





The Maharaja Sayajirao University of Baroda Faculty of Science

M.Sc. ENTRANCE EXAMINATION

SUBJECT: Five Year Integrated M.Sc. in Cell & Molecular BiologyDAY: FridayDATE: 8th July 2022TIME: 12:00 Pm to 1:30 pm

Important Instructions:

- 1. This test booklet is to be opened only when instructed by the invigilators to do so.
- 2. This booklet carries 100 questions on 14 printed pages. All questions carry equal marks.
- 3. For every correct answer, candidate will earn 1 mark, for every wrong answer 25% mark will be deducted.
- 4. **Test Registration Number** must be entered correctly in the OMR sheet, as advised by the invigilators. The **Question Booklet code (A, B, C, or D)** must also be mentioned on the OMR sheet (if not printed already) as instructed.
- 5. Answers must be marked in the OMR sheet using **a black or dark blue ball point pen only**. The circle should be filled in completely, leaving no gaps.
- 6. Gadgets (Mobile phones, pagers, ear phones, music players, calculators, smart watches etc.) are strictly prohibited in the exam hall. If any candidate is found in possession of any of these at his/her exam seat, he/she is liable to be disqualified.
- 7. In case of tie in the marks the merit will be considered based on total marks in qualifying examination.

Correct way of marking answer:

Incorrect way of marking answer:





Invigilator's signature_

Five Year Integrated M.Sc. in Cell & Molecular Biology Faculty of Science The M. S. University of Baroda Vadodara

Entrance Test - 2022

	Part-A	
	GENERAL APTITUDE & GENERAL KNOWLEDGE QUESTIONS	
No.	Ouestions	
1	How many different salads can be made from carrot, tomato, onion, cucumber, and	
	capsicum?	
	A 21	
	A. 51 B. 126	
	$\begin{array}{c} \mathbf{D} \cdot 120 \\ \mathbf{C} \cdot 15 \end{array}$	
	D. 625	
2	In how many ways you can rearrange word "SCIENCE"?	
	A. 5040	
	B. 1260	
	C. 1060	
	D. 2520	
3	India has won which of the following cup in sports?	
	A. Uber Cup	
	B. Thomas Cup	
	D. FIFA world cup	
4	Two candidates are selected randomly with replacements from the list containing 8	
	boys and 10 girls. What will be the probability of at most one girl being selected?	
	A. 4/9	
	B. 36/81	
	C. 20/81	
	D. 5/9	
5	A, P, R, X, S, and Z are sitting in a row. S and Z are in the centre. A and P are at	
	the ends. R is sitting to the left of A. Who is to the right of S?	
	A. Z	
	B. R	
	C. A	
6		
0	From his nouse, Kohit went 15 km to the North. Then he turned to his left and	
	be covered 10 km. In which direction is he from his house?	
	A. East	
L		

	B. North	
	C. North-East	
	D. South-West	
7	"He is the son of the only son of my grandfather " Lauren says, pointing to a	
/	The is the soli of the only soli of my grandramer, Lauren says, pointing to a	
	A Drother	
	A. BIOURI	
	B. Fauler	
	C. Uncle	
0	D. Cousin	
8	1 wo numbers are respectively 20% and 50% more than a third number. The ratio	
	of the two numbers is:	
	A 2.5	
	B. 3:5	
	C. 4:5	
	D. 5:4	
9	Which was the biggest aircraft that was recently damaged in Ukraine Russia war?	
	A Boeing 747 Dreamlifter	
	R Aero Spaceline's Super Guppy	
	C Antonov An-225 Mrive	
	D. Lockheed C-5 Galaxy	
	D. Locklied C-5 Galaxy	
10	The military operation which annexed Hyderabad into the Indian Union was code	
	named as	
	A. Operation Vijay	
	B. Operation Polo	
	C. Operation Megndoot	
11	D. Operation Vilat The 2022 International Booker Prize for translated fiction was recently awarded to	
11	Geetaniali Shree for her novel named	
	Geetanjan Shree for her nover hamed,	
	A. Happy Stories	
	B. Cursed Bunny	
	C. Heaven	
12.	D. Tomb of Sand	
	D. Tomb of Sand Which of the following countries borders Ukraine?	
	D. Tomb of Sand Which of the following countries borders Ukraine? A. Germany	
	D. Tomb of Sand Which of the following countries borders Ukraine? A. Germany B. Czech Republic	
	D. Tomb of Sand Which of the following countries borders Ukraine? A. Germany B. Czech Republic C. Slovakia	
12	D. Tomb of Sand Which of the following countries borders Ukraine? A. Germany B. Czech Republic C. Slovakia D. Croatia	
13	D. Tomb of Sand Which of the following countries borders Ukraine? A. Germany B. Czech Republic C. Slovakia D. Croatia Which of the following organization decides the REPO rate? A. Becamic Bank of India	
13	D. Tomb of Sand Which of the following countries borders Ukraine? A. Germany B. Czech Republic C. Slovakia D. Croatia Which of the following organization decides the REPO rate? A. Reserve Bank of India B. Securities Exchange Board of India	
13	D. Tomb of Sand Which of the following countries borders Ukraine? A. Germany B. Czech Republic C. Slovakia D. Croatia Which of the following organization decides the REPO rate? A. Reserve Bank of India B. Securities Exchange Board of India C. Insurance Regulatory and Development Authority	
13	 D. Tomb of Sand Which of the following countries borders Ukraine? A. Germany B. Czech Republic C. Slovakia D. Croatia Which of the following organization decides the REPO rate? A. Reserve Bank of India B. Securities Exchange Board of India C. Insurance Regulatory and Development Authority D. State Bank of India 	

14	The size of SARS-CoV2 viral genome is approximately	
	A. 22 kb	
	B. 30 kb	
	C = 50 kb	
	D. 67 kb	
15.	Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What	
	is the probability that the ticket drawn has a number which is a multiple of 3 or 5?	
	A. 9/20	
	B. 8/15	
	C. 1/2	
	D. 3/5	
	Part B- CHEMISTRY and PHYSICS	
16	The dissolution of a substance in a solvent is accompanied with	
	A. Change in enthalpy	
	B. Change in entropy	
	C. Change in both a) and b)	
	D. None	
17	Which has the maximum freezing point?	
	A. 6 g CH ₃ COOH solution in 100 g water	
	B. 6 g NaCl solution in 100 g water	
	C. 6 g Urea solution in 100 g water	
10	D. All have equal freezing point	
18	Hardness of water is 200 ppm in presence of CaCO3. Molarity of CaCO3 is	
	A. $2 \times 10^{-3} \text{ M}$	
	B. $1 \times 10^{-9} \text{ M}$	
	D 2 X 10^{-4} M	
10	D. 2 A 10 M The rate constant of 1^{st} order reaction is 0.0603 min ⁻¹ . If we start with 20 mol/L it	
17	is reduced to 2.5 mol/L in	
	A. 40 min	
	B. 30 min	
	C. 20 min	
	D. 10 min	
20	The unit of cell constant is	
	A. cm	
	B. cm^{-1}	
	C. cm^{-2}	
	D. mol/L	
21	Smoke generally has a blue tinge. This is due to	
	A. Light Scattering	
	B. Coagulation	
	C. Brownian motion	
	D. Electro-osmosis	

22	After the electrolysis of aqueous solution of NaCl using Pt electrodes, the pH of the	
	solution will	
	A. Remain constant	
	B. Increase	
	C. Decrease	
	D. Cannot be determined	
23	What is the coordination number of Cobalt in the $[Co(H_2O)_4 (NO_3)_2]^{2-}$ and	
	$[Co(CO)_2Cl_4]^+$, respectively?	
	A. 6 and 6	
	B. 4 and 4	
	C. 2 and 1	
	D. 8 and 5	
24	Choose the correct decreasing order of the oxidation state of nitrogen from the	
	following	
	A. HNO_3 , NH_3 , NO , N_2	
	B. HNO_3 , NO, NH ₄ Cl, N ₂	
	C. HNO_3 , NO , N_2 , NH_3	
	D. NH ₃ , HNO ₃ , NO, N ₂	
25	Which set of four quantum numbers corresponds to an electron in a 4p orbital?	
	A. $n = 4, l = 1, ml = 0, m_s = 1/2$	
	B. $n = 4, l = 3, ml = 3, m_s = -1/2$	
	C. $n = 4, l = 2, ml = 0, m_s = 1/2$	
	D. $n = 4, 1 = 4, ml = 3, m_s = -1/2$	
26	Determine the hybridization of oxygen in CH ₃ OH	
	A. sp	
	B. sp^2	
	C. sp^3	
	D. sp ³ d	
27	What is the electron configuration for Fe^{2+} ?	
	A. $4s^2 3d^6$	
	B. $4s^23d^4$	
	C. $4s^{0}3d^{0}$	
	D. $4s^23d^8$	
28	Calculate the wavelength of an electron traveling with a speed of 2.65×10^6 m/s.	
	A. $2.7 \times 10^{-10} \text{ m}$	
	B. 2.7 X 10 ⁻⁸ m	
	C. $2.9 \times 10^{-21} \text{ m}$	
	D. $2.9 \times 10^{-19} \text{m}$	
29	What is the correct IUPAC name of the following compound?	
	what is the confect for the name of the following compound.	
	A 3-Methyl-4-ethylbex-6-ene	
	B 2 3-Diethylhex-5-ene	
L	D. 2,5 Dieurymex 5 ene	



36	Which of the following is the most suitable reagent used for converting ArN ₂ Cl to	
	ArCl?	
	A. Conc. HCl	
	B. $Cu(0) + HCl$	
	$C. CuCl_2$	
	D. Cu ₂ Cl ₂	
37	Which of the following is the most adequate reagent for conversion of	
	acetophenone to ethyl benzene?	
	A. LiAlH ₄	
	B. NaBH ₄	
	C. NH ₂ NH ₂ in NaOH	
	D. H ₂ , Pd-C (Catal.)	
38	A Na ⁺ ion and a Cl ⁻ ion are separated from each other by 10 Å. In which medium	
	will the electrostatic force between them be the highest?	
	A. In vacuum	
	B. In water with dielectric constant = 80	
	C. In polymer with dielectric constant = 210 D. Force will be the same in all the above media	
39	D. Force will be the same in an the above metha Three charges of $-0.15e$ equidistant from the origin at a distance of 1.307 Å	
57	arranged in an equilateral triangle in the xy plane. What is the electric field at the	
	origin?	
	A. 0.118 X 10 ⁻¹¹ N/C	
	B. 0	
	C. 0.118 X 10 ⁻²⁹ N/C	
	D. 0.118 X 10 ¹¹ N/C	
40	A TV tube contains two parallel plates 7.5 mm apart. If a potential difference of	
	150 V is maintained between them. What is the force on an electron in the gap	
	between the plates?	
	A. $3.2 \times 10^{-13} \text{ N}$	
	B. 3.2 X 10 ⁻²⁰ N	
	C. 20 N	
4.1	D. None of the above	
41	The dipole moment of a C=O bond is 2.70 D and the bond length is 0.122	
	nm. What is the effective charges on the two atoms (e represents the electronic	
	charge)?	
	A. 0.461 e	
	B. 7.38×10^{-5} C	
	$\begin{array}{c} \text{C. } 7.38 \text{ e} \\ \text{D. } \text{Path}(a) \text{ and } (b) \end{array}$	
12	D. Bolli (a) alid (b)	
42	A geosylicii olious satellite is one which A Bevolves around the earth in the same speed as that of the earth's	
	A. Revolves around the carm in the same speed as that of the earth s	
	B Revolves around the earth in the same sneed as that of the earth's	
	b. Revolves around the earth in the same speed as that of the earth s	

