



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 2020 - PhD _ Biological Sciences

SI No	Question	Answer	OptionA	OptionB	OptionC	OptionD
1	Emmanuelle Charpentier and Jennifer A. Doudna received Nobel prize in the year 2020 for the development of a method for genome editing in the field of:	B	Physics	Chemistry	Physiology	Medicine
2	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 cooler prior to its increase?	C	5154.5	5915.0	6500	6760
3	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?	B	7:15	20:21	21:20	3:2
4	A and B started a business by investing Rs. 36,000 and Rs. 63,000 each. Find the share of each, out of the annual profit of Rs. 5500.	A	Rs. 2000, Rs. 3500	Rs. 2500, Rs. 3500	Rs. 3500, Rs. 2500	None of these
5	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:	C	Rs. 1950	Rs. 1981.25	Rs. 2000	Rs. 2007.75
6	GENEALOGY: ANCESTRY, ENTOMOLOGY: _____	B	Words	Insects	Fossils	Inscriptions
7	Which number comes next in this sequence? 1, 1.5, 2.5, 4, ___?	D	9	8	7	6
8	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:	A	-30	-20	-5	0
9	_____ helps in viewing objects at the surface of water from a submarine under water	A	Periscope	Kaleidoscope	Telescope	Spectroscope
10	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 codes will he complete typing after an hour?	B	100	250	350	600
11	A pescatarian is someone who eats	C	Egg	Chicken	Fish	Clams
12	If 'a' is the smallest prime number greater than 50 and 'b' is the largest prime number less than 10, then ab =	B	299	371	229	261
13	According to the Centre for Disease Control (CDC), what does 'N' in the N95 respirator stand for?	A	Not resistant to oil	Not resistant to water	Number of particles	Not resistant to bacteria
14	What is the greatest value of x for which $(3x - 2)(x + 1) = 0$?	C	-1	-2/3	2/3	1
15	For safety, the fuse wire used in the mains for household supply of electricity must be made of metal having	B	high resistance	low melting point	low specific heat	high melting point
16	The radius as well as the height of a circular cone increases by 10%. The percentage increase in its volume is _____.	C	17.1	21	33.1	72.8
17	The perimeters of a circle, a square and an equilateral triangle are equal. Which one of the following statements is true?	A	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.
18	In doing action research what is the usual sequence of steps?	B	Reflect, observe, plan, act	Plan, act, observe, reflect	Plan, reflect, observe, act	Act, observe, plan, reflect
19	Escape velocity of a rocket fired from the earth towards the moon is a velocity to get rid of the	C	Centripetal force due to the earth's rotation	Moon's gravitational pull	Earth's gravitational pull	Pressure of the atmosphere
20	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?	B	A and D	B only	E only	C only
21	Which is the odd number in the series: 81, 121, 169, 289, 361	A	81	169	289	361
22	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	C	Slowth and Failure	Hardwork and Success	Judgement and Advocacy	Exercise and Health
23	Select the lettered pair that best expresses a relationship similar to that expressed in the original pair COLOR : SPECTRUM	A	tone : scale	sound : waves	dimension : space	cell : organism

24	Frederick Sanger is a twice recipient of the Nobel Prize for	C	Chemistry in 1954 and Peace in 1962	Physics in 1956 and 1972	Chemistry in 1958 and 1980	Physics in 1903 and Chemistry in 1911
25	Fill up the blanks in the following sentence "Early _____ of hearing loss is _____ by the fact that the other senses are able to compensate for moderate amounts of loss, so that people frequently do not know that their hearing is imperfect.	C	discovery . . . Indicated	development . . . prevented	detection . . . complicated	treatment . . . facilitated
26	Choose word or phrase that is most nearly opposite in meaning to the word DIFFUSE	A	concentrate	contend	imply	pretend
