give an example of it.					
١	/iii)	What is organ	n culture ? Name any two methods of it.					
	ix)	What do you	mean by hybrid and cybrid ?					
3. <i>A</i>	A) A	Attempt any tv	vo of the following:	10				
		i) Write a note	e on instruments required in plant tissue culture laboratory?					
		ii) What is mid	cropropagation? Explain the stages of it.					
	i	ii) What is son production.	natic embryogenesis? Explain the method of artificial seed					
E	•	Explain in brief - umigation.	- surface sterilization of explant and laboratory	Δ				



4. Attempt any two of the following:

14

- i) Give a detailed account on anther and pollen culture.
- ii) Explain in detail somaclonal variation.
- iii) Discuss the methods of protoplast isolation and protoplast fusion.
- 5. Attempt any two of the following:

14

- i) Write an account on different plant tissue culture media and add a note on media composition with significance and preparation.
- ii) Write in detail about cryopreservation and its applications.
- iii) Explain in detail about the plant regeneration through organogenesis with neat labeled diagram.



Seat	_	
No.	Set	P

## B.Sc. (Semester – IV) Examination, 2018 BIOTECHNOLOGY Animal Tissue Culture (Old CGPA)

		Animai IIssue	Culture (Old CGPA)	
•	d Date : Tuesd 10.30 a.m. to 1	lay, 11-12-2018 .00 p.m.		Total Marks : 70
	Instructions :	, ,	are <b>compulsory</b> . <b>ht</b> indicate <b>full</b> marks. d labeled diagrams.	
1. Re	write the follow	ving sentences by	choosing <b>correct</b> alternat	ives. 14
1)	Laminar air flo	ow platform sterilize	ed by using	_
	a) 70% ethan	nol	b) 100% ethanol	
	c) 50% ethan	nol	d) 30% ethanol	
2)		described procedu	ure to obtain passaged m	onolayer culture.
	a) Carrel		b) Dulbecco	
	c) Butler		d) Freshney	
3)		material is used fo	or treatment of substrate s	surface.
	a) Albumin		b) Transferin	
	c) Collagen		d) Casein	
4)	_	tritional and hormo survival of cell in cu	nal factors Ilture.	_ factor is also
	a) Insulin		b) Lipids	
	c) Proteins		d) Stromal	
5)	Isolation of spemethod.	ecific cell from tiss	ue for culture is carried or	ut by
	a) Disaggreg	ation	b) Heat shock	
	c) Centrifuga	ıtion	d) Radiation	



6)	serum is particularly used for more demanding cell lines.		
	a) Tiger	b) Foetal Bovine	
	c) Horse	d) Goat	
7)	serum may also be less likely to metabolize polyamines due to lower level of polyamine oxidase.		
	a) Camel	b) Bovine	
	c) Horse	d) Goat	
8) Most dispersed cell cultures prefer lower tension.		res prefer lower tension.	
	a) Hydrogen	b) Nitrogen	
	c) Carbon dioxide	d) Oxygen	
9) is usually measured by depression of the freezing p			
	a) Osmolality	b) Apoptosis	
	c) Temperature	d) Karyotyping	
10) An cell counter is suitable for rapid counting of mu samples of cells in suspension.			
	a) Magnetic	b) Electronic	
	c) Manual	d) Parabolic	
11) The most sensitive assay used for protein determination i		used for protein determination is	
	a) Biuret assay	b) BCA assay	
	c) Lowry assay	d) Nicolson's assay	
12)			
	a) Histone	b) Protein	
	c) MTT	d) Chromosome	
13)	A cell line can be identified by use of fluorescent labeled antibody specific for antigen.		
	a) Membrane	b) Protein	
	c) Lipid	d) Internal	
14)	Encapsulation of DNA in improve the efficiency of	vesicle is an effective way to cellular uptake.	
	a) Dextran	b) Liposome	
	c) Gel	d) DEAE-Dextran	



2. Answer the following (any seven):	14
1) Write a note on substrate for cell growth.	
2) Write a note on CO2 Incubator.	
3) Explain in brief criteria for subculture.	
4) Give brief account on complete media.	
5) Explain in brief cell counting.	
6) Write a note on cell separation.	
7) Enlist physiological properties of media.	
8) Write a note on type of product in production strategy.	
9) Write a note on cell determination by glucose.	
3. A) Answer the following (any two):	10
1) Explain analysis of cell cycle.	
2) Give details of warm trypsinization.	
3) Give details of cell synchronization.	
B) Write a note on history of ATC.	4
4. Answer the following (any two).	14
1) Describe in detail serum free media.	
2) Describe Instruments used in ATC.	
3) Discuss glycoprotein production from mammalian cells.	
5. Answer the following (any two).	14
1) Discuss in detail cell counting and monitoring.	
2) Explain selection and maintenance of cell line.	
3) Explain production of blood clotting factors.	


**SLR-SJ - 37** 

Seat	
No.	

Set P

# B.Sc. – II (Biotechnology) (Semester – IV) (CGPA) Examination, 2018 BIOENERGETICS AND ENZYMOLOGY (Old)

DIOLINE HOLD E	142 TWOLOGT (Old)
Day and Date : Wednesday, 12-12-2018 Time : 10.30 a.m. to 1.00 p.m.	Total Marks: 70
Instructions: 1) All questions carry each 2) Figures to right indice 3) Draw neat and labeled 1. Rewrite the following sentences by using a	ate <b>full</b> marks. ed diagrams <b>wherever</b> necessary.
<ul><li>1) Half cells contain two ions of same ele</li><li>a) Atomic mass</li><li>c) Nucleon number</li></ul>	ment with different b) Oxidation state d) Electronic configuration
<ul><li>2) Negative electrode in half cell is made</li><li>a) Hydrogen b) Zinc</li></ul>	up of c) Copper d) Tungsten
<ul><li>3) The enzyme which forms the peptide be</li><li>a) Carbonic unhydrase</li><li>c) Carbohydrase</li></ul>	bond is known as b) Peptidase d) Peptidyl transferase
<ul><li>4) The catalytic efficiency of two distinct e factor.</li><li>a) Km</li><li>c) Size of the enzymes</li></ul>	b) Product formation d) pH of optimum value
<ol><li>Inhibition of enzyme cytochrome oxidas for</li></ol>	e by carbon monoxide is an example
<ul> <li>a) Feed back inhibition</li> </ul>	b) Competitive inhibition
c) Non competitive inhibition	d) Uncompetitive



6)	<ul> <li>In non-competitive inhibition extent of inhibition depends only on</li> <li>a) Concentration of enzyme</li> <li>b) Concentration of substrate</li> <li>c) Concentration of inhibitor</li> <li>d) Concentration of ES complex</li> </ul>						
7)	In uncompetitive a) Enzyme c) ES-complex	inhibition inhibitor bind	b)	only to Substrate Active site			
8)	When V and P value $\Delta$ S	alues are constant in b b) $\Delta T$		hemical system $\Delta$ Q		= ΔE	
9)	The number of i	soenzyme forms of al	coh	ol dehydrogenos	e ir	n maize are	
	a) 4	b) 8	c)	12	d)	16	
10)	The required pH a) 5	for action of trypsin is b) 6	c)		d)	8	
l1)	•	nposition of product's but the structure is diff	ere b)	•	-		
12)	Coenzyme carbo	oxybiotin is the derivati b) B2		of vitamin B3	d)	B7	
13)	Inhibitor of succinal Sulfa drugs c) Succinic acid	nate dehydrogenase is	b)	Cyanides Malonic acid			
14)	ATP molecules in	energy by breakdown			ed	in bonds of	
	<ul><li>a) Potential ene</li><li>c) Hydra energy</li></ul>		,	Kinetic energy Thermal energy			
	o, riyara onorgy	•	$\neg$	omai onorgy			



2.	Ans	wer the following (any 7):	14
	i)	What is inhibitor give its one example?	
	ii)	Give two examples of coenzyme and prosthetic group.	
	iii)	Define entropy and enthalpy.	
	iv)	What is the significance of km and Vmax?	
	v)	Define abzymes.	
	vi)	What is the unit of enzyme activity and specific activity?	
	vii)	Draw the structure of ATP.	
	viii)	Write a note on mass action ratio of reaction.	
	ix)	Define cofactor with one example.	
3.	A) ,	Answer the following (any 2):	10
		i) Explain first and second law of thermodynamics.	
		ii) Write a note on biological half reactions.	
		iii) How the substrate concentration affects the enzyme activity?	
	B) I	Explain concept of activation energy in enzyme catalysed reaction.	4
4.	Ans	wer <b>any two</b> of the following:	14
	i)	Derive of Michaelis-Menten equation for single substrate.	
	ii)	Explain relationship between equilibrium constant and standard free energy change.	
	iii)	Write a note on classification system of enzyme with example of each class.	
5.	Ans	wer any two of the following:	14
	i)	Write a note on types of enzyme inhibition with their kinetics.	
	ii)	Explain regulation of enzyme in living system.	
	iii)	Write a note on standard redox potential and free energy change.	



Seat	
No.	

