

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY
THIRUVANANTHAPURAM – 695 011, KERALA ,INDIA

Biological – Biomedical
Entrance Exam January 2024

Sl No.	Question	Option 1	Option 2	Option 3	Option 4	Correct Option
1	Which of the following are not present in cytosol?	Enzymes	RNA molecules	Nucleotides	Genes	4
2	Which of the following is the smallest cellular organism?	Mycoplasma	Cryptococcus	Plasmodium	Amoeba	1
3	Which is true with respect to obligate anaerobe?	They grow well in presence of oxygen	They die when exposed to oxygen	They neither grow nor die in presence of oxygen	None of these	2
4	Which of the following non-covalent interactions hold biomolecules together?	Ionic interactions	Hydrogen bonds	van der Waals interactions	All of the above	4
5	Which of the following hydrolytic enzymes is present in human tears?	Lysozyme	amylase	glycosylase	None of the above	1
6	Which of the following diseases is caused by protein misfolding?	Type 1 Diabetes	Asthma	Alzheimer's disease	Influenza	3
7	Which of the following is not a substrate for the enzyme hexokinase (Brain)	ATP	D-Glucose	D-Fructose	D-Lactose	4
8	What is the ligand of cholera toxin?	Gal	GM1 pentasaccharide	Mannose octasaccharide	None of the above	2
9	What type of bond links nucleotides in nucleic acids?	Peptide bonds	Phosphodiester bonds	Glycosidic bonds	All of the above	2
10	Who discovered the first direct evidence that DNA is the bearer of genetic information?	James Watson and Francis Crick	Rosalind Franklin	Oswald T. Avery, Colin MacLeod, and Maclyn McCarty	Frederick Griffith	3

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11	What is the role of vitamin K in the body?	It helps regulate blood sugar levels	It helps in muscle contraction	It helps in nerve function	It helps in blood clotting	4
12	What is the approximate percentage of oxygen saturation in hemoglobin in arterial blood passing from the lungs through the heart to the peripheral tissues?	50%	89%	96%	100%	3
13	Which of the following statements best describes the interaction of 2,3-bisphosphoglycerate (BPG) with hemoglobin?	BPG binds to the same site on hemoglobin as oxygen, leading to decreased oxygen binding.	BPG binds to a separate site on hemoglobin from oxygen, leading to increased oxygen binding.	BPG binds to the same site on hemoglobin as oxygen, leading to increased oxygen binding.	BPG binds to a separate site on hemoglobin from oxygen, leading to decreased oxygen binding.	4
14	What is the primary application of DNA microarrays in molecular biology?	To analyze gene expression levels	To identify the location of DNA damage	To amplify and sequence DNA samples	To visualize the structure of DNA molecules	1
15	In rod and cone cells of the retina, what happens when light activates rhodopsin?	Rhodopsin activates G protein transducin, which replaces GDP with GTP.	Rhodopsin activates G protein transducin, which replaces GTP with GDP	Rhodopsin inhibits G protein transducin, which increases cAMP levels in the cell.	Rhodopsin inhibits G protein transducin, which decreases cAMP levels in the cell.	1
16	What is the basis of DNA fingerprinting?	DNA replication	DNA polymorphisms	DNA translation	DNA transcription	2

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17	What is the relationship between G bands and metaphase chromosomes?	G bands are regions of the genome that are replicated during metaphase	G bands are produced by exposing metaphase chromosomes to UV radiation	G bands correspond to regions of the genome with low G-C content.	G bands are used to visualize the location of histones on metaphase chromosomes.	3
18	What are polytene chromosomes?	Polytene chromosomes are condensed chromosomes found in mitotic cells.	Polytene chromosomes are enlarged interphase chromosomes found in the salivary glands of dipteran insects.	Polytene chromosomes are circular chromosomes found in bacteria.	Polytene chromosomes are sex chromosomes found in mammals.	2
19	What is the telomere repeat sequence in humans and other vertebrates?	CCAGGT	TTAGGG	AGCTAG	GGCCAA	2
20	What is the major mammalian extracellular binding protein that donates or accepts fatty acids?	Serum albumin	Hemoglobin	Myoglobin	Immunoglobulin	1
21	Which family of Intermediate filament-associated proteins (IFAPs) is responsible for linking intermediate filaments with both microtubules and microfilaments?	Lamins	Plectins	Desmoplakins	Filaggrins	2
22	What triggers the contraction of both skeletal and smooth muscle?	A decrease in cytosolic Ca ²⁺	A decrease in extracellular Ca ²⁺	An increase in extracellular Ca ²⁺	An increase in cytosolic Ca ²⁺	4

