

UNIVERSITY OF MYSORE

Ph.D. Entrance Examination, Nov. - 2020

SUBJECT CODE :

0 9

Entrance Reg. No.

QUESTION BOOKLET NO.

500458

QUESTION BOOKLET

(Read carefully the instructions given in the Question Booklet)

SUBJECT:

BIOTECHNOLOGY

MAXIMUM MARKS: 100

MAXIMUM TIME: THREE HOURS

(Including initial 10 minutes for filling O.M.R. Answer sheet)

INSTRUCTIONS TO THE CANDIDATES

- 1. The sealed questions booklet containing 50 questions enclosed with O.M.R. Answer Sheet is given to you.
- 2. Verify whether the given question booklet is of the same subject which you have opted for examination.
- Open the question paper seal carefully and take out the enclosed O.M.R. Answer Sheet outside the question booklet and fill up the general information in the O.M.R. Answer sheet. If you fail to fill up the details in the form of alphabet and signs as instructed, you will be personally responsible for consequences arising during scoring of your Answer Sheet.
- 4. During the examination:
 - a) Read each question carefully.
 - b) Determine the Most appropriate/correct answer from the four available choices given under each question.
 - c) Completely darken the relevant circle against the Question in the O.M.R. Answer Sheet. For example, in the question paper if "C" is correct answer for Question No.8, then darken against SI. No.8 of O.M.R. Answer Sheet using Blue/Black Ball Point Pen as follows:

Question No. 8. (A) (B) (Only example) (Use Ball Pen only)

- 5. Rough work should be done only on the blank space provided in the Question Booklet. Rough work should not be done on the O.M.R. Answer Sheet.
- 6. <u>If more than one circle is darkened for a given question, such answer is treated as wrong and no mark will be given. See the example in the O.M.R. Sheet.</u>
- 7. The candidate and the Room Supervisor should sign in the O.M.R. Sheet at the specified place.
- 8. Candidate should return the original O.M.R. Answer Sheet and the university copy to the Room Supervisor after the examination.
- 9. Candidate can carry the question booklet and the candidate copy of the O.M.R. Sheet.
- 10. The calculator, pager and mobile phone are not allowed inside the examination hall.
- 11. If a candidate is found committing malpractice, such a candidate shall not be considered for admission to the course and action against such candidate will be taken as per rules.

INSTRUCTIONS TO FILL UP THE O.M.R. SHEET

- 1. There is only one most appropriate/correct answer for each question.
- For each question, only one circle must be darkened with BLUE or BLACK ball point pen only. Do not try to alter it.
- 3. Circle should be darkened completely so that the alphabet inside it is not visible.
- 4. Do not make any stray marks on O.M.R. Sheet.

ಗಮನಿಸಿ : ಸೂಚನೆಗಳ ಕನ್ನಡ ಆವೃತ್ತಿಯು ಈ ಮಸ್ತಕದ ಹಿಂಭಾಗದಲ್ಲಿ ಮುದ್ರಿಸಲ್ಪಟ್ಟಿದೆ.



PART - A

This part shall contains 50 multiple choice/objective type questions, each question carrying one mark. $[50 \times 1 = 50]$

1)	A ge	ne that takes part in the synthesis of	poly	peptide is
	(A)	Structural gene	(B)	Regulator gene
	(C)	Operator gene	(D)	Promoter gene
2)	DNA	A replicates during		
-,		G1 - phase	(B)	S - phase
		G2 - phase	(D)	M - phase
3)	Мус	obacterium tuberculosis was first d	liscov	ered by
	(A)	Robert Koch	(B)	Edward Jenner
	(C)	Louis Pasteur	(D)	None of these
4)	Cros	ssing-over most commonly occurs	durin	ong nd 1900 ay bang ba Panganan 1800 ay bang Panganan 1800 ay bang bang
	(A)	Prophase I	(B)	Prophase II
	(C)	Anaphase I	(D)	Telophase II
5)	DN.	A-replication is by the mechanism o	of	onegger en
	(A)	Conservative	(B)	Semi conservative
	(C)	Dispersive		None of the above
6)	Ant	ibodies are		reginal come stancing problem of the come of the large of the co of the come of the come of the come
	(A)	Proteins	(B)	Glycoproteins
	4 The State of the			