	C. Its period of revolution matches the period of revolution of the moon	
13	When sound waves travel from air to water, what happens?	
	Δ Their frequency changes but velocity remains constant	
	B Their velocity changes, but frequency remains constant	
	C. Both velocity and frequency change	
	D. Both velocity and frequency remain unchanged	
4.4	D. Both velocity and frequency remain unchanged	
44	The ear of some animals can distinguish ultrasonic sound waves, but not numan	
	A They have frequency lower than 10 milli Hz	
	A. They have frequency lower than 10 kilo Hz	
	C They have frequency higher than 20 kilo Hz	
	D They have frequency higher than 20 milli Hz	
45	Which optical phenomenon is involved in formation of rainbow?	
	A Light scattering	
	B Light reflection	
	C Light refraction	
	D. Diffraction of light	
46	Which of the following is a magnetic material?	
-	A. Carbon	
	B. Cobalt	
	C. Aluminium	
	D. Manganese	
47	Newtonian mechanics failed to explain which concept?	
	A. Motion of rocket	
	B. Features of atomic phenomena	
	C. Falling of objects on the ground	
	D. Motion of planets	
48	What is the coefficient of performance of a refrigerator? Let Q_1 be the heat released	
	to hot reservoir, Q_2 be the heat extracted from a cold reservoir & W be the work	
	done on the refrigerator.	
	A. QI/W B. Q_1/Q_2	
	$\begin{array}{c} \mathbf{D}, \mathbf{Q}_1/\mathbf{Q}_2\\ \mathbf{C}, \mathbf{Q}_2/\mathbf{W} \end{array}$	
	$D_{1} O_{2} O_{1}$	
49	Consider the damped SHM of a spring mass system. If the time taken for the	
	amplitude to become half is 'T', what is the time taken for mechanical energy to	
	become half?	
	A. I $\mathbf{P} \cdot \mathbf{T}/2$	
	D. 1/2 C 2T	
	D. T/4	
l		

50	Which of the following is the mathematical representation of law of conservation of	
	total linear momentum?	
	A. $dP/dt = 0$	
	B. $dF/dt = 0$	
	C. $dP/dt = F_{internal}$	
	D. $dF/dt = P$	
51	Which device is used to measure atmospheric pressure?	
	A. Odometer	
	B. Barometer	
	C. Dynamometer	
	D. Hydrometer	
52	A concave mirror is held in water. What should be the change in the focal length of	
	the mirror?	
	A. Halved	
	B. Doubled	
	C. Remains the same	
	D. Increases exponentially	
53	Which of the following causes refraction of light?	
	A. Change in the density of light from one medium to another	
	B. Change in viscosity of light from one medium to another	
	C. Change in the speed of light from one medium to another	
	D. Change in direction of light from one medium to another	
54	Two beams, one of red light and the other of blue light, of the same intensity are	
	incident on a metallic surface to emit photoelectrons. Which emits electrons of	
	greater frequency?	
	A. Doll B. Dod light	
	C. Blue light	
	D Neither	
55	Flactric field inside a hollow conducting sphere	
55	A Increases with distance from the center of the sphere	
	B Decreases with distance from the center of the sphere	
	C. is zero	
	D. May increase or decrease with distance from the center	
	Part C (Biology)	
56	NADPH is generated in which of the following pathway?	
	A. Kreb's cycle	
	B. Photosynthesis	
	C. Glycolysis	
	D. Urea cycle	
57	Which of the following characteristics is common in humans and adult frogs?	
	A. Four-chambered heart	
	B. internal fertilization	
	C. nucleated RBCs	
	D. ureotelic mode of excretion	

58	Which of the following is an X-Chromosome linked genetic disorder?	
	A. sickle cell disease	
	B. Hemophilia	
	C. Thalassemia	
	D. Leukemia	
59	A linear peptide is made up of 6 residues of an amino acid of molecular weight	
	120Da. The molecular weight of the peptide will be	
	A. 618	
	B. 630	
	C. 600	
	D. 720	
60	Which of the following structures in Pheretima is correctly matched with its	
	function?	
	A. clitellum- secretes cocoon	
	B. gizzard- absorbs digested food	
	C. setae- defence against predators	
	D. typhlosole- storage of extra nutrients	
61	Which of the following is a Sulphur containing amino acid?	
	A. Proline	
	B. Histidine	
	C. Cysteine	
	D. Glycine	
62	Which of the following glucose transporters is insulin-dependent?	
02	when of the following gracose transporters is insumit dependent.	
	A. GLUT I	
	B. GLUT II	
	C. GLUT III	
	D. GLUT IV	
(2	Which one of the following phylo is correctly metched with its two several	
03	which one of the following phyla is correctly matched with its two general	
	characteristics?	
	A. Echinodermata- pentamerous radial symmetry and mostly internal	
	fertilization	
	B Mollusca- normally ovinarous and development through a trochophore or	
	D. Wondsed- normany oviparous and development through a trochophore of	
	C. Arthropoda- body divided into head, thorax and abdomen and respiration	
	by tracheae	
	D. Chordata- notochord at some stage and separate anal and urinary openings	
	to the outside	
64	Mucus is secreted by which cells in the gastro-intestinal tract?	
	A. Chief Cells	
	B Goblet cells	
	C. Ovumtia colla	
	C. Oxyntic cens	

	D. Duodenal cells	
65	Which one of the following is an example of polygenic inheritance?	
	A. skin colour in humans	
	B. flower colour in Mirabilis jalapa	
	C. production of male honey bee	
	D. pod shape in garden pea	
66	Antibody present in tears is	
	A. IgA	
	B. IgG	
	C. IgD	
	D. IgM	
67	Test cross involves:	
	A. crossing between two genotypes with dominant trait	
	B. crossing between two genotypes with recessive trait	
	C. crossing between two F1 hybrids	
	D. crossing the F1 hybrid with a double recessive genotype	
68	Convergent evolution is illustrated by evolution of	
	A. rat and dog	
	B. bacterium and protozoan	
	C. starfish and cuttlefish	
	D. dogfish and whale	
69	Which of the following techniques will be useful for tracing the origin of particular	
	tribe?	
	A. blood grouping.	
	B. mitochondrial DNA analysis.	
	C. DNA fingerprinting.	
70	D. Karyotyping.	
70	it does not affect human call?	
	Δ Human and bacterial ribosomes are different	
	B Antibiotic molecules can't enter human cells	
	C. Antibiotic gets degraded by human cell.	
	D. different genetic code of human and bacteria.	
71	Which of the following is true for Golden rice?	
	A. It is Vitamin A enriched, with a gene from daffodil	
	B. It is pest resistant, with a gene from Bacillus thuringiensis	
	C. It is drought tolerant, developed using Agrobacterium vector	
	D. It has yellow grains, because of a gene introduced from a primitive variety	
	of rice	
72	The upright pyramid of number is absent in	
	A. pond	
	B. lake	
	C. forest	
	D. grassland	

73	A heterozygous colorblind woman marries a color blind man. What is the ratio of	
	carrier daughters, color blind daughters, normal sons and color blind sons in F1	
	generation?	
	A. 1:2:2:1	
	B. 1:1:1:1	
	C. 2:1:1:2	
	D. 1:1:2:2	
74	Full form of shRNA is	
	A. Small helix Ribonucleic Acid	
	B. Single hairpin Ribonucleic Acid	
	C. Short hairpin Ribonucleic Acid	
	D. Short Ribonucleic Acid	
75	Hormone Releasing Intrauterine Devices release	
	A. synthetic form of the hormone Estrogen	
	B. synthetic form of the hormone progesterone	
	C. synthetic form of the hormone Prolactin	
	D. synthetic form of the hormone Testosterone	
76	The glucose homeostasis is maintained in the body by	
	A. Insulin	
	B. Glucagon	
	C. Insulin & Glucagon	
	D. Somatostatin	
77	What is the site of perception of photoperiod necessary for induction of flowering	
	in plants?	
	A. Lateral buds	
	B. Pulvinus	
	C. Shoot apex	
	D. Leaves	
78	Thermogenin is responsible for	
	A. Uncoupling of oxidative phosphorylation	
	B. Thermal insulation	
	C. Shivering theromogenesis	
	D. Glucose production	
79	Which of the following is NOT an RNA virus	
	A. Hepatitis B virus	
	B. SARS-CoV-2	
	C. Ebola Virus	
	D. Hepatitis C Virus	
80	Which of the following immune responses is responsible for rejection of kidney	
	graft?	
	A. Auto- immune response	
	B. Humoral immune response	
L		

	C. Inflammatory immune response	
	D. Cell-mediated immune response	
0.1		
81	Which of the following is a polysaccharide of animal origin	
	A. Pectin	
	B. Cellulose	
	C. Chitin	
	D. Arabinoxylans	
82	At meta phase, chromosomes are attached to the spindle fibres by	
	A. Satellites	
	B. Centromere	
	C. Kinetochore	
	D. None of the above	
83	Hexokinase and Glucokinase are example of	
	B Holoenzyme	
	C Co enzyme	
	D. Isoenzyme	
84	Which of the following one is called molecule scissors?	
	A. Ligases	
	B. Restriction endonucleases	
	C. Reverse transcriptase	
	D. Exonucleases	
85	Which of the following hormone is released by the pineal gland?	
	A. FSH	
	B. Melatonin	
	C. ACTH	
	D. MSH	
86	Humoral immunity is mediated by	
	A. T cells	
	B. Dendritic cells	
	C. Plasma cells	
	D. NK cells	

87	Zymogens of pancreatic juice are activated by	
	A Kinase	
	B Phosphatase	
	C Enterokinase	
	D. Trypsingen	
88	Which enzyme is used for lysis of plant cells during DNA isolation?	
	A. Lysozyme	
	B. Cellulase	
	C. Chitinase	
	D. Hydrolase	
89	Role of parathyroid hormone is to	
07	A regulate thyroid hormone levels	
	P. regulate hody temperature	
	D. regulate body temperature	
	C. regulate levels of following	
00	D. regulate levels of Calcium	
90	Which of the following is an autonomously replicating circular extra-chromosomal	
	A Colluc	
	A. Callus P. Diagmid	
	D. Flashilu C. Protoplast	
	D. Transposon	
91	Cell wall of cyanobacteria is mainly composed of	
	A. Chitin	
	B. Cellulose	
	C. Chitosan	
	D. Peptidoglycan	
92	Which of the following phase is dominant in bryophyte lifecycle?	
	A. Gametophyte	
	B. Sporophyte	
	C. Pteridophyte	
	D. Cryptophyte	
93	Chlorophyll b is found in	
	A. land plants	
	B. green algae	
	C. cyanobacteria	
0.4	D. All of these	
94	A mosting of the most of the m	
	A. masucation B. ejection	
	C emulsification	
	D peristalsis	
95	The chloroplast evolved from	
	A Blue-green algae	
1		L