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23	Which of the following is an example of a microtubule destabilizing protein?	Myosin	Kinesin	Katanin	Dynein	3
24	Which of the following statements accurately describes pluripotent or multipotent stem cells?	They can generate any type of cell in the body.	They can generate a limited number of different cell types.	They can only generate one specific type of cell.	They cannot generate any new cells once they have differentiated.	2
25	How does erythropoietin promote the formation of erythrocytes?	By directly converting other cell types into erythrocytes.	By inhibiting the formation of leukocytes	By activating several different intracellular signal transduction pathways, leading to changes in gene expression that promote the formation of erythrocytes.	None of the above	3
26	What type of mutation is caused by benzo(a)pyrene, after undergoing metabolic activation in the liver?	Transition mutation	Deletion mutation	Insertion mutation	Transversion mutation	4
27	Which fungal metabolite is a known liver carcinogen?	Aflatoxin	Penicillin	Tetracycline	Streptomycin	1
28	What does MRSA stand for?	Methicillin-resistant streptococcus aureus	Methicillin-resistant staphylococcus aureus	Methicillin-resistant salmonella aureus	Methicillin-resistant sepsis aureus	2

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29	Which of the following best describes the principle of PFGE (Pulsed-Field Gel Electrophoresis)?	PFGE uses a specialized electrophoresis device to separate chromosomal fragments	PFGE uses a specialized electrophoresis device to separate proteins.	PFGE uses a specialized electrophoresis device to separate carbohydrates	None of the above	1
30	Which technology is used to produce monoclonal antibodies?	Gene editing	CRISPR-Cas9	Hybridoma technology	Polymerase chain reaction (PCR)	3
31	Which of the following is the vector and definitive host for Plasmodia?	Anopheles mosquito	Culex mosquito	Aedes mosquito	None of the above	1
32	Which of the following cells are commonly known as hepatocytes?	Lung cells	Kidney cells	Liver cells	Blood cells	3
33	When does congenital infection of the fetus occur?	Only when the mother is infected before pregnancy	Only when the mother is infected after delivery	Only when the mother is infected during pregnancy	Only when the mother is infected during breastfeeding	3
34	What type of genetic disorder is Ataxia-Telangiectasia (A-T)?	Autosomal dominant	Autosomal recessive	X- linked dominant	X- linked recessive	2
35	What is the infectious agent responsible for COVID-19?	SARS CoV-1	SARS CoV-2	MERS CoV-2	H1N1	2
36	Which of the following statements regarding immunoglobulins is correct?	Immunoglobulins are antigen binding glycoproteins synthesized only by T cells.	Immunoglobulins are antigen binding glycoproteins synthesized by both B and T cells.	Immunoglobulins are antigen binding glycoproteins synthesized exclusively by B cells	None of the above	3

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37	Which of the following statements accurately describes exogenous superantigens?	Exogenous superantigens are membrane-bound proteins secreted by bacteria.	Exogenous superantigens are soluble proteins secreted by bacteria.	Exogenous superantigens are proteins produced by human immune cells.	None of the above	2
38	Which of the following statements regarding Delayed Type Hypersensitivity (DTH) is correct?	DTH is a type of hypersensitivity that is triggered by antigen-specific B cells.	DTH is a type of hypersensitivity that is triggered by antigen-specific T cells.	DTH is a type of hypersensitivity that is triggered by a defect in the complement system.	All of the above	2
39	What is the hormone secreted by the trophoblast during pregnancy?	Human chorionic gonadotropin (hCG)	Luteinizing hormone (LH)	Progesterone	Follicle-stimulating hormone (FSH)	1
40	Which of the following glands is the largest endocrine gland in the body?	Adrenal gland	Pituitary gland	Sebaceous gland	Thyroid gland	4
41	What is Tundra biome known for?	Being a tropical rainforest with hot and humid climate	Being a temperate forest with mild and moderate climate	Being a polar desert with extreme cold and harsh climatic conditions	Being a grassland with moderate to hot climate	3
42	Which of the following statements about the valves in the heart is correct?	They increase blood pressure in the arteries.	They allow the flow of blood in both directions.	They decrease blood flow to the heart	They allow the flow of blood in only one direction.	4

