

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

Physical Sciences
Entrance Exam January 2024

Sl No	Question	Option 1	Option 2	Option 3	Option 4	Correct Option
1	The smallest particle that takes part in a chemical reaction is	Atom	Molecule	Proton	Neutron	1
2	The valency of Aluminum in Al_2O_3 is	2	1	3	4	3
3	Humidity in air is measured by	Hydrometer	Hygrometer	Manometer	Hubometer	2
4	A material having different properties in different directions is known as:	Amorphous	Austenite	Anisotropic	Crystalline	3
5	Which bond in the list has the highest bond energy?	H-H	H-O	H-F	H-I	3
6	0.5 square meters is equal to	50 sq.cm	500 sq.cm	5000 sq.cm	50000 sq.cm	3
7	Which of the following electronic configurations corresponds to a noble gas	2,8,4	2,8,18,8	2,8,18,7	2,8,3	2
8	National Science day is celebrated on 28 th February to honour	Sir C. V. Raman	Homi Bhabha	S.N.Bose	Vikram Sarabhai	1
9	Meniscus of mercury in capillary is	Concave	Convex	Plane	Cylindrical	2
10	A metal needle or a pin can be made floating on the surface of water because of	Surface tension	Lighter weight	Adhesive force	Viscosity	1
11	When iron rusts, its weight	Increases	Decreases	Remains same	First increases and then decreases	1
12	Dry ice is	solid ammonia	solid carbon dioxide	solid nitrogen	solid carbon monoxide	2
13	Hydrogen bomb is based on the principle of	Nuclear fission	Natural Radioactivity	Nuclear Fusion	Artificial Radioactivity	3

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14	The superconductivity is characterized by	High electrical resistance	Medium electrical resistance	Low electrical resistance	Zero electrical resistance	4
15	Which of the following has the same atomic number and atomic weight?	Chlorine	Nitrogen	Helium	Hydrogen	4
16	A pressure cooker reduces cooking time because	The heat is more evenly distribute	The higher pressure tenderizes the food	The boiling point of the water inside is elevated	A large flame is use	3
17	'Flow chart' used by a computer professional is	Computer programme	Pictorial representation at computer	Pictorial representation of algorithm	Picture of computer units	3
18	Water passes from the soil into the root hair by a physical process called	Diffusion	Absorption	Osmosis	Adsorption	3
19	'Poise' is the unit of	Coefficient of viscosity	Coefficient of friction	Coefficient of bulk modulus	Coefficient of young's modulus	1
20	How many electrons are involved in the double bond between two atoms?	2	4	6	3	2
21	Which of the following effects occurs for transverse waves but not for longitudinal waves?	Interference	Diffraction	Reflection	Polarization	4
22	For a parallel-plate capacitor with plate area "A" and plate separation "d", the capacitance is proportional to which of the following?	A divided by d squared	A times d	A divided by d	D divided by A	3

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Entrance Exam January 2024

23	The vibrational energy of a molecule in its ground state is	0	$1/2h\nu_0$	$h\nu_0$	$3/2h\nu_0$	2
24	Einstein's theory concludes that at lower temperatures the specific heat	Drops linearly with increase of temperature	Drops linearly with decrease of temperature	Drops exponentially with decrease of temperature	Remains constant of temperature	3
25	Which of the following statement about the energy in a quantum of radiation is true?	Varies directly with frequency	Varies inversely with frequency	Same for all frequencies	Not related to frequency	1
26	A boy throws a ball vertically upward with a velocity of 6 meters per second. How long does it take the ball to return to the boy's hand?	1.22 Sec	2.2Min	4.2Min	4.2Sec	1
27	Regarding diffraction which of the following is false?	it is best explained with the wave theory of light	it occurs when there is an obstruction to the light	both constructive and destructive interference occurs	it decreases with longer wavelength	4
28	Caesium has nuclear spin of $7/2$. The hyperfine spectrum of the d lines of the caesium atom of the d line will consist of	10 lines	4 lines	6 lines	14 lines	1
29	Piezoelectric effect is the production of electricity by	chemical effect	varying field	temperature	pressure	4
30	The favourable condition both for superconductivity and high resistance is	a weak electron-phonon interaction	a strong electron-phonon interaction	a weak phonon-phonon interaction	a strong phonon-phonon interaction	2