Set P

# B.Sc. – II Biotechnology (Semester – IV) (CGPA) Examination, 2018 METABOLISM (Old)

•		ate : Thursday, 13-12-2018 0 a.m. to 1.00 p.m.		Total Marks : 70
In	str	ructions: 1) All questions carry <b>e</b> 2) Figures to <b>right</b> indice 3) Draw <b>neat</b> and labe	cate	e <b>full</b> marks.
1. Rev	vrit	e the following sentences by usin	g <b>cc</b>	correct alternative. 14
1) I	Fat	ty acid with 14 carbons will under	go _	cycles of beta oxidation.
i	a)	7 b) 6	c)	) 5 d) 4
2) I	n e	eukaryotes fatty acid breakdown o	ccu	urs in
i	a)	Cytosole	b)	) Mitochondrial matrix
	c)	Ribosome	d)	) Endoplasmic reticulum
3) _		is not used for fatty acid	bios	synthesis.
i	a)	Biotin	b)	) NADPH
	c)	Bicarbonate	d)	) Cyanocobalamine
4) l	Ure	ea and are by product	of ι	urea cycle.
i	a)	Aspartate	b)	) Arginine
	c)	Ornithine	d)	) Citrulline
•		transamination amino group from	ı am	mino acid is collected in the
i	a)	Aspartate	b)	) Keto glutarate
	c)	Glutamate	d)	) Keto acid



6)	Precursor for starch synthe	sis is
	a) UTP-glucose	b) UDP-glucose
	c) ATP-glucose	d) ADP-glucose
7)	The site of dark reaction of	photosynthesis is
	a) Grana	b) Stroma
	c) Thylakoid	d) Both a and b
8)	Which of the following abs	rb light energy for photosynthesis?
	a) RUBP	b) ATP
	c) Chlorophyll	d) ADP
9)	Kranz anatomy is seen in _	
	a) C3 plants	b) C4 plants
	c) C2 plants	d) CAM plants
10)	is an example of	f uncoupler of ATP synthesis.
	a) DNSA	b) 2, 4 dinitrophenol
	c) Tryptomycin	d) IAA
11)	Pyruvate is converted into	CO <sub>2</sub> and H <sub>2</sub> O through
	a) Kerb's cycle	b) Glycolysis
	c) ETC	d) Lactate fermentation
12)	How many molecules of ac acid $(C_{16})$ ?	etyl co-A produced in oxidation of palmitic
	a) 6 b) 7	c) 8 d) 9
13)	Fatty acids are covalently litheir synthesis.	nked with carrier proteins during
	a) Methyl	b) Ethyl
	c) Butyryl	d) Acyl
14)	• • • •	on of glyceraldehydes 3 phosphate to 1, 3 acts an electron acceptor.
	a) NAD+	b) NADH
	c) FADH	d) FAD



2.	An	swer the following (any 7):	14
	i)	Write a note on cori cycle.	
	ii)	What is transamination?	
	iii)	Define gluconeogenesis.	
	iv)	Write two examples of inhibitors of electron transport chain.	
	v)	How the fatty acids are transported in mitochondria?	
	vi)	Write a note on Rubisco enzyme.	
	vii)	Draw the structure of mitochondria.	
	viii)	Write a note on lactic acid fermentation.	
	ix)	Write down examples of ketogenic amino acids.	
3.	A)	Answer the following (any 2):	10
		<ul> <li>i) Write a note on ATP synthase complex and ATP generation in mitochondria.</li> </ul>	
		ii) What are the sources of atoms in purine and pyrimidine molecules?	
		iii) Explain $\beta$ oxidation of saturated fatty acids.	
	B)	Write a note on starch synthesis in plants.	4
4.	An	swer <b>any two</b> of the following:	14
	i)	Explain in detail components of electron transport chain and transfer of electron through this components.	
	ii)	Write down the reactions involved in aerobic breakdown of glucose into pyruvate.	
	iii)	How the biosynthesis of saturated and unsaturated fatty acid takes place ?	
5.	An	swer <b>any two</b> of the following :	14
	i)	Explain in detail CO <sub>2</sub> fixation reaction in C <sub>3</sub> plants.	
	ii)	Write a note on urea cycle.	
	iii)	Explain reactions and physiological significance of hexose monophosphate shunt.	
		S	et P



Seat	Set	В
No.	Set	

#### B.Sc. (Biotechnology) III (Semester – V) (New CBCS) Examination, 2018 ENGLISH (Compulsory) Literary Quest

		Literary	Qu	est	
-	d Date : Saturday, 2.30 p.m. to 5.00 p.				Max. Marks : 70
	,	<b>All</b> questions are Figures to the <b>rig</b>			arks.
1. Cho	oose the correct alt	ernative.			14
1)	/ivekananda ?				
	a) Hinduism		b)	Christianity	
	c) Judaism		d)	None of the ab	oove
2)	What has destroye to Vivekananda?	ed civilization and s	ent	whole nations to	o despair, according
	a) sectarianism	b) bigotry	c)	fanaticism	d) all the above
3)	What did Mother	Teresa want to be	as	a child ?	
	a) teacher	b) nun	c)	missionary	d) nurse
4)	When did Mother	Teresa receive No	be	l Peace Prize a	ward?
	a) 1979	b) 1980	c)	1981	d) 1978
5)	When you are def	rauded it is easy t	o b	е	
	a) angry	b) jealous	c)	peaceful	d) selfish
6)	According to Lawr	rence, money is ou	ır v	ast r	nadness.
	a) individual	b) personal	c)	collective	d) none of the above
7)	Science is addres	sed as			
	a) daughter of Old	d Time	b)	enemy of Old	Time
	c) wife of Old Tim	ie	d)	herald of New	Time
8)	Father Gilligan wa	s tired because			
	a) people were w	orking hard	b)	people were ti	red
	c) people were si	ck	d)	people were co	elebrating
9)	The young childre classes twice a we			(have: Sii	mple Present) yoga
	a) has	b) are	c)	have	d) is



	10)	)) Karan (work: past progressive) in Solapur.				
		a) is working	b)	was working		
		c) worked	d)	were working		
	11)	Either Murali or Tara	u (use:	Present Perfect) these pens.		
		a) have used	b)	had used		
		c) has used	d)	has been used		
	12)	What is the superlat	ive form of 'young'	?		
		a) younger	b)	more young		
		c) most young	d)	youngest		
	13)	What is the compara	ative form of 'fine' ?	,		
		a) more fine	b)	finer		
		c) most fine	d)	finest		
	14)	What is the positive	form of 'further'?			
		a) furthest	b)	more further		
		c) far	d)	none of the above		
2.	Ans	swer <b>any four</b> of the f	following questions		16	
	1)	What does one gain	from being calm?			
	2)	What are the solution money mindedness	•	rence to the problems caused by		
	3)	What is the theme of	f the sonnet 'To So	ience' ?		
	4)	What did God do wh	en Father Gilligan	fell asleep ?		
	5)	What is the central is	dea of the poem 'M	loney Madness' ?		
	6)	Why doesn't Father	Gilligan have rest,	joy and peace ?		
3.	Ans	swer <b>any two</b> of the f	ollowing questions.		12	
	1)	How has India displa	ayed religious toler	ance to the world ?		
	2)	What Mother Teresa	a initially did after c	ompleting nursing course?		
	3)	Write the dialogues	for the following sit	uation :		
		Mahesh goes to his f will gift to their friend		se. They talk about which book they rthday.		
	4)	Write the dialogues	for the following sit	uation :		
		You call a restauran	t to ask how long it	is open and to make a reservation		

14



- 4. Answer **any one** of the following questions.
  - 1) Write an argumentative speech on 'Smoking at Public Places'.

OR

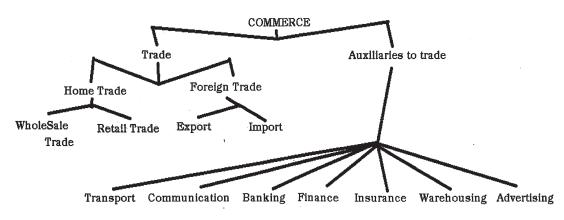
2) Write a script of a debate on the topic- 'Should Plastic Bags be Banned?' Use following points below to develop a debate. You can work in a group of four with two people choosing to argue for affirmative and two people arguing for the negative.

#### Affirmative:

- 1) Environmental damage
- 2) The Great Waste
- 3) Non-biodegradable
- 4) They litter our streets
- 5) Plastic bags suffocate and kill
- 6) Wildlife concerns
- 7) Spread Awareness.

#### Negative:

- 1) No need to ban, add a tax
- 2) Freedom of choice
- 3) People forget their re-useable bags
- 4) Causes loss of jobs
- 5) The environmental war needs to be won elsewhere
- 6) Loss of Technology
- 7) So what do we carry our shopping in?
- 8) No need to ban just reduce the use of plastic.
- 5. Write a detailed paragraph on the following tree diagram.



14



Seat	Set	D
No.	Set	<b>P</b>

# B.Sc. (Biotechnology) (Part – III) (Semester – V) (New CBCS)

				nation, 20 EVELOPN		, (	,
-	d Date : Monda 2.30 p.m. to 5.0	•	1-2018			Т	otal Marks : 70
1	Instructions :	1) Figu	ures to the	right indic	ate <b>full</b> mark	S.	
		,	w a neat, essary.	well labeled	l, complete d	iagram	wherever
	<ol> <li>Use of calculators, cell phones or any other electronic gadgets is prohibited.</li> </ol>						
		4) <b>A</b> II	questions	are <b>comp</b> u	lsory.		
1. Ch	oose a <b>correc</b>	t altern	ative from	the followin	ıg:		14
1)	The phenome of the termina a) Lateral do c) Apical sup	al bud o minanc	n the brande	ch is knowr b)	-	nance	-
2)	In embryo de	-	ent, a filam	ent of 6-9 c	ells arising fr	om bas	al cell is known
	a) Hypophys	sis b)	Epiphysis	c)	Suspensor	d)	Stock
3)		is the i	meristam t	hat gives ri	se to epiderm	nis.	
	a) Ground m	eristem		b)	Procambium	1	
	c) Basal mei	ristem		d)	Protoderm		
4)		is the 1	fused prod	luct of two p	oolar nuclei in	the em	nbryo sac.
	a) Zygote			b)	Pollen		
	c) Definitive	nucleus	3	d)	Antipodal		
5)	and several c	of the fol	lowing div	isions are a	ccompanied	by wall	
	a) Helobial	D	) Nuclear	C)	Cellular	u)	Acellular