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43	What is the primary factor that determines production efficiency in animals?	Animal metabolism	Animal genetics	Animal behavior	Animal diet	1
44	What is the source of energy in detrital food chain?	Sunlight	Decayed organic matter	Chemical energy from inorganic molecules	Producers such as plants and algae	2
45	What is a habitat?	The place where an organism gets its food	The process by which organisms convert food into energy	The place in which a particular organism lives	The transfer of energy from one organism to another	3
46	Which of the following is an example of an extinct species?	Blue whale	Bald Eagle	Giant Panda	Dodo	4
47	An example of altruistic behavior is seen with	Vampire bats	Female worker ants	Both a and b	None of the above	3
48	What is coevolution?	The evolution of a single species over time	The process of two or more species reciprocally influencing each other's' evolution	The emergence of new species through geographic isolation	The diversification of a common ancestor into different lineages	2
49	Which protein on the egg surface is required for fusion with a sperm?	CD 9 Protein	CD10 Protein	CD 8 protein	None of these	1
50	What is ubiquinone?	A type of protein found in muscle tissue	A molecule involved in cellular respiration	A type of lipid found in cell membranes	None of these	2
51	What is the instantaneous source of energy in the body?	Proteins	Vitamins	minerals	Carbohydrates	4

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52	Which of the following substance can inhibit mitosis	cyclin	colchicine	cytokines	Mitogenic factor	2
53	Y chromosome in human males is	metacentric	telocentric	acentric	acrocentric	4
54	The cloning organism commonly known as natural genetic “engineer” is	E Coli	Agrobacterium	Yeast	None of the above	2
55	What is kuru?	A virus that causes brain infections in humans	A type of bacteria found in contaminated water	first naturally occurring spongiform encephalopathy of humans caused by prions	A genetic disorder that affects the nervous system	3
56	Which of the following statements is true about apoptosis?	It is an uncontrolled process of cell death	It is a highly regulated process of programmed cell death	Both a and b	None of these.	2
57	From which type of cells do sarcomas originate?	Neuronal cells	Hematopoietic cells	Epithelial cells	Mesenchymal cells	4
58	Which organism was the first to demonstrate natural competence?	Escherichia coli	Bacillus subtilis	Hemophilus influenzae	Streptococcus pneumoniae	3
59	Which of the following statements about antiseptics is true?	Antiseptics are nontoxic enough to be used on living tissues	Antiseptics are chemical agents that kills/ inhibit the growth of microorganisms	Both a and b	None of the above	3
60	Which of the following antibiotic has broad spectrum of activity	chloramphenicol	penicillin	cephalosporin	None of these	1

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61	One-tenth of one bag of potatoes weighs the same as one-seventh of one bag of small pebbles. What is the ratio of the weight of 2 bags of potatoes to 3 bags of pebbles?	07:15	20:21	21:20	03:02	2
62	A and B started a business by investing Rs. 36,000 and Rs. 63,000. Find the share of each, out of the annual profit of Rs. 5500.	Rs. 2000, Rs. 3500	Rs. 2500, Rs. 3500	Rs. 3500, Rs. 2500	None of these	1
63	A sum of Rs. 13,950 should be divided among three persons A, B and C. B must get the double of A's share and C must get Rs. 50 less than the double of B's share. The share of A will be	Rs. 1950	Rs. 1981.25	Rs. 2000	Rs. 2007.75	3
64	GENEALOGY: ANCESTRY, ENTOMOLOGY: _____	Words	Insects	Fossils	Inscriptions	2
65	If 'a' is the smallest prime number greater than 39 and 'b' is the largest prime number less than 10, then ab =	299	287	229	261	2
66	Find the odd number from the series 8, 64, 99, 216, 343, 729, 1728	64	216	729	99	4
67	A person has the capability of thinking 100 lines of code in five minutes and can type 100 lines of code in 10 minutes. He takes a break for five minutes after every ten minutes. How many lines of	100	250	350	600	2

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codes will be complete typing
after an hour?

68	Which number comes next in this sequence? 1, 1.5, 2.5, 4, ___?	9	8	7	6	4
69	If 3 less than twice a certain number is equal to 2 more than 3 times the number, then 5 less than 5 times the number is	-30	-20	-5	0	1
70	Complete the equation by correctly identifying the incomplete number of the calculation from the list of options given below.- Equation: $(4.25 + 2.75)2 + \underline{\hspace{1cm}} = 53 - (9 \times 8)$	2	4	6	8	2
71	A pescatarian is someone who eats	Egg	Chicken	Fish	None of the above	3
72	Chandrayaan 3 was launched from	Satish Dhawan Space Centre	VSSC, Thumba	Dr Abdul Kalam Island, Bhadrak, Odisha	Kennedy Space Centre	1
73	In doing action research what is the usual sequence of steps?	Reflect, observe, plan, act	Plan, act, observe, reflect	Plan, reflect, observe, act	Act, observe, plan, reflect	2
74	When you reverse the age of the father you will get the age of the son. One year ago the age of the father was twice that of son's age. What are the current ages of son and father?	37 and 73	24 and 42	13 and 31	15 and 51	1

