Hall Ticket Number:

B-9

ENTRANCE EXAMINATIONS – 2022

PhD. 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 a 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. The pH of a solution having a hydrogen ion concentration of $3.3 \times 10^{-13} \mathrm{M}_\odot$	is?
---	-----

A) 3.001

B) 6.031

C) 7.461

D) 8.301

2. Which of the following is an indirect method for measuring bacterial growth?

A) Cell count

B) Cell mass

C) Cell activity

D) Cell shape

3. Antibodies used in immunotherapy are subjected to partial proteolysis by the enzyme pepsin.

Consider the following statements

- I. F(ab)₂ fragment having the antigen binding activity is generated
- II. Fab fragment having antigen binding activity and the crystallizable Fc fragment are generated
- III. The F(ab)₂ fragment generated forms a visible precipitate on incubation with a proper antigen
- IV. The F(ab)₂ fragment generated is incapable of forming a visible precipitate on incubation with a proper antigen

Which of the above statement(s) regarding the partial digestion of antibodies by pepsin are true.

- A) I and II
- C) I and IV

- B) I and III
- D) II and III
- 4. In a bioreactor, if the mass fed to the separation process was 460 kg and the mass recovered was 422 kg, what is the percentage yield?
 - A) 93.77%

B) 8.20%

C) 91.73%

- D) 9%
- 5. One of the following exotoxins is responsible for capillary disruption.
 - A) Botulism toxin

B) Erythrogenic toxin

C) Perfringens toxin

- D) Pyrogen toxin
- 6. The partial amino acid sequence of the human adrenocorticotrophin is ser-tyr-ser-met-glu-hisphe-ser. The number of peptides released when it is treated with cyanogen bromide are
 - A) 5

B) 2

C) 3

- D) 4
- 7. Base call accuracy for Phred quality score of 20 is
 - A) 70%

B) 80%

C) 99.90%

D) 99%

- 8. Match the following:
- A) Confocal microscopy
- B) SEM
- C) TEM
- D) FRET

- 1. Surface composition and topography
- 2. Ultrastructure analysis
- 3. Energy transfer
- 4. Pinhole
- A) A-3, B-2, C-1, D-4
- C) A-4, B-1, C-3, D-2

- B) A-4, B-1, C-2, D-3
- D) A-2, B-1, C-3, D-2

9. The a	accumulation of lactic acid from a cancer	cell l	ine maintained in the culture media is due to
,	Excess production of ethyl alcohol Excess of oxygen	B) D)	Lack of enough oxygen Inhibition of glycolysis
10. Wh	ich one of the following methods is used	to det	ect protein-protein interactions?
A) C)	Western blotting In situ hybridization	B) D)	Northern blotting Far-Western blotting
in pl cp	cubated with glycogen in the present hosphorylase. Radioactivity was incorpora	ce of	c activity of 16,000 cpm per micromole) was f a cell free extract containing glycogen nto the glycogen at an initial velocity of 2,550 ne reaction in terms of micromoles glucose
A) C)	0.159 6.2745	B) D)	0.00265 376.470
	membrane bound vesicle has to transit a clocity of 1 μm/sec, the time taken for the		ace of 2 meters along an axon with an average at will be?
A) C)	0.23 days 23 days	B) D)	2.3 days 230 days
13. Wh	ich one of the following dye exclusion as	says	is used to assess cell viability?
A) C)	Diacetylfluorescein Trypan blue	B) D)	MTT H ³ thymidine
	nich one of the following approaches can erogeneous mixture of cell types?	be us	ed to isolate a specific cell population from a
A) C)	Column Chromatography Flow Cytometry	B) D)	High-throughput microscopy Histochemistry
	NA protein interactions are assessed at ger sllowing techniques?	nome-	-wide level by using which one or more of the
I.	EMSA; II. ChIP on Chip; III. RNA Seq;	IV. S	South-Western blotting
A) C)	I, II and IV I only	B) D)	I, III and IV II only

