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A-58

ENTRANCE EXAMINATION 2021

Ph.D. Animal Biology

Time: 2 hours

Maximum Marks: 70

INSTRUCTIONS: PLEASE READ BEFORE ANSWERING!

> Enter your hall ticket number on this sheet and the answer (OMR) sheet.

> Answers have to be marked on the OMR answer sheet following the instructions provided there upon.

> Hand over OMR answer sheet at the end of the examination.

> All questions carry one mark each. Answer all, or as many as you can.

> There are total of 12 pages in this question paper. Answer sheet (OMR) will be provided

separately. Check this before you start answering.

> The question paper consists of Part A and Part B. The marks obtained in Part A will be taken into consideration in case of a tie i.e., when more than one student gets equal marks, to prepare the merit list.

PART "A"

1.	pΗ	of	500	ml	water	when	20 ml	of 1.0	M	HNO ₃	is	added

A) 1.4

B) 2.4

C) 3.4

D) 4.4

2. The affinity of an antibody can be determined quantitatively by

A) MALDI-TOF-MS

B) equilibrium dialysis

C) isoelectric focusing

D) SDS-PAGE

3. Alpha complementation is associated with

A) identification of colonies with recombinant plasmid

B) downstream processing

c) expression of extracellular proteins

D) heterologous expression

4. The	e movement of a single cell that was mark ntinually observed during development. T	ted w his ca	ith a reporter gene was required to be an be monitored by			
A) C)	phase contrast microscopy atomic force microscopy	B) D)	bright field microscopy fluorescence microscopy			
5. Wh	nich one of the following methods is used ecific RNA?	l to m	easure the quantitative levels of a given gene-			
A)	RNAse protection assay	B)	DNAse foot printing			
C)	Northern blotting	D)	Southern blotting			
6. Th	e cell density in a 100 mm culture dish 7 ratio and 100 μl seeded per well into a 9	was 2 96 we	2.7×10^6 cells/ml. The culture was diluted to ell plate. The final cell density per well is			
A)	1×10^{5}	B)	1 x 10 ⁴			
C)	2.7×10^4	D)	2.7×10^5			
7. Which one of the following methods finds the location of genes on a chromosome?						
A)	Gene tracking	B)	Genome walking			
C)	Genome mapping	D)	Chromosome walking			
8. Wh	nich one of the following radiolabeled nuc restation procedures?	eleotic	de is used while labeling DNA following Nick			
A)	Apha-32P ATP	B)	Gamma- ³² P ATP			
C)	Beta- ³² P ATP		Beta-35S ATP			
9. Mo	lar absorption coefficient of tyrosine is 2 samino acid will exhibit an O.D. of 1.0 in	00M ⁻ a cu	or cm ⁻¹ at 257 nm. At what concentration (g/L) vette of 0.5 cm path length at 257 nm?			
A)	3.30	B)	1.65			
C)	0.33	D)	0.17			
10. W	hich one of the following methods is used	d to m	neasure the rate of transcription of gene/s?			
A)	Global Run ON sequencing (GRO-seq)	В	Northern Hybridization			
C)	RNA-seq	D	DNase-seq			
11. In	rocket immunodiffusion, the length of th	e rocl	cet is			
A)	directly proportional to the amount	B)	inversely proportional to the amount			
C)	of antibody	D)	of antigen			
C)	directly proportional to the amount of antigen	D)	inversely proportional to the amount of antibody			