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THIRUVANANTHAPURAM – 695 011, KERALA ,INDIA

Physical Sciences
Entrance Exam January 2024

31	To obtain laser from a system, the stimulating radiation must be	electromagnetic wave of any frequency with suitable phase	electromagnetic wave of any frequency with any phase	electromagnetic wave of suitable frequency with any phase	any wave with suitable frequency	3
32	If r is the radius of the atom in a crystal, crystallizing in the simple cubic structure, then the nearest neighbour distance is	$r/2$	$2r$	$4r$	$6r$	2
33	Magnetic materials which can be readily magnetized in either direction are called	soft magnetic materials	hard magnetic materials	low hysteresis loss materials	high hysteresis loss materials	1
34	The half-life of an isotope of an element is 5 days. The mass of a 10 gram sample of this isotope remaining after 20 days is:	0.312 grams	0.625 grams	1.25 grams	2.50 grams	2
35	In a junction diode, for which X is the width of the depletion layer, the transition capacitance (C) is proportional to	X	X^2	$1/X^2$	$1/X$	4
36	Planck's constant can be directly measured using	Millikan's oil drop experiment	Photoelectric effect experiment	AC Josephson effect experiment	Michelson - Moreley experiment	2
37	The change in entropy is	Positive in a reversible change	Negative in an irreversible change	Positive in an irreversible change	Negative in a reversible change	3
38	Dulong-Petit's law obeys at room temperature for many metals while it fails for light elements such as boron, beryllium because	the Debye's temperatures of these elements are very high	the Debye's temperatures of them is about 300 K	the Debye's temperatures of them is low	No well defined Debye's temperatures for them	1

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Physical Sciences
Entrance Exam January 2024

39	Consider a point on a bicycle wheel as the wheel turns about a fixed axis, neither speeding up nor slowing down. Compare the linear and angular accelerations of the point.	Both are zero	Only the angular acceleration is zero	Only the linear acceleration is zero	Neither is zero	1
40	Below the ferromagnetic Curie temperature, the ferromagnetic material exhibits B-H curve in the form of	B-H loop	straight line	exponential curve	none of these	1
41	According to Debye theory of specific heat, at high temperature, specific heat is proportional to	T	T^2	T^3	Independent of T	4
42	A particle starting from rest and moving with constant acceleration covers a distance x in first 2 seconds and distance y in the next 2 seconds. Then	$y = x$	$y = 2x$	$y = 3x$	$y = 4x$	3
43	The 'time constant' of a thermocouple	has a low value when it is bare	has a low value if it is provided with a sheath	do not change whether it is bare or provided with sheath	is unpredictable	1
44	Mobility of the electron is	flow of electron per unit electric field	reciprocal of conductivity	average electron drift velocity per unit electric field	A definite multiple of conductivity	3
45	The discrete values of energy the atomic oscillators can have are	$n\hbar\omega^2$	$n\hbar\omega$	$n^2\hbar\omega$	$2n\hbar\omega^2$	2

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	(where ω =frequency and n= an integer including zero)					
46	If 0.28 nm is the spacing between the nearest neighboring ions in NaCl lattice, the unit cell parameter is	1.4 Å	5.6 Å	0.7 Å	1 nm	2
47	The Miller indices of the plane parallel to the x and y axes are	(1 0 0)	(0 1 0)	(0 0 1)	(1 1 1)	3
48	A plane intercepts at a, b/2, 3c in a simple cubic unit cell. The Miller indices of the plane are	(1 3 2)	(2 6 1)	(3 6 1)	(1 2 3)	3
49	In a solar cell, light energy is converted into	Heat Energy	Sound Energy	Electrical Energy	Nuclear Energy	3
50	According to Schrodinger, a particle is equivalent to a	Single Wave	Wave packet	Light wave	Cannot behave as wave	2
51	For polyatomic gases such as hydrogen, the corresponding degrees of freedom would be	Two and Three	Five and Six	Three and Nine	Three and Four	1
52	The magnetic material in which permanent magnetic dipoles (due to electron spin) are aligned due to bonding forces are known as	paramagnetic materials	ferromagnetic materials	ferrimagnetic materials	diamagnetic materials	2
53	A 9A fuse wire is connected in the electric line of 220V. Maximum number of 60W bulbs which can be connected in parallel is	44	20	22	33	4
54	The amplitudes of electric and magnetic fields are related to each other by the relation	$E_0B_0=c$	$B_0 =E_0c$	$E_0= B_0c$	$E_0B_0 = c^2$	3