16. The	wavelength range of visible light is		
A)	0.39 to 0.77 mm	B)	0.39 to $0.77~\mu m$
C)	0.39 to 0.77 nm	D)	0.39 to 0.77 cm
	ich one of the following techniques allow gen specific cells in a given population?	vs the	quantitative determination of the number of
A) C)	Indirect ELISA Competitive ELISA	B) D)	Sandwich ELISA ELISPOT
18. Spl	icing of a gene can be monitored by		
A)	Southern hybridization	B)	Northern hybridization
C)	Western blotting	D)	South-western blotting
19. Wh	nich one of the following methods is used	to ide	entify the N-terminus of a polypeptide?
A)	Edwards degradation	B)	Ninhydrin test
C)	Edmans degradation	D)	Anthrone test
20. Ch	i-square is zero, when		
A)	Expected frequency is half of the	B)	Expected frequency is double that of
C)	observed frequency Expected frequency is triple that of the observed frequency	D)	the observed frequency Expected frequency is equal to observed frequency
	e cell density in a culture medium is 6.8 seive 2 x 10 ⁵ cells in 1ml, what should be		cells/ml. If each well of a 6-well plate has to lution strategy?
A)	1:6.8 followed by 1:10	B)	1:3.4 followed by 1:10
C)	1:10 followed by 1:2	D)	1:3.4 followed by 1:2
	arting from cathode side, the correct order to nsfer by Western blotting technique is	to be f	followed in placing the components for protein
A)	Filter paper, SDS gel, nitrocellulose membrane, filter paper	B)	Filter paper, nitrocellulose membrane, SDS gel, Filter paper
C)	Nitrocellulose membrane, filter paper, SDS gel-filter paper	D)	Filter paper, filter paper, nitrocellulose membrane, SDS gel
23. W	hich of the following is not a protein detec	ction	method?
A)	Fluorescence in situ hybridization	B)	Immunofluorescence microscopy
C)	Immunoelectron microscopy	D)	Immunoblotting

24. Wh	24. Which one of the following algorithms is used for local alignment of sequences? (SK)			
A) C)	Smith-Waterman De brujin	B) D)	Needleman-Wunsch Sankoff	
25. Me	elting temperature (Tm) of DNA is 56°C. U	Jpon	addition of salts, its Tm would be	
,	< 56°C = 56°C	,	> 56°C < 56°C initially and > 56°C later	
	nich one of the following scientists modifi- duction of passive immunity	ed the	e diphtheria toxin to antitoxin for successful	
,	Edward Jenner Alexander Yersin	B) D)	Emil von Behring Jonas Edward Salk	
27. If t	he average of a series of values is 10 and	their	variance is 4, the coefficient of variation is	
A) C)	10% 40%	B) D)	20% . 80%	
28. What is the free energy change for translocating a proton out of the mitochondrial matrix, where $pH_{matrix} = 7.8$, $pH_{cytosol} = 7.15$, $\Delta \Psi = 170$ mV and $T = 25$ °C.				
,	+20.1 kJ.mol ⁻¹ +2.01 kJ.mol ⁻¹	,	- 20.1 kJ.mol ⁻¹ - 2.01 kJ.mol ⁻¹	
29. A	prefix of dextro- or laevo- associated with	the 1	name of a monosaccharide indicates the	
A) C)	direction of rotation of polarized light position of OH group on the carbon next to the primary alcohol group	B) D)		
	aromosome Conformation Capture (3C) is omolecular interactions.	used	to study which one of the following	
A)	DNA-DNA	B)	RNA-RNA	
C)	DNA-RNA	D)	RNA-protein	
			•	

31. Atr	actyloside interferes with oxidative phosp	hory	lation by
A)	inhibiting the electron transfer	B)	inhibiting ATP synthase
C)	uncoupling the phosphorylation from electron transfer	D)	inhibiting adenine nucleotide translocase
32. Wł	nich one of the following sets of bacterial	group	os can be differentiated by coagulase test?
A)	Staphylococcus epidermidis from Neisseria meningitidis	B)	Staphylococcus aureus from Staphylococcus epidermidis
C)	2	D)	
33. Mo	onoclonal antibodies are purified using	co	onjugated resin
A) C)	Protein A Protein M	B) D)	Protein K Protein S
34. WI	hich one of the following techniques is use	ed to	identify translating mRNAs
A) C)	Ribosome profiling RNA Seq	B) D)	Western blotting RNase protection assay
35. Th	e number of oxygen atoms in 50 gm of Ca	aCO3	is
A) C)	7.033×10^{23} 9.033×10^{23}	B) D)	8.033×10^{23} 6.033×10^{23}