	a Next Generation Sequencing data, ccuracy?	if the p	hred quality score is 20, what is the base call
A)	90%	B)	99%
C)	99.90%	D)	99.99%
13. St	andard deviation is the square of		•
A)	Mean	B)	variance
C)	standard error	D)	mode
	Thich one of the following techniques exture of dCDP, dCTP and dCMP?	s will b	e most appropriate to separate dCTP from a
A) C)	Cation exchange chromatography Anion exchange chromatography	B) D)	Gel-filtration chromatography Hydrophobic interaction chromatography
ci ci	ulture was added to 9.9 ml of dilution	blank. F	of dilution blank. One-tenth ml of this diluted from this dilution, 100 μ l was plated on a solid re observed. The bacterial count (CFU / ml) in
A)	4.4×10^6	B)	4.4×10^4
C)	2.2×10^6	D)	2.2×10^4
	box contains 6 white puppies, 4 blac hat is the probability that it is either a l		es and 2 grey puppies. A puppy is taken out. grey puppy?
`A)	1/16	B)	1/4
Ć)	1/8	D)	1/2
lig	~ .		oured solution. Eighty percent of the incident ses through 2 cm of the same solution, the
A)	60	B)	40
C)	80	D)	70
18. R	ecombinant protein expressed with C-to	erminal	His-tag is purified using
A)	GST-Sepharose	B)	Sephedex-G-50
Ć)	Nickel-Sepharose	D)	Dextrin-Sepharose

	hich region of the gene should be preferre nicroarray Chip for whole genome expres		selection of unique target sequence to design analysis of a eukaryotic system?
A)	Any region of the coding DNA	B)	5' region of the coding DNA
C)	sequences 3' region of the coding DNA sequences and 3' untranslated region	D)	Any region of intron only
20. R-	loop mapping is associated with mapping	g of	•
A)	exons in a gene	B)	translation start site
C)	transcription start site	D)	small RNA binding sites
ex		he an	ad Histidine (H) was fractionated using cation nino acids were eluted with an increasing salt
A)	R, H, F		B) F, H, R
C)	H, FR		D) R, F, H
	Lysine, the pKa of the side chain is abnino groups are 2.0 and 9.0 respectively, t		0.5. Assuming that the pKa of carboxyl and of lysine is closest to
A)	5.5	B)	6.2
C)	7.4	D)	9.8
23. In	MacConkey's agar broth, inh	nibits	the growth of Gram-positive bacteria.
A)	Tryptone	B)	peptone
C)	Tryptophan	D)	bile salts
pı 48	coteolytic digestion were immunized in go	oat se _l ti-sera	ne. The Fab and Fc fragments obtained after parately. The sera samples were collected after a were used for probing the H and L chains.
A)	The antibody to the Fab fragment reacts only to the L chain	B)	The antibody to the Fc fragment reacts only to the H chain
C)	The antibody to the Fab fragment reacts only to the H chain	D)	The antibody to the Fab fragment could react to both the H and L chain
	researcher would like to estimate the levene of the following techniques would be M		a cytokine in a cell culture supernatant. Which Γ suited for this purpose?
A)	Fluorescence in situ hybridization	B)	Enzyme linked immunosorbent assay
Ć)	Fluorescence activated cell sorting	D)	Immuno-fluorescence microscopy

26. Du	iring counter-immunoelectro	pnoresis,		
A)	antigen and antibody	migrate	B)	antibody will migrate towards anode
C)	opposite to each other antibody will migrate cathode	towards	D)	antibody and antigen migrate parallel to each other
glu	icose-6-phosphate. The Kcat ncentration is 20 nanomole	of Glucoking of and subst	nase is rate c	ycolysis in liver and converts glucose into 600 per second. When the total enzyme (Et) concentration is 40 nanomoles, the reaction the substrate in this reaction is
A)	20 micromoles		B)	15 micromoles
C)	10 micromoles		D)	5 micromoles
28. Li	ght of a specific wavelength	in a spectrop	hoton	neter is generated by
A)	UV lamp		B)	monochromator
C)	while light lamp		D)	beam divider
29. B	iomaterials placed in the bod	y are expecte	ed to r	nimic the functions of
A)	transmembrane proteins		B)	Cytoplasm
C)	cell organelles		D)	extracellular matrix
30. In	an oxygen-hydrogen cell, _		is t	pubbled at cathode.
A)	Oxygen		B) .	Hydrogen
C)	Nitrogen		D)	Chlorine
31. In	Gram's staining, the correct	t order of add	dition	of reagents is:
A)	Crystal violet, alcohol, iodi	ne, safranin	B)	•
C)	Crystal violet, safranin, alc	ohol, iodine	D) Iodine, crystal violet, alcohol, safranin
32. I b	ndole (I), methylene (M), V acteria. Which one of the fol	oges-Proska lowing test r	uer (Vesult i	V), and citrate (C) are tested to detect enteric s positive for <i>E. coli</i> ?
A)	I,M,V,C (+,+,-,-)		B)	I,M,V,C (+,-,+,+)
,	I,M,V,C (-,-,+,-)		D)	I,M,V,C (+,-,+,-)
C	hannel would not spill over i	sis what has	r chan	adjusted to ensure that fluorescence from one nel/s?
A)	Threshold		B)	compensation
C)	Gate		D)	Voltage