6)	Arabidopsis thaliana is a membe	r of			
	a) Brassicaceae	b)	Arabidopsis		
	c) Asteraceae	d)	Bigniniaceae		
7)	Exine of pollen is composed of _				
,	a) Sporopollenin		Chitin		
	c) Peptidoglycan	d)	Collagen		
8)	Cytokinins are involved in				
,	a) Cell elongation	b)	Cell multiplica	ation	
	c) Apoptosis	•	Senescence		
9)	is the proces	ss of trans	sfer of nollen a	rains fi	rom anther
0)	to stigma.	oo or traine	ner or policing	ranio ii	om ammor
	a) Fertilization	b)	Pollination		
	c) Microsporogenesis	d)	Emasculation	l	
10)	In cryogenic storage, pollen grair	ns are sto	red as		temperature.
	a) -80°C b) -196°C				
11)	Mature endosperm with any deg surface contour is called as				ness in its
	a) Helobial b) Nuclear	c)	Cellular	d)	Ruminate
12)	is composed center cells in <i>Arabidopsis</i> root m	of a grou	up of four cells	s, also	known as
	a) Quiescent center		Cortical cente	er	
	c) Endodermis	,	Columella		
13)	Vegetative meristems are highly structures over and over again – a this phenomenon is known as	and their a	ctivity can con		
	a) Indeterminate growth	b)	Definite grow	th	
	c) Immortality	d)	Differentiation	า	
14)	is substitut multiplication process without nu			ction k	oy an asexua
	a) Double fertilization		Polyembryon	V	
	c) Endosperm	,	Apomixis	у	
	0, <b>-</b> 11000001111	u i	, ipolitikio		



2.	A)	<ol> <li>Answer the following (any four).</li> <li>What is <i>in vitro</i> fertilization?</li> <li>What is pollination? Enlist vectors involved in pollination.</li> <li>Explain in brief seed technology.</li> <li>Differentiate between male and female gametophyte.</li> <li>Describe xylem tissue.</li> </ol>	8
	B)	<ul> <li>Write notes on (any two).</li> <li>1) Why is <i>Arabidopsis thaliana</i> known as a Model of plant development?</li> <li>2) Explain in brief – pollen germination.</li> <li>3) Write the storage proteins of endosperm and embryo.</li> </ul>	<b>6</b>
3.	A)	<ul> <li>Answer the following (any two).</li> <li>1) Discuss the methods of pollen storage.</li> <li>2) Discuss the classification of seeds on the presence or absence of endospem.</li> <li>3) Explain the stages of embryo development.</li> </ul>	8
	B)	<ul><li>Answer the following (any one).</li><li>1) Give a detailed account on root development.</li><li>2) Give a detailed account on structure and synthesis of plant cell walls.</li></ul>	6
4.	A)	Answer the following (any two).  1) Explain the mechanism of fertilization.  2) Give a detailed account on polyembryony.  3) Write the mode of action of different phytohormone.	10
	B)	<ul><li>Answer the following (any one).</li><li>1) Explain the concept of pollen embryos.</li><li>2) Explain the concept of sporophytic and gametophytic self-incompatibility.</li></ul>	4
5.		swer the following (any two).  Explain in detail – Development of female gametophyte.  Give a detailed account on development of endosperm.  Write a note on – biochemistry and molecular biology of fruit maturation.	14
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## B.Sc. – III (Semester – V) Biotechnology (New CBCS) Examination, 2018 FERMENTATION TECHNOLOGY

Day and Date: Tuesda Time: 2.30 p.m. to 5.00		Total Marks : 70
2)	<b>All</b> questions are <b>comp</b> Figures to the <b>right</b> indi Draw <b>neat</b> labeled diag	•
1. Choose the <b>correc</b>	t alternative and rewrite	the sentences again. 14
1)	organism used in Vitam	in B12 production.
a) Streptomyce	es griseus	
b) Saccharomy	vces cerevisiae	
c) Acetobacter	suboxydane	
d) Escherichia	coli	
2) Corn steep liquo	or is the waste of	industries.
a) Oil	b) Dairy	
c) Corn	d) None of	these
3) Laboratory scale	e fermentor having	liters capacity.
a) 1 – 2	b) 1,00,000	
c) 100 – 500	d) None of	these
4)	_ technique is used for is	solation of auxotrophic mutant.
a) Crowded pla		
c) Penicillin	d) Citric aci	d

-	The purification and recovers proces	ery of the production after fermentation is called ss.
	a) Upstream	b) Downstream
	c) Fermentation	d) None of these
6)	Stock culture maintained b	oy
	a) Sterilization	b) Lyophilization
	c) Pasteurization	d) Tyndalisation
-	microorganism.	ric acid is carried out using
	a) Escherichia coli	
	b) Aspergillus niger	riaa
	<ul><li>c) Saccharomyces cerevis</li><li>d) Acetobacter suboxydan</li></ul>	
<b>0</b> \		
8)		llowing is not used as antifoaming agent.
	a) Citric acid	b) Vegetable oils
	c) Lard oil	d) Silicon derivatives
9)	Solvent extraction is used	for recovery of
	a) Penicillin	b) Alcohol
	c) Amylase	d) Citric acid
10)	In penicillin G production _	is the precursor used.
	a) Phenyl acetic acid	b) Alcohol
	c) Vinegar	d) Sodium chloride
11)	Fermentation economics is	based on
	a) Recovery	b) Incubation period
	c) Medium constituent	d) All of these



1	12) of fermentation process is always done before starting la scale operation of any fermentation.				
		a) Scale up	b)	Economics	
		c) Scale down	d)	Screening	
1	3)	substrate	ma	inly used in amylase production.	
		a) Malt	b)	Peptone	
		c) Starch	d)	Beef extract	
1	4)	The sterilization of heat sen out by	sitiv	ve material in fermentation industry is carried	
		a) Centrifugation	b)	Electrostatic precipitation	
		c) Heat	d)	Filtration	
2.	A)	Define and explain (any fou	ır)	of the following:	8
		1) Define fermentation.			
		2) Culture Collection Center	ers 1	for Microorganisms.	
		3) Distillation.			
		4) Biological assay.			
		5) Precipitation.			
	B)	Write short note on any two	of	the following:	6
		1) Write a note on anaerob	oic f	ermentation.	
		2) Write a note on filtration			
		3) Write a note on inoculur	n pı	reparation.	
3.	A)	Answer <b>any two</b> of the follo	win	g:	8
		1) Write an essay on drying	g fo	r product recovery.	
		2) Explain in detail bioinse	ctici	ide production.	
		3) Write in detail fermentat	ion	economics.	
	B)	Answer <b>any one</b> of the follo	win	ng:	6
		1) Explain in detail primary	scr	reening.	
		2) Write an essay on amyla	ase	fermentation.	
				0-	



- 4. A) Answer any two of the following:

  Explain in detail microbial growth kinetics.
  Write an essay on penicillin fermentation.
  Explain in detail sterilization of fermentation media.

  B) Answer any one of the following:

  Describe in detail batch fermentations.
  Give an account on computer applications in fermentation technology.

  Answer any two of the following:

  Answer any two of the following:
  - 2) Write an essay on citric acid production.3) Discuss in detail different methods of strain improvement.

1) Write an essay on Vitamin B12 fermentation.

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## B.Sc. Biotechnology (Semester – V) (New CBCS) Examination, 2018 TOOLS AND TECHNIQUES

-		ate : Thursday, 22 p.m. to 5.00 p.m				Total Marks :	70
I	nstı	, -	questions are <b>cor</b> res to the <b>right</b> in w <b>neat</b> and labele	ndicat	te <b>full</b> marks.		
1. Re	writ	te the following se	entences by choo	sing c	correct alterna	atives.	14
1)	Wh	nich is the techniq	ue suited for the	separ	ation of large	er DNA fragments?	•
	a)	PFGE	b) AGE	c) P	AGE	d) SDS-PAGE	
2)	Wh	nen is electrophor	esis not used?				
	a)	Separation of pro	oteins	b) S	eparation of	lipids	
	c)	Separation of an	nino acids	d) S	eparation of	nucleic acids	
3)	Wh	nich of the followir	ng factors does no	ot infl	uence electro	phoretic mobility?	
	a)	Molecular weigh	t	b) S	hape of mole	ecule	
	c)	Stereochemistry	of molecule	d) S	ize of molecu	ıle	
4)	Wh	nich of the followir	ng statements is o	correc	t with respec	t to exonuclease?	
	a)	They only act on	single stranded	DNA i	molecules		
	b)	They only act on	double stranded	DNA	molecules		
	c)	They remove nu	cleotide bases fro	om the	e middle of po	olynucleotide chain	
	d)	They remove a s	single nucleotide l	base	at a time		



5)	Which of the following statements is correct regarding S1 nuclease?		
	a) It acts on single stranded DNA	b) It acts on double stranded DNA	4
	c) It acts on both types of strands	d) It is obtained from E.coli	
6)	Type II cuts the sequence in the follo	wing way.	
	a) At 100-1000 nucleotides away fro	om the recognition sequence	
	b) Within the recognition sequence		
	c) At 27-30 nucleotides away from the	he recognition sequence	
	d) It cuts randomly		
7)	The most popular and widely used en	ngineered plasmid vector is	
	a) pSC 101	b) pUC 18	
	c) pBR 322	d) pBR 327	
8)	Autonomously Replicating Sequence	s (ARS) is characteristic feature of	
	a) Plasmid vector	b) Cosmid vector	
	c) Phage vector	d) Yeast vector	
9)	Which of the following is not true abo	ut phagemids?	
	a) Can only propagated as phage		
	b) Contain $\lambda$ att site		
	c) Contain functional Ori of palsmid	& λ phage	
	d) May be propagated as a plasmid	or as phage in appropriate strain	
0)	The ability of cells to take up DNA fra	igments from surrounding is called	
	a) Transduction	b) Transformation	
	c) Transfection	d) Conjugation	
1)	Which of the following chemical enhance	inces vir gene expression?	
	a) Cyanidin	b) Glutennin	
	c) Acetosyringone	d) Dextran	Set P