7)	Ant	ibody present in colostrums is		
	(A)	IgG .	(B)) IgA
	(C)	IgM	(D)) IgE
8)	Whi	ch antibody is called millionaire mo	olecul	e?
		IgA		IgM
	(C)	IgG		IgD
9)	A lip	oid bilayer is permeable to		Mind of the state
	(A)	Urea	(B)	Fructose
	(C)	Glucose	(D)	Potassium
		The first Landbroom of		
10)	The	Golgi complex		
	(A)	Synthesizes proteins	(B)	Produces ATP
	(C)	Both A and B	(D)	Forms glycoproteins
11)	Polys	saccharides are		grecous as incommon
		Polymers	(B)	Acids
	(C)	Proteins	(D)	Oils
2)	RNIA	does not contain		
2)				a na santa ar ka matawa. Bina santa ar ka matawa
		Uracil	(B)	Adenine
	(C) I	Hydroxy methyl cytosine	(D)	Phosphate
		As		

13)	Sulp	bhur containing amino acid is		
	(A)	Methionine	(B)	Leucine
	(C)	Valine	(D)	Asparagine
14)	Urin	nary water loss is increased in		e server de la companya del companya del companya de la companya d
	(A)	Diabetes mellitus	(B)	Diabetes insipidus
	(C)	Chronic glomerulonephritis	(D)	All of these
15)	Whi	ch of the following describe the mid	ddle p	part of a group of numbers?
	(A)	Measure of Variability	(B)	Measure of Central Tendency
	(C)	Measure of Association	(D)	Measure of Shape
16)	Whi	ch of the following is not a measure	of ce	entral tendency?
	(A)	Mean	(B)	Median
	(C)	Standard deviation	(D)	Mode
17)		atistical test used to determine whethe ificant is called the	r a co	rrelation coefficient is statistical
	(A)	one-way analysis of variance		
	(B)	t-test for independent samples		
	(C)	chi-square test for contingency tab	les	
	(D)	t-test for correlation coefficients		
18)	Whi	ch of the following divides a group	of da	ata into four subgroups?
	(A)	Percentiles	(B)	Deciles
	(C)	Median	(D)	Quartiles

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19)	with	Which of the following microscopy techniques relies on the specimen interfering with the wavelength of light to produce a high contrast image without the need for dyes or any damage to the sample?		
	(A)) Conventional bright field light micros	copy	
	(B)	Phase contrast microscopy		
	(C)	Electron microscopy	PCCCC III agrang ay chimodiff (135)	
	(D)	Fluorescence microscopy	and a causoilgand a can	
20)	Whi	nich of the following statements is correct	et?	
	(A)	Animal and fungal cells contain chlore	pplasts.	
	(B)	Animal and plant cells do not contain	mitochondria.	
	(C)	Plant, animal and fungal cells possess	mitochondria.	
	(D)	All plant cells contain chloroplasts.		
		to more what (a)		
21)	The	e process of passing a mobile phase thro ed which one of the following?	ough a chromatography column is	
	(A)	Flushing (B	Washing	
	(C)	Elution (D	Partitioning	
			inothale lag blattaging (8).	
(2)	Iden	ntify the amino acids containing nonpola	ar, aliphatic R groups	
	(A)	Phenylalanine, tyrosine and tryptophar		
	(B)	Glycine, alanine, leucine	Present regular version to the extra	
	(C)	Lysine, arginine, histidine		
	(D)	Serine, threonine, cysteine		

23) The catalytic efficiency of two distinct enzymes can be compared which of the following factor?		nes can be compared based on		
	(A)	Km	(B)	Product formation
	(C)	Size of the enzymes	(D)	pH of optimum value
24)	Pho	sphoryl groups are derivatives of		
	(A)	Phosphorous acid	(B)	Phosphoric acid
	(C)	Acetic acid	(D)	Citric acid
25)	Exp	periment: Pure IgG loaded on SDS-PA ds can be seen after coomassie brilli	AGE g ant bl	gel with DTT, How many protein ue staining of gel.
	(A)	Four bands	(B)	Three bands
	(C)	Two bands	(D)	Single band
26)	Ab	zymes are:		nam on althoughtening, and
	(A)	catalytic antibodies	(B)	artificial enzymes
	(C)	both the above	(D)	none of these
27) Gro	eater than 100Mb DNA can be separ	ated b	by using following technique
	(A)) General Agrose gel electrophoresi	S	
	(B)	Pulse field gel electrophoresis		
	(C)) Urea PAGE		Pot all the fact of the same o
	(D) None of these		uka Hisa ing Kabupatèn California
28	3) Ho	ow many neutrons present in Phospl	norus.	-32 (³² P)
	(A) 17	(B) 15
	(C	2) 16	(D) 18