	B. Brown algae	
	C. Green algae	
	D. Red algae	
96	When calyx and corolla are fused it is known as?	
	A. Corolla	
	B. Sepals	
	C. Petals	
	D. Perianth	
97	The oxidation state of Fe in Methemoglobin is	
	A. +1	
	B. +2	
	C. +3	
	D. None of the above	
98	Which of the following cytoskeletal elements is not found in plants	
	A. microtubules	
	B. actin filaments	
	C. intermediate filaments	
	D. spindle fiber	
99	Islets of Langerhans are found in	
	A. liver	
	B. gall bladder	
	C. small intestine	
	D. pancreas	
100	Mycorrhizae are mutualistic associations between Fungi and	
	A. Algae	
	B. Bacteria	
	C. Fungi	
	D. Vascular plants	

5 year integrated M.Sc. in Cell and Molecular Biology

Entrance exam 8-7-2022

ANSWER KEY (SET-A)

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







The Maharaja Sayajirao University of Baroda Faculty of Science

M.Sc. ENTRANCE EXAMINATION

SUBJECT: Five Year Integrated M.Sc. in Cell & Molecular BiologyDAY: FridayDATE: 8th July 2022TIME: 12:00 Pm to 1:30 pm

Important Instructions:

- 1. This test booklet is to be opened only when instructed by the invigilators to do so.
- 2. This booklet carries 100 questions on 14 printed pages. All questions carry equal marks.
- 3. For every correct answer, candidate will earn 1 mark, for every wrong answer 25% mark will be deducted.
- 4. **Test Registration Number** must be entered correctly in the OMR sheet, as advised by the invigilators. The **Question Booklet code (A, B, C, or D)** must also be mentioned on the OMR sheet (if not printed already) as instructed.
- 5. Answers must be marked in the OMR sheet using **a black or dark blue ball point pen only**. The circle should be filled in completely, leaving no gaps.
- 6. Gadgets (Mobile phones, pagers, ear phones, music players, calculators, smart watches etc.) are strictly prohibited in the exam hall. If any candidate is found in possession of any of these at his/her exam seat, he/she is liable to be disqualified.
- 7. In case of tie in the marks the merit will be considered based on total marks in qualifying examination.

Correct way of marking answer:

Incorrect way of marking answer:





Invigilator's signature_

Five Year Integrated M.Sc. in Cell & Molecular Biology Faculty of Science The M. S. University of Baroda Vadodara

Entrance Test - 2022

	Part-A	
	GENERAL APTITUDE & GENERAL KNOWLEDGE QUESTIONS	
No.	Questions	
1	Which of the following organization decides the REPO rate?	
	A. Reserve Bank of India	
	B. Securities Exchange Board of India	
	C. Insurance Regulatory and Development Authority	
	D. State Bank of India	
2	The size of SARS-CoV2 viral genome is approximately	
	A. 22 kb	
	B. 30 kb	
	C. 50 kb	
	D. 67 kb	
3	Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What	
	is the probability that the ticket drawn has a number which is a multiple of 3 or 5?	
	A. 9/20	
	B. 8/15	
	C. 1/2	
	D. 3/5	
4	Two candidates are selected randomly with replacements from the list containing 8	
	boys and 10 girls. What will be the probability of at most one girl being selected?	
	A. 4/9	
	B. 36/81	
	C. 20/81	
	D. 5/9	
5	A, P, R, X, S, and Z are sitting in a row. S and Z are in the centre. A and P are at	
	the ends. R is sitting to the left of A. Who is to the right of S?	
	A.Z	
	B. R	
	C. A	
6		
6	From his nouse, Rohit went 15 km to the North. Then he turned to his left and	
	covered 10 km. Then he turned south and covered 5 km. Finally, turning to his left,	
	A East	
	A. Lasi B. North	
	D. NOIUI	

	C. North-East	
	D. South-West	
7	"He is the son of the only son of my grandfather," Lauren says, pointing to a	
	photograph. How is the man in the picture related to Lauren?	
	A. Brother	
	B. Father	
	C. Uncle	
	D. Cousin	
8	Two numbers are respectively 20% and 50% more than a third number. The ratio	
	of the two numbers is:	
	A. 2:5	
	B. 3:5	
	C. 4:5	
0		
9	which was the biggest aircraft that was recently damaged in Ukraine Russia war?	
	A. Boeing 747 Dreamlifter	
	B. Aero Spaceline's Super Guppy	
	C. Antonov An-225 Mriva	
	D. Lockheed C-5 Galaxy	
10	The military operation which annexed Hyderabad into the Indian Union was code	
	named as	
	A. Operation Vijay	
	B. Operation Polo	
	C. Operation Meghdoot	
11	D. Operation Virat	
11	The 2022 International Booker Prize for translated fiction was recently awarded to	
	Geetanjali Shree for her novel named,	
	A. Happy Stories	
	B. Cursed Bunny	
	C. Heaven	
	D Tomb of Sand	
12	Which of the following countries borders Ukraine?	
12.	A. Germany	
	B. Czech Republic	
	C. Slovakia	
	D. Croatia	
13	How many different salads can be made from carrot, tomato, onion, cucumber, and	
	capsicum?	
	A. 51 D. 126	
	B. 120	
	U. 15	

	D. 625	
14	In how many ways you can rearrange word "SCIENCE"?	
	A. 5040	
	B. 1260	
	C. 1060	
	D. 2520	
15.	India has won which of the following cup in sports?	
	A. Uber Cup	
	B. Thomas Cup	
	C. Davis Cup	
	D. FIFA world cup	
	Part B- CHEMISTRY and PHYSICS	
16	Which device is used to measure atmospheric pressure?	
	A. Odometer	
	B. Barometer	
	C. Dynamometer	
	D. Hydrometer	
17	A concave mirror is held in water. What should be the change in the focal length of	
	the mirror?	
	A. Halved	
	B. Doubled	
	C. Remains the same	
	D. Increases exponentially	
18	Which of the following causes refraction of light?	
	A. Change in the density of light from one medium to another	
	B. Change in viscosity of light from one medium to another	
	C. Change in the speed of light from one medium to another	
10	D. Change in direction of light from one medium to another	
19	incident on a metallic surface to emit photoelectrons. Which emits electrons of	
	greater frequency?	
	A Both	
	B. Red light	
	C. Blue light	
	D. Neither	
20	Electric field inside a hollow conducting sphere	
-	A. Increases with distance from the center of the sphere	
	B. Decreases with distance from the center of the sphere	
	C. is zero	
	D. May increase or decrease with distance from the center	
21	Smoke generally has a blue tinge. This is due to	
	A. Light Scattering	
	B. Coagulation	

	C. Brownian motion	
	D. Electro-osmosis	
22	After the electrolysis of aqueous solution of NaCl using Pt electrodes, the pH of the	
	solution will	
	A. Remain constant	
	B. Increase	
	C. Decrease	
	D. Cannot be determined	
23	What is the coordination number of Cobalt in the $[Co(H_2O)_4 (NO_3)_2]^{2-}$ and	
	$[Co(CO)_2Cl_4]^+$, respectively?	
	A. 6 and 6	
	B. 4 and 4	
	C. 2 and 1	
	D. 8 and 5	
24	Choose the correct decreasing order of the oxidation state of nitrogen from the	
	following	
	A. HNO_3 , NH_3 , NO , N_2	
	B. HNO_3 , NO, NH_4Cl , N_2	
	C. HNO_3 , NO , N_2 , NH_3	
	D. NH_3 , HNO_3 , NO , N_2	
25	Which set of four quantum numbers corresponds to an electron in a 4p orbital?	
	A. $n = 4, l = 1, ml = 0, m_s = 1/2$	
	B. $n = 4, l = 3, ml = 3, m_s = -1/2$	
	C. $n = 4, l = 2, ml = 0, m_s = 1/2$	
	D. $n = 4$, $l = 4$, $ml = 3$, $m_s = -1/2$	
26	Determine the hybridization of oxygen in CH ₃ OH	
	A. sp	
	B. sp^2	
	C. sp^3	
	D. $sp^{3}d$	
27	What is the electron configuration for Fe^{2+} ?	
	A. $4s^23d^6$	
	B. $4s^23d^4$	
	C. $4s^03d^6$	
	D. $4s^23d^8$	
28	Calculate the wavelength of an electron traveling with a speed of 2.65 $\times 10^6$ m/s.	
	$\Lambda = 2.7 \times 10^{-10} \text{ m}$	
	$R = 2.7 \times 10^{-8} \text{ m}$	
	D. 2.7×10^{-11} m	
	D 20 X 10^{-19} m	
20	D. 2.9 X 10 III What is the correct HIBAC name of the following compound?	
27	what is the confect for AC name of the following compound?	



	$\begin{array}{c c} & & & \\ & & & \\$	
	A NO ₂ NO ₂ Me D	
36	Which of the following is the most suitable reagent used for converting ArN_2Cl to $ArCl^2$	
	A. Conc. HCl	
	B. $Cu(0) + HCl$	
	C. CuCl ₂	
	D. Cu ₂ Ci ₂	
37	Which of the following is the most adequate reagent for conversion of	
	acetophenone to ethyl benzene?	
	A. LiAlH ₄	
	B. NaBH4	
	C. NH_2NH_2 in NaOH D. H. Dd C (Cotal.)	
29	D. H_2 , Pd-C (Catal.)	
30	will the electrostatic force between them be the highest?	
	A. In vacuum	
	B. In water with dielectric constant $= 80$	
	C. In polymer with dielectric constant $= 210$	
20	D. Force will be the same in all the above media	
39	Three charges of -0.15 <i>e</i> equidistant from the origin at a distance of 1.307 A,	
	origin?	
	A. 0.118 X 10 ⁻¹¹ N/C	
	B. 0	
	C. $0.118 \times 10^{-29} \text{ N/C}$	
10	D. $0.118 \times 10^{11} \text{ N/C}$	
40	A 1V tube contains two parallel plates 7.5 mm apart. If a potential difference of 150 V is maintained between them. What is the force on an electron in the con-	
	between the plates?	
	A. $3.2 \times 10^{-15} \text{ N}$	
	B. $3.2 \times 10^{-20} \text{ N}$	
	C. 20 N	
	D. None of the above	
41	The dipole moment of a C=O bond is 2.70 D and the bond length is 0.122	
	nm. What is the effective charges on the two atoms (e represents the electronic	
	charge)?	
	A. 0.461 e	
	$\begin{array}{c} B. \ /.38 X 10^{-6} C \\ C. \ 7.28 c \end{array}$	
	D. Both (a) and (b)	