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75	The perimeters of a circle, a square and an equilateral triangle are equal. Which one of the following statements is true? The radius as well as the height of a circular cone increases by 10%. The percentage increase in its volume is _____.	The circle has the largest area.	The square has the largest area	The equilateral triangle has the largest area.	All the three shapes have the same area.	1
76	If the average of 5 numbers is 36 and the average of four of those numbers is 34, then what is the value of the fifth number?	17.1	21	33.1	72.8	3
77	A, B and C are intelligent, A, D and E are laborious and D, C and E are honest and . A, B, and E are ambitious. Who is neither laborious nor honest?	2	34	35	44	4
78	Although it does contain some pioneering ideas, one would hardly characterize the work as _____.	A and D	B	E	C	2
79	A car got 33 Km per liter using petrol that cost Rs.89.5 per liter. Approximately what was the cost, in Rs, of the petrol used in driving the car 350 Km?	Orthodox	Conventional	Original	Trifling	3
80	A certain jar contains 60 jelly beans — 22 white, 18 green, 11 yellow, 5 red, and 4 purple. If a jelly bean is to be chosen at	1000	880	950	1100	3
81		0.09	0.15	0.85	0.91	3

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random, what is the probability that the jelly bean will be neither red nor purple?

Which pair of words among the following are odd ones Crime and Punishment, Exercise and Health, Judgement and Advocacy, Hardwork and Success, Slowth and Failure?

What is the greatest value of x for which $(3x - 2)(x + 1) = 0$?

Which of the following numbers is farthest from the number 1 on the number line?

Select the lettered pair that best expresses a relationship similar to that expressed in the original pair
 Antidote: Poison

Choose word or phrase that is most nearly opposite in meaning to the word ENERVATE

The sum of three numbers is 98. If the ratio of the first to second is 2:3 and that of the second to the third is 5:8, then the second number is?

Distance between two stations, X and Y is 778 km. A train covers the journey from X to Y at 84 Km per

Slowth and failure	Hardwork and success	Judgement and advocacy	Exercise and Health	3
-1	02-Mar	-0.666666667	1	2
0	5	-10	10	3
Cure: recovery	Tonic: lethargy	Narcotic: sleep	Stimulant: relapse	2
Recuperate	Resurrect	Strengthen	Gather	3
20	30	40	58	2
67Km/hr	67.2Km/hr	69Km/hr	69.2Km/hr	2

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	hour and returns back to X with a uniform speed of 56 Km per hour. Find the average speed of the train during the whole journey?					
	Due to an increase in taxes on electronic devices, the price of a cooler has increased to Rs. 8450, which is 30% increase of the original price. What was the original price of the TV prior to the increase?	5154.5	5915	6500	6760	3
89	If one-third of one-fourth of a number is 15, then three-tenth of that number is	35	35	45	54	4
90	Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is	15	13	11	9	1
91	The difference between a two-digit number and the number obtained by interchanging the positions of its digits is 36. What is the difference between the two digits of that number?	3	4	9	Cannot be determined	2
92	Which is the odd word?	Inch	Yard	Ounce	Centimeter	3
93	Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30° and 45° respectively.	173	200	273	300	3
94						

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If the lighthouse is 100 m high, the distance between the two ships is:

The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is:

2.3 4.6 7.8 9.2 4

95 From a point P on a level ground, the angle of elevation of the top tower is 30° . If the tower is 100 m high, the distance of point P from the foot of the tower is:

149 156 173 200 3

96 Choose the word which best expresses the meaning of the word CORPULENT

Lean Emaciated Obese Gaunt 3

97 In a shower, 5 cm of rain falls. The volume of water that falls on 1.5 hectares of ground is:

75 cu. m 750 cu. m 7500 cu. m 75000 cu. m 2

98 A hall is 15 m long and 12 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of four walls, the volume of the hall is

720 900 1200 1800 3

99 A and B invest in a business in the ratio 3: 2. If 5% of the total profit goes to charity and A's share is Rs. 855, the total profit is:

1425 1500 1537.5 1576 2

100