12)	PCR is used in		
	a) Site specific recombination	b) Site specific translocation	
	c) Site specific transformation	d) Site directed mutagenesis	
13)	DNA footprinting is a suitable techn	ique for identifying	
	a) Protein binding site within DNA	b) Introns within DNA	
	c) tRNA associated with DNA	d) mRNA associated with DNA	
14)	Alec Jeffery's name is associated w	vith	
	a) DNA sequencing	b) DNA fingerprinting	
	c) RNA sequencing	d) Protein fingerprinting	
2. <i>F</i>	A) Answer the following (any four):		8
	1) Give brief account on introduc	tion of genetic engineering.	
	2) Define exonucleases and end	onucleases.	
	3) Define Vectors.		
	4) Enlist the advantages and app	olications of electroporation.	
	5) Define probes.		
E	3) Write notes on ( <b>any two</b> ) :		6
	1) Write a note on transformation	١.	
	2) Write a note on particle gun m	ediated gene transfer.	
	3) Write a note on synthetic oligo	onucleotide probes and riboprobes.	
3. <i>A</i>	A) Answer the following (any two):		8
	1) Give details of agarose gel ele	ectrophoresis.	
	Explain AMV reverse transcrip	otase.	
	, .		
	<ol><li>Discuss shuttle vector.</li></ol>		

B) Answer the following (any one): 6 1) Describe chain termination method of DNA sequencing. 2) Discuss DNA blotting technique. 4. A) Answer the following (any two): 10 1) Explain SDS-PAGE technique. 2) Discuss reverse transcriptase PCR. 3) Describe chemical methods used for direct DNA transfer. B) Answer the following (any one): 4 1) Describe DNA polymerase I. 2) Explain nick translation and random primed method of labeling. 14 5. Answer the following (any two): 1) Describe in detail RFLP. 2) Discuss in detail DNAse I and Ribonuclease H. 3) Explain p<sup>BR</sup> 322 and p<sup>SC</sup> 101 vector.

<b>SLR-SJ – 45</b>



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### B.Sc. – III (Semester – V) (Biotechnology) (New-CBCS) Examination, 2018 RECENT TRENDS IN BIOTECHNOLOGY

RECENT TRENDS IN I	BIOTECHNOLOGY
Day and Date : Saturday, 24-11-2018 Time : 2.30 p.m. to 5.00 p.m.	Total Marks: 70
Instructions : 1) All questions are con 2) Figures to the right i 3) Draw neat labeled di	•
1. Choose the <b>correct</b> alternative and rewri	ite the sentences again.
1) Biodegration of specific compounds by	inoculating bacterial cell is known as
<ul><li>a) Bioremediation</li><li>c) Energy plantation</li></ul>	<ul><li>b) Bioaugmentation</li><li>d) Phytoremediation</li></ul>
in genetically modified organisms.	f active pharmaceuticals substances b) Molecular biology d) r-DNA technology
<ul><li>3) The process of extracting metals from ore</li><li>a) Bioextraction</li><li>c) Biofiltration</li></ul>	bearing rocks is called as b) Microbial extraction d) Bioleaching
4) Stem cells are present in  a) Unicellular organisms  c) Non-living thing	b) Multicellular organisms d) Viruses
<ul><li>5) The selection of immobilization of cell</li><li>a) Number of step in the process</li><li>c) Stability and catalytic specificity</li></ul>	b) Cost

6)	6) For transformation of chloroplast of higher plants, a vector is used which doesn't in the chloroplast.				
		Replicates		Recombine	
	•	Include	d)	Reduce	
7) means use of plants to remediate the soil contamin					
		Phytoremediation		Bioaugmentation	
	c)	Magnification	d)	Clarification	
8)		is an important water	co	ntaminant.	
	a)	Heavy metals	b)	Carbon monoxide	
	c)	Nitrogen oxide	d)	Sulphur dioxide	
9)		is not an objective of	ΕIΑ	۸.	
	a)	Risk analysis and disaster manag	gem	nent	
	•	Assessment of international fund	_		
	,	Recycling and reduction of waste	•		
	d)	All of the above			
10)		bacterium is called as	the	e superbug that could clean up oil	
	spills.				
	,	Bacillus subtilis	•	Bacillus cereus	
	C)	Pseudomonas pituda	d)	Escherichia coli	
11)		control coefficient measures the $\underline{\ }$			
		Steady state change	,	pH change	
	c)	Temperature change	d)	Hormonal change	
12)		process of converting environmen		•	
	-	aturally occurring microbes called			
	-	Extrinsic bioremediation	-		
	C)	Ex-situ bioremediation	u)	mmsic bioremediation	
13)		molecular weight compounds can		-	
	,	Covalent cross-linking	,	Microencapsulation	
	c)	Adsorption	d)	Entrapment	
14)		is the practice of optimiz	_		
		n cells to increase the cells' produ			
	,	Genetic engineering	,	Gnotobiology	
	C)	Metabolic engineering	d)	Nanotechnology	



2.	A)	Define and explain <b>any four</b> of the following.  1) Define Bioremediation.  2) Edible vaccines.  3) Stem cell.  4) Bioaugmentation.  5) Remote sensing.	8
	B)	<ul><li>Write short note on any two of the following.</li><li>1) Clinical biotechnology.</li><li>2) Limitations of metabolic engineering.</li><li>3) Write a note on biofiltration.</li></ul>	6
3.	A)	Answer <b>any two</b> of the following.  1) Explain in detail components of EIA.  2) Write an essay on analysis of metabolic network.  3) Write in detail principles of clinical biochemical analysis.	8
	B)	Answer <b>any one</b> of the following.  1) Write an essay on Methods of immobilizations.  2) Write an essay on Sampling methods.	6
4.	A)	<ul><li>Answer any two of the following.</li><li>Write an essay on environmental monitoring.</li><li>Write an essay on phytoremediation and wetland system.</li><li>Explain in detail industrial applications of immobilization.</li></ul>	10
	B)	<ul><li>Answer any one of the following.</li><li>1) Describe in detail importance of laboratory tests in clinical medicine.</li><li>2) Give an account on cloning and over expression of heterologous genes.</li></ul>	4
5.	1) 2)	swer <b>any two</b> of the following:  Explain in detail Ex-situ and In-situ bioremediation.  Explain in detail industrial waste biotreatment technologies.  Discuss in detail integration of genetic engineering in agriculture.	14

Seat No.

### B.Sc. – III (Semester – V) Biotechnology (New-CBCS) Examination, 2018 INTRODUCTION TO BIOTECHNOLOGY BASED INDUSTRIES

•	d Date : Saturday, 24 2.30 p.m. to 5.00 p.m		Total Marks : 70	
lr	, -	ires to the <b>right</b> in	<b>mpulsory</b> . ndicate <b>full</b> marks agrams <b>wherever</b>	
1. Cho	oose the <b>correct</b> alte	ernative and rewri	te the sentences a	again : 14
1)	Asking for quotation functions of	• •		of invoice are the
	a) packaging		b) purchase	
	c) quality control		d) production	
2)	Assessment of p	roduct for any	defect has be	en practiced by
	a) upstream proce	essing	b) production	
	c) quality assuran	ce	d) quality control	
3)	3) is working as interfaces between board and employees.			d and employees.
	a) CEO	b) Director	c) Manager	d) Officer
4)	The responsibilities comes under		•	tood and recorded
	a) raw material		b) quality control	
	c) personnel		d) production lot	
5)	is a set to help workers care		•	l by an organization
	a) GMP	b) SOP	c) QA	d) QC



6)	•		•	nd its worker protection vill be considered in
	a) industrial hy	giene	b) industrial	quality
	c) industrial sa	fety	d) industrial	security
7)	In the EPA OW	stands for		
	a) Office of Wa	iter	b) Objective	s of Water
	c) Objections of	on Water	d) Organizat	tion of Water
8)	The sixth Directo	or-General of the V	VTO is	
	a) Dr. Margare	t Chan	b) Dr. Letitia	Robinson
	c) Francis Guri	ry	d) Roberto A	Azevedo
9)	Food safety an	d Standards Act	was published	by the parliament in
	a) 1995	b) 1999	c) 2003	d) 2006
10)		istilled, alcoholic d ol by volume are c		an alcohol content of at
	a) beer	b) spirits	c) cider	d) wine
11)	Nanozyme have	ability to mimic na	atural enzyme su	ıch as
	a) catalase		b) peroxidas	se
	c) both of these	Э	d) none of th	nese
12)	The Department	of Biotechnology	established in th	ne year
	a) 1986	b) 1991	c) 2002	d) 2007
13)	CSIR-Institute	of Microbial Ted —	hnology (CSIF	R-IMT) is located at
	a) Bhubaneswa	ar	b) Lucknow	
	c) Jorhat		d) Chandiga	rh
14)	Per year total	10 lakh researd	ch fellow gran	ts are offered under
	a) Simons-NCE	38	b) PMRF	
	c) ICGEB		d) iTHEMS-	IKEN



2.	A)	Answer any four of the following:  1) Equipment cleaning  2) Marketing.  3) Ethics.  4) Biosimilar.  5) Research fellow.	8 2 2 2 2 2
	B)	Write short note on <b>any two</b> of the following:  1) Medical coding.  2) PMRF.  3) ICAR.	6 3 3
3.	A)	Answer <b>any two</b> of the following:  1) Write in brief role and responsibilities of personnels in organization.  2) Describe in brief structure and importance of SOP.  3) Explain in brief role and responsibilities of WHO.	8 4 4 4
4.	·	Answer <b>any one</b> of the following.  1) Write an essay on DBT.  2) Describe in detail plant tissue culture.  Answer <b>any two</b> of the following:  1) Explain in detail on New Zealand Commonwealth Scholarship Program.	6 6 10
	B)	2) Describe in brief on production of biotherapeutic proteins and peptides. 3) Give brief note on validation programs.  Answer <b>any one</b> of the following: 1) Explain in brief production and applications of veterinary vaccines. 2) Describe in brief various biotechnology based CSIR institutes.	5 5 4 4 4
5.		wer <b>any two</b> of the following: Write an essay on GMP. Describe in detail upstream and downstream processing. Write in detail location, establishment, role and responsibility of ISO.	14 7 7 7