49)	IVIO	Molecular taxonomy of prokaryotes based on				
	(A)	23S RNA sequencing	(B)	18S RNA sequencing		
	(C)	16S RNA sequencing	(D)	both B and C		
30)	Dih	ydroxyacetone phosphate is rapidly	and r	eversibly converted to		
	(A)	Glyceraldehyde 3-phosphate	(B)	1, 3-bis-phosphoglycerate		
	(C)	Fructose 1, 6-bisphosphate	(D)	Fructose 6-phosphate		
31)	On	what basis protein can be separated	by Ex	clusion chromatography		
	(A)	Based on size and oligomeric state	of pr	oteins		
	(B)	Based on charge and size				
	(C)	Based on affinity and charge				
	(D)	All the above				
2)	Who	o discovered E. coli DNA polymeras	se I	e e Minibal Control (1994)		
	(A)	Linus Pauling	(B)	Emil Fischer		
	(C)	Arthur Kornberg	(D)	All the above		
3)	mR	NA in Eukaryotes contain following c	harac	teristics, generally		
	(A)	Poly cistronic and poly A tail				
	(B)	Capping at 5' end and poly A tail		Power grantification agent the		
	(C)	Only Poly A tail				
	(D)	None of the above				

34)		ch of the following enzymes remove se replication fork?	uper-	coiling in replicating DNA ahead
	(A)	DNA polymerases	(B)	Helicases
	(C)	Primases	(D)	Topoisomerases
35)	The	enzyme used to join bits of DNA is		efficience oracle way cowy field 46
	(A)	DNA polymerase	(B)	DNA ligase
	(C)	Endonuclease	(D)	Primase
36)	Whi	ch of the following is true for a plas	mid?	
	(A)	Contains an origin of replication		este lete sino parte.
	(B)	Imparts a useful characteristic to the	ne ho	st bacterium
	(C)	Possesses one or more genes		
	(D)	Replicates only when the host gene	ome i	s undergoing replication
				expulsion in (f)
37)	Ti p	plasmids are plasmids.		
	(A)	Tumor inducing	(B)	Degradation
	(C)	High copy number	(D)	Mammalian
38)) Ho	w many sets of antibiotic resistance	does	the plasmid pBR322 carry?
	(A)	1	(B)	3
	(C)	2 (1) 10 10 20 20 20 20 20 20 20 20 20 20 20 20 20) = 4 = 0 = 30 (0.5) = 1
39) A §	genomic library is a collection of _		<u>sheab</u> is a street of (f)
) Genes) Proteins
) Vectors	(D) Recombinants

40)	Wol	bble base hypothesis is applicable t	o the	k teropidah perunasah 408.
	(A)	Mitochondrial codon	(B)	1st base in codon
	(C)	2 nd base in codon	(D)	3 rd base in codon
				died georgianes (2)
41)	Nor	thern blot technique used to detect		and the state of t
	(A)	Protein	(B)	DNA
	(C)	RNA	(D)	Lipids
42)	Rest	triction endonucleases can recogniz	æ	adrogen en Danti senaspaciac
		Tandem repeats	(B)	Palindromic sequences
	(C)	GATC	(D)	No sequence specificity
43)	Whi	ich of the sequence will Dcm methyl	ate?	(a) Unanobilizar sell beet not
,		GATC		GAATC
		CCGTT	birti i	CCAGG
44)	In w	which disease of plant white milderes?	w app	pears typically on underside of
	(A)	Cylindrocladium	(B)	Angular leaf Spot
	(C)	Downy Mildew	(D)	Black arm of Cotton
		sond, cittin scool, (6)		
45)	Whi	ch of the following statements is fals	se?	
	(A)	BAC is a circular DNA molecule		
	(B)	YAC is a linear DNA molecule		
	(C)	Taql is a DNA polymerase		and the Bullion of the second
	(D)	BAC is a linear DNA molecule		

