



श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेंद्रम, केरल- 695 011
(एक राष्ट्रीय महत्व का संस्थान, विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार)
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ENTRANCE EXAMINATION - ACADEMIC SESSION JANUARY 2025

PhD Biological/ Biomedical Sciences

Time:90 Minutes

Max. Marks: 100

(Select the most appropriate answer)

(There are **no negative** marks for wrong answers)

1	Thrombin is also known in the blood coagulation nomenclature as
a	Factor Ia
b	Factor IIa.
c	Factor IIIa
d	Factor VIa
2	What is a xenograft?
a	A tissue graft of from same species
b	A tissue graft form the same organism
c	A tissue graft form another species
d	All of the above
3	Which of the following is NOT a characteristic of embryonic stem cells?
a	The ability to make identical copies of themselves
b	Exists inside the adult body
c	The highest form of pluripotency
d	Found in the early embryo
4	Correct statement about erythrocytes is
a	They fight infection.
b	They Lack a nucleus.
c	Produced in the spleen.
d	Important for the formation of blood clot.
5	What is the term used to describe the dose of a drug that produces toxicity in 50% of the population?
a	Lethal Dose (LD50)
b	Effective Dose (ED50)
c	Toxic Dose (TD50)
d	Minimum Inhibitory Concentration (MIC)
6	Among the enlisted, the most used animal species in biomedical research is
a	Rats
b	Mice
c	Guinea pigs
d	Rabbits
7	What are the two different types of immune responses elicited by the body?
a	Cell mediated immune response

	b	Antibody mediated immune response
	c	All of the above
	d	None of the above
8		Platelet activating materials are generally...
	a	Negatively charged
	b	Positively charged
	c	Neutral
	d	Glycated
9		Which among the following is TRUE for rats and mice?
	a	They are of same Kingdom and Order, but different in size
	b	Both are from same Kingdom, but different Order, and Species with difference in physiology, anatomy and behaviour
	c	Both are from same Kingdom and Order, but different Species with difference in physiology, anatomy and behaviour
	d	Nocturnal pests with the same physiology, anatomy and behaviour
10		What is decellularised tissue?
	a	A tissue scaffold devoid of cellular elements and ECM
	b	A tissue scaffold devoid of cellular elements , but ECM is preserved
	c	All of the above
	d	None of the above
11		The following species cannot synthesize Vitamin C on its own (intrinsically)
	a	Rats
	b	Non Human Primates
	c	Guinea Pigs
	d	Both b and c
12		Which of the following is NOT a route of exposure to toxic substances?
	a	Inhalation
	b	Ingestion
	c	Absorption
	d	Radiation.
13		How many chiral centers in isoleucine ?
	a	1
	b	2
	c	3
	d	4
14		Ethically and technically, it is important to perform experiments in the following order
	a	Use large mammals, In silico (web search to find replications and try to avoid use of animals), try experiments in Cell lines, use small rodents or zebra fishes
	b	In silico (web search to find replications and try to avoid use of animals), try experiments in Cell lines, use small rodents or zebra fishes, use large mammals
	c	In silico (web search to find replications and try to avoid use of animals), Use small rodents or zebra fishes, Use large mammals, try experiments in Cell lines
	d	Use small rodents or zebra fishes, Use large mammals, try experiments in Cell lines, use small rodents or zebra fishes, In silico (web search to find replications and try to avoid use of animals)
15		What is the primary reason why some toxicants do not readily enter the central nervous system (CNS)?
	a	Rapid metabolism of toxicants in the blood
	b	Blood-brain barrier
	c	Active transport of toxicants out of the brain