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### B.Sc. – III (Semester – V) (Biotechnology) Examination, 2018 ENGLISH (Compulsory) (Old) (CGPA) Breakthrough

Day and Date : Saturday, 17-11-2018 Time : 2.30 p.m. to 5.00 p.m.	Max. Marks: 70
<b>N.B.</b> : 1) <b>All</b> questions are <b>co</b> . 2) Figures to the <b>right</b> i	•
1. A) Choose the correct alternative :	10
Shaw is a a) Capitalist	Church, School and Press prove that  b) Anarchist
but by its millions of obedient sub	
<ul><li>a) Patriots</li><li>c) Journalists</li></ul>	b) Peasants d) Rebels
3) The Gettysburg Address was deli- a) 1863 b) 1862	vered by Abraham Lincoln in c) 1865 d) 1864
4) Abraham Lincoln appeals to the strengthen a) Aristocracy c) Democracy	people assembled at Gettysburg to b) Autocracy d) Both democracy and aristocracy
,	n angel was writing in his golden book



6)	The poem "O Captain! My Capta	in!" is written to mourn the death of	
	a) Poet's father	b) Abraham Lincoln	
	c) The captain of the ship	d) Poet's brother	
7)	Which of the following statements	s about women is not true ?	
	a) In the 19 <sup>th</sup> Century women we	ere encouraged to be an artist	
	b) Anonymity runs in the blood o	f women	
	<ul><li>c) A woman must have money a fiction</li></ul>	and a room of her own if she is to write	
	d) Even in the 19 <sup>th</sup> century, very exhorted	vomen were slapped, lectured and	
8)	According to Virginia Woolf, chas woman's life.	stity had then a importance in a	
	a) Political	b) Social	
	c) Economical	d) Religious	
9)	The poem <i>Abou Ben Adhem</i> was	written by	
	a) Lord Hunt	b) Leigh Hunt	
	c) Walt Whitman	d) Robert Browning	
10)	The captain does not answer bec	ause	
	a) He is busy in his work		
	b) He is fast asleep		
	c) His lips are pale and still		
	d) He could not hear properly		
-	ewrite the following sentences cho ne brackets.	osing the correct modal auxiliary from	2
1	) I swim hours and hou	urs. (can, could, may, should)	
2	) you please give me a lift might, shall)	up to the police station ? (would, must,	
C) W	Irite the following sentences in indi	rect speech.	2
1	) Reema said to Kavita, "What are	you doing ?"	
2	) He said to us, "Let's go home".		



2. Answer any four of the following questions:	16

- 1) What are Shaw's views on Press?
- 2) What does G. B. Shaw say about the corruption in the field of education?
- 3) Write a note on Abraham Lincoln's address to the people assembled at the Gettysburg.
- 4) What are the principles on which the American democracy was founded?
- 5) How does society erode the talents of women writers?
- 6) What are the immaterial conditions of life that hinder women's talents as writers?
- 3. Answer any two of the following:

12

- 1) Write a note on the appropriateness of the title of poem *O Captain! My Captain!!*
- 2) What did Abou Ben Adhem see in his dream?
- 3) Write a report on the send off ceremony of your class.
- 4) Write a report on your visit to National Park.
- 4. Answer any one of the following:

14

- 1) Prepare a presentation consisting of five charts or slides to promote a "Dish Washer" in the market.
- 2) Write a presentation on the topic "Child Sexual Abuse" using charts, transparencies or slides.
- 5. Write a transcript of group discussion on the topic "Lynching in India".

14


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Set P

# B.Sc. Biotechnology (Part – III) Semester – V (Old-CGPA) Examination, 2018 PLANT DEVELOPMENT

		PLANT DEV	ELOPMENT	
•	d Date : Monday 2.30 p.m. to 5.00		Total N	Marks : 70
Ins	2) 3)	Draw a neat, well la necessary.		
1. Ch	oose a <b>correct</b> a	alternative from the	ollowing :	14
	of the terminal k a) Lateral dom c) Apical support In embryo deve known as	oud on the branch is inance ression elopment, a filamen	rowth of an axillary bud in the presence known as b) Apical dominance d) Apical meristem of 6-9 cells arising from basal of the company of the compan	cell is
3)	a) Ground mer	istem	nat gives rise to epidermis. b) Procambium d) Protoderm	
4)	sac. a) Zygote c) Definitive nu		uct of two polar nuclei in the er b) Pollen d) Antipodal	nbryo
5)	division and se formation.	veral of the following	dosperm formation in which the g divisions are accompanied by c) Cellular d) Acel	y wall



6)	Arabidopsis Thaliana is a member of_	
	a) Brassicaceae	b) Arabidopsis
	c) Asteraceae	d) Bigniniaceae
7)	Exine of pollen is composed of	
,	a) Sporopollenin	b) Chitin
	c) Peptidoglycan	d) Collagen
8)	Cytokinins are involved in	
,	a) Cell elongation	b) Cell multiplication
	c) Apoptosis	d) Senescence
9)	is the process of trans	sfer of pollen grains from anther to
,	stigma.	
	a) Fertilization	b) Pollination
	c) Microsporogenesis	d) Emasculation
10)	In cryogenic storage, pollen grains temperature.	are stored at
	a) -80°C b) -196°C	c) 37°C d) 10°C
11)	Mature endosperm with any degree of surface contour is called as	
	a) Helobial	b) Nuclear
	c) Cellular	d) Ruminate
12)	is composed of a ground cells in <i>Arabidopsis</i> root meristem.	up of four cells, also known as center
	a) Quiescent center	b) Cortical center
	c) Endodermis	d) Columella
13)	Vegetative meristems are highly repet structures over and over again-and the this phenomenon is known as	eir activity can continue indefinitely,
	a) Indeterminate growth	b) Definite growth
	c) Immortality	d) Cytodifferentiation
14)	is substitution of semultiplication process without nucleus	exual reproduction by an asexual or cell fusion.
	a) Double fertilization	b) Polyembryony
	c) Endosperm	d) Apomixis



2.	A)	Answer the following (Any Four).  1) What is double fertilization?  2) Enlist the modes of pollination.  3) What is embryogenesis?  4) Differentiate between diplospory and apospory.  5) Describe xylem tissue.	8
	B)	<ul> <li>Write notes on (Any Two).</li> <li>1) Why is <i>Arabidopsis thaliana</i> known as a model of plant development?</li> <li>2) Explain in brief-pollen germination.</li> <li>3) Explain in brief-seed vernalization.</li> </ul>	6
3.	A)	<ol> <li>Answer the following (Any Two).</li> <li>Discuss the methods of pollen storage.</li> <li>Discuss the classification of seeds on the presence or absence of endosperm.</li> <li>Explain the stages of embryo development.</li> </ol>	8
	B)	Answer the following (Any One).  1) Give a detailed account on root development.  2) Give a detailed account on structure and synthesis of plant cell walls.	6
4.	A)	Answer the following (Any Two).  1) Explain the mechanism of fertilization.  2) Give a detailed account on polyembryony.  3) Give a general account of phytohormone.	10
	B)	<ul><li>Answer the following (Any One).</li><li>1) Explain the concept of pollen embryos.</li><li>2) Explain the concept of sporophytic and gametophytic self-incompatibility.</li></ul>	4
5.	An: 1) 2) 3)	swer the following ( <b>Any Two</b> )  Explain in detail-Development of female gemetophyte.  Give a detailed account on development of endosperm.  Write a note on-biochemistry and molecular biology of fruit maturation.  Set	14 P



Seat		
No.	Set	1

### B.Sc. III (Biotechnology) (Semester V) (Old - CGPA) Examination, 2018 ANIMAL DEVELOPMENT

•	ate : Tuesday, 20-11-2018 p.m. to 5.00 p.m.		Total Marks: 70
Instr	uctions : 1) All questions are cor 2) Draw neat and labele 3) Figures to right indic	ed diagrams <b>wherever</b>	· necessary.
1. Rewrite	e the following sentences by using	correct alternative.	14
a)	940 proposed the Weismann Driesh	e Mosaic theory. b) Roux d) Child	
ŕ	smann recognized units of heredit	-	
,	Genes Factors	<ul><li>b) Determinants</li><li>d) All of these</li></ul>	
a) b) c)	rmiogenesis means Conversion of spermatogonia into Formation of spermatids Conversion of spermatids into sp Formation of spermatogonia	·	
4) Inter	titial cells is also called as	cells.	
•	Sertoli	, , ,	
c)	Sperm	d) Spermatogonial	
5) Cort	ical granules contains		
•	Proteins	b) Acid mucopolysac	
c)	Lipids	d) Fatty acids and gly	/cerol



6)	Hum	nan eggs shows	type of cleavage.	
	a)	Incomplete	b) Partially complete	
	c)	Complete	d) Meroblastic	
7)	Inse	ct egg is an example of		
	a)	Centrolecithal	b) Telolecithal	
	c)	Mesolecithal	d) Microlecithal	
8)		ording to Gilchrist (1968), the p	prospective is called "Zone	
	a)	Ectodermal zone	b) Endodermal zone	
	c)	Mesodermal zone	d) Notochordal zone	
9)	Deve	elopment of an egg without fer	rtilization is called as	
	a)	Parthenogenesis	b) Reproduction	
	c)	Cloning	d) Metamorphosis	
10)	Spre	eading of malignant cells from	primary site to distant sites is called as	
	a)	Metastasis	b) Morphogenesis	
	c)	Metamorphosis	d) Organogenesis	
11)		is an example of	sexual reproduction.	
	a)	Conjugation	b) Binary fission	
	c)	Gemmule formation	d) Budding	
12)	Age	spots are result of an excess	production of	
,	a)	Hormone	b) Antioxidants	
	c)	Melanin	d) Albumin	
13)	Duri	ng metamorphosis cells ar	re destroyed through process called	
	a)	Necrosis	b) Apoptosis	
	c)	Cell quit	d) All of these	
14)		is an example o	f anti-oncogene.	
,	a)	p53 b) Rb		