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THIRUVANANTHAPURAM – 695 011, KERALA ,INDIA

Physical Sciences
Entrance Exam January 2024

55	According to wave mechanics, a free particle can possess	Discrete energies	Continuous energies	One single value of energy	One single value of momentum	2
56	Value of critical current density (j_c) in a superconductor depends upon	electrical conductivity and magnetic field strength	thermal conductivity and potential difference	temperature and magnetic field strength	electrical conductivity and thermal conductivity	3
57	The focal length of the objective of a microscope is	Greater than the focal length of the eyepiece	Less than the focal length of the eyepiece	Equal to the focal length of the eyepiece	Arbitrary	2
58	The amount of heat required to raise the temperature of 5 Kg of water by 10°C is	50 Kcal	50 cal	0.02Kcal	50 watt	1
59	The mechanical equivalent of an LCR series circuit with a voltage source is	Damped harmonic oscillator	Forced harmonic oscillator	Free linear harmonic oscillator	Damped and forced harmonic oscillator	1
60	The work done by a friction force is:	always positive	always negative	always zero	either positive or negative depending upon the situation	2
61	One-tenth of one bag of potatoes weighs the same as one-seventh of one bag of small pebbles. What is the ratio of the weight of 2 bags of potatoes to 3 bags of pebbles?	07:15	20:21	21:20	03:02	2
62	A and B started a business by investing Rs. 36,000 and RS.	Rs. 2000, Rs. 3500	Rs. 2500, Rs. 3500	Rs. 3500, Rs. 2500	None of these	1

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THIRUVANANTHAPURAM – 695 011, KERALA ,INDIA

Physical Sciences
Entrance Exam January 2024

	63,000. Find the share of each, out of the annual profit of Rs. 5500.					
	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					
63	Rs. 1950	Rs. 1981.25	Rs. 2000	Rs. 2007.75	3	
64	GENEALOGY: ANCESTRY, ENTOMOLOGY:_____	Words	Insects	Fossils	Inscriptions	2
65	If 'a' is the smallest prime number greater than 39 and 'b' is the largest prime number less than 10, then ab =	299	287	229	261	2
66	Find the odd number from the series 8, 64, 99, 216, 343, 729, 1728	64	216	729	99	4
67	A person has the capability of thinking 100 lines of code in five minutes and can type 100 lines of code in 10 minutes. He takes a break for five minutes after every ten minutes. How many lines of codes will he complete typing after an hour?	100	250	350	600	2
68	Which number comes next in this sequence? 1, 1.5, 2.5, 4,___?	9	8	7	6	4
69	If 3 less than twice a certain number is equal to 2 more than 3	-30	-20	-5	0	1

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THIRUVANANTHAPURAM – 695 011, KERALA ,INDIA

Physical Sciences
Entrance Exam January 2024

	times the number, then 5 less than 5 times the number is Complete the equation by correctly identifying the incomplete number of the calculation from the list of options given below.- Equation: $(4.25 + 2.75)2 + \underline{\hspace{1cm}} = 53 - (9 \times 8)$	2	4	6	8	2
70						
71	A pescatarian is someone who eats	Egg	Chicken	Fish	None of the above	3
72	Chandrayaan-3 was launched from _____.	Satish Dhawan Space Centre	VSSC Thumba	Abdul Kalam Island Odisha	Kennedy Space Centre Cape Canaveral	1
73	In doing action research what is the usual sequence of steps? When you reverse the age of the father you will get the age of the son. One year ago the age of the father was twice that of son's age. What are the current ages of son and father?	Reflect, observe, plan, act	Plan, act, observe, reflect	Plan, reflect, observe, act	Act, observe, plan, reflect	2
74						
75	The perimeters of a circle, a square and an equilateral triangle are equal. Which one of the following statements is true? The radius as well as the height of a circular cone increases by 10%. The percentage increase in its volume is _____.	The circle has the largest area.	The square has the largest area	The equilateral triangle has the largest area.	All the three shapes have the same area.	1
76						
		17.1	21	33.1	72.8	3