	d	High pH of cerebrospinal fluid
16		Cells in a suspension culture were counted and found to be 2.7×10^6 cells/ml. This is further diluted to 1:27 and 100µl of diluted cells were seeded per well into a 96 well plate. What is the final cell number per well?
	a	1×10^5
	b	2.7×10^4
	c	2.7×10^5
	d	1×10^4
17		What is a predictive animal model?
	a	An animal model used for explaining the mechanism underlying in normal biological functioning or a mechanism associated with an abnormal biological function
	b	An animal model designed to understand a more or less complex biological problem
	c	An animal model used to discover and quantify the effect of treatment
	d	All of the above
18		The animals free from all other sorts of microbial/parasitic/viral agents- or in other words, animals that are free of all detectable microorganisms, including pathogenic and commensal bacteria are known as
	a	Axenic
	b	SPF or Specific Pathogen Free
	c	Allomorphic
	d	Isogenic
19		Nobel Prize for Medicine in 2023 is given for what?
	a	CRISPR Cas9
	b	mRNA technologies for vaccine and therapeutic purposes
	c	Discovery of cancer therapy by inhibition of negative immune regulation
	d	Work on Next generation sequencing
20		Which of the following is NOT a type of genetic damage caused by genotoxic substances?
	a	Micronuclei formation
	b	Chromosomal aberrations
	c	Oxidative stress
	d	DNA adduct formation
21		In an electron microscope, what is the objective lens primarily made of?
	a	Super fine glass
	b	Iridium
	c	Electrons
	d	Magnetic coils
22		Which one among the following is a FALSE statement?
	a	Cell culture and in vitro experimentation is an important part of biomaterial evaluation
	b	Animal experimentation is an important part of biomaterial and medical devices evaluation
	c	Laboratory Rodents shall not be housed in naturalistic environment subjected to climatic variations
	d	Pharmaceuticals and biomedical devices can be tested in animals as a first step towards testing the safety and efficacy before being passed on to human patients
23		The following organism/technique can be used in drug screening experiments (to find out whether a drug is effective and safe to be used in human patients or for other animals)
	a	Organ on a chip
	b	C. elegans
	c	Zebra Fishes

	d	All of the above
24		Which reagent is used to precipitate DNA
	a	Ethanol
	b	Isopropanol
	c	Both a and b
	d	None of the above
25		What is an allograft?
	a	A tissue graft from the same species
	b	A tissue graft from the same organism
	c	A tissue graft from another species
	d	All of the above.
26		Who is considered as Father of modern ethology? This scientist had also won a Nobel Prize in 1973 in Physiology (Medicine) for his/her work on animal behavior.
	a	Nikolaas Tinbergen
	b	Robert Scott
	c	Peter Styris Edmundsen
	d	Alaxander Popov Kalliokoski
27		What will heterozygous single nucleotide substitution look like on chromatogram after sequencing a DNA sample?
	a	Two peaks of equal height at the same position
	b	One peak thrice the height at the same position
	c	Three peaks of equal height at the same position
	d	An additional peak at adjacent position
28		What is an autograft?
	a	A tissue graft of from same species
	b	A tissue graft form the same organism
	c	A tissue graft form another species
	d	All of the above
29		In affinity chromatography, which of the following conditions would be the most appropriate for eluting target proteins from an affinity column?
	a	Low salt concentrations
	b	High salt concentrations
	c	Adding a buffer containing a ligand which competes for binding to the column
	d	Just keep washing buffer through the column, isocratic elution
30		Which class of antibody has the highest valency?
	a	IgG
	b	IgA
	c	IgM
	d	IgE
31		What is an animal model
	a	A conceptually developed in vitro system used to explore the structural and functional and disease dynamics in humans.
	b	A conceptually developed in vivo system used to explore the structural and functional and disease dynamics in humans.
	c	All of the above
	d	None of the above
32		Which of the following is a major focus of a technique of tissue engineering called autologous chondrocyte transplantation (ACT)?
	a	Cartilage
	b	Bone