34. Ed	osinate of methylene blue is a(n)		dye.
A)	acidic	B)	basic
C)	neutral	D)	Oxazine
-	ynthetic Promoter Ptac is used while component Plac promoter as it doesn't contain	nstruct	ing expression vectors. The Ptac is different
A)	a cAMP-CRP binding motif	B)	an attenuator sequence
C)	an operator site	D)	a lactose binding motif
	P	AR T	Г "В"
36. W	hich one of the following gene clusters d	lo not o	contribute to the antigen recognition?
A)	VL (variable light chain)	B)	VH (variable region of heavy chain
C)	CL (Constant region of light chain)	D)	D (Diversity region of heavy chain)
37. W	which one of the following inhibits transcr	ription	elongation?
A)	Rifamycin	B)	Chloramphenicol
C)	Ampicillin	D)	Tetracycline
	Which one of the following Sars-Cov-2 vintibody?	rus an	tigens offers a potential target for neutralizing
A)	Spike protein	B)	U3
C) '	Reverse transcriptase	D)	TMPRSS2
	Which one of the following restriction extivity on the same subunit?	nzyme	s contains both restriction and methylase
A)) EcoB1	B)	EcoRV
\mathbf{C}_{i}^{c}) EcoRI	D)	Hind[II]
40. A	A homeotic mutation is one in which		
A)	some proteins are made from mRNA	B)	one cell type follows the developmental
C)	transcribed by the mother	<i>D</i>)	path of another
C)	programmed cell death occurs	D)	gene activity depends upon whether the gene is of maternal or paternal origin

41. E	Embryonic stem cells are	, wherea	s a	dult stem cells are
A)	multipotent; totipotent	B))	unipotent; totipotent
,	pluripotent; unipotent	D))	pluripotent; multipotent
	ouring sea urchin development, if evelop, they will	blastomeres	ar	e separated at 4 cell embryo and allowed to
A) C)	other blastomeres	l from B)		develop aberrantly, as nuclear determinants are distributed among blastomeres develop normally, since each blastomere can regulate its own development
43. A	collar of tissue that usually surr	ounds the inf	fun	dibular stalk or infundibulum is
A)	Pars nervosa	B))	Pars tuberalis
C)	Pars distalis	D))	Pars intermedia
	part. What proportion of the prog		re t	he two genes are linked and are 50 map units he genotype aabb? 1/4 1/16
		•	,	column A and column B, respectively.
1. Bo 2. Di 3. Pe	tumn A (Toxin) otulism toxin phtheria toxin orfringens toxin otanus toxin	Column B (a) Rigid pa (b) Membra (c) Flaccid 1 (d) Inhibits	ara inė par	lysis lysis
Ident	tify the correct set of column A v	ersus columi	n E	3 match.
A)	1 (c), 2 (d), 3 (b), 4 (a)	В	()	1 (d), 2 (b), 3 (a), 4 (c)
C)	1 (b), 2 (a), 3 (c), 4 (d)	D)	1 (d), 2 (c), 3 (b), 4 (a)
46. I	nactivated whole virus is used as	a source of	vac	ccine in all except
A)	Polio	В	3)	Rabies
(C)		D	,	Hepatitis B