27	Select the lettered pair that best expresses a relationship similar to that expressed in the original pair Antidote: Poison	B	Cure: recovery	Tonic: lethargy	Narcotic: sleep	Stimulant: relapse
28	The corporation expects only _____ increases in sales next year despite a yearlong effort to revive its retailing business.	D	dynamic	predictable	expanding	modest
29	Although it does contain some pioneering ideas, one would hardly characterize the work as _____.	C	orthodox	eccentric	original	trifling
30	NITI Aayog was established in?	B	03-Jan-19	01-Jan-15	01-Sep-15	26-Jan-19
31	Choose word or phrase that is most nearly opposite in meaning to the word AMALGAMATE	D	Circulate	Reduce	Endure	Separate
32	Choose word or phrase that is most nearly opposite in meaning to the word ENERVATE	C	Recuperate	Resurrect	Strengthen	Gather
33	A rectangle becomes a square when its length and breadth are reduced by 10 m and 5 m, respectively. During this process, the rectangle loses 650 sq.m of area. What is the area of the original rectangle in square meters?	B	1125	2250	2500	4500
34	A set of 4 parallel lines intersect with another set of 5 parallel lines. How many parallelograms are formed?	C	20	48	60	72
35	Which metal is used for galvanizing iron?	D	Lead	Copper	Aluminium	Zinc
36	This simple discovery led to a population boom in 1900	B	Penicillin	Haber-Bosch Process	Small pox vaccine	none of the above
37	A wire would enclose an area of 1936 sq.m, if it is bent into a square. The wire is cut into two pieces. The longer piece is thrice as long as the shorter piece. The long and the short pieces are bent into a square and a circle, respectively. Which of the following choices is closest to the sum of the areas enclosed by the two pieces in square meters?	C	1096	1111	1243	2486
38	Whose autobiography is the book " My Music, My Life"	B	Pandit Shiv kumarsharma	Pandit Ravi Shankar	Ustad Zakir Hussain	ustad Amjad Ali Khan
39	In which one of the following countries, is Tamil a major language?	A	Singapore	Indonesia	Mauritius	Myanmar
40	Biotic index gives us an idea about the pollution of:	A	water	air	sound	all the above
41	Centrolecithal eggs show	C	discoidal cleavage	bilateral cleavage	superficial cleavage	displaced radial cleavage
42	Which one of the following reactions takes place during the reduction phase of the Calvin-Benson cycle?	D	Ribulose 5-phosphate to ribulose 1,5-bisphosphate	Ribulose 1,5-bisphosphate to 3-phosphoglycerate	Dihydroxyacetone phosphate to fructose 1,6-bisphosphate	1,3-bisphosphoglycerate to glyceraldehyde-3-phosphate
43	Which one of the following statements CANNOT be included while defining the fermentation process?	B	Requires an electron transport system.	Utilizes an organic compound as the final electron acceptor	Alcohol is formed from sugar residues	Produces lactic acid in oxygen deprived muscle
44	The frequency of homozygotes in a diploid population is 0.68. Assuming that the population is in Hardy-Weinberg equilibrium, the frequencies of the two alleles are	A	0.2 and 0.8	0.1 and 0.9	0.4 and 0.6	0.5 and 0.5
45	Vascular wilts are wide spread and destructive plant diseases. The symptoms of this disease are primarily caused by the clogging of	C	phloem vessels	stomata	xylem vessels	hydathodes
46	The cells of inner cell mass of a blastocyst stage mammalian embryo are	C	unipotent	multipotent	Pluripotent	totipotent
47	In a neuron, proteins and membranes are primarily synthesized in the cell body. These materials must be transported down the axon to the synaptic region using microtubules in an anterograde fashion. Such axonal transport is directed by	C	Myosin	Dynein	Kinesin I	Dynein and Kinesin I

48	The dye used in Gram staining is	B	Giemsa	Crystal violet	Methylene blue	Rhodamine
49	Which of the following statements about meiosis is NOT true?	C	Chiasma is formed in Prophase I.	Homologous chromosomes are segregated in Meiosis I.	Kinetochores of sister chromatids attach to opposite poles in Meiosis I.	Kinetochores of sister chromatids attach to opposite poles in Meiosis II.