	c	Skin
	d	Stem Cells
33	Transplanting the cells of a human ear onto the back of a mouse is an example of which type of cell?	
	a	Autologous
	b	Allogenic
	c	Xenogenic
	d	Somatic
34	Which organ is primarily responsible for the metabolism of most drugs, making it a key focus in drug toxicology?	
	a	Heart
	b	Liver
	c	Lungs
	d	Kidneys
35	Proteins after digestion are converted into	
	a	Glucose
	b	Globulins
	c	Amino acids
	d	Fatty acids
36	What are different types of animal models	
	a	Exploratory
	b	Explanatory
	c	Predictive
	d	All of the above
37	Which of the following is an example of epimers?	
	a	Mannose & Glucose
	b	Glucose & Ribose
	c	Glucose & Galactose
	d	Galactose & Mannose
38	Which is best method for checking mycoplasma contamination in a mammalian cell line?	
	a	Southern Hybridization
	b	ELISA
	c	PCR
	d	Western Hybridization
39	Carbohydrates in the plants are stored in the form of	
	a	Glycogen
	b	Starch
	c	Glucose
	d	Maltose
40	What is an Exploratory animal model	
	a	An animal model designed to understand a more or less complex biological problem
	b	An animal model used for explaining the mechanism underlying in normal biological functioning or a mechanism associated with an abnormal biological function
	c	All of the above
	d	None of the above
41	Which element is specific in the synthesis of proteins?	
	a	Hydrogen
	b	Oxygen
	c	Nitrogen
	d	Carbon dioxide

42	Bioink mainly consist of	
	a	Extracellular matrix
	b	Hydrogel and cells
	c	Biomolecules and ink
	d	Plasma and Extracellular matrix
43	Chlorophyll is a naturally occurring chelate compound in which central metal is	
	a	copper
	b	magnesium
	c	Iron
	d	calcium
44	What is an explanatory animal model	
	a	An animal model designed to understand a more or less complex biological problem
	b	An animal model used for explaining the mechanism underlying in normal biological functioning or a mechanism associated with an abnormal biological function
	c	All of the above
	d	None of the above
45	Deoxy-hemocyanin is	
	a	Heme protein and paramagnetic
	b	Colorless and diamagnetic
	c	O ₂ transporter and paramagnetic
	d	Blue colored and diamagnetic
46	Temporary finger like projections on amoeba are called	
	a	Vesicle
	b	Villi
	c	Pseudopodia
	d	Cilia
47	The biodegradable polymer among the following polymers is	
	a	Poly(3-hydroxybutyrate-co-3-hydroxyvalerate)
	b	Poly(butylene terephthalate)
	c	Polystyrene
	d	Poly(propylene)
48	Which of the following aqua regia is?	
	a	1 part conc. HCl and 3 parts conc. HNO ₃
	b	3 part conc. HCl and 1 part conc. HNO ₃
	c	2 parts conc. HCl and 1 part conc. HNO ₃
	d	3 parts conc. HCl and 2 parts conc. HNO ₂
49	The keto-hexose among the following is	
	a	Xylose
	b	Galactose
	c	Fructose
	d	Mannose
50	Which of the following is commonly used as an antibiotic to prevent bacterial contamination in cell culture?	
	a	Penicillin-Streptomycin
	b	Amoxicillin
	c	Erythromycin
	d	Ciprofloxacin
51	Bile juice is secreted by	