40)	The	anosteric inhibitor of an enzyme		
	(A)	Causes the enzyme to work faster		Adsorption of Section 1917 Fig.
	(B)	Binds to the active site		ments in a series (b)
	(C)	Participates in feedback regulation		
	(D)	Denatures the enzyme		41) Sayingto subject to the m
				nout (A)
47)		ch of the following enzyme is respo ogen fixation?	nsibl	e for the regulation of biological
	(A)	Dinitrogenase reductase	(B)	Dinitrogenase oxidase
	(C)	Phosphatase	(D)	Kinase
48)	Imm	nobilized cell bioreactors are based of	on	
	(A)	Cells cultures in solid medium		DIM SUBBLICE SILL FORD WELLS
	(B)	Cells cultured in liquid medium		Transition of
	(C)	Cells entrapped in gels		
	(D)	All of these		Jahr he s 1890 Holdway 1
				1 CeAte 7
49)	Dow	n's syndrome is characterized by		
	(A)	19 trisomy	(B)	21 trysomy
	(C)	46XXY		None of the above
				international of the learning of the
50)	The	human fibroplast is a classical exam	ple o	f
	(A)	stable primary cell lines	(B)	established cell lines
	(C)	cell transformations	(D)	none of these

PART - B

This part shall contains Five questions, each question carrying ten marks.

 $[5\times10=50]$

- 1) Describe the classification and structure of carbohydrates with examples.
- 2) Briefly describe the cells and molecules involved in innate and adaptive immunity.
- 3) Write a note on construction of genomic and cDNA libraries.
- 4) Write a note on Intellectual Property Rights (IPR) in agricultural technology and its implications for India.
- 5) Describe the development transgenic animals and its applications.



ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

- 1. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ಜೊತೆಗೆ 50 ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿರುವ ಮೊಹರು ಮಾಡಿದ ಪ್ರಶ್ನೆ ಮಸ್ತಕವನ್ನು ನಿಮಗೆ ನೀಡಲಾಗಿದೆ.
- 2. ಕೊಟ್ಟಿರುವ ಪ್ರಶ್ನೆ ಮಸ್ತಕವು, ನೀವು ಪರೀಕ್ಷೆಗೆ ಆಯ್ಕೆ ಮಾಡಿಕೊಂಡಿರುವ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ್ದೇ ಎಂಬುದನ್ನು ಪರಿಶೀಲಿಸಿರಿ.
- 3. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಮೊಹರನ್ನು ಜಾಗ್ರತೆಯಿಂದ ತೆರೆಯಿರಿ ಮತ್ತು ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯಿಂದ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯನ್ನು ಹೊರಗೆ ತೆಗೆದು, ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಸಾಮಾನ್ಯ ಮಾಹಿತಿಯನ್ನು ತುಂಬಿರಿ. ಕೊಟ್ಟಿರುವ ಸೂಚನೆಯಂತೆ ನೀವು ನಮೂನೆಯಲ್ಲಿನ ವಿವರಗಳನ್ನು ತುಂಬಲು ವಿಫಲರಾದರೆ, ನಿಮ್ಮ ಉತ್ತರ ಹಾಳೆಯ ಮೌಲ್ಯಮಾಪನ ಸಮಯದಲ್ಲಿ ಉಂಟಾಗುವ ಪರಿಣಾಮಗಳಿಗೆ ವೈಯಕ್ತಿಕವಾಗಿ ನೀವೇ ಜವಾಬ್ದಾರರಾಗಿರುತ್ತೀರಿ.
- 4. ಪರೀಕ್ಷೆಯ ಸಮಯದಲ್ಲಿ:
 - a) ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಯನ್ನು ಜಾಗ್ರತೆಯಿಂದ ಓದಿರಿ.
 - b) ಪ್ರತಿ ಪ್ರಶ್ನೆಯ ಕೆಳಗೆ ನೀಡಿರುವ ನಾಲ್ಕು ಲಭ್ಯ ಆಯ್ಕೆಗಳಲ್ಲಿ ಅತ್ಯಂತ ಸರಿಯಾದ/ ಸೂಕ್ತವಾದ ಉತ್ತರವನ್ನು ನಿರ್ಧರಿಸಿ.
 - c) ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಸಂಬಂಧಿಸಿದ ಪ್ರಶ್ನೆಯ ವೃತ್ತಾಕಾರವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಿರಿ. ಉದಾಹರಣೆಗೆ, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ 8ಕ್ಕೆ "C" ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದರೆ, ನೀಲಿ/ಕಷ್ಟು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಬಳಸಿ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ಕ್ರಮ ಸಂಖ್ಯೆ 8ರ ಮುಂದೆ ಈ ಕೆಳಗಿನಂತೆ ತುಂಬಿರಿ:
 - ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ 8. 🔘 📵 🔘 (ಉದಾಹರಣೆ ಮಾತ್ರ) (ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರ ಉಪಯೋಗಿಸಿ)
- 5. ಉತ್ತರದ ಪೂರ್ವಸಿದ್ದತೆಯ ಬರವಣಿಗೆಯನ್ನು (ಚಿತ್ತು ಕೆಲಸ) ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಒದಗಿಸಿದ ಖಾಲಿ ಜಾಗದಲ್ಲಿ ಮಾತ್ರವೇ ಮಾಡಬೇಕು (ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಮಾಡಬಾರದು).
- 6. ಒಂದು ನಿರ್ದಿಷ್ಟ ಪ್ರಶ್ನೆಗೆ ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚು ವೃತ್ತಾಕಾರವನ್ನು ಗುರುತಿಸಲಾಗಿದ್ದರೆ, ಅಂತಹ ಉತ್ತರವನ್ನು ತಮ್ಮ ಎಂದು ಪರಿಗಣಿಸಲಾಗುತ್ತದೆ ಮತ್ತು ಯಾವುದೇ ಅಂಕವನ್ನು ನೀಡಲಾಗುವುದಿಲ್ಲ. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಉದಾಹರಣೆ ನೋಡಿ.
- 7. ಅಭ್ಯರ್ಥಿ ಮತ್ತು ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ನಿರ್ದಿಷ್ಟಪಡಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯ ಮೇಲೆ ಸಹಿ ಮಾಡಬೇಕು.
- 8. ಅಭ್ಯರ್ಥಿಯು ಪರೀಕ್ಷೆಯ ನಂತರ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ಮೂಲ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆ ಮತ್ತು ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಪ್ರತಿಯನ್ನು ಹಿಂದಿರುಗಿಸಬೇಕು.
- 9. ಅಭ್ಯರ್ಥಿಯು ಪ್ರಶ್ನೆ ಮಸ್ತಕವನ್ನು ಮತ್ತು ಓ.ಎಂ.ಆರ್. ಅಭ್ಯರ್ಥಿಯ ಪ್ರತಿಯನ್ನು ತಮ್ಮ ಜೊತೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
- 10. ಕ್ಯಾಲ್ಕುಲೇಟರ್, ಪೇಜರ್ ಮತ್ತು ಮೊಬೈಲ್ ಘೋನ್'ಗಳನ್ನು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಒಳಗೆ ಅನುಮತಿಸಲಾಗುವುದಿಲ್ಲ.
- 11. ಅಭ್ಯರ್ಥಿಯು ದುಷ್ಕ್ರತ್ಯದಲ್ಲಿ ತೊಡಗಿರುವುದು ಕಂಡುಬಂದರೆ, ಅಂತಹ ಅಭ್ಯರ್ಥಿಯನ್ನು ಕೋರ್ಸ್ಗೆ ಪರಿಗಣಿಸಲಾಗುವುದಿಲ್ಲ ಮತ್ತು ನಿಯಮಗಳ ಪ್ರಕಾರ ಇಂತಹ ಅಭ್ಯರ್ಥಿಯ ವಿರುದ್ಧ ಕ್ರಮ ಕೈಗೊಳ್ಳಲಾಗುವುದು. <u>ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯನ್ನು ತುಂಬಲು ಸೂಚನೆಗಳು</u>
- 1. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೆ ಒಂದೇ ಒಂದು ಅತ್ಯಂತ ಸೂಕ್ತವಾದ/ಸರಿಯಾದ ಉತ್ತರವಿರುತ್ತದೆ.
- 2. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ವೃತ್ತವನ್ನು ಮಾತ್ರ ನೀಲಿ ಅಥವಾ ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ನಿನಿಂದ ಮಾತ್ರ ತುಂಬತಕ್ಕದ್ದು, ಉತ್ತರವನ್ನು ಮಾರ್ಪಡಿಸಲು ಪ್ರಯತ್ನಿಸಬೇಡಿ.
- 3. ವೃತ್ತದೊಳಗಿರುವ ಅಕ್ಷರವು ಕಾಣದಿರುವಂತೆ ವೃತ್ತವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬುವುದು.
- 4. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿ ಯಾವುದೇ ಅನಾವಶ್ಯಕ ಗುರುತುಗಳನ್ನು ಮಾಡಬೇಡಿ.

Note: English version of the instructions is printed on the front cover of this booklet.