42	A geosynchronous satellite is one which	
	A. Revolves around the earth in the same speed as that of the earth's	
	revolution around the sun	
	B. Revolves around the earth in the same speed as that of the earth's	
	rotation around its axis	
	C. Its period of revolution matches the period of revolution of the moon	
	D. None of the above	
43	When sound waves travel from air to water, what happens?	
	A. Their frequency changes, but velocity remains constant	
	B. Their velocity changes, but frequency remains constant	
	C. Both velocity and frequency change	
	D. Both velocity and frequency remain unchanged	
44	The ear of some animals can distinguish ultrasonic sound waves, but not human	
	ear. What is the frequency of ultrasonic sound waves?	
	A. They have frequency lower than 10 milli Hz	
	B. They have frequency lower than 10 kilo Hz	
	C. They have frequency higher than 20 kilo Hz	
	D. They have frequency higher than 20 milli Hz	
45	Which optical phenomenon is involved in formation of rainbow?	
	A. Light scattering	
	B. Light reflection	
	C. Light refraction	
	D. Diffraction of light	
46	Which of the following is a magnetic material?	
	A. Carbon	
	B. Cobalt	
	C. Aluminium	
	D. Manganese	
47	Newtonian mechanics failed to explain which concept?	
	A Motion of realist	
	A. Motion of locket P. Eastures of stomic phonomena	
	B. Features of atomic phenomena	
	D. Motion of planets	
	D. Motion of planets	
48	What is the coefficient of performance of a refrigerator? Let Q ₁ be the heat released	
	to hot reservoir, Q_2 be the heat extracted from a cold reservoir & W be the work	
	done on the refrigerator.	
	A. U/ W B. O. /O	
	D. Q_1/Q_2	
	\mathbf{D} . $\mathbf{Q}_2/\mathbf{Q}_1$	

49	Consider the damped SHM of a spring mass system. If the time taken for the	
	amplitude to become half is 'T', what is the time taken for mechanical energy to	
	become half?	
	А. Т	
	B. T/2	
	C. 2T	
	D. T/4	
50	Which of the following is the mathematical representation of law of conservation of	
	total linear momentum?	
	A. $dP/dt = 0$	
	B. $dF/dt = 0$	
	C. $dP/dt = F_{internal}$	
	D. $dF/dt = P$	
51	The dissolution of a substance in a solvent is accompanied with	
	A. Change in enthalpy	
	B. Change in entropy	
	C. Change in both a) and b)	
	D. None	
52	Which has the maximum freezing point?	
	A. 6 g CH ₃ COOH solution in 100 g water	
	B. 6 g NaCl solution in 100 g water	
	C. 6 g Urea solution in 100 g water	
	D. All have equal freezing point	
53	Hardness of water is 200 ppm in presence of CaCO3. Molarity of CaCO3 is	
	A. $2 \times 10^{-5} \text{ M}$	
	B. 1 X 10 ⁻⁵ M	
	C. $2 \times 10^{-2} M$	
	D. 2 X 10 ⁻⁴ M	
54	The rate constant of 1^{st} order reaction is 0.0693 min ⁻¹ . If we start with 20 mol/L, it	
	is reduced to 2.5 mol/L in	
	A. 40 min	
	B. 30 min	
	$C_{\rm c} = 20 \text{ min}$	
	D. 10 min	
55	The unit of cell constant is	
	A. cm	
	B. cm^{-1}	
	$C. cm^{-2}$	
	D. mol/L	
	Part C (Biology)	
56	When calyx and corolla are fused it is known as?	
	A. Corolla	
	B. Sepals	
	C. Petals	
	D. Perianth	

57	The oxidation state of Fe in Methemoglobin is	
	A. +1	
	B. +2	
	C. +3	
	D. None of the above	
58	Which of the following cytoskeletal elements is not found in plants	
	A. microtubules	
	B. actin filaments	
	C. intermediate filaments	
	D. spindle fiber	
59	Islets of Langerhans are found in	
	A. liver	
	B. gall bladder	
	C. small intestine	
60	D. pancreas	
00		
	A. Algae D. Dactoria	
	D. Datiena C. Fungi	
	D Vascular plants	
61	Which of the following is a Sulphur containing amino acid?	
	A. Proline	
	B Histidine	
	C Cysteine	
	C. Cysteme	
	D. Grycine	
62	Which of the following glucose transporters is insulin-dependent?	
	A. GLUT I	
	B. GLUT II	
	C. GLUT III	
	D. GLUT IV	
63	Which one of the following phyla is correctly matched with its two general	
	characteristics?	
	A. Echinodermata- pentamerous radial symmetry and mostly internal fortilization	
	D Mollusse normally evinements and devidence of the second states in the	
	b. Monusca- normany oviparous and development through a trochophore or veliger larva	
	C. Arthropoda- body divided into head, thorax and abdomen and respiration	
	hy tracheae	
	D Chardete notoehord at some stage and senarete anal and wringers are right	
	D. Chordata- holochord at some stage and separate anal and urmary openings	
	to the outside	

64	Mucus is secreted by which cells in the gastro-intestinal tract?	
	A Chief Cells	
	B Goblet cells	
	C Oxyntic cells	
	D. Duodenal cells	
	D. Duodenai cens	
65	Which one of the following is an example of polygenic inheritance?	
	A. skin colour in humans	
	B. flower colour in Mirabilis jalapa	
	C. production of male honey bee	
	D. pod shape in garden pea	
66	Antibody present in tears is	
	A. IgA	
	B. IgG	
	C. IgD	
	D. IgM	
67	Test cross involves:	
	A. crossing between two genotypes with dominant trait	
	B. crossing between two genotypes with recessive trait	
	C. crossing between two F1 hybrids	
69	D. crossing the F1 hybrid with a double recessive genotype	
08	Convergent evolution is illustrated by evolution of	
	A. rat and dog	
	B. bacterium and protozoan	
	C. starfish and cuttlefish	
(0)	D. dogfish and whale	
69	which of the following techniques will be useful for tracing the origin of particular	
	A blood grouping	
	A. blood grouping. B. mitochondrial DNA analysis	
	C DNA fingerprinting	
	D. karvotyping.	
70	Bacterial infection can be treated by an antibiotic that blocks protein synthesis. why	
	it does not affect human cell?	
	A. Human and bacterial ribosomes are different	
	B. Antibiotic molecules can't enter human cells.	
	C. Antibiotic gets degraded by human cell.	
	D. different genetic code of human and bacteria.	
71	Which of the following is true for Golden rice?	
	A. It is Vitamin A enriched, with a gene from daffodil	
	B. It is pest resistant, with a gene from Bacillus thuringiensis	
	C. It is drought tolerant, developed using Agrobacterium vector	
	D. It has yellow grains, because of a gene introduced from a primitive variety	
	01 1100	

72	The upright pyramid of number is absent in	
	A. pond	
	B. lake	
	C. forest	
	D. grassland	
73	A heterozygous colorblind woman marries a color blind man. What is the ratio of	
	carrier daughters, color blind daughters, normal sons and color blind sons in F1	
	generation?	
	A. 1:2:2:1	
	B. 1:1:1:1 C. 2:1:1:2	
	D 1:1:2:2	
74	Full form of shRNA is	
/ -	A. Small helix Ribonucleic Acid	
	B. Single hairpin Ribonucleic Acid	
	C. Short hairpin Ribonucleic Acid	
	D. Short Ribonucleic Acid	
75	Hormone Releasing Intrauterine Devices release	
	A. synthetic form of the hormone Estrogen	
	B. synthetic form of the hormone progesterone	
	C. synthetic form of the hormone Prolactin	
	D. synthetic form of the hormone Testosterone	
76	The glucose homeostasis is maintained in the body by	
	A. Insulin	
	B. Glucagon	
	C. Insulin & Glucagon	
	D. Somatostatin	
77	What is the site of perception of photoperiod necessary for induction of flowering	
	in plants?	
	A. Lateral buds	
	B. Pulvinus	
	C. Shoot apex	
	D. Leaves	
/8	Thermogenin is responsible for	
	A. Uncoupling of oxidative phosphorylation	
	B. Thermal insulation	
	C. Shivering theromogenesis	
	D. Glucose production	
79	Which of the following is NOT an RNA virus	
	A. Hepatitis B virus	
	B. SARS-CoV-2	
	C. Ebola Virus	

	D. Hepatitis C Virus	
80	Which of the following immune responses is responsible for rejection of kidney	
	graft?	
	$\Delta = \Delta u t_{0-}$ immune response	
	B Humoral immune response	
	C Inflammatory immune response	
	D. Cell-mediated immune response	
81	Which of the following is a polysaccharide of animal origin	
	A. Pectin	
	B. Cellulose	
	C. Chitin	
	D. Arabinoxylans	
82	At meta phase, chromosomes are attached to the spindle fibres by	
	A. Satellites	
	B. Centromere	
	C. Kinetochore	
	D. None of the above	
83	Hexokinase and Glucokinase are example of	
	A Anoony/zmo	
	A. Apoenyzine B. Holoenzyme	
	C Co enzyme	
	D Isoenzyme	
84	Which of the following one is called molecule scissors?	
	A. Ligases	
	B. Restriction endonucleases	
	C. Reverse transcriptase	
	D. Exonucleases	
85	Which of the following hormone is released by the pineal gland?	
	A. FSH	
	B. Melatonin	
	C. ACTH	
	D. MSH	
86	Humoral immunity is mediated by	
	A T cells	
	B Dendritic cells	
	C Plasma cells	

	D. NK cells	
87	Zymogens of pancreatic juice are activated by	
	A Kinase	
	B Phosphatase	
	C. Enterokinase	
	D. Trypsinogen	
88	Which enzyme is used for lysis of plant cells during DNA isolation?	
	A. Lysozyme	
	B. Cellulase	
	C. Chitinase	
	D. Hydrolase	
89	Role of parathyroid hormone is to	
	A. regulate thyroid hormone levels	
	B. regulate body temperature	
	C. regulate levels of iodine	
	D. regulate levels of Calcium	
90	Which of the following is an autonomously replicating circular extra-chromosomal	
	DNA, used for rDNA technology	
	A. Callus	
	B. Plasmid	
	C. Protoplast	
01	D. Transposon	
91	Cell wall of cyanobacteria is mainly composed of	
	A. Cillula B. Callulasa	
	C. Chitosan	
	D Pentidoglycan	
92	Which of the following phase is dominant in bryophyte lifecycle?	
	A. Gametophyte	
	B. Sporophyte	
	C. Pteridophyte	
	D. Cryptophyte	
93	Chlorophyll b is found in	
	A. land plants	
	B. green algae	
	C. cyanobacteria	
0.4	D. All of these	
94	Movement of food through the gastrointestinal tract is known	
	A. mastication	
	D. ejection	
	D peristalsis	
95	The chloroplast evolved from	
<i>95</i>		

	A. Blue-green algae	
	B. Brown algae	
	C. Green algae	
	D. Red algae	
96	NADPH is generated in which of the following pathway?	
	A. Kreb's cycle	
	B. Photosynthesis	
	C. Glycolysis	
	D. Urea cycle	
97	Which of the following characteristics is common in humans and adult frogs?	
	A. Four-chambered heart	
	B. internal fertilization	
	C. nucleated RBCs	
	D. ureotelic mode of excretion	
98	Which of the following is an X-Chromosome linked genetic disorder?	
	A. sickle cell disease	
	B. Hemophilia	
	C. Thalassemia	
	D. Leukemia	
99	A linear peptide is made up of 6 residues of an amino acid of molecular weight	
	120Da. The molecular weight of the peptide will be	
	A. 618	
	B. 630	
	C. 600	
	D. 720	
100	Which of the following structures in Pheretima is correctly matched with its	
	function?	
	A. clitellum- secretes cocoon	
	B. gizzard- absorbs digested food	
	C. setae- defence against predators	
	D. typhlosole- storage of extra nutrients	

5 year integrated M.Sc. in Cell and Molecular Biology

Entrance exam 8-7-2022

ANSWER KEY (SET-B)

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

С



Test Registration No. _

The Maharaja Sayajirao University of Baroda Faculty of Science

M.Sc. ENTRANCE EXAMINATION

SUBJECT: Five Year Integrated M.Sc. in Cell & Molecular BiologyDAY: FridayDATE: 8th July 2022TIME: 12:00 Pm to 1:30 pm

Important Instructions:

- 1. This test booklet is to be opened only when instructed by the invigilators to do so.
- 2. This booklet carries 100 questions on 14 printed pages. All questions carry equal marks.
- 3. For every correct answer, candidate will earn 1 mark, for every wrong answer 25% mark will be deducted.
- 4. **Test Registration Number** must be entered correctly in the OMR sheet, as advised by the invigilators. The **Question Booklet code (A, B, C, or D)** must also be mentioned on the OMR sheet (if not printed already) as instructed.
- 5. Answers must be marked in the OMR sheet using **a black or dark blue ball point pen only**. The circle should be filled in completely, leaving no gaps.
- 6. Gadgets (Mobile phones, pagers, ear phones, music players, calculators, smart watches etc.) are strictly prohibited in the exam hall. If any candidate is found in possession of any of these at his/her exam seat, he/she is liable to be disqualified.
- 7. In case of tie in the marks the merit will be considered based on total marks in qualifying examination.