	a	Stomach
	b	Pancreas
	c	Small intestine
	d	Liver
52	Colour of Biliverdin present in bile is?	
	a	Blue
	b	Green
	c	Yellow
	d	Orange
53	Ptyalin acts on	
	a	Maltose
	b	Sucrose
	c	Starch
	d	All of these
54	What is the purpose of adding fetal bovine serum (FBS) to cell culture media?	
	a	To provide nutrients and growth factors
	b	To maintain osmotic balance
	c	To act as a buffering agent
	d	To inhibit cell growth
55	Respiratory pigment in human muscle is	
	a	Chlorophyll
	b	Xanthophyll
	c	Myoglobin
	d	Haemoglobin
56	Entry of enveloped viruses into its host cells is mediated by	
	a	Only endocytosis
	b	Both endocytosis and phagocytosis
	c	Both endocytosis and membrane fusion
	d	Only pinocytosis
57	Which enzyme is responsible for catalyzing the rate-limiting step in glycolysis?	
	a	Hexokinase
	b	Phosphofructokinase-1 (PFK-1)
	c	Pyruvate kinase
	d	Glucokinase
58	Polymethyl methacrylate and silicone can be used respectively in	
	a	medical syringe and hip joint
	b	soft tissue replacement and contact lenses
	c	hip joint and medical syringe
	d	contact lenses and soft tissue replacement
59	One cell-thick vessels are called	
	a	Arteries
	b	Veins
	c	Capillaries
	d	Pulmonary artery
60	Rats can transmit the following	
	a	Rat bite fever
	b	Plague
	c	Leptospira
	d	All of the above

61	W20 (Women 20) Inception Meeting on February 27th -28th, 2023, was hosted atcity.
	a Trivandrum
	b Chennai
	c Aurangabad
	d Hyderabad
62	'Suposhit Maa Abhiyan', nutritional support program for pregnant mothers and girls, was launched in
	a Kerala
	b Karnataka
	c Assam
	d Rajasthan
63	The Unique Identification Authority of India is a statutory authority established under the provisions of Aadhaar act 2016 by the Govt. of India under.....
	a Ministry of Electronics and Information Technology
	b Ministry of Defence
	c Ministry of External Affairs
	d Ministry of Science & Technology
64	Jan Aushadhi Train seeks to raise awareness about
	a Create awareness about Jan Aushadhi scheme
	b Provide affordable medical devices
	c Conduct medical camps
	d Provide vaccinations at free of cost
65	'Medium Range Surface-to-Air Missile (MRSAM)' is produced at
	a IOCL
	b GAIL
	c SAIL
	d BDL
66	The capital city of is Pyongyang.
	a South Africa
	b North Korea
	c Singapore
	d Japan
67	'World Braille Day' is observed on
	a Jan 1
	b Jan 4
	c Jan 7
	d Jan 10
68	National Data & Analytics Platform (NDAP), was launched by
	a State Bank of India
	b NITI Aayog
	c HDFC
	d NASSCOM
69	Which Institute has won the National Intellectual Property Award 2019 in the category "Top Indian R & D Institution/Organisation for Patents & Commercialization"?
	a SCTIMST
	b IIT Roorkee
	c IIT Guwahati
	d Arrow Greentech Ltd.

70	New Space India Limited is the commercial arm of	
	a	SCTIMST
	b	ISRO
	c	DRDO
	d	BHEL
71	The oath to the Judge of a high court is administered by	
	a	Prime Minister
	b	President
	c	Governor
	d	Chief Justice of India
72	NITI Aayog organized the fifth edition of the Women Transforming India (WTI) Awards in March 2022. As part of the Azadi ka Amrit Mahotsav, the WTI Awards were conferred on women achievers to celebrate their contribution towards a 'Sashakt Aur Samarth Bharat'.	
	a	25
	b	50
	c	75
	d	100
73	Who has been appointed as coordinator for the G20 summit, which will be hosted by India in 2023	
	a	Ajith Doval
	b	Harsh Vardhan Shringla
	c	S Jaishankar
	d	Amitabh Kant
74	The maximum term of a Panchayat in a state is years	
	a	5
	b	4
	c	3
	d	2
75	According to National Commission for Protection of Child Rights (NCPCR) a child is defined as any person in the age group of?	
	a	0-5
	b	0-10
	c	0-15
	d	0-18
76	The Whistle Blowers Protection Act was enacted in the year	
	a	2015
	b	2014
	c	2013
	d	2012
77	The 5G testbed has been developed as a multi-institute collaborative project by eight institutes led by	
	a	IIT Bombay
	b	IIT Delhi
	c	IIT Madras
	d	IIT Kanpur
78	What is the name of the first Indian space mission to observe the Sun?	
	a	Aditya-L1
	b	Chandrayaan-1
	c	Mangalyaan
	d	Chandrayaan-2