50	Virus induced gene silencing (VIGS) is a process that takes advantage of the RNAi-mediated antiviral defence mechanism. Which one of the following ultimately guides siRNA to degrade the target transcript (mRNA)?	D	ssRNA	dsRNA	dsRNA binding protein	RNA Induced Silencing (RIS) complex
51	Which among the assay system given can be used to specifically detect apoptotic cells?	A	FACS analysis with FITC — Annexin V	Tetrazolitim dye (MTT) based colorimetric assay	51Cr release assay	Trypan blue exclusion assay
52	The muscle protein that has the affinity to bind with Ca ⁺⁺ ions	D	Myosin	Actin	Tropomyosin	Troponin
53	The aminoacids at pH below pI will be	C	No charge	Anionic	Cationic	Net charge 0
54	The amino acids that forms a 'salt bridge' in a protein are	D	Cys — Cys	Tyr — Phe	Ala — Val	Lys — Glu
55	The part of root involved in perceiving gravity is	B	Endodermis	Root cap	Quiescent center	Elongation zone
56	Which among the following is not involved in defining the fermentation process	C	Utilizes an organic compound as the final electron acceptor	Alcohol is formed from sugar residues	Requires an electron transport system	Produces lactic and in oxygen deprived muscle
57	The hormone that mobilizes calcium from the bone and increasing urine excretion of phosphate is	A	Parathormone	Angiotensin II	Vasopressin	Calcitonin
58	A doctor suggested that the patient take glucose and electrolyte solution orally to a patient who comes to hospital complaining of vomiting and diarrhoea.	C	Insulin receptor protein (IRP)	Sucrase-isomaltase protein (SIP)	Sodium glucose transporter protein I (SGLTI)	Cystic fibrosis transmembrane regulator (CFTR)
59	The baby of a mother having blood group AB Rh- and father having blood group O RH+ is expected to have which of the following blood groups.	B	O, Rh+	B, Rh+	O, Rh-	AB, Rh+
60	In an experimental analysis quantitative measurement taken 10 times yielded 10 distinct values. Which of the statements are necessarily correct in the the following statements? A. At least one value will lie at the mean B. At least one value will lie above the median C. Five of these values will lie above the mean and five below it D. Five of these values will lie above the median and five below it	B	B and D	B and C	A and D	A, C and D
61	Individual cells has to be obtained from a primary cell culture by braking down the cell-cell and cell-matrix interaction. Which of the following is not recommended for this	A	Separase	EDTA	Collagenase	Trypsin
62	Which factor is unfavorable for protein folding?	B	Hydrogen bond	Conformational entropy	Hydrophobic interaction	van der Waal's interaction
63	Following assumptions are made in Michaelis Menton equation	C	Concentration of the substrate can be ignored	Non-enzymatic degradation of the substrate is the major step	Rate limiting step in the reaction is the breakdown of the ES complex to product and free enzyme	Rate limiting in the reaction is the formation of ES complex
64	The glycosidic linkage in lactose	B	Alpha 1-4	Beta 1-4	Alpha 1-6	Alpha 1-2
65	The major fat in adipose tissue	C	Phospholipid	Cholesterol	Triacyl glycerol	Sphingolipids
66	The lysosomal storage disorder caused by mutations in Glucocerebrosidase gene	D	Tay-Sach's disease	Niemann-Pick's disease	Sandhoff's disease	Gaucher's disease
67	Hormone responsible for the release of FSH from the anterior pituitary	A	GnRH	Somatostatin	TRH	Growth Hormone

68	Anti-beriberi factor	B	Vitamin C	Vitamin B1	Vitamin B12	Vitamin K
69	Acinar cells are stimulated to produce zymogens by _____, a hormone produced by the "I" cells in the duodenum	B	Secretin	Cholecystokinin	Gastrin	GIP