2.	A)	Answer the following questions (any 4).  i) What is gradient theory?  ii) What are antioxidants?  iii) What is polyspermy?  iv) Write a note spermiogenesis.  v) Give structure of Graffian follicle.	8
	B)	Answer the following questions (any 2).  i) Write properties of cleavage.  ii) Define invagination and involution.  iii) Hormonal control of spermatogenesis.	6
3.	A)	Answer the following questions (any 2).  i) Describe T.S. of ovary with neat labeled diagram.  ii) Describe regeneration in invertebrates with suitable example.  iii) Describe post-fertilization changes in egg cytoplasm.	8
	B)	Answer the following ( <b>any 1</b> ).  1) Describe blastulation in telolecithal egg with suitable example.  2) Write a note on stem cells.	6
4.	A)	Answer the following questions (any 2).  i) Describe process acrosome reaction and cortical reaction.  ii) Explain different planes and types of cleavage with suitable examples.  iii) Describe meatamorphosis in amphibians suitable examples.	10
	B)	<ul><li>Answer the following (any 1).</li><li>1) Explain free radical theory of aging.</li><li>2) Describe process of gastrulation in frog with neat labeled diagram.</li></ul>	4
5.	i, ii,		14

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Set D

# B.Sc. – III Biotechnology (Semester – V) (Old CGPA) Examination, 2018 BIOINFORMATICS AND NANOTECHNOLOGY

Day and Date : Thursday, Time : 2.30 p.m. to 5.00 p		Total Marks : 70
2) Fi	<b>II</b> questions carry <b>equal</b> i igures to <b>right</b> indicate <b>fu</b> raw <b>neat</b> and labeled dia	
1. Rewrite the following	sentences by using corr	rect alternative. 14
<ol> <li>For antibacterial a</li> <li>Manganese</li> <li>Silver</li> </ol>	b)	anoparticles are widely used. Cobalt Molybdenum
		s in the form of
a) Liposomes	s are able to pass the blo	od brain barrier. Fullerenes
c) Quantum dots	,	Nanotubes
3) The term nano wa	as first coined by	
a) Alexander Fle	ming b)	John Tyndall
c) Richard Fynm	ann d)	Rutherford
4) High energy ball synthesis.	milling is a	method of nanoparticle
a) Physical	b)	Chemical
c) Bilological	d)	Natural
5) The any external influence	mechanism involve ence.	es gathering of entities without
a) Polymerization	n b)	Degradation
c) Isomerization	d)	Self assembly
	e used in nd illuminating it from out	_ therapy by placing a nanodot side.
a) Imaging	b)	Chemo
c) Photodynamic	d)	Natural



7)		ne ability of one molecule to attract an as	nd l	oind to another is often referred	
			b)	Molecular recognition	
		Agglumeration		Coagulation	
8)		ee view is used for constructing			
		Multiple alignment	b)	Dendogram tree	
	c)	Local alignment	d)	Global alignment	
9)	Sa	anger Centre, HGMP-RC, EBI is host	ed	by	
	a)	Hinxton Hall	b)	MIPS	
	c)	UCL	d)	NCBI	
10)	Th	ne PubMed provides information of _		database.	
		Nucleotide b) Protein			
11)	Th	ne protein sequence database is			
	a)	GenBank	b)	EMBL	
	c)	DDBJ	d)	SWISS-PROT	
12)	Bl	_AST is used for al	ign	ment.	
	a)	Global	b)	Local	
	c)	Multiple	d)	Global and Local	
13)		alignment is widely u	use	d for prediction of phylogenetic	
		lationship.			
	-		-	Local-pairwise	
	C)	Global-multiple	u)	Local-multiple	
,		ne structural database of nucleic acid			
	a)	PDB	b)	NRL-3D	
	c)	GenBank	d)	NDB	
2. <i>A</i>	۱ns	wer <b>any seven</b> of the following:		1	14
	1)	Which techniques are used for synthemethods?	hes	is of nanomaterials by physical	
	2)	Enlist different types of lithography.			
	-	What is TrEMBL?			
	4)	What is quantum mechanics?			
	,	What is consensus sequence? Give	e ex	ample.	
	•	·		Cot I	2



- 6) What are BLOSUM matrices?
- 7) What is the difference between top down and bottom up approach of nanomaterial synthesis?
- 8) What is SCOP database?
- 9) What are different nano size materials in human body?
- 3. A) Answer any two of the following:

10

- 1) Describe the primary protein sequence databases.
- 2) Add a note on quantum idea and quantum mechanics.
- 3) Add a note on polymerization of nanomaterials.
- B) Describe various applications of Bioinformatics.

4

4. Answer any two of the following:

14

- 1) Describe biological methods of nanomaterial synthesis.
- 2) Describe tools for measurement of nanostructures.
- 3) Describe various properties of nanostructures.
- 5. Answer any two of the following:

14

- 1) What is structural database? Explain any three Protein Structural Databases.
- 2) What is biological database? Explain nucleic acid sequence database.
- 3) Add a detail account on 'NCBI'.


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Set P

### B.Sc. (Part – III) (Semester – V) (CGPA) Examination, 2018 BIOTECHNOLOGY (Old) Recent Trends in Biotechnology

Day and Date : Saturda Time : 2.30 p.m. to 5.00			Total Marks:	70
2)	<b>All</b> questions are <b>c All</b> questions carry Draw <b>neat</b> and labe	equal i		
1. Rewrite the senten	ce selecting <b>most c</b>	orrect a	nswer from the given options:	14
1)spills.	bacterium is called	as the s	superbug that could clean up oil	
a) Bacillus sub	otilis	b)	Pseudomonas putida	
c) Bacillus cer	reus	d)	Escherichia coli	
Biodegration of as	•	s by inc	oculating bacterial cell is known	
a) Bioaugmen	tation	b)	Bioremediation	
c) Phytoremed	diation	d)	Energy plantation	
3)	is an important w	vater co	ntaminant.	
a) Heavy meta			Carbon monoxide	
c) Nitrogen ox	ide	d)	Sulphur dioxide	
	converting environm		ollutants into harmless products	
a) Ex-situ bior	emediation	b)	Intrinsic bioremediation	
c) Extrinsic bid	oremediation	d)	None of these	
5) Low molecular by	weight compounds	cannot	be immobilize	
a) Microencap	sulation	b)	Entrapment	
c) Adsorption		d)	Covalent bonding	

6)	Environmental biotechnology inv		
	a) The use of microbes to clean	up the environment	
	<ul><li>b) Bioremediation</li><li>c) The study of benefits and haz</li></ul>	zards associated with	GMM's
	d) All of these	Lardo abboolatoa Willi	GIVIIVI O
7)	Bioethics is concerned with		
,	a) Healthcare law	<del></del>	
	b) Etiquette in medical facilities		
	c) The ethical implication of biol	ogical research metho	ods and results
	d) None of above		
8)	The dosage of chemical needed treated animal is		50 percent of the
	a) LD50 b) MD50	c) MLD	d) LD30
9)	The process of extracting metals	from ore bearing rock	s is called
0)	as	mom ore bearing ree.	to to ballou
	a) Bioextraction	b) Bioleaching	
	c) Energy plantation	d) Biofiltration	
10)	Petroleum is a mixture of		
	a) Sulfure and nitrogen	b) Hydrocarbo	
	c) Oxygen and water	d) Nitrogen ar	id silver
11)	The selection of immobilization of	•	ends on
	a) Number of step in the proces	S	
	<ul><li>b) Cost</li><li>c) Stability and catalytic specific</li></ul>	sitv	
	d) All of the above	nty	
12\	Toxicants are absorbed by the be	ody by	
12)	a) Inhalation	b) Skin	
	c) Ingestion	d) All of these	
13)	Flux control coefficient measures	s the	
. 5)	a) Steady state change	b) pH change	-
	c) Temperature change	d) Hormonal d	hange



14	•	is the practice of optimizing genetic and regulatory rocesses within cells to increase the cell's production of a certain ubstance.	
	а	a) Genetic engineering b) Gnotobiology	
	C	c) Metabolic engineering d) Nanotechnology	
2.	1) 2) 3) 4) 5) 6) 7) 8)	Solvent engineering.  Define bioleaching.  Bioethics.  MCA.  Enlist the industrial applications of enzyme engineering.  Bioagumentation.  Enlist carries used for enzyme immobilization.	14
3.	Í		10
	B)	Describe in detail industrial wastewater biotreatment technologies.	4
4.	An	swer <b>any two</b> of the following:	14
	1)	Explain the role of organs involved in detoxification mechanism.  Write in detail types of enzyme immobilization with its industrial applications.	
5.	Ans 1) 2) 3)	Swer <b>any two</b> of the following:  Describe in brief site directed mutagenesis.  Write an essay on analysis of metabolic network.  Describe in detail types of Bioremediation and explain any one of them with suitable example.	14



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# B.Sc. III (Biotechnology) (Semester – VI) (CGPA) Examination, 2018 ENGLISH COMPULSORY (Breakthrough)

		(DI Cakt	ili ougii)	
-	d Date : Monday 0.30 a.m. to 1.0			Max. Marks : 70
	<b>N.B.</b> :	<ol> <li>All questions at 2) Figures to the r</li> </ol>	• •	narks.
1. Cho	oose the correct	answer from the al	ternatives given.	14
1)	What task was	Jim set by Aunt Po	lly ?	
	a) to whitewash	n the fence		
	b) to check on	Tom's work		
	c) to bring the	water from the towr	n pump	
	d) to tend to his			
2)	•	s pretending to be		
	,	, -	,	d) Johnny Miller
3)	_	_	_	hen Ben offered him
	a) the core of h		b) a bully law	
	c) half of his ap	-	d) the whole ap	•
4)		suggest Mathilde		
_,	a) flowers	•	c) a necklace	,
5)	_		le by the time she	had repaid the loan?
	a) She had age	•		
	b) She became	•		ام ما م ما ما
	•	look at a robust wo	•	nousenoia
6)		young, still beautifu		oiotmy of Education
6)				nistry of Education. d) driver
7)	a) clerk	•	c) professor	u) unver
7)	a) Tomb of Nin	hisbe reside (live) i	b) Greece	
	c) Baby Ionia	us	d) Semiramins	
	U, Pub v Idilia			

2.