Correct way of marking answer:

Incorrect way of marking answer:





Invigilator's signature_

Five Year Integrated M.Sc. in Cell & Molecular Biology Faculty of Science The M. S. University of Baroda Vadodara

Entrance Test - 2022

	Part-A					
	GENERAL APTITUDE & GENERAL KNOWLEDGE QUESTIONS					
No.	Questions					
1	Which of the following organization decides the REPO rate?					
	A. Reserve Bank of India					
	B. Securities Exchange Board of India					
	C. Insurance Regulatory and Development Authority					
	D. State Bank of India					
2	The size of SARS-CoV2 viral genome is approximately					
	A. 22 kb					
	B. 30 kb					
	C. 50 kb					
	D. 67 kb					
3	Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What					
	is the probability that the ticket drawn has a number which is a multiple of 3 or 5?					
	A. 9/20					
	B. 8/15					
	C. 1/2					
	D. 3/5					
4	How many different salads can be made from carrot, tomato, onion, cucumber, and					
	capsicum?					
	A. 31					
	B. 126					
	C. 15					
	D. 625					
5	In how many ways you can rearrange word "SCIENCE"?					
	A. 5040					
	B. 1260					
	C. 1060					
	D. 2520					
6	India has won which of the following cup in sports?					
	A. Uber Cup					
	B. Thomas Cup					
	C. Davis Cup					
	D. FIFA world cup					
7	"He is the son of the only son of my grandfather," Lauren says, pointing to a					
	photograph. How is the man in the picture related to Lauren?					

	A. Brother	
	B. Father	
	C. Uncle	
	D. Cousin	
8	Two numbers are respectively 20% and 50% more than a third number. The ratio	
	of the two numbers is:	
	A. 2:5	
	B. 3:5	
	C. 4:5	
0	D. 5.4 Which was the biggost aircreft that was recently demaged in Ultraine Pussie war?	
9	which was the biggest ancialt that was recently damaged in Okrame Russia war?	
	A. Boeing 747 Dreamlifter	
	B. Aero Spaceline's Super Guppy	
	C. Antonov An-225 Mriya	
	D. Lockheed C-5 Galaxy	
10	The military operation which appeared Hyderabad into the Indian Union was code	
10	named as	
	A. Operation Vijav	
	B. Operation Polo	
	C. Operation Meghdoot	
	D. Operation Virat	
11	The 2022 International Booker Prize for translated fiction was recently awarded to	
	Geetanjali Shree for her novel named,	
	A Happy Stories	
	B. Cursed Bunny	
	C Heaven	
	D. Tomb of Sand	
12	Which of the following countries borders Ukraine?	
12.	A Germany	
	B Czech Republic	
	C. Slovakja	
	D. Croatia	
13	Two candidates are selected randomly with replacements from the list containing 8	
	boys and 10 girls. What will be the probability of at most one girl being selected?	
	A. 4/9	
	B. 36/81	
	C. 20/81	
	D. 5/9	
14	A, P, R, X, S, and Z are sitting in a row. S and Z are in the centre. A and P are at	
	the ends. R is sitting to the left of A. Who is to the right of S?	
	A. Z	
	B. R	
	C. A	

	D. P	
15.	From his house, Rohit went 15 km to the North. Then he turned to his left and	
	covered 10 km. Then he turned south and covered 5 km. Finally, turning to his left,	
	he covered 10 km. In which direction is he from his house?	
	A. East	
	B. North	
	C. North-East	
	D. South-West	
	Part B- CHEMISTRY and PHYSICS	
16	Which device is used to measure atmospheric pressure?	
10	A Odometer	
	B Barometer	
	C. Dynamometer	
	C. Dynamometer	
17	D. Hydrollieler	
1/	A concave mirror is neid in water. what should be the change in the local length of	
	A Helved	
	A. Halved P. Doubled	
	C. Pomoins the same	
	D. Increases exponentially	
18	Which of the following causes refraction of light?	
10	A Change in the density of light from one medium to another	
	B. Change in viscosity of light from one medium to another	
	C Change in the speed of light from one medium to another	
	D Change in direction of light from one medium to another	
19	Two beams one of red light and the other of blue light of the same intensity are	
17	incident on a metallic surface to emit photoelectrons. Which emits electrons of	
	greater frequency?	
	A Both	
	B Red light	
	C. Blue light	
	D. Neither	
20	Electric field inside a hollow conducting sphere	
	A. Increases with distance from the center of the sphere	
	B. Decreases with distance from the center of the sphere	
	C. is zero	
	D. May increase or decrease with distance from the center	
21	The dissolution of a substance in a solvent is accompanied with	
	A. Change in enthalpy	
	B. Change in entropy	
	C. Change in both a) and b)	
	D. None	
22	Which has the maximum freezing point?	
	A. 6 g CH ₃ COOH solution in 100 g water	

	B. 6 g NaCl solution in 100 g water	
	C. 6 g Urea solution in 100 g water	
	D. All have equal freezing point	
23	Hardness of water is 200 ppm in presence of CaCO3. Molarity of CaCO3 is	
	A. 2 X 10 ⁻³ M	
	B. 1 X 10 ⁻³ M	
	C. $2 X 10^{-2} M$	
	D. 2 X 10 ⁻⁴ M	
24	The rate constant of 1 st order reaction is 0.0693 min ⁻¹ . If we start with 20 mol/L, it	
	is reduced to 2.5 mol/L in	
	A. 40 min	
	B. 30 min	
	C. 20 min	
	D. 10 min	
25	The write of call constant is	
23		
	A. $\operatorname{CHI}^{\mathbf{R}}$ cm^{-1}	
	B. Cm^{-2}	
	$D_{\rm mel}/I$	
26	D. III01/L Determine the hybridization of evugan in CH_OH	
20		
	A. sp $P = cr^2$	
	B. sp^{-}	
	$C. sp^{-}$	
27	D. $sp^{2}d$	
27	what is the electron configuration for Fe^{-2} ?	
	A. 48 50 $P = 4e^{2}2d^{4}$	
	B. $45^{-}30^{-}$	
	$C. 45^{\circ}30^{\circ}$	
20	D. $48^{-}30^{\circ}$	
28	Calculate the wavelength of an electron traveling with a speed of 2.65 $\times 10^{\circ}$ m/s.	
	A. 2.7 X 10 ⁻¹⁰ m	
	B. 2.7 X 10 ⁻⁸ m	
	C. $2.9 \times 10^{-21} \text{ m}$	
	D. $2.9 \times 10^{-19} \text{m}$	
29	What is the correct IUPAC name of the following compound?	
	A. 3-Methyl-4-ethylhex-6-ene	
	B. 2,3-Diethylhex-5-ene	
	C. 4,5-Diethylhex-1-ene	
	D. 4-Ethyl-5-methylhept-1-ene	



	A. Conc. HCl	
	B. $Cu(0) + HCl$	
	C. CuCl ₂	
	D. Cu_2Cl_2	
37	Which of the following is the most adequate reagent for conversion of	
	acetophenone to ethyl benzene?	
	A. LiAlH ₄	
	B. NaBH ₄	
	C. NH ₂ NH ₂ in NaOH	
	D. H ₂ , Pd-C (Catal.)	
38	A Na ⁺ ion and a Cl ⁻ ion are separated from each other by 10 Å. In which medium	
	will the electrostatic force between them be the highest?	
	A. In vacuum	
	B. In water with dielectric constant = 80	
	C. In polymer with dielectric constant = 210	
20	D. Force will be the same in all the above media Three changes of 0.15 acquidistant from the origin at a distance of 1.207 Å	
39	arranged in an equilateral triangle in the ry plane. What is the electric field at the	
	origin?	
	A. $0.118 \times 10^{-11} \text{ N/C}$	
	B. 0	
	C. 0.118 X 10 ⁻²⁹ N/C	
	D. 0.118 X 10 ¹¹ N/C	
40	A TV tube contains two parallel plates 7.5 mm apart. If a potential difference of	
	150 V is maintained between them. What is the force on an electron in the gap	
	between the plates?	
	A. 3.2 X 10 ⁻¹⁵ N	
	B. 3.2 X 10 ⁻²⁰ N	
	C. 20 N	
	D. None of the above	
41	The dipole moment of a C=O bond is 2.70 D and the bond length is 0.122	
	nm. What is the effective charges on the two atoms (e represents the electronic	
	charge)?	
	A. 0.461 e	
	B. 7.38 X 10 ⁻²⁰ C	
	C. 7.38 e	
	D. Both (a) and (b)	
42	A geosynchronous satellite is one which	
	A. Revolves around the earth in the same speed as that of the earth's	
	revolution around the sun	
	B. Revolves around the earth in the same speed as that of the earth's	
	rotation around its axis	
	C. Its period of revolution matches the period of revolution of the moon	
	D. None of the above	

43	When sound waves travel from air to water, what happens?	
	A. Their frequency changes, but velocity remains constant	
	B. Their velocity changes, but frequency remains constant	
	C. Both velocity and frequency change	
	D. Both velocity and frequency remain unchanged	
44	The ear of some animals can distinguish ultrasonic sound waves, but not human	
	ear. What is the frequency of ultrasonic sound waves?	
	A. They have frequency lower than 10 milli Hz	
	B. They have frequency lower than 10 kilo Hz	
	C. They have frequency higher than 20 kilo Hz	
	D. They have frequency higher than 20 milli Hz	
45	Which optical phenomenon is involved in formation of rainbow?	
	A. Light scattering	
	B. Light reflection	
	C. Light refraction	
	D. Diffraction of light	
46	Which of the following is a magnetic material?	
	A. Carbon	
	B. Cobalt	
	C. Aluminium	
	D. Manganese	
47	Newtonian mechanics failed to explain which concept?	
	A. Motion of rocket	
	B. Features of atomic phenomena	
	C. Falling of objects on the ground	
	D. Motion of planets	
18	What is the coefficient of performance of a refrigerator? Let Ω_1 be the heat released	
-10	to hot reservoir. Ω_2 be the heat extracted from a cold reservoir & W be the work	
	done on the refrigerator	
	A. Q_1/W	
	B. Q_1/Q_2	
	$C. Q_2/W$	
	D. Q_2/Q_1	
49	Consider the damped SHM of a spring mass system. If the time taken for the	
	amplitude to become half is 'T', what is the time taken for mechanical energy to	
	become half?	
	A. T	
	B. T/2	
	C. 2T D. T/4	
50	U. 1/4 Which of the following is the methometical representation of law of conversion of	
50	which of the following is the mathematical representation of law of conservation of total linear momentum?	
	total linear momentum?	