	h human liver, the initial step in the utilize phosphate. This is followed by	zation	of fructose is its phosphorylation to fructose
A)	phosphorylation to fructose 1,6- biphosphate	B)	cleavage of fructose 1-phosphate to form glyceraldehyde and dihydroxyacetone phosphate
C)	conversion to fructose 6-phosphate	D)	isomerization to glucose 1-phosphate
48. W	Thich one of the following is a non-organ-	speci	fic autoimmune disease?
A)	Hashimoto's thyroiditis	B)	Insulin-dependent Diabetes mellitus
C)	Systemic lupus erythematosus	D)	Di George syndrome
49. Th	e 'mid-blastula transition' is a stage in an	imal	development when,
A)	translation of maternal mRNA is initiated	B)	transcription of zygotic genes begins
C)	blastocoel formation occurs	D)	cell determination is completed
	Thich one of the following tissue / githydrotestosterone than testosterone in pro-		s has high levels of the potent androgen, s?
A)	Testis	B)	Vas deferens
C)	Prostate	D)	Seminal Vesicle
	normal adult is placed on a diet deficient tements is correct?	only	in phenylalanine. Which one of the following
A)	Protein synthesis continues normally	B)	Phenylalanine is a non-essential amino acid
C).	Phenylalanine is formed from alanine and benzoic acid and no metabolic changes are observed	D)	Tyrosine becomes an essential amino acid
52. W	Thich of the following are most effective is	in des	troying intracellular pathogens?
A)	T helper cells	B)	B cells
C)	Mast cells	D)	T cytolytic cells
53. C	old sores are caused by	-	
A)	Human herpes virus 8	B)	Human herpes virus 6
C)	Herpes simplex virus 1	D)	Herpes simplex virus 2

A)	trp operon	B)	ara operon
C)	nif operon	D)	lac operon
	he lipid moieties and peripheral membra spectively.	ane pr	oteins are given in column A and column B,
2. 3.	Column A Isoprenoid tails Myristoyl tails Transmembrane cadherin GPI tails		Column B (i) Thy 1 (ii) β-catenin (iii) Ras (iv) Src peptide
Identi	ify the correct set of column A versus col	umn I	3 match.
A)	1-(iv), 2- (iii), 3-(i), 4 (ii)	B)	1-(iii), 2-(iv), 3-(ii), 4 (i)
C)	1-(ii), 2- (i), 3-(iv), 4 (iii)	D)	1-(iv), 2- (i), 3-(iii), 4 (ii)
56. V po	Which one of the following anterior morpolarity during <i>Drosophila</i> embryonic developments	phoge elopm	ens is critical for establishing anterio-posterior nent is
A)	Nanos	B)	Torso
C)	Bicoid	D)	Torpedo
I I I	Which of the following statement/s holds Transcriptionally active RNA Pol II binding to promoters CII. Contain H3K4me3 and H3K27me3 notes. W. Highly condensed chromatin		or "Poised genes" in embryonic stem cells?
A)	I and II	B)	II and IV
C)	III and IV	D)	II and III
	Which one of the following does not ushysiological response?	ıtilize	phosphatidyl inositol lipid for signaling in a
A)	Vasopressin	B)	Acetyl choline
C)	Follicle stimulating hormone	D)	Adrenaline
	Migration of cancerous cells from the secondary tumors is referred to as	site	of origin to other parts of the body forming
A)	epithelial mesenchymal transition	B)	metastasis
C)		D)	invasion

