

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY
THIRUVANANTHAPURAM – 695 011, KERALA ,INDIA
Bioengineering
Entrance Exam January 2024

	Question	Option 1	Option 2	Option 3	Option 4	Correct Option
1.	Doppler velocimetry works on the principle of	frequency measurement of fiber optic sensor	amplitude measurement of fiber optic sensor	phase measurement of fiber optic sensor	time shift measurement of fiber optic sensor	1
2.	Monopolar needle electrode have a coating of which material over the stainless steel wires which are bare only at the tips?	carbon	calcium	sodium	teflon	4
3.	In medical devices, the amplifiers that are used for the amplification purpose of the input signal must have	low frequency response	high frequency response	average frequency response	frequency response has no role to play in it	1
4.	_____ is non-invasive method allowing the monitoring of the saturation of a patient's hemoglobin.	Ear Oximetry	Pulse Oximetry	Skin-Reflectance Oximetry	Intravascular Oximetry	2
5.	The middle ear is exposed to atmospheric pressure only through the	eustachian tube	tympanic membrane	pinna	auditory nerve	1
6.	The viscosity of liquid was classified as both dilatant and rheopectic, which means that the viscosity	increased with stirring speed but decreased with mixing time	increased with stirring speed and increased with mixing time	decreased with stirring speed but increased with mixing time	decreased with stirring speed and decreased with mixing time	2
7.	Which of the following is not a piezo-electric material?	quartz	rochelle salt	aluminium	barium titanate	3

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8.	Which of the following is a material employed making diaphragm to measure pressure?	tourmaline	barium titanate	phosphor bronze	zirconate titanate	3
9.	Strain gauge is used to measure _____	temperature	pressure	height	displacement	2
10.	When two wires of different material are joined together at either end, forming two junctions which are maintained at a different temperature, a thermomotive force is generated causing a current to flow around the circuit. This arrangement is called _____	thermal pair	thermistor	thermocouple	thermostat	3
11.	The lower temperature junction in thermocouple is maintained at _____	-273 K	0 K	-327 K	273 K	4
12.	The resistance R_t of a metallic conductor at any temperature t is given by _____	$R_t = R_o(1+at)$	$R_t = R_o(1-at)$	$R_t = R_o(at-1)$	$R_t = R_o(10+at)$	1
13.	RTD stands for _____	resistance temperature device	resistance temperature detector	reluctance thermal device	resistive thermal detector	1
14.	On increasing the distance between the plates of a variable capacitor, the displacement-capacitance characteristics changes _____	proportionally	linearly	exceptionally	hyperbolically	4

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15.	LVDT works on the principle of _____	variable resistance	variable inductance	variable capacitance	variable pressure	2
16.	Which of the following is a displacement transducer?	Thermistor	LVDT	Strain gauge	Thermocouple	2
17.	Linear encoders gives _____ output.	angular	analog	digital	unstable	3
18.	According to static failure theories, the shape of the safe region for the distortion energy failure criteria is _____	Square	Hexagonal	Rhomboid	Circle	4
19.	The biological response of the biosensor is determined by _____	biocatalytic membrane	physio-chemical membrane	chemical membrane	artificial membrane	1
20.	Home blood glucose sensor works on which principle?	electro-physiological	electrochemical	physio-chemical	chemical	2
21.	Which of the following is not a fundamental block in recording systems?	electrodes and transducers	signal conditioner	analysis for the output	writing system	3
22.	_____ amplifies all the frequencies except those in a certain band.	high pass filter	low pass filter	band pass filter	band stop filter	4
23.	Which of the following component is not a part of the passive filter?	resistor	operational amplifier	capacitor	inductor	2
24.	Which of the following material is used to build photovoltaic cells?	selenium	celenuim	silicon	iron	1
25.	The instruments which give a direct reading of the temperature at the thermistor position are known as _____	thermistor	telethermometers	rtd	tempothermometer	2

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26.	Which type of electrodes are employed to study the electrical activities of individual cells?	milli-electrodes	micro-electrodes	surface-electrodes	pre-jelled electrodes	2
27.	Glass microcapillaries are preferred over metallic electrodes because of the former _____	polarizes with input current	does not have sustainable current carrying capacity	has less contact surface area	has sustainable current carrying capacity	4
28.	Metallic micro electrodes have impedance _____ compared to conventional electrodes?	equal	smaller	high	very high	4
29.	According to the international 10/20 system to measure EEG, even number denotes which side of the brain?	left	top	bottom	right	4
30.	Which rhythm is the principal component of the EEG that indicates the alertness of the brain?	theta rhythm	gamma rhythm	beta rhythm	alpha rhythm	4
31.	Which of the following is a preferred electrode for measuring EMG?	surface electrodes	needle electrodes	pregelled electrodes	scalp electrodes	2
32.	_____ instrument is used to hold patients head and guide the placement of electrodes.	Monotaxic	Stereotonic	Stereotaxic	Monotonic	3
33.	The contraction of the skeletal muscles results in the generation of action potential in the individual muscle fibers. Record of this	ECG	EMG	EEG	EKG	2