PART "B"

	e amount of DNA present in a mature spec cle respectively are.	rmato	zoan and in a skin cell that is in G2 phase of
,	1X & 1X 0.5X & 1X	B) D)	1X & 2X 1X & 4X
	ive T cells after receiving proper signals from the consider the following statements:	om ar	ntigen presenting cells differentiate to effector
	I. IL-12 promotes naive T cells different II. IL-10 promotes naive T cells different III. Th17 cells plays important role in aut IV. IL-4 cytokine is not produced by Th2	iatior oimn	n to Th2 cells. nunity
Which	of the above statements is/are correct?		
	I, II, IV I, II, III, IV		I, III, IV I, II , III
38. Wi	th reference to intracellular pathogens, on	e of t	he following statements is false.
A)	They are degraded in the cytoplasm	B)	Their antigenic determinants are presented to CD8 T cells
C)	Their elimination is mediated by superoxide radicals formed by myeloperoxidase	D)	•
	ore enzyme of RNA polymerase is guided art site.	by _	factor to recognize the transcription
A)	Gamma	B)	Delta
C)	Alpha	D)	Sigma
1.5	n enzyme protein kinase hydrolyzed a sub 5 x 10 ⁻³ mmol/L/min and a maximum velo s enzyme is	strate city c	(0.03 mmol/L) with an initial velocity of of 4.5 x 10^{-3} mmol/L/min. The Km of
A)	0.06	B)	0.02
C)	0.08	D)	0.12

41. W	hich one of the following statements is fal	se?	
A)	Interkinetic movement of the nuclei is a characteristic feature of developing ventricular zone.	B)	Subventricular zone displays interkinetic nuclei during the development.
C)	1	D)	Rhombic lip produces cells of the external granule cell layer of the epithelium.
	hich one of the following cytokines is im differentiation?	porta	nt for activation of naive T cell proliferation
	IL-2 IL-17	B) D)	IL-6 IL-12
43. Th	e small hillock of granulosa cells formed	during	g folliculogenesis is referred to as
A) C)	Liquor folliculi Antrum	B) D)	Cumulus oophorus Corona radiate
44. Oı	ne of the following statements is true for b	ivaler	at genes in stem cells.
(A)	H3K4me3 & H3K9me3 on one of the parental alleles H3K4me3 in maternal allele and H3K9me3 in paternal allele	B) D)	H3K4me3 & H3K9me3 on both the parental alleles H3K4me3 in paternal allele and H3K9me3 in maternal allele
45. W	hich one of the following is not a commor	n metl	nod used in human genetic analysis?
A) C)		B) D)	Pedigree analysis Test cross
re su		organ	ontaining nutrient A by the enzyme catalyzed ism, which is a nutrient auxotroph, failed to was supplied to the medium. This is best
A)	The central dogma of life	B)	One gene –one enzyme hypothesis
· C)	One gene – many enzyme hypothesis	D)	Amino acid activation
47. T	he refractive period of DNA replication in	E.co	<i>li</i> is caused by
A)		B) D)	hemimethylated origin acetylated origin

48. Wr	48. Which one of the following best describes death upon detachment?				
A) C)	Anoikis Extravasation	B) D)	Necroptosis Metastasis		
49. Dev	relopment of regionally distinct cutaneous	s feat	ures in birds is mediated by		
A) C)	epithelial cells germ layer cells	B) D)	mesenchymal cells stem cells		
50. One	e of the following is not a representative of	f Arc	hea.		
	Methanococcus jannaschii Archaeglobus fulgidua	B) D)	Thermotoga martima Areopyrum pernix		
51. Bac	eterial flagellar proteins are recognized by				
A) C)	TLR3 TLR4	B) D)	TLR5 TLR9		
	hich one of the following represents neuro undaries of the CNS and contribute to the		dermal thickenings that form outside of the ed specialized sense organs?		
A) C)	Neural crest Rhombomeres	B) D)	Placodes Spongioblasts		
	nromosomes with a single kinetochore atta Il division is known as	ached	simultaneously to both spindle poles during		
A) C)	monotelic amphitelic	B) D)	syntelic merotelic		
54. An	example of a substance where 50% of the	e filte	ered load is reabsorbed by the kidneys is		
A) C)	Potassium Urea	B) D)	Chloride Bicarbonate		
55. Cla	ass B GPCRs are receptors for hormones	that i	nclude		
A) C)	insulin, T3 and aldosterone glucagon, PTH and calcitonin	B) D)	glucagon, TSH and calcitonin insulin, FSH and cortisol		