8)	Pyramus and Thisbe communicate	d through
	a) secret midnight meetings at the	Tomb of Ninus
	b) common friends	
	c) a crack in a wall	
	d) letters	
9)	On seeing Pyramus ass	umed that Thisbe was dead.
	a) a crack in a wall	
	b) a bloody, torn veil	
	c) the white mulberry tree turned re	ed
	d) the footsteps of a lion in the san	d
10)	sells tunics, mirrors and	d daggers in the poem 'In the Bazaars
	of Hyderabad.	
	a) The magicians	b) The gold smiths
	c) The merchants	d) The flower sellers
11)	In the poem The 'bright jewel' being	g addressed here is
	a) chastity	b) virtue
	c) the speaker's soul	d) none of these
12)	The tag question of "That is a great	t idea" is
	a) isn't that? b) is that?	c) isn't it? d) isn't it
13)	The girl knitted mittens while listening	ng to a music CD the underlined clause is
	a) noun clause	b) an adverbial clause
	c) a relative clause	d) an adjectival clause
14)	It was raining, yet we went shopping	g. The sentence is
	a) simple sentence	b) complex sentence
	c) compound sentence	d) none of these
Ans	swer <b>any seven</b> of the following que	estions in short.
		help with his task and what was the result?
•	What task was Tom set by his aunit	·
•	What did Tom acquire at the end o	
,	Why was Mathilde dissatisfied and	•
,	How did Mathilde and Loisel replace	
,	Where did Pyramus and Thisbe de	
,	What happens to Thisbe before Py	
•		
0)	Where does Pyramus find Thisbe's	ven and what does he tillink!



- 3. A) Answer any two of the following questions.
  - 1) Describe the scene of the bazaar in the poem of Sarojini Naidu. (In the Bazaars of Hyderabad).
  - 2) What is the theme of the poem 'On Virtue'?
  - 3) What does the poet speak about life on earth in the poem 'on virtue'?
  - B) Answer **any two** of the following.

6

14

8

- 1) Write the important tips on time management.
- 2) Imagine that you have recently been quarrelling a lot with a friend and want to make up your relationship with him/her better. Write six to eight sentences on how you would handle the problem.
- 3) Describe briefly a difficult situation you found yourself in what did you do to adapt yourself to it.
- 4. A) Write a description of a person who sat opposite you on a train journey. Remember to use words to convey what the character, thoughts and mood of the person seemed to be.

OR

- B) Write a description of national hockey-player you watched at an interview programme on T.V. conducted by the TV anchor, by describing his personal qualities, attitude, speech etc.
- 5. Read the following passage and write **one-third** summary of it.

Trees give shade for the benefits of others and while they themselves stand in the sun and endure scorching heat, they produce the fruit by which others profit. The character of good men is like that of trees. What is the use of this perishable body, if no use of it is made for the benefit of mankind?

Sandalwood – the more it is rubbed the more scent does it yield. Sugarcane – the more it is peeled and cut into pieces, the more juice does it produce. Gold – the more it is burnt, the more brightly does it shine. The men who are noble at heart do not lose these qualities even in losing their lives. What does it matter whether men praises them or not? What difference does it make whether riches abide with them or not? What does it signify whether they die at this moment or whether their lives prolonged? Happen what may, those who tread in the right path will not set foot in any other. Life itself is unprofitable to a man who does not live for others. To live for the mere shake of living one's life is to live the life of dogs and cows. Those who lay down their lives for the shake of a friend or even for the sake of a stranger, will assuredly dwell forever in a world of bliss.

Set P



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Set P

### B.Sc. – III Biotechnology (Semester – VI) (CGPA) Examination, 2018 TOOLS AND TECHNIQUES

Max. Marks: 70
compulsory. ndicate full marks. abeled diagrams.
noosing correct alternatives : 14
I gradient is called as of
o) Absorptivity
d) Viscosity
gel is used for separation ?
o) PAGE
d) Sedimentation
o) RFLP
d) RNA blotting
plus(+) minus(-) method of DNA
o) Sanger's
d) Gilbert's
o known as
o) People's Carrier Reaction
d) People's Choice Radiator P.T.O.



6)		cloning vector h	as	COS site of $\lambda$ phage.
	a)	pBR <sup>322</sup>	b)	Phagemid
	c)	Cosmid	d)	Plasmid
7)		analysis has be	en	successfully applied for epidemiology
	of I	Listera monocytogens.		
	a)	Protein Blotting	b)	Spectroscopic
	c)	DNA Sequencing	d)	RAPD
8)		DNA sequencing m	eth	od is known as chemical degradation
	me	thod.		
	a)	Sanger's	b)	Smith's
	c)	Carrel's	d)	Maxam's and Gilbert's
9)	Мо	lecular weight of subunit of all	kali	ne phosphatase is
	a)	69 Kd	b)	60 Kd
	c)	54 Kd	d)	120 Kd
10)	Mir	nisatellites are		
	•	Short non-coding repetitive se chromosome	equ	ences present through out the
	b)	30-40 bp sized short sequence	es	within the gene
	c)	Short coding repetitive region	s o	n eukaryotic chromosome
	d)	Short coding repetitive region	s o	n prokaryotic chromosome
11)	RT	-PCR is the method that is us	ed 1	for
	a)	Analysis of DNA	b)	Analysis of mRNA expression
	c)	Analysis of Plasmid	d)	Amplification of genomic DNA
12)	Wh	nich of the following therapies	dev	reloped by rDNA techniques?
	a)	HIV vaccine	b)	Hepatitis B vaccine
	c)	Malaria vaccine	d)	Vaccine against cold



	13)	YAC stands for		
		a) Yeast Automated Chromosom	ne	
		b) Yeast Artificial Clone		
		c) Yeast Artificial Chromosome		
		d) Yeast Automated Clone		
	14)	Size of the pBR322 is		
		a) 4.1 kb	b) 4.66 kb	
		c) 4.362 kb	d) 4.22 kb	
2.	An	swer the following (any seven):		14
	1)	Write a note on scope of Genetic	Engineering.	
	2)	Define restriction endonucleases		
	3)	Give brief account on c-DNA pro	bes.	
	4)	Write a note on nucleic acid mod	ifying enzymes.	
	5)	Draw a neat and labeled diagram	n of shuttle vector.	
	6)	Enlist the applications of RAPD.		
	7)	Explain principle of autoradiograph	ohy.	
	8)	Explain cloning from genomic DN	NA.	
	9)	Write a note on screening by nuc	cleic acid probes.	
3.	A)	Answer the following (any two):		10
		1) Explain direct DNA transfer by	y using electroporation.	

2) Describe bacteriophage vector.

3) Discuss agarose gel electrophoresis for DNA.

B) Explain in short DNA transfer by Transduction.

4



4. Answer the following (any two):

14

- 1) Describe in detail AFLP as molecular marker.
- 2) Give details of RNA polymerases.
- 3) Discuss in detail chromosome walking.
- 5. Answer the following (any two):

14

- 1) Give details of automated DNA sequencing.
- 2) Discuss PCR and enlist its applications.
- 3) Explain yeast vectors.

Set P



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## B.Sc. – III (Semester – VI) (CGPA) Examination, 2018 BIOTECHNOLOGY Applications

		Applic	ations	
•	nd Date : Wed 10.30 a.m. to	nesday, 31-10-2018 1.00 p.m.		Max. Marks: 70
I	nstructions :	<ol> <li>All questions are c</li> <li>Figures to the right</li> <li>Draw neat and lab</li> </ol>	nt indicate full ma	rks.
1. Re	write the follo	wing sentences by cho	osing correct alte	rnatives. 14
1)	50% Biomas	s of our planet is repre	sented by	
	a) Microbes	<b>.</b>	b) Plants	
	c) Animals		d) Insects	
2)	•	tion ofdes with ribonucleotide	•	· ·
	a) Chimeric		b) Antisense	
	c) Fused		d) Antagonist	
3)	Subunit vaco	cine for cholera is prepa	ared by	epitope.
	a) Cholera t	toxin A subunit	b) Cholera tox	rin B subunit
	c) Cholera	toxin D subunit	d) Cholera tox	rin C subunit
4)	•	d aromatic compound re converted to		nt in pesticides and
	a) Pyruvic a	icid	b) Catechol	
	c) Protocate	ecol	d) Succinic ac	id
5)	A <sub>1</sub> peptide de	omain of A subunit of _	has	a toxic activity.
	a) <i>S. typhi</i>	b) <i>Shigella</i>	c) <i>V. cholerae</i>	d) <i>P. vivax</i>
6)	Human grow	th hormone has	amino acid	ds.
	a) 100	b) 121	c) 191	d) 181

	7)	is related with respira	tory system.		
		a) Malaria	b) Phenylketonuria		
		c) Anemia	d) Cystic fibrosis		
	8)	of the following has fl	at/irregular crystal shape.		
		a) CRI I (subgroup)	b) CRY II (subgroup)		
		c) CRY IV	d) CRY III (subgroup)		
	9)	Phosphoramidate antisense oligonum in vivo in mice.	ucleotides have been shown to be		
		a) Effective b) Inactive	c) Neutral d) Toxic		
	10)	compounds are che	micals which are foreign to the		
		biosphere.			
		a) Xenobiotic b) Transgenic	c) Gaseous d) Fluid		
	11)	is the second generation	on of rDNA technology.		
		a) Metallergy	b) Protein engineering		
		c) Engineering	d) Lipid engineering		
12)		Genetically engineered <i>X. Campestris</i> was grow on whey due to insertion of gene.			
		a) Bacillus lac ZY	b) <i>E. coli</i> lac ZY		
		c) Fungus lac ZY	d) Pseudomonas lac ZY		
	13)	Monellin is a which is	3000 times sweeter than sucrose.		
		a) Aldehyde	b) Lipid		
		c) Protein	d) Amino acid		
	14)	is a infectious agent f that react against intact form of infect			
		a) Envelope glycoprotein A	b) Envelope glycoprotein C		
		c) Envelope glycoprotein D	d) Envelope glycoprotein B		
2.	Ans	swer the following (any seven):		14	
	1)	Explain in brief peptide vaccines.			
	2)	Write a note on increase in enzyme s	tability.		
	3)	Explain attenuated vaccine.			
	4)	Explain antisense oligonucleotide.			