70	Proteins can NOT be precipitated by	A	Shifting the pH away from the iso-electric point	Alcohol and acetone	Salts of heavy metals	Ammonium sulfate
71	Iodoacetate inhibit the enzyme by reacting with which group?	A	Sulfhydryl	Amide	Carbonyl	Imidazole
72	Which one does NOT take place inside mitochondria?	B	Citric acid cycle	De novo fatty acid synthesis	Electron transport chain	Beta oxidation of fatty acids
73	Non reducing sugar	A	Sucrose	Maltose	Lactose	Isomaltose
74	Transketolase activity is decreased in the deficiency of	C	NAD+	FAD	TPP	PLP
75	The ring structure of cholesterol	A	Cyclopentanophenanthrene ring	Cholanthrene ring	Naphthoquinone	Corrin ring
76	A person with 60 kg weight, was given food containing 65 gm of proteins per day for two weeks. After the experiment, his weight was found to be 60 kg. His nitrogen balance is:	C	Minus 5 gm	Minus 2.5 gm	0 gm	Plus 2.5 gm
77	Polymerase chain reaction was invented by	B	Sanger	Karry Mullis	Francis Crick	Khorana
78	At pH 10.5, what is the value of net charge of GWYQR peptide	B	0	-1	-2	1
79	Flattened sacks within the cell were discovered by	D	Gregor Mendel	Ernst Haeckel	David Baltimore	Camillo Golgi
80	In animal cell, which of the following is high inside cell than outside	C	Sodium	Calcium	Potassium	Magnesium
81	The following base in the anti-codon contribute to codon degeneracy	A	First	Second	Third	All
82	5' cap of mRNA in eukarotes is made of	D	2-methylguanosine	3-methylguanosine	5-methylguanosine	7-methylguanosine
83	With reference to the promoter, where are the enhancers located?	D	Upstream	Downstream	Far away	All of the above
84	Which of the following statement is incorrect regarding signal recognition particle?	D	It is made up of 6 polypeptides	It contains 7S L scRNA	It is ribonucleoprotein	It acts as molecular chaperone
85	When muscle contracts, which of the following triggers filament sliding?	B	Decrease in Na ions in cytosol	Increase in Ca ions in cytosol	Bending of myosin head	Energy release from ATP breakdown
86	Cytoskeleton of eukaryotic cells does not contain the following	A	Mitochondria	Microtubules	Intermediate filaments	Microfilaments
87	The ion that is required in trace amounts for the growth of bacteria is	D	Copper	Cobalt	Zinc	All of these
88	The Objective lens used in electron microscope is made up of	A	magnetic coils	superfine glass	Iridium	Electrons
89	Transformation was first reported by Griffith (1928) in	C	Streptococcus Pyogenes	Escherichia coli	Streptococcus Pneumonia	Staphylococcus aureus
90	The concept of "Immunological tolerance" is associated with the name	D	Owen	Kohler	Medwar	Burnet
91	The source of electrons in an electron microscope is	B	Mercury lamp	Tungsten lamp	both 1 and 2	None of these
92	Mycotoxins are formed at the end of which stage of growth curve	B	lag phase	log phase	stationary phase	decline phase
93	An outstanding example of traditional microbial fermentation product is	C	Penicillin	Citric acid	Vinegar	streptomycin
94	Transgenic animals improve the quality of which of the following products	D	Milk	Meat	Egg	All of these
95	Fermentation process which allows microorganism in the nutrient medium is	C	Dual	submerged	surface	All of these
96	The penicillin produced in large scale submerged fermentations are	A	Penicillin G	Penicillin A	Penicillin D	None of these
97	The Antibody with high valency is	C	IgA	IgG	IgM	IgD
98	Basophills have receptors for which of the followig antibodies	D	IgA	IgM	IgD	IgE
99	Diagnostic markers of auto immunity is/are	D	response to cortisol	hypergamma globulinemia	lymphoid hyperplasia	All of these
100	The most abundant antibody present in serum	B	IgG1	IgA1	IgG2	IgG4