56. The	e complement protein C3b mediates		
A)	opsonization	B)	formation of membrane attack complex
C)	inflammation	D)	lysis of pathogen
		,	
57 W	high and of the Coursement months interests	vy vi+h	Cur, gang in terms of male say dayslenment
	mich one of the Sox genes mostly interacts mice?	WILII	Sry gene in terms of male sex development
A)	Sox2	B)	Sox19
C)	Sox30	D)	Sox9
Eac ars mic gro	ch mouse of the groups is immunized with onite or lipopolysaccharide or dextron. Force and antigen-specific IgG1 and IgG2A pups would show the antibody response?	th the our wo ELI	I groups and in each group there are 4 mice. Exception the keyhole limpet hemocyanin or azobenzene eeks later, the sera were collected from these SA was performed. Which one of the mice
A)	keyhole limpet hemocyanin-primed mice	B)	Azobenzene-primed mice
C)	Lipopolysaccharide-primed mice	D)	Dextron-primed mice
59. Na	-K-ATPase is predominant on si	de of	plasma membrane
A)	basolateral	B)	Apical
C)	Luminal	D)	paracellular
60. On	e of the following is not a synthetic steroi	d.	
A)	Cortisone	B)	Methylprednisone
C)	Dexamethasone	D)	Dehyroepiandrosterone
	aring the course of evolution, some hormoregulate new functions. Such a transformation		emain structurally stable, but can be recruited is referred to
A)	speciation	B)	transmutation
C)	exaptation	D)	adaptation
62. T	he chemical signals for catecholamine sec	retion	from the adrenal medulla is activated by
A)	GABA	B)	Acetyl choline
C)	Taurine	D)	Dopamine

	class of microtubules have a adle by interaction with cell cortex.	role i	n orientation and repositioning of the mitotic
A) C)	Interpolar Kinetochore	B) D)	Astral Spindle mid-zone
64. FSI	H is secreted by which one of the following	ng cel	ll types of the anterior pituitary gland.
A) C)	Corticotropes Lactotropes	B) D)	Thyrotropes Gonadotropes
65. Ave	erage requirement of daily amount of asco	orbic a	acid in adults is
A) C)	90 mg-uptake of neurotransmitters 45 mg	B) D)	180 mg 360 mg
66. The	shortest phase during cell cycle is		
A) C)	G1 M	B) D)	S G2
leng			of zygotic transcription, increase in cell cycle or how many cell divisions of the fertilized
,	10 14	B) D)	12 16
68. Em	bryonic stem cells are characterized by or	ne of	the following properties.
A) C)	Longer S phase of the cell cycle Totipotency	B) D)	B) Hypodynamic chromatinD) Shorter telomeres.
	Kartagener's syndrome the spermatozoa e flagellum.	are in	nmotile due to lack of protein in
A)	Dyenin	B)	
	Synuclein onormal breathing rhythm is associated vitions.	D) vith r	Lamin nalfunctioning of one of the following brain
A)	Hypothalamus Medulla oblongata	B)	Hippocampus Cerebellum

For Rough Work

University of Hyderabad Ph.D. Entrance Examinations - 2022

School/Department/Centre

: Department of Animal Biology, School of Life Sciences

Course: Ph.D.

Subject : Animal Biology

Q.No.	Answer	Q.No.	Answer	Q.No.	Answer
1	D	26	В	51	Α
2	С	27	В	52	В
3	В	28	Α	53	D
4	С	29	C	54	С
5	В	30	А	55	С
6	В	31	D	56	Α
7	D	32	В	57	D
8	В	33	А	58	Α
9	В	34	А	59	Α
10	D	35	С	60	D
11	Α	36	D	61	С
12	С	37	D	62	В
13	С	38	C	63	В
14	С	39	D	64	D
15	D.	40	Α	65	С
16	В	41	В	66	С
17	D	42	А	67	В
18	В	43	В	68	А
19	С	44	В	69	А
20	D	45	D	70	С
21	В	46	В		
22	А	47	В		
23	А	48	А		
24	Α	49	В		
25	В	50	В		

Note/Remarks:

K. Souni has ve 21/11/2022

Signature

School/Department/Centre