3.

4.

5.

	-3-	3L11-30 - 3 <del>1</del>
<ul><li>5) Explain in brief synthe</li><li>6) Enlist the applications</li><li>7) Write a note on gene t</li><li>8) Write a note on increa</li><li>9) Write a note on interfe</li></ul>	therapy for cystic fibrosis. se in activity of enzyme.	
	RNA as therapeutic agent. stock by nuclear transfer.	10
B) Explain synthesis of hu	uman interferon.	4
•	,	<b>14</b> ol.
Answer the following (any 1) Describe in detail trans	,	14

2) How will you engineered a xanthomonas for xanthan gum production.

3) Explain development of senescence tolerant plants.



Seat	Set	D
No.	Jet	

# B.Sc. (Part – III) (Semester – VI) (CGPA) Examination, 2018 BIOTECHNOLOGY Fermentation Technology

		Fermentation T	echnology		
-	d Date : Thursday, 1- 10.30 a. m. to 1.00 p.			Max. Marks :	70
	Instructions: 1) A	<b>II</b> questions are <b>co</b> gures to <b>right</b> ind			
	write the following selow:	ntences by choos	ing the correct alter	_	14
1)	Chemically well defin	ned fermentation i	media is called as _		
	a) Synthetic media		b) Waste as a raw	material	
	c) Living media		d) Semi synthetic	media	
2)	The production of su sequence		trial microbiology o	ccurs in the	
	a) fermentation, dov	vnstream process	ing, removal of was	ste, inoculation	
	b) Inoculation, down	istream processin	g, fermentation, rer	moval of waste	
	c) Inoculation, ferme	entation, downstre	eam processing, rer	noval of waste	
	d) Removal of waste	e, inoculation, ferr	nentation, downstre	eam processing	
3)	Detection and isolaticalled as		portant microorgan	isms from soil is	
	a) assay		b) primary screeni	ng	
	c) fermentation		d) none of these		
4)	technique	is used for select	ion of auxotrophic	mutants.	
	a) Alkali	o) Acid	c) Alcohol	d) Penicillin	
5)	Enzymes are separa	ated from fermente	ed broth by	technique.	
	a) centrifugation		b) solvent recover	у	
	c) filtration		d) none of these		

SLR-S	J – 55	-2-			
6)	Pilot plant fermento	or liters	capacity.		
	a) 100-500		b) 1-2		
	c) 1,00,000		d) none of these		
7)	Industrial productio	n of citric acid is ca	arried out by using		
	a) Bacillus lichenife	ormis	b) <i>E.coli</i>		
	c) Saccharomyces	s cerevisiae	d) <i>Aspergillus nig</i>	ger	
8)	End point determin	ation assay are me	eant for	_ substances.	
	a) vitamins	b) amino acids	c) antibiotic	d) enzymes	
9)	is used a	as precursor in Per	nicillin V production	١.	
	a) Phenyl acetic ac	eid	b) Hydroxy Phen	yl acetic acid	
	c) Phenoxyacetic a	acid	d) None of these		
10)	are adde	ed in the fermentor	used to avoid foar	n formation.	
	a) Silicon compour	nds	b) Lard oil		
	c) Impeller		d) All of these		
11)	Solvent extraction i	s used for recover	y of		
	a) Amylase	b) Penicillin	c) Alcohol	d) Citric acid	
12)	Cell population is m	naintained in stead	y state in	culture.	
	a) Batch	b) Continuous	c) Fed batch	d) All of these	
13)	Fungal culture is m	aintained by using			
	a) Soil		b) Lyophilization		
	c) Pasteurization		d) Tyndallization		
14)	Curries medium is	used for large scal	e production of		
	a) Penicillin	b) Ethanol	c) Citric acid	d) Wine	
2. Ans	swer <b>any seven</b> of t	the following:			14
1)	Recovery of citric a	cid from fermentat	ion broth.		
2)	Give raw materials	used for media for	mulation.		
3)	Give fermentation r	medium and organ	ism used for produ	ction of ethanol.	
4)	Give examples for	Antifoam agents.			

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	5) Define inoculums preparation.	
	6) Culture collection units.	
	7) Crowded plate technique.	
	8) Primary screening of acid producers.	
	9) Aeration and agitation.	
3.	A) Answer <b>any two</b> of the following:	10
	1) Write on design and characteristics of an ideal fermentor.	
	2) Fermentation economics.	
	3) Application of computer in fermentation technology.	
	B) Write an essay on citric acid fermentation.	4
4.	Answer any two of the following:	14
	1) Explain in detail Microbial growth kinetics in continuous culture.	
	2) Strain improvement by mutation.	
	<ol> <li>Write an account on different methods of filtration and centrifugation used for purification of fermented broth.</li> </ol>	ation
5.	Answer <b>any two</b> of the following :	14

- 1) Explain biological assays.
- 2) Preservation and maintenance of industrial strains.
- 3) Give an account on types of Fermentation media.



Seat	
No.	

Set P

#### B.Sc. – III (Semester – VI) (CGPA) Examination, 2018 BIOTECHNOLOGY Food and Dairy Technology

•	d Date : Friday, 10.30 a. m. to 1.			Max. Marks	: 70
		, •	are <b>compulsory</b> . r <b>ight</b> indicate <b>full</b> mar eled diagram <b>whereve</b>		
1. Ch	oose the correct	alternative and re	write the sentence ag	ain:	14
i)	Available water	or water activity (	$a_{_{ m w}}$ ) is decreased using	9	
	a) pasteurization	on b) drying	c) filtration	d) canning	
ii)	Indian pickles a	are preserved due	to		
	a) hypertonic condition		b) hypotonic condition		
	c) isotonic condition		d) isoelectric point		
iii)		has been called the	ne 'Father of Canning		
	a) Pasteur		b) Robert Hook		
	c) Tyndall		d) Nicolas Appe	rt	
iv)	The cow milk contain		% of lactose sugar generally.		
	a) 2	b) 3	c) 4	d) 5	
v)	The cow milk c	ontain	_ % of casein protein generally.		
	a) 1.5	b) 2.5	c) 3.5	d) 4.5	
vi)	Pasteurization is the process of				
	a) sterilization	b) drying	c) disinfection	d) vaccination	
vii)	Milk's Phospha	te test is used to o	letermine the		
	a) quality of mi	lk			
	b) efficiency of	pasteurization			
	c) quantity of n	nilk			
	d) lactose in m	ilk			

viii)	In quality control microbial examination ingredients products in process, equip is known as					
	a) control at source	e	b) hazard			
	c) criteria		d) quality			
ix)	Unacceptable control for food spoilage is	amination, microbia s microbial	_	zymes responsible		
	a) severity	b) criteria	c) examination	d) hazard		
x)	As per MBRT test qualit		er 8 hours indicates	s that milk has		
	a) better	b) good	c) excellent	d) poor		
xi)	Most probable nun	nber of milk is used	to determine			
	a) presence of all					
	, ·	b) presence of coliforms				
	<ul><li>c) presence of pyscrophilic microbes</li><li>d) presence of thermophilic microbes</li></ul>					
xii)	Halophilic microbe	-				
,	a) beer	b) pickle		d) yoghurt		
xiii)	Sauerkraut is ferm	ented product of ca	abbage and contair	ns		
	a) high salts		b) lactic acid			
	c) glucose		d) both a) and b)			
xiv)	Penicillium camen	-	_			
	a) Roqueforti che		b) Camembert ch	neese		
	c) Cheddar chees	e	d) Swiss cheese			
2. De	fine and explain <b>an</b>	y seven of the follo	owing:		14	
i)	Indicator organism	S				
ii)	Record keeping					
iii)	SPC					
iv)	Perishable food					
v)	Toxin					
vi)	MPN					



- vii) Disinfection
- viii) Spoilage of food
- ix) Pickles.
- 3. A) Answer any two of the following:

10

- i) Explain genetic and immunological methods used for determination of food spoilage by toxins and microbes.
- ii) Explain microbial spoilage of eggs and poultry products.
- iii) Explain quality systems with examples in food industry.
- B) Define pasteurization and explain methods of pasteurization.

4

4. Answer any two of the following:

14

- i) Explain dye reduction tests in detail with its significance.
- ii) Explain the production, spoilage, preservation and nutritional value of Vinegar.
- iii) Explain the general methods of food preservation.
- 5. Answer any two of the following:

14

- i) Explain Hazard Analysis and Critical Control Points (CACCP) system in detail.
- ii) Explain the production, spoilage, preservation and nutritional value of Cheese.
- iii) Explain microbial spoilage of vegetables and fruits.