	A. $dP/dt = 0$	
	B. $dF/dt = 0$	
	C. $dP/dt = F_{internal}$	
	D. $dF/dt = P$	
51	Smoke generally has a blue tinge. This is due to	
	A. Light Scattering	
	B. Coagulation	
	C. Brownian motion	
	D. Electro-osmosis	
52	After the electrolysis of aqueous solution of NaCl using Pt electrodes, the pH of the	
	solution will	
	A. Remain constant	
	B. Increase	
	C. Decrease	
	D. Cannot be determined	
53	What is the coordination number of Cobalt in the $[Co(H_2O)_4 (NO_3)_2]^{2-}$ and	
	$[Co(CO)_2Cl_4]^+$, respectively?	
	A. 6 and 6	
	B. 4 and 4	
	C. 2 and 1	
	D. 8 and 5	
54	Choose the correct decreasing order of the oxidation state of nitrogen from the	
	following	
	A. HNO_3 , NH_3 , NO , N_2	
	B. HNO ₃ , NO, NH ₄ Cl, N ₂	
	C. HNO_3 , NO , N_2 , NH_3	
	D. NH_3 , HNO_3 , NO , N_2	
55	Which set of four quantum numbers corresponds to an electron in a 4p orbital?	
	A. $n = 4$, $l = 1$, $ml = 0$, $m_s = 1/2$	
	B. $n = 4, l = 3, ml = 3, m_s = -1/2$	
	C. $n = 4, l = 2, ml = 0, m_s = 1/2$	
	D. $n = 4$, $l = 4$, $ml = 3$, $m_s = -1/2$	
	Part C (Biology)	
56	When calyx and corolla are fused it is known as?	
	A. Corolla	
	B. Sepals	
	C. Petals	
	D. Perianth	
57	The oxidation state of Fe in Methemoglobin is	
	A. +1	
	$\begin{array}{c} B. +2 \\ C +2 \end{array}$	
	C. +3	
50	D. None of the above	
58	which of the following cytoskeletal elements is not found in plants	
	A. Inicrotubules	
	B. actin filaments	

D. spindle fiber 59 Islets of Langerhans are found in A. liver B. gall bladder C. small intestine	
 59 Islets of Langerhans are found in A. liver B. gall bladder C. small intestine 	
A. liverB. gall bladderC. small intestine	
B. gall bladder C. small intestine	
C. small intestine	
D. pancreas	
60 Mycorrhizae are mutualistic associations between Fungi and	
A. Algae	
B. Bacteria	
C. Fungi	
D. Vascular plants	
61 NADPH is generated in which of the following pathway?	
A. Kreb's cycle	
B. Photosynthesis	
C. Glycolysis	
D. Urea cycle	
62 Which of the following characteristics is common in humans and adult frog	gs?
A. Four-chambered heart	
B. internal fertilization	
C. nucleated RBCs	
D. ureotelic mode of excretion	
63 Which of the following is an X-Chromosome linked genetic disorder?	
A. sickle cell disease	
B. Hemophilia	
C. Thalassemia	
D. Leukemia	
64 A linear peptide is made up of 6 residues of an amino acid of molecular we	ight
120Da. The molecular weight of the peptide will be	
A. 618	
B. 630	
C. 600	
D. 720	
65 Which of the following structures in Pheretima is correctly matched with its	s
function?	
A. clitellum- secretes cocoon	
B. gizzard- absorbs digested food	
C. setae- defence against predators	
D. typhlosole- storage of extra nutrients	
66 Antibody present in tears is	
A. IgA	
B. IgG	
C. IgD	
D. IgM	
67 Test cross involves:	

	A. crossing between two genotypes with dominant trait	
	B. crossing between two genotypes with recessive trait	
	C. crossing between two F1 hybrids	
	D. crossing the F1 hybrid with a double recessive genotype	
68	Convergent evolution is illustrated by evolution of	
	A. rat and dog	
	B. bacterium and protozoan	
	C. starfish and cuttlefish	
	D. dogfish and whale	
69	Which of the following techniques will be useful for tracing the origin of particular	
	tribe?	
	A. blood grouping.	
	B. mitochondrial DNA analysis.	
	C. DNA fingerprinting.	
-	D. karyotyping.	
70	Bacterial infection can be treated by an antibiotic that blocks protein synthesis. why	
	it does not affect human cell?	
	A. Human and bacterial ribosomes are different	
	B. Antibiotic molecules can't enter human cells.	
	C. Antibiotic gets degraded by human cell.	
71	D. different genetic code of numan and bacteria.	
/1	Which of the following is true for Golden rice?	
	A. It is vitamin A enriched, with a gene from dailodil B. It is nost resistant, with a gene from Basillus thuringinging	
	B. It is pest resistant, with a gene from Bacillus thuringtensis	
	C. It is drought tolerant, developed using Agrobacterium vector D. It has vallow grains, because of a gone introduced from a primitive variety	
	of rice	
72	The upright pyramid of number is absent in .	
	A. pond	
	B. lake	
	C. forest	
	D. grassland	
73	A heterozygous colorblind woman marries a color blind man. What is the ratio of	
	carrier daughters, color blind daughters, normal sons and color blind sons in F1	
	generation?	
	A. 1:2:2:1	
	B. 1:1:1:1	
	C. 2:1:1:2	
	D. 1:1:2:2	
74	Full form of shRNA is	
	A. Small helix Ribonucleic Acid	
	B. Single hairpin Ribonucleic Acid	
	C. Short hairpin Ribonucleic Acid	
	D. Short Ribonucleic Acid	
75	Hormone Releasing Intrauterine Devices release	

	A. synthetic form of the hormone Estrogen	
	B. synthetic form of the hormone progesterone	
	C. synthetic form of the hormone Prolactin	
	D. synthetic form of the hormone Testosterone	
76	The glucose homeostasis is maintained in the body by	
	A. Insulin	
	B. Glucagon	
	C. Insulin & Glucagon	
	D. Somatostatin	
77	What is the site of perception of photoperiod necessary for induction of flowering	
	in plants?	
	A. Lateral buds	
	B. Pulvinus	
	C. Shoot apex	
70	D. Leaves	
/8	Thermogenin is responsible for	
	A. Uncoupling of oxidative phosphorylation	
	B. Thermal insulation	
	C. Shivering theromogenesis	
	D. Glucose production	
79	Which of the following is NOT an RNA virus	
	A. Hepatitis B virus	
	B SARS-CoV-2	
	C Ebola Virus	
	D Hepatitis C Virus	
80	Which of the following immune responses is responsible for rejection of kidney	
00	oraft?	
	A. Auto- immune response	
	B. Humoral immune response	
	C. Inflammatory immune response	
	D. Cell-mediated immune response	
81	Which of the following is a polysaccharide of animal origin	
	A. Pectin	
	B. Cellulose	
	C. Chitin	
	D. Arabinoxylans	
82	At meta phase, chromosomes are attached to the spindle fibres by	
	A. Satellites	
	B. Centromere	

	C. Kinetochore	
	D. None of the above	
83	Hexokinase and Glucokinase are example of	
	A. Apoenvzme	
	B. Holoenzyme	
	C. Co enzyme	
	D. Isoenzyme	
84	Which of the following one is called molecule scissors?	
	A. Ligases	
	B. Restriction endonucleases	
	C. Reverse transcriptase	
	D. Exonucleases	
85	Which of the following hormone is released by the pineal gland?	
	A. FSH	
	B. Melatonin	
	C. ACTH	
	D. MSH	
86	Humoral immunity is mediated by	
	A. T cells	
	B. Dendritic cells	
	C. Plasma cells	
	D. NK cells	
87	Zymogens of pancreatic juice are activated by	
	A. Kinase	
	B. Phosphatase	
	C. Enterokinase	
	D. Trypsinogen	
88	Which enzyme is used for lysis of plant cells during DNA isolation?	
	A. Lysozyme	
	B. Cellulase	
	C. Chitinase	
	D. Hydrolase	
89	Role of parathyroid hormone is to	
	A. regulate thyroid hormone levels	
	B. regulate body temperature	
	C. regulate levels of iodine	
	D. regulate levels of Calcium	

90	Which of the following is an autonomously replicating circular extra-chromosomal	
	DNA, used for rDNA technology	
	A. Callus	
	B. Plasmid	
	C. Protoplast	
	D. Transposon	
91	Cell wall of cyanobacteria is mainly composed of	
	A. Chitin	
	B. Cellulose	
	C. Chitosan	
	D. Peptidoglycan	
92	Which of the following phase is dominant in bryophyte lifecycle?	
	A. Gametophyte	
	B. Sporophyte	
	C. Pteridophyte	
	D. Cryptophyte	
93	Chlorophyll b is found in	
	A. land plants	
	B. green algae	
	C. cyanobacteria	
	D. All of these	
94	Movement of food through the gastrointestinal tract is known	
	A. mastication	
	B. ejection	
	C. emulsification	
05	D. peristalsis	
95	The chloroplast evolved from	
	A. Blue-green algae	
	B. Brown algae	
	C. Green algae	
06	D. Ked algae	
90	which of the following is a Surphur containing annuo acid?	
	A. Proline	
	B. Histidine	
	C. Cysteine	
	D. Glycine	
97	Which of the following glucose transporters is insulin-dependent?	
	A. GLUT I	
	B. GLUT II	
	C. GLUT III	
	D GLUTIV	
98	Which one of the following phyla is correctly matched with its two general	
	characteristics?	