79	1853 is a landmark in India's Transport because of first	
	a	Passenger train
	b	Cargo plane
	c	Submarine
	d	None of the above
80	Which section of the Drugs and Cosmetics Act, 1940 defines the standards of quality for drugs?	
	a	16
	b	20
	c	21
	d	22
81	Choose the option that is most nearly same in meaning of the word "Ubiquitous"	
	a	Unanimous
	b	Omnipresent
	c	Doubt
	d	Anonymous
82	Choose the option that is most nearly same in meaning of the word "Callous"	
	a	Kind
	b	Apathy
	c	Sympathetic
	d	Insensitive
83	Choose the option that is most nearly same in meaning of the word "Genesis"	
	a	End
	b	Abolishment
	c	Origin
	d	Attack
84	What will be the remainder if 3^7 is divided by 8?	
	a	1
	b	2
	c	3
	d	4
85	A quantity $x=240$ is increased by 50%. What is the resultant value?	
	a	120
	b	240
	c	360
	d	480
86	A quantity $x=100$ is first increased by 20% and then the resultant is decreased by 10%. What is the final value?	
	a	108
	b	109
	c	110
	d	111
87	Anoop bought a car for INR 320000 and sold it for INR 240000. What is the loss percentage?	
	a	20
	b	25
	c	30
	d	35

88	Rohan bought 100 glasses for INR 8500. He broke 20 glasses while transporting them. What should be the selling price of each of the remaining glasses in order to have an overall profit of 4%?	
	a	100.5
	b	110.5
	c	120.5
	d	130.5
89	A worker A can finish work in 3 days and B can finish work in 9 days. How long will it take to finish the work if they both worked together?	
	a	9/2 days
	b	9/7 days
	c	9/5 days
	d	9/4 days
90	Pipes A and B can fill a tank in 4 and 8 hours respectively. Pipe C can empty it in 16 hours. If all the three pipes are opened together, then how long will it take to fill the tank?	
	a	4.5 hours
	b	2 hours
	c	6 hours
	d	3.2 hours
91	A man rows upstream 18 km and downstream 30 km taking 3 h each time. What is the velocity of the current?	
	a	2 km/h
	b	3 km/h
	c	4 km/h
	d	5 km/h
92	A car covers first 300 m at a speed of 54 km/h and next 500 m at a speed of 72 km/h. What is the average speed of the car?	
	a	50 km/h
	b	47 km/h
	c	60 km/h
	d	64 km/h
93	How many words can be formed out of the letters of the word "UNITED" taking all the letters at a time considering no letter is to be repeated?	
	a	620
	b	720
	c	820
	d	920
94	How many words can be formed from the letters of the word "APPLE" taking all the letters at a time considering no letter is to be repeated and first and last letter of the words are "P"?	
	a	6
	b	12
	c	24
	d	48
95	A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?	
	a	3/7
	b	4/7
	c	5/7
	d	6/7

96	A card is drawn from a pack of 52 cards. What is the probability of getting a queen of club or a king of heart?	
	a	1/26
	b	2/26
	c	3/26
	d	4/26
97	Fill in the number that completes the following sequence 3, 5, 7, 11, 13, 17, 19,	
	a	20
	b	21
	c	22
	d	23
98	Fill in the blank most appropriately. A of wolves.	
	a	Bunch
	b	Fleet
	c	Pack
	d	Litter
99	Which of the following words does not have a similar meaning to densely populated?	
	a	Populace
	b	Crowded
	c	Populous
	d	Packed
100	Find the unit digit of $122^{122} \times 133^{133}$	
	a	1
	b	2
	c	3
	d	4

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Answer Key

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

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