54. Which of the following mRNA contains attenuator sequence at the 5' UTR?

60.	Androgen insensitivity syndrome is caus humans.	ed by	mutation of AR gene in chromosome of
\mathbf{A}) X	B)	Y
C		D)	11
	Inactivation of Ca ²⁺ channel is mediated G-proteins.	by one	e of the following family members of trimeric
\mathbf{A}) Gs	B)	Gt
C) Go	D)	Gj
62.	refers to the process of glycoglycogen breakdown. refers to process of glycogen breakdown.	gen sy rocess	of glucose to pyruvate production.
A) Glycogenolysis, glycolysis, Gluconeogenesis	B)	Glycogenolysis, glycogenesis, Glycolysis
C) Glycolysis, glycogenolysis, Glycogenesis	D)	
63.	BRCA-2 protein is involved in repairing d	lamage	ed DNA. Its loss of function affects
A) mismatch repair	B)	nucleotide excision repair
C) repair by homologous recombination	D)	DNA interstrand cross repair
	Consider the following statements for special. Maternal and paternal chromosomes policy. Metaphase I stage chromosomes loose III. Sperm retains haploid set of maternal of IV. Sperm retains haploid set of chromosomes.	resent paren or pate	in spermatogonial cells. tality. ernal chromosomes.
	Which of the above statements are incorre	ect?	•
A) I, III and IV	B)	II, III and IV
C) I, II and III	D)	I, II and IV
65.	A botanist is accidentally exposed to a neeffect would you expect at cellular level w	euotox vithin t	in that interferes with tubuin dynamics. What the first few minutes of exposure?
A) Re-uptake of neurotransmitters	B)	Generation of axon potential
C) Movement of K ⁺ ions across the cellular membrane	•	4
66.	Major structures of integumentry system of	of prim	nates are
A) trachea, nose and mouth	B)	eyes, bones and joints
C	skin, nails and hair	D)	brain, sense organs and oesophagus

67. In the left hemisphere, Broca's area is related to

A) speech

- B) smell sensation
- C) impulses received from eyes
- D) reasoning and learning

68. Which one of the following trace minerals is essentially required for thyroid hormone production in addition to iodine?

A) Copper

B) Selenium

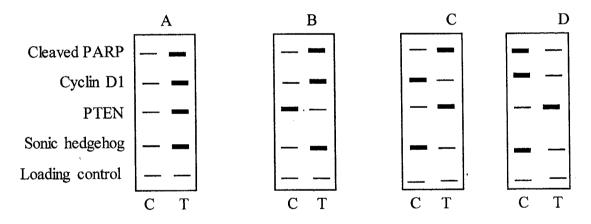
C) Manganese

D) Fluoride

69. Quantal transmission is

- A) the release of neurotransmitter in discrete packets
- C) an incremental effect of pre-synpatic inhibition
- B) the transmission from non-spiking neurons only
- D) the transmission at neuromuscular junction only

70. A researcher treated cancer cells with an anticancer drug and performed Western blot analysis. Which one of the following blots is the best representation of untreated control (C) and treated samples (T) in the respective order?



For rough work

University of Hyderabad Entrance Examinations - 2021

School/Department/Centre

: Department of Animal Biology

Course/Subject

: PhD in Animal Biology

Q.No.	Answer	Q.No.	Answer	Q.No.	Answer	Q.No.	Answer
1	Α	26	A	51	D	76	
2	B	27	ECONOMIC CONTRACTOR	52	'D': ::::	77	
3	А	28	В	53	С	78	
4	D	29	D	54	Α ·	79	
5	Α	30	Α	: 55	В	80	
6	В	31	В	56	С	81	
7	С	32	Α	57	D	82	
8	Α	33	В	58	D	83	
9	В	34	С	59	В	84	
10	А	35	А	60	А	85	
11	С	36	С	61	С	86	
12	В	37	Α	62	D	87	
13	A/B/C/D	38	Α	63	С	88	
14	С	39	Α	64	D	89	
15	C	40	В	65	D	90	,
16	D	41	D	66	С	91	
17	В	42	D	67	Α .	92	•
18	С	43	В	68	В	93	
19	С	44	D	69	Α	·94	
20	A	45	A	70	C	95	
21	В	46	D	71		96	
22	D	47	В	. 72		97	
23	D	48	С	73		98	
24	D	49	В	74		99	
25	В	50	С .	75		100	

Note/Remarks: Q.No.13 - Options A, B, C, D will be considered as right answers.