	A.	Echinodermata- pentamerous radial symmetry and mostly internal					
		fertilization					
	В.	follusca- normally oviparous and development through a trochophore or					
		veliger larva					
	C.	Arthropoda- body divided into head, thorax and abdomen and respiration					
		by tracheae					
	D.	Chordata- notochord at some stage and separate anal and urinary openings					
		to the outside					
99	Mucus	s is secreted by which cells in the gastro-intestinal tract?					
	А	Chief Cells					
	B	Goblet cells					
	D. C	Oxyntic cells					
	С. D	Duodonal calla					
	D.	Duodenai cens					
100	Which	one of the following is an example of polygenic inheritance?					
	A.	skin colour in humans					
	B.	flower colour in Mirabilis jalapa					
	C.	production of male honey bee					
	D.	pod shape in garden pea					

5 year integrated M.Sc. in Cell and Molecular Biology

Entrance exam 8-7-2022

ANSWER KEY (SET-C)

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

D



Test Registration No. _

The Maharaja Sayajirao University of Baroda Faculty of Science

M.Sc. ENTRANCE EXAMINATION

SUBJECT: Five Year Integrated M.Sc. in Cell & Molecular BiologyDAY: FridayDATE: 8th July 2022TIME: 12:00 Pm to 1:30 pm

Important Instructions:

- 1. This test booklet is to be opened only when instructed by the invigilators to do so.
- 2. This booklet carries 100 questions on 14 printed pages. All questions carry equal marks.
- 3. For every correct answer, candidate will earn 1 mark, for every wrong answer 25% mark will be deducted.
- 4. **Test Registration Number** must be entered correctly in the OMR sheet, as advised by the invigilators. The **Question Booklet code (A, B, C, or D)** must also be mentioned on the OMR sheet (if not printed already) as instructed.
- 5. Answers must be marked in the OMR sheet using **a black or dark blue ball point pen only**. The circle should be filled in completely, leaving no gaps.
- 6. Gadgets (Mobile phones, pagers, ear phones, music players, calculators, smart watches etc.) are strictly prohibited in the exam hall. If any candidate is found in possession of any of these at his/her exam seat, he/she is liable to be disqualified.
- 7. In case of tie in the marks the merit will be considered based on total marks in qualifying examination.

Correct way of marking answer:

Incorrect way of marking answer:





Invigilator's signature_

Five Year Integrated M.Sc. in Cell & Molecular Biology Faculty of Science The M. S. University of Baroda Vadodara

Entrance Test - 2022

	Part-A	
	GENERAL APTITUDE & GENERAL KNOWLEDGE QUESTIONS	
No.	Questions	
1	Two numbers are respectively 20% and 50% more than a third number. The ratio	
	of the two numbers is:	
	A. 2:5 D. 2:5	
	B. 5:5 C. 4:5	
	D 5:4	
2	Which was the biggest aircraft that was recently damaged in Ukraine Russia war?	
-		
	A. Boeing 747 Dreamlifter	
	B. Aero Spaceline's Super Guppy	
	C. Antonov An-225 Mriya	
	D. Lockheed C-5 Galaxy	
3	The military operation which annexed Hyderabad into the Indian Union was code	
	named as	
	A. Operation Vijay	
	B. Operation Polo	
	C. Operation Meghdoot	
	D. Operation Virat	
4	The 2022 International Booker Prize for translated fiction was recently awarded to	
	Geetanjali Shree for her novel named,	
	A. Happy Stories	
	B. Cursed Bunny	
	C. Heaven	
	D. Tomb of Sand	
5	Which of the following countries borders Ukraine?	
	A. Germany	
	B. Czech Republic	
	C. Slovakia	
-	D. Croatia	
6	Which of the following organization decides the REPO rate?	
	A. Keserve Bank of India D. Securities Euclidean as Decard of India	
	B. Securities Exchange Board of India C. Incurance Regulatory and Development Authority	
	C. Insurance Regulatory and Development Authority	

	D. State Bank of India	
7	The size of SARS-CoV2 viral genome is approximately	
	A. 22 kb	
	B. 30 kb	
	C. 50 kb	
	D. 67 kb	
8	How many different salads can be made from carrot, tomato, onion, cucumber, and	
	capsicum?	
	A. 31 D. 126	
	D. 120 C. 15	
	D 625	
9	In how many ways you can rearrange word "SCIENCE"?	
-	A. 5040	
	B. 1260	
	C. 1060	
	D. 2520	
10	India has won which of the following cup in sports?	
	A. Uber Cup	
	B. Thomas Cup	
	C. Davis Cup	
11	D. FIFA world cup Two candidates are selected randomly with replacements from the list containing 8	
11	how and 10 girls. What will be the probability of at most one girl being selected?	
	$\Lambda = \frac{1}{2}$	
	A. 4/9 D. 26/81	
	D. $30/81$	
	C. $20/81$	
12	D. $J/2$	
12.	A, T, K, A, S, and Z are strong in a row. S and Z are in the centre. A and T are at the ends R is sitting to the left of A. Who is to the right of S?	
	A. Z	
	B. R	
	C. A	
	D. P	
13	From his house, Rohit went 15 km to the North. Then he turned to his left and	
	covered 10 km. Then he turned south and covered 5 km. Finally, turning to his left,	
	he covered 10 km. In which direction is he from his house?	
	A. East D. North	
	D. NOIM C. North-East	
	D South-West	

14	"He is the son of the only son of my grandfather," Lauren says, pointing to a	
	photograph. How is the man in the picture related to Lauren?	
	A. Brother	
	B. Father	
	C. Uncle	
	D. Cousin	
15.	Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What	
	is the probability that the ticket drawn has a number which is a multiple of 3 or 5?	
	A. 9/20	
	B. 8/15	
	C. $1/2$ D. $2/5$	
	D. 5/5 Deart P. CHEMISTDV and DUVSICS	
	Fart B- CHEWIISTKT and FHISICS	
16	Determine the hybridization of oxygen in CH ₃ OH	
	A. sp	
	B. sp^2	
	$C. sp^3$	
17	D. $sp^{2}d$ What is the electron configuration for Ea^{2+2}	
1/	what is the electron configuration for Fe ? $A = As^2 3d^6$	
	$\begin{array}{c} A. 48.50\\ B. 4s^23d^4 \end{array}$	
	$\begin{array}{c} \mathbf{D} \cdot 4 5 5 \mathbf{d} \\ \mathbf{C} \cdot 4 5^{0} 3 \mathbf{d}^{6} \end{array}$	
	D. $4s^23d^8$	
18	Calculate the wavelength of an electron traveling with a speed of 2.65×10^6 m/s.	
	$A = 2.7 \times 10^{-10} \text{ m}$	
	B $2.7 \times 10^{-8} \text{ m}$	
	C. $2.9 \times 10^{-21} \text{ m}$	
	D. $2.9 \times 10^{-19} \text{m}$	
19	What is the correct IUPAC name of the following compound?	
	A 2 Mathril 4 athribay 6 and	
	A. 5-Methyl-4-ethylnex-o-ene B 2.3-Diethylbey-5-ene	
	C = 4.5-Diethylhex-1-ene	
	D. 4-Ethyl-5-methylhept-1-ene	
20	What major product is obtained when anisole (PhOMe) is treated with n-	
	propylchloride and anhydrous AlCl ₃ ?	
	A B C D	



	D. All have equal freezing point	
28	Hardness of water is 200 ppm in presence of CaCO3. Molarity of CaCO3 is	
	A. 2 X 10 ⁻³ M	
	B. 1 X 10 ⁻³ M	
	C. $2 \times 10^{-2} M$	
	D. 2 X 10 ⁻⁴ M	
29	The rate constant of 1 st order reaction is 0.0693 min ⁻¹ . If we start with 20 mol/L, it	
	is reduced to 2.5 mol/L in	
	$\Lambda = 40$ min	
	$\begin{array}{c} A. 40 \text{ min} \\ B. 20 \text{ min} \end{array}$	
	$\begin{array}{c} \mathbf{D} 30 \text{ min} \\ \mathbf{C} 20 \text{ min} \end{array}$	
	D 10 min	
	D. 10 mm	
30	The unit of cell constant is	
	A. cm	
	B. cm^{-1}	
	C. cm^{-2}	
	D. mol/L	
31	Smoke generally has a blue tinge. This is due to	
	A. Light Scattering	
	B. Coagulation	
	C. Brownian motion	
	D. Electro-osmosis	
32	After the electrolysis of aqueous solution of NaCl using Pt electrodes, the pH of the	
	solution will	
	A. Remain constant	
	B. Increase	
	C. Decrease	
	D. Cannot be determined	
33	What is the coordination number of Cobalt in the $[Co(H_2O)_4 (NO_3)_2]^{2-}$ and	
	$[Co(CO)_2Cl_4]^+$, respectively?	
	A. 6 and 6	
	B. 4 and 4	
	C. 2 and 1	
	D. 8 and 5	
34	Choose the correct decreasing order of the oxidation state of nitrogen from the	
	following	
	A. HNO_3 , NH_3 , NO , N_2	
	B. HNO_3 , NO, NH_4Cl , N_2	
	C. HNO_3 , NO , N_2 , NH_3	
25	D. NH ₃ , HNO ₃ , NO, N ₂	
35	Which set of four quantum numbers corresponds to an electron in a 4p orbital?	
	A. $n = 4, l = 1, ml = 0, m_s = 1/2$	
	B. $n = 4, l = 3, ml = 3, m_s = -1/2$	
	C. $n = 4, l = 2, ml = 0, m_s = 1/2$	
	D. $n = 4$, $l = 4$, $ml = 3$, $m_s = -1/2$	

36	Which of the following is the most suitable reagent used for converting ArN ₂ Cl to	
	ArCl?	
	A. Conc. HCl	
	B. $Cu(0) + HCl$	
	C. $CuCl_2$	
	D. Cu_2Cl_2	
37	Which of the following is the most adequate reagent for conversion of	
	acetophenone to ethyl benzene?	
	A. LiAlH ₄	
	B. NaBH ₄	
	C. NH ₂ NH ₂ in NaOH	
	D. H ₂ , Pd-C (Catal.)	
38	A Na ⁺ ion and a Cl ⁻ ion are separated from each other by 10 Å. In which medium	
	will the electrostatic force between them be the highest?	
	A. In vacuum	
	B. In water with dielectric constant = 80	
	C. In polymer with dielectric constant = 210	
20	D. Force will be the same in all the above media Three charges of 0.15 , equidictant from the origin at a distance of 1.207 Å	
39	arranged in an equilatoral triangle in the xy plane. What is the electric field at the	
	origin?	
	$A = 0.118 \times 10^{-11} \text{ N/C}$	
	B 0	
	C. $0.118 \times 10^{-29} \text{ N/C}$	
	D. $0.118 \times 10^{11} \text{ N/C}$	
40	A TV tube contains two parallel plates 7.5 mm apart. If a potential difference of	
	150 V is maintained between them. What is the force on an electron in the gap	
	between the plates?	
	A. 3.2 X 10 ⁻¹⁵ N	
	B. 3.2 X 10 ⁻²⁰ N	
	C. 20 N	
	D. None of the above	
41	The dipole moment of a C=O bond is 2.70 D and the bond length is 0.122	
	nm. What is the effective charges on the two atoms (e represents the electronic	
	charge)?	
	A. 0.461 e	
	B. $7.38 \times 10^{-20} \text{ C}$	
	C. 7.38 e	
	D. Both (a) and (b)	
42	A geosynchronous satellite is one which	
	A. Revolves around the earth in the same speed as that of the earth's	
	revolution around the sun	
	B. Revolves around the earth in the same speed as that of the earth's	
	rotation around its axis	