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	action potential is called _____					
34.	Which of the following is not the property of the instrumentational amplifier?	Extremely high input impedance	Low bias and offset currents	High slew rate	Very low CMRR	1
35.	CMRR is measured in _____	v/s	dB	dB/s	dB/ms	2
36.	Which on the following is not a type of isolation amplifier?	capactively coupled isolation amplifiers	optically isolated isolation amplifiers	resistive coupled isolation amplifiers	transformer type isolation amplifiers	3
37.	_____ are commonly used for providing protection against leakage currents.	Isolation amplifiers	Differential amplifiers	Instrumentational amplifiers	Inverting amplifiers	1
38.	The removal of waste products during dialysis is _____	inversely proportional to the concentration gradient across the membrane	proportional to the concentration gradient across the membrane	proportional to the flow rate across the membrane	inversely proportional to the flow rate across the membrane	2
39.	The ability of the amplifier to reject common voltages on its two input leads is known as _____	common mode rejection rate	coupled mode rejection rate	common mode rejection ratio	coupled mode rejection ratio	1
40.	The output of differential gain is given by _____	(difference of the two input voltage)*(feedback resistance/input resistance)	(sum of the two input voltage)*(feedback resistance/input resistance)	(difference of the two input voltage)*(input resistance/feedback resistance)	(sum of the two input voltage)*(input resistance/feedback resistance)	1
41.	The impedance of the input should be _____ in order to obtain	low	High	Does not matter	Very low	2

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	high CMRR in the differential amplifier.					
42.	_____ is common engineering term and refers to its function to control a process.	Open-loop	Feedback	Reaction	Closed-loop	2
43.	Which of the following instrument is used for measuring the average activity of sweat glands?	EOG	ECG	GSR	PCG	3
44.	BSR(Basal skin response) gives _____	activity of sweat glands	baseline value of skin resistance	activity of endocrine glands	baseline value of breathing	2
45.	What is employed to measure the variable that is to be controlled by the feedback process?	Transducers	Sensing device	Tape recorder	Piezo-electric device	1
46.	Which of the following is the type of exercise protocols used in treadmill tests?	The Balke-Bruce Protocol	The Bruce-Ware Protocol	The Balke-Ware Protocol	The Balke Protocol	3
47.	_____ is a blood pressure measuring instrument.	Sphygmomanometer	Ergometer	Treadmill	Holtzmanometer	1
48.	_____ compare various algorithms employed for processing stress ECG signals.	Friesen	Jen and Hwang	Clynes	Alfonso	4
49.	The instrument which carries out a continuous and simultaneous recording of the instantaneous foetal heart rate and labour activity is called _____	Ergometer	Cardiotocograph	Cardiotocometer	Cardiotonometer	2
50.	FHR yields important information about the status of _____	fats	eye	fibrous joint	foetus	4

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51.	What is the role of Cupraphan in haemodialysis?	used to check conductivity of dialyzer	used as membrane	used to check blood leakage	not at all used	2
52.	Most of the _____ processes result in chemical changes in the internal environment of the human body.	micromorphological	pathological	immunological	neuropsychological	2
53.	Which section deals with the determinations of the number and characteristics of the constituents of the blood, particularly the blood cells?	Chemistry	Haematology	Microbiology	Blood Bank	2
54.	Source of Bioelectric potential is _____ in nature.	electronic	electric	ionic	mechanical	3
55.	What is the relatively static membrane potential of quiescent cells called?	half-cell potential	action potential	resting membrane potential	cell potential	3
56.	Electrooculography (EOG/E.O.G.) is a technique for measuring what?	abnormal function of the retina	heart rate	respiration rate	cornea-retinal standing potential	4
57.	Phonocardiography is listening to _____	arm muscle sound	lungs sound	heart sound	respiratory tract sound	3
58.	Where are the electrodes placed for recording foetal electrocardiogram?	heart	abdomen	brain	veins	2
59.	Which of the following is the most common substance for analysis from the body?	CSF	Urine	Blood	Glucose	3

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60.	What is the pH of Arterial blood?	7.25	7.3	7.35	7.4	4
61.	One-tenth of one bag of potatoes weighs the same as one-seventh of one bag of small pebbles. What is the ratio of the weight of 2 bags of potatoes to 3 bags of pebbles?	07:15	20:21	21:20	03:02	2
62.	A and B started a business by investing Rs. 36,000 and RS. 63,000. Find the share of each, out of the annual profit of Rs. 5500.	Rs. 2000, Rs. 3500	Rs. 2500, Rs. 3500	Rs. 3500, Rs. 2500	None of these	1
63.	A sum of Rs. 13,950 should be divided among three persons A, B and C. B must get the double of A's share and C must get Rs. 50 less than the double of B's share. The share of A will be	Rs. 1950	Rs. 1981.25	Rs. 2000	Rs. 2007.75	3
64.	GENEALOGY: ANCESTRY, ENTOMOLOGY: _____	Words	Insects	Fossils	Inscriptions	2
65.	If 'a' is the smallest prime number greater than 39 and 'b' is the largest prime number less than 10, then ab =	299	287	229	261	2
66.	Find the odd number from the series 8, 64, 99, 216, 343, 729, 1728	64	216	729	99	4
67.	A person has the capability of thinking 100 lines of code in five minutes and can type 100 lines of	100	250	350	600	2

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

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	What are the current ages of son and father?					
75.	The perimeters of a circle, a square and an equilateral triangle are equal. Which one of the following statements is true?	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.	The radius as well as the height of a circular cone increases by 10%. The percentage increase in its volume is _____.	17.1	21	33.1	72.8	3
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

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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, Hardwork and Success, Slowth and Failure?	Slowth and failure	Hardwork and success	Judgement and advocacy	Exercise and Health	3
83.	What is the greatest value of x for which $(3x-2)(x+1) = 0$?	-1	$2/3$	$-2/3$	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	20	30	40	58	2

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	third is 5:8, then the second number is?					
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 original price. What was the original price of the TV prior to the increase?	5154.5	5915	6500	6760	3
90.	If one-third of one-fourth of a number is 15, then three-tenth of that number is	35	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	3	4	9	Cannot be determined	2

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	the difference between the two digits of that number?					
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
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	720	900	1200	1800	3

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	the floor and the ceiling is equal to the sum of the areas of four walls, the volume of the hall is					
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