

RGUPET 22
Common Entrance Test, 2022
Ph.D. IN ELECTRONICS AND COMMUNICATION ENGINEERING

1	We review the relevant literature to know:					
	a) What is already known about the topic	b) What concepts and theories have been applied to the topic	c) Who are the key contributors to the topic	d) All of the above	d	All of the above
2	A deductive theory is one that					
	a) Allows theory to emerge out of the data	b) Involves testing an explicitly defined hypothesis	c) Allows for findings to feed back into the stock of knowledge	d) Uses qualitative methods whenever possible	b	Involves testing an explicitly defined hypothesis
3	Which of the following is not a type of research question?					
	a) A hypothesis	b) Predicting an outcome	c) Evaluating a phenomenon	d) Developing good practice	a	A hypothesis
4	What does ‘sampling cases’ mean?					
	a) Sampling using a sampling frame	b) Identifying people who are suitable for research	c) Literally, the researcher’s brief-case	d) Sampling people, newspapers, television programmes etc	d	Sampling people, newspapers, television programmes etc
5	An example of scientific knowledge is					

	a) Laboratory and field experiments	b) Social traditions and customs	c) Authority of the Prophet or great men	d) Religious scriptures	a	Laboratory and field experiments
6	The process not needed in experimental researches is					
	a) Reference collection	b) Controlling	c) Observation	d) Manipulation and replication	a	Reference collection
7	The per capital income of India from 1950 to 1990 is four times. This study is					
	a) Social	b) Factorial	c) Horizontal	d) Longitudinal	d	Longitudinal
8	Nine years old children are taller than 7 years old ones. It is an example of					
	a) Vertical studies	b) Cross-sectional studies	c) Experimental studies	d) Case studies	b	Cross-sectional studies
9	Attributes of objects, events or things which can be measured are called					
	a) Data	b) ribulose biphosphate	c) Variables	d) None of the above	c	Variables
10	In order to augment the accuracy of the study a researcher					
	a) Should be honest and	b) Should increase the size	c) Should keep the	d) All of these	d	All of these

	unbiased	of the sample	variance high			
11	Hypothesis cannot be stated in					
	a) Declarative terms	b) Null and question form terms	c) General terms	d) Directional terms	c	General terms
12	All cause non sampling errors except					
	a) Faulty tools of measurement	b) Defect in data collection	c) Non response	d) Inadequate sample	d	Inadequate sample
13	Formulation of hypothesis may not be necessary in					
	a) Survey studies	b) Fact finding (historical) studies	c) Experimental studies	d) Normative studies	b	Fact finding (historical) studies
14	Who is regarded the father of scientific social surveys ?					
	a) Best	b) Booth	c) Darwin	d) None of these	b	Booth
15	For doing external criticism (for establishing the authenticity of data) a researcher must verify					
	a) The signature and handwriting of the author	b) The paper and ink used in that period which is under study	c) Style of prose writing of that period	d) All of the above	d	All of the above
16	Survey study aims at (i) knowing facts about the existing					

	situation (ii) comparing the present status with the standard norms (iii) criticising the existing situation (iv) identifying the means of improving the existing situation					
	a) (i) and (ii) only	b) (i),(ii),(iii)and(iv)	c) (ii)and (iii) only	d) (i),(ii)and(iii)	d	(i),(ii)and(iii)
17	Which of the following is not the characteristic of a researcher?					
	a) He is industrious and persistent on the trial of discovery	b) He is a specialist rather than a generalist	c) He is objective	d) He is not versatile in his interest and even in his native abilities	d	He is not versatile in his interest and even in his native abilities
18	The validity and reliability of a research will be at stake when					
	a) The incident was reported after a long period of time from that of its occurrence	b) The author who is the source of information is biased, incompetent or dishonest	c) The researcher himself is not competent enough to draw logical conclusions	d) All of the above	d	All of the above
19	A researcher wants to study the future of the Congress I in India. For the study which tool is most appropriate for him ?					
	a) Rating scale	b) Interview	c) Schedule	d) Questionnaire	d	Questionnaire
20	Catharsis means discharge of emotions. A teacher can let off pent-up energy of his disciples through					

	a) Picnics / excursions	b) Mock-parliament	c) Celebration of festivals	d) All of the above	d	All of the above
21	Seeing a very big turnout, it was reported that JD will win the election, the conclusion was based on					
	a) Random sampling	b) Purposive sampling	c) Cluster sampling	d) Systematic sampling	c	Cluster sampling
22	A researcher divides his population into certain groups and fixes the size of the sample from each group. It is called					
	a) Stratified sample	b) Quota sample	c) Cluster sample	d) All of the above	b	Quota sample
23	Which technique is generally followed when the population is finite ?					
	a) Purposive sampling technique	b) Area sampling technique	c) Systematic sampling technique	d) None of the above	c	Systematic sampling technique
24	Which of the following is a non-probability sample ?					
	a) Quota sample	b) Simple random sample	c) Purposive sample	d) (a) and (c) both	d	(a) and (c) both
25	If a researcher is studying the effect of using laptops in his classroom to ascertain their merit and worth, he is likely conducting which type of research?					
	a) Basic	b) Applied	c) Experimental	d) Evaluation	d	Evaluation

26	How many NAND gates are used to form an AND gate?					
	a)1	b)2	c)3	d)4	b)	2
27	In which of following base system a number 321 is not valid					
	a)Base5	b) Base8	c) Base3	d) Base18	c)	Base3
28	The inverter can be produced with how many NOR gates?					
	a)1	b)2	c)3	d)4	a)	1
29	A full adder can be constructed from.....					
	a) 2 Full adders	b) 2 Full adders and 1 AND Gate	c) 2 Half adder and 1 OR Gate	d) 2 Full adder and 1 XOR Gate	c)	2 Half adder and 1 OR Gate
30	An AND gate will function as OR if.....					
	a) all the inputs to the gates are "1"	b) all the inputs to the gates are "0"	c) Either of inputs is 1	d) All inputs and outputs are complemented	d)	All inputs and outputs are complemented
31	In a counter, maximum number of states possible with 4 flip flops is					
	a)15	b)16	c)4	d)3	b)	16
32	Which of the following is an asynchronous counter?					
	a) Ripple Counter	b) Johnson	c) Ring Counter	d) None of Above	a)	Ripple Counter

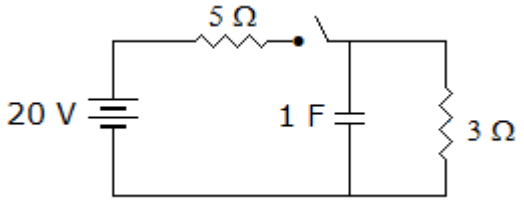
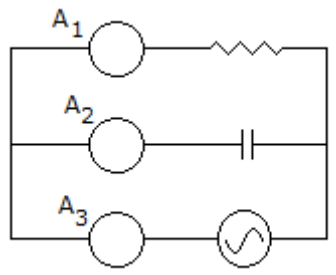
		counter				
33	Which of the following can be used for storage of 1-bit data?					
	a) a Flip Flop	b) a Multiplexer	c) a Decoder	d) a Encoder	a)	a Flip Flop
34	A 32:1 Multiplexer will have how many select lines ?					
	a)3	b)4	c)5	d)32	c)	5
35	The interface between an analog signal and a digital processor is					
	a) D/A converter	b) A/D converter	c) Modulator	d) Demodulator	b)	A/D converter
36	The speech signal is obtained after					
	a) Analog to digital conversion	b) Digital to analog conversion	c) Modulation	d) Quantization	b)	Digital to analog conversion
37	Telegraph signals are examples of					
	a) Digital signals	b) Analog signals	c) Impulse signals	d) Pulse train	a)	Digital signals
38	The Nyquist theorem for sampling 1) Relates the conditions in time domain and frequency domain					

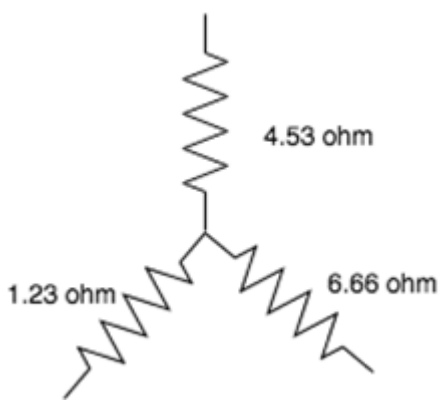
	<p>2) Helps in quantization</p> <p>3) Limits the bandwidth requirement</p> <p>4) Gives the spectrum of the signal</p>					
	a) 1, 2 and 3 are correct	b) 1 and 2 are correct	c) 1 and 3 are correct	d) All the four are correct	c)	1 and 3 are correct
39	The process of converting the analog form into digital form is occurs after					
	a) Modulation	b) Multiplexing	c) Quantization	d) Sampling	c)	Quantization
40	The characteristics of compressor in μ -law companding are					
	a) Continuous in nature	b) Logarithmic in nature	c) Linear in nature	d) Discrete in nature	a)	Continuous in nature
41	The expression for bandwidth BW of a PCM system, where v is the number of bits per sample and fm is the modulating frequency, is given by					
	a) $BW \geq vfm$	b) $BW \leq vfm$	c) $BW \geq 2vfm$	d) $BW \geq \frac{1}{2}vfm$	a)	$BW \geq vfm$
42	In digital transmission, the modulation technique that requires minimum bandwidth is					
	a) Delta modulation	b)PCM	c)DPCM	d)PAM	a)	Delta modulation
43	In Delta Modulation, the bit rate is					
	a) N times the sampling frequency	b) N times the modulation	c) N times the nyquist criteria	d) None of the above	a)	N times the sampling frequency

	y	frequency				
44	In Differential Pulse Code Modulation techniques, the decoding is performed by					
	a) Accumulator	b) Sampler	c) PLL	d) Quantizer	a)	Accumulator
45	Differential Pulse Code Modulation techniques suffers from					
	a) Slope over load distortion	b) Quantization noise	c) Both a & b	d) None of the above	c)	Both a & b
46	A semiconductor is formed by bonds.					
	a) Covalent	b) Electrovalent	c) Co-ordinate	d) None of the above	a)	Covalent
47	A semiconductor has _____ temperature coefficient of resistance.					
	a) Positive	b) Zero	c) Negative	d) None of the above	c)	Negative
48	The most commonly used semiconductor is _____					
	a) Germanium	b) Silicon	c) Carbon	d) Sulphur	b)	Silicon
49	A semiconductor has generally _____ valence electrons.					
	a) 2	b) 3	c) 6	d) 4	d)	4
50	When a pentavalent impurity is added to a pure semiconductor, it becomes _____					
	a) An insulator	b) An intrinsic semicond	c) p-type semiconduct	d) n-type semiconduct	d)	n-type semiconduct

		uctor	or	or		or
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5 1	A 1000 kHz carrier is simultaneously modulated with 300 Hz, 800 Hz and 2 kHz audio sine waves. Which of the following frequency is least likely to be present in the output?				
	a) 1002 kHz	b) 1000 kHz	c) 999.2 kHz	d) 998.0 kHz	b) 1000 kHz
5 2	<p>In the figure $m(t) = \frac{2 \sin 2\pi t}{t}$, $s(t) = \cos 200\pi t$ and $n(t) = \frac{\sin 199\pi t}{t}$, the output $y(t)$ will be</p>				
	a) $\frac{\sin 2\pi t}{t}$	b) $\frac{\sin 2\pi t}{t} + \frac{\sin \pi t}{t}$	c) $\frac{\sin 2\pi t}{t} + \frac{\sin 0.5\pi t}{t}$	d) $\frac{\sin 2\pi t}{t} + \frac{\sin \pi t}{t}$	c) $\frac{\sin 2\pi t}{t} + \frac{\sin 0.5\pi t}{t}$
5 3	What about the stability of system in $H(z) = \frac{z(3z - 4)}{(z - 0.4)(z - 2)}$				
	a) system is stable	b) unstable	c) stable at 0.4	d) cant say	a) system is stable
5 4	$\mathcal{L}[f(t)] = F(s)$, then $\mathcal{L}[f(t - T)] =$				
	a) $e^{st} F(s)$	b) $e^{-st} F(s)$	c) $\frac{F(s)}{1 + e^{st}}$	d) $\frac{F(s)}{1 - e^{-st}}$	b) $e^{-st} F(s)$
5 5	In an RC series circuit $R = 100 \Omega$ and $X_C = 10 \Omega$. In this circuit				

	a) the current and voltage are in phase	b) the current leads the voltage by about 6°	c) the current leads the voltage by about 84°	d) the current lags the voltage by about 6°	b) the current leads the voltage by about 6°
5 6	<p>In the circuit of figure, the switch is closed at $t = 0$. At $t = 0^+$ the current through C is</p> 				
	a) 4 A	b) 2.5 A	c) 3.1 A	d) 0	a) 4 A
5 7	<p>In the figure shown, A_1, A_2, A_3 are identical Ammeters. If A_1 and A_3 read 5 and 13 A respectively, reading of A_2 will be</p> 				
	a) 8	b) 13 A	c) 18	d) 12	d) 12
5 8	<p>A half wave diode circuit using ideal diode has an input voltage $20 \sin \omega t$ volts. Then average and rms values of output voltage are</p>				
	a) $\frac{10}{\pi}$ V and 10 V	b) $\frac{20}{\pi}$ V and 10 V	c) $\frac{10}{\pi}$ V and 5 V	d) $\frac{20}{\pi}$ V and 5 V	b) $\frac{20}{\pi}$ V and 10 V
5 9	<p>The maximum power is delivered from a source to its load when the load resistance is _____ the source resistance.</p>				
	a) greater	b) less than	c) equal to	d) less than or equal to	c) equal to

	than				
6 0	If the source impedance is complex, then the condition for maximum power transfer is?				
	a) $Z_L = Z_S$	b) $Z_L = Z_S^*$	c) $Z_L = -Z_S$	d) $Z_L = -Z_S^*$	b) $Z_L = Z_S^*$
6 1	Find the equivalent delta circuit. 				
	a) 3ohm, 10ohm, 5ohm	b) 3ohm, 10ohm, 15ohm	c) 3ohm, 1ohm, 5ohm	d) 3ohm, 10ohm, 6ohm	a) 3ohm, 10ohm, 5ohm
6 2	When the unit step response of a unity feedback control system having forward path transfer function $G(s) = 80/s(s+18)$?				
	a) Overdamped	b) Critically damped	c) Under damped	d) Un Damped oscillatory	a) Overdamped
6 3	Given a unity feedback system with $G(s) = K/s(s+4)$. What is the value of K for a damping ratio of 0.5?				
	a)1	b)16	c)4	d)2	b) 16
6 4	The total period of the function shown in the figure is 4 sec and the amplitude is 10. Find the function $f_1(t)$ from $t = 0$ to 1 in terms of unit step function.				

	a) $10t [u(t) - u(t+1)]$.	b) $10t [u(t) + u(t-1)]$.	c) $10t [u(t) + u(t+1)]$.	d) $10t [u(t) - u(t-1)]$.	d) $10t [u(t) - u(t-1)]$.
6 5	Find the total voltage applied in a series RLC circuit when $i=3\text{mA}$, $V_L=30\text{V}$, $V_C=18\text{V}$ and $R=1000\text{ ohms}$.				
	a) 3.95V	b) 51V	c) 32.67V	d) 6.67V	b) 51V
6 6	In an RLC circuit, which of the following is always used as a vector reference?				
	a) Voltage	b) Resistance	c) Impedance	d) Current	a) Voltage
6 7	What is the correct expression for the phase angle in an RLC series circuit?				
	a) $\phi = \tan^{-1} \frac{XL - XC}{R}$	b) $\phi = \tan^{-1} \frac{XL + XC}{R}$	c) $\phi = \tan \frac{XL - XC}{R}$	d) $\phi = \tan^{-1} (XL - XC)$	a) $\phi = \tan^{-1} \frac{XL - XC}{R}$
6 8	When is current in phase with the voltage?				
	a) When $XL > XC$	b) When $XL < XC$	c) When $XL = XC$	d) When $XC = \text{infinity}$	c) When $XL = XC$
6 9	State space analysis is applicable even if the initial conditions are _____				
	a) Zero	b) Non-zero	c) Equal	d) Not equal	b) Non-zero

70	For an LTI discrete system to be stable, the square sum of the impulse response should be					
	a) Integral multiple of 2π	b) Infinity	c) Finite	d) Zero	c	Finite
71	Which of the following is a representation of system function?					
	a) Normal system function	b) Laplace transform	c) Rational system function	d) All of the mentioned	d	All of the mentioned
72	If $h_{lp}(n)$ denotes the impulse response of a low pass filter with frequency response $H_{lp}(\omega)$, then what is the frequency response of the high pass filter in terms of $H_{lp}(\omega)$?					
	a) $H_{lp}(\omega - \pi/2)$	b) $H_{lp}(\omega + \pi/2)$	c) $H_{lp}(\omega - \pi)$	d) $H_{lp}(\omega + \pi)$	c	$H_{lp}(\omega - \pi)$
73	In General conductors possess temperature coefficient of Resistance.					
	a) Zero	b) Negative	c) Positive	d) None of the above	c	Positive
74	The leakage current across a pn junction is due to					
	a) Minority carriers	b) Majority carriers	c) Junction capacitance	d) None of the above	a	Minority carriers
75	When drain voltage equals the pinch-off-voltage, then drain current with the increase in drain voltage					

	a) Decreases	b) Increases	c) remains constant	d) none of the above	c	remains constant
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76	The number of comparators in 4-bit flash ADC is					
	a) 4	b) 5	c) 15	d) 16	C	15
77	The resolution of a 4-bit counting ADC is 0.5 Volts. For an analog input of 6.6 Volts, the digital output of the ADC will be					
	a) 1011	b) 1101	c) 1100	d) 1110	D	1110
78	The output Y of a 2-bit comparator is logic 1 whenever the 2-bit input A is greater than the 2-bit input B. The number of combinations for which