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Entrance Exam January 2024

77	If the average of 5 numbers is 36 and the average of four of those numbers is 34, then what is the value of the fifth number?	2	34	35	44	4
78	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?	A and D	B	E	C	2
79	Although it does contain some pioneering ideas, one would hardly characterize the work as _____.	Orthodox	Conventional	Original	Trifling	3
80	A car got 33 Km per liter using petrol that cost Rs.89.5 per liter. Approximately what was the cost, in Rs, of the petrol used in driving the car 350 Km?	1000	880	950	1100	3
81	A certain jar contains 60 jelly beans — 22 white, 18 green, 11 yellow, 5 red, and 4 purple. If a jelly bean is to be chosen at random, what is the probability that the jelly bean will be neither red nor purple?	0.09	0.15	0.85	0.91	3
82	Which pair of words among the following are odd ones Crime and Punishment, Exercise and Health, Judgement and Advocacy,	Slowth and failure	Hardwork and success	Judgement and advocacy	Exercise and Health	3

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Entrance Exam January 2024

	Hardwork and Success, Slowth and Failure?					
83	What is the greatest value of x for which $(3x-2)(x+1) = 0$?	-1	$\frac{2}{3}$	$-\frac{2}{3}$	1	2
84	Which of the following numbers is farthest from the number 1 on the number line?	0	5	-10	10	3
85	Select the lettered pair that best expresses a relationship similar to that expressed in the original pair Antidote: Poison	Cure: recovery	Tonic: lethargy	Narcotic: sleep	Stimulant: relapse	2
86	Choose word or phrase that is most nearly opposite in meaning to the word ENERVATE	Recuperate	Resurrect	Strengthen	Gather	3
87	The sum of three numbers is 98. If the ratio of the first to second is 2:3 and that of the second to the third is 5:8, then the second number is?	20	30	40	58	2
88	Distance between two stations, X and Y is 778 km. A train covers the journey from X to Y at 84 Km per hour and returns back to X with a uniform speed of 56 Km per hour. Find the average speed of the train during the whole journey?	67Km/hr	67.2Km/hr	69Km/hr	69.2Km/hr	2
89	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	5154.5	5915	6500	6760	3

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	original price. What was the original price of the TV prior to the increase?					
90	If one-third of one-fourth of a number is 15, then three-tenth of that number is	25	35	45	54	4
91	Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is	15	13	11	9	1
92	The difference between a two-digit number and the number obtained by interchanging the positions of its digits is 36. What is the difference between the two digits of that number?	3	4	9	Cannot be determined	2
93	Which is the odd word?	Inch	Yard	Ounce	Centimeter	3
94	Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30° and 45° respectively. If the lighthouse is 100 m high, the distance between the two ships is:	173	200	273	300	3
95	The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is:	2.3	4.6	7.8	9.2	4

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Entrance Exam January 2024

96	From a point P on a level ground, the angle of elevation of the top tower is 30° . If the tower is 100 m high, the distance of point P from the foot of the tower is:	149	156	173	200	3
97	Choose the word which best expresses the meaning of the word CORPULENT	Lean	Emaciated	Obese	Gaunt	3
98	In a shower, 5 cm of rain falls. The volume of water that falls on 1.5 hectares of ground is:	75 cu. m	750 cu. m	7500 cu. m	75000 cu. m	2
99	A hall is 15 m long and 12 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of four walls, the volume of the hall is	720	900	1200	1800	3
100	A and B invest in a business in the ratio 3: 2. If 5% of the total profit goes to charity and A's share is Rs. 855, the total profit is:	1425	1500	1537.5	1576	2