	C. Its period of revolution matches the period of revolution of the moon	
13	D. Note of the above When sound ways travel from air to water, what happens?	
43	A Their frequency changes but valority remains constant	
	A. Their requercy changes, but velocity remains constant	
	B. Their velocity changes, but frequency remains constant	
	C. Both velocity and frequency change	
	D. Both velocity and frequency remain unchanged	
44	The ear of some animals can distinguish ultrasonic sound waves, but not human	
	ear. What is the frequency of ultrasonic sound waves?	
	A. They have frequency lower than 10 milli Hz	
	B. They have frequency lower than 10 kilo Hz	
	C. They have frequency higher than 20 kilo Hz	
	D. They have frequency higher than 20 milli Hz	
45	Which optical phenomenon is involved in formation of rainbow?	
	A. Light scattering	
	B. Light reflection	
	C. Light refraction	
	D. Diffraction of light	
46	Which of the following is a magnetic material?	
	A. Carbon	
	B. Cobalt	
	C. Aluminium	
	D. Manganese	
47	Newtonian mechanics failed to explain which concept?	
	A. Motion of rocket	
	B. Features of atomic phenomena	
	C. Falling of objects on the ground	
	D. Motion of planets	
48	What is the coefficient of performance of a refrigerator? Let Q ₁ be the heat released	
	to hot reservoir, Q_2 be the heat extracted from a cold reservoir & W be the work	
	done on the refrigerator.	
	A. Q_1/W	
	$\begin{array}{c} B. Q_1/Q_2 \\ C. Q. W \end{array}$	
	$C. Q_2/W$	
	$D. Q_2/Q_1$	
49	Consider the damped SHM of a spring mass system. If the time taken for the	
	amplitude to become half is 'T', what is the time taken for mechanical energy to	
	become half?	
	A. T	
	B. T/2	
	C. 2T	
	D. T/4	

50	Which of the following is the mathematical representation of law of conservation of							
	total linear momentum?							
	A. $dP/dt = 0$							
	B. $dF/dt = 0$							
	C. $dP/dt = F_{internal}$							
	D. $dF/dt = P$							
51	Which device is used to measure atmospheric pressure?							
	A. Odometer							
	B. Barometer							
	C. Dynamometer							
	D. Hydrometer							
52	A concave mirror is held in water. What should be the change in the focal length of							
	the mirror?							
	A. Halved							
	B. Doubled							
	C. Remains the same							
52	D. Increases exponentially Which of the following courses refraction of light?							
33	A Change in the density of light from one medium to another							
	B Change in viscosity of light from one medium to another							
	C. Change in the speed of light from one medium to another							
	D. Change in direction of light from one medium to another							
54	Two beams, one of red light and the other of blue light, of the same intensity are							
	incident on a metallic surface to emit photoelectrons. Which emits electrons of							
	greater frequency?							
	A. Both							
	B. Red light							
	C. Blue light							
	D. Neither							
55	Electric field inside a hollow conducting sphere							
	A. Increases with distance from the center of the sphere							
	B. Decreases with distance from the center of the sphere $C_{\rm res}$ is zero.							
	D May increase or decrease with distance from the center							
	Part C (Biology)							
56	Humoral immunity is mediated by							
00								
	A. T cells							
	B. Dendritic cells							
	C. Plasma cells							
	D. NK cells							
57	Zymogens of pancreatic juice are activated by							
	A. Kinase							

	B. Phosphatase	
	C. Enterokinase	
	D. Trypsinogen	
58	Which enzyme is used for lysis of plant cells during DNA isolation?	
	A. Lysozyme	
	B. Cellulase	
	C. Chitinase	
	D. Hydrolase	
50	Pole of parethyroid hormone is to	
39	A regulate thyroid hormone levels	
	A. regulate division normone levels	
	B. regulate body temperature	
	C. regulate levels of iodine	
	D. regulate levels of Calcium	
60	Which of the following is an autonomously replicating circular extra-chromosomal	
	DNA, used for rDNA technology	
	A. Callus	
	B. Plasmid	
	D. Transposon	
61	D. Haisposoli Cell well of even obseteria is mainly composed of	
01	A Chitin	
	B Cellulose	
	C. Chitosan	
	D. Peptidoglycan	
62	Which of the following phase is dominant in bryophyte lifecycle?	
	A. Gametophyte	
	B. Sporophyte	
	C. Pteridophyte	
	D. Cryptophyte	
63	Chlorophyll b is found in	
	A. land plants	
	B. green algae	
	C. cyanobacteria	
	D. All of these	
64	Movement of food through the gastrointestinal tract is known	
	A. mastication	
	B. ejection	
	D. poristolsis	
65	D. peristalsis The chloroplast evolved from	
05	$A = Blue_areen algae$	
	A. Diuc-giccii algac B. Brown algae	
	C Green algae	
	D Red algae	
L		

66	When calyx and corolla are fused it is known as?									
	A. Corolla									
	B. Sepals									
	C. Petals									
	D. Perianth									
67	The oxidation state of Fe in Methemoglobin is									
	A. +1									
	B. +2									
	C. +3									
	D. None of the above									
68	Which of the following cytoskeletal elements is not found in plants									
	A. microtubules									
	B. actin filaments									
	C. intermediate filaments									
	D. spindle fiber									
69	Islets of Langerhans are found in									
	A. liver									
	B. gall bladder									
	C. small intestine									
	D. pancreas									
70	Mycorrhizae are mutualistic associations between Fungi and									
	A. Algae									
	B. Bacteria									
	C. Fungi									
	D. Vascular plants									
71	Which of the following is true for Golden rice?									
	A. It is Vitamin A enriched, with a gene from daffodil									
	B. It is pest resistant, with a gene from Bacillus thuringiensis									
	C. It is drought tolerant, developed using Agrobacterium vector									
	D. It has yellow grains, because of a gene introduced from a primitive variety									
	of rice									
72	The upright pyramid of number is absent in									
	A. pond									
	B. lake									
	C. forest									
	D. grassland									
73	A heterozygous colorblind woman marries a color blind man. What is the ratio of									
15	carrier daughters, color blind daughters, normal sons and color blind sons in F1									
	generation?									
	$\Delta 1.2.2.1$									
	B 1.1.1.1									
	C 2.1.1.1									
	D $1 \cdot 1 \cdot 2 \cdot 2$									
74	Full form of shPNA is									
/4	Full follit of ShKINA IS									
	A. Small neux Kibonucielc Acid									

	B. Single hairpin Ribonucleic Acid										
	C. Short hairpin Ribonucleic Acid										
	D. Short Ribonucleic Acid										
75	Hormone Releasing Intrauterine Devices release										
	A. synthetic form of the hormone Estrogen										
	B. synthetic form of the hormone progesterone										
	C. synthetic form of the hormone Prolactin										
	D. synthetic form of the hormone Testosterone										
76	The glucose homeostasis is maintained in the body by										
	A. Insulin										
	B. Glucagon										
	C. Insulin & Glucagon										
	D. Somatostatin										
77	What is the site of perception of photoperiod necessary for induction of flowering										
	in plants?										
	A. Lateral buds										
	B. Pulvinus										
	C. Shoot apex										
70	D. Leaves										
78	Thermogenin is responsible for										
	A. Uncoupling of oxidative phosphorylation										
	B. Thermal insulation										
	C. Shivering theromogenesis										
-	D. Glucose production										
79	Which of the following is NOT an RNA virus										
	A. Hepatitis B virus										
	B. SARS-CoV-2										
	C. Ebola Virus										
	D. Hepatitis C Virus										
80	Which of the following immune responses is responsible for rejection of kidney										
	graft?										
	A Auto immuna response										
	A. Auto- minute response B. Humoral immune response										
	C. Inflammatory immune response										
	D Cell-mediated immune response										
81	Which of the following is a polysaccharide of animal origin										
	A. Pectin										
	B. Cellulose										
	C. Chitin										

	D. Arabinoxylans	
82	At meta phase, chromosomes are attached to the spindle fibres by	
	A. Satellites	
	B. Centromere	
	C. Kinetochore	
	D. None of the above	
83	Hexokinase and Glucokinase are example of	
	A. Apoenyzme	
	B. Holoenzyme	
	C. Co enzyme	
	D. Isoenzyme	
84	Which of the following one is called molecule scissors?	
	A. Ligases	
	B. Restriction endonucleases	
	C. Reverse transcriptase	
	D. Exonucleases	
85	Which of the following hormone is released by the pineal gland?	
	A. FSH	
	B. Melatonin	
	C. ACTH	
	D. MSH	
86	NADPH is generated in which of the following pathway?	
	A. Kreb's cycle	
	B. Photosynthesis	
	C. Glycolysis	
87	D. Utea cycle Which of the following characteristics is common in humans and adult frogs?	
07	A Four-chambered heart	
	B. internal fertilization	
	C. nucleated RBCs	
	D. ureotelic mode of excretion	
88	Which of the following is an X-Chromosome linked genetic disorder?	
	A. sickle cell disease	
	B. Hemophilia	
	C. Thalassemia	
	D. Leukemia	
89	A linear peptide is made up of 6 residues of an amino acid of molecular weight	
	120Da. The molecular weight of the peptide will be	
	A. 618	

	B. 630 C. 600 D. 720	
90	 Which of the following structures in Pheretima is correctly matched with its function? A. clitellum- secretes cocoon B. gizzard- absorbs digested food C. setae- defence against predators D. typhlosole- storage of extra nutrients 	
91	 Which of the following is a Sulphur containing amino acid? A. Proline B. Histidine C. Cysteine D. Glycine 	
92	 Which of the following glucose transporters is insulin-dependent? A. GLUT I B. GLUT II C. GLUT III D. GLUT IV 	
93	 Which one of the following phyla is correctly matched with its two general characteristics? A. Echinodermata- pentamerous radial symmetry and mostly internal fertilization B. Mollusca- normally oviparous and development through a trochophore or veliger larva C. Arthropoda- body divided into head, thorax and abdomen and respiration by tracheae D. Chordata- notochord at some stage and separate anal and urinary openings to the outside 	
94	 Mucus is secreted by which cells in the gastro-intestinal tract? A. Chief Cells B. Goblet cells C. Oxyntic cells D. Duodenal cells 	
95	Which one of the following is an example of polygenic inheritance?A. skin colour in humansB. flower colour in Mirabilis jalapaC. production of male honey beeD. pod shape in garden pea	

96	Antibody present in tears is							
	A. IgA							
	B. IgG							
	C. IgD							
	D. IgM							
97	Test cross involves:							
	A. crossing between two genotypes with dominant trait							
	B. crossing between two genotypes with recessive trait							
	C. crossing between two F1 hybrids							
	D. crossing the F1 hybrid with a double recessive genotype							
98	Convergent evolution is illustrated by evolution of							
	A. rat and dog							
	B. bacterium and protozoan							
	C. starfish and cuttlefish							
	D. dogfish and whale							
99	Which of the following techniques will be useful for tracing the origin of particular							
	tribe?							
	A. blood grouping.							
	B. mitochondrial DNA analysis.							
	C. DNA fingerprinting.							
	D. karyotyping.							
100	Bacterial infection can be treated by an antibiotic that blocks protein synthesis. why							
	it does not affect human cell?							
	A. Human and bacterial ribosomes are different							
	B. Antibiotic molecules can't enter human cells.							
	C. Antibiotic gets degraded by human cell.							
	D. different genetic code of human and bacteria.							

5 year integrated M.Sc. in Cell and Molecular Biology

Entrance Exam 8-7-2022

ANSWER KEY (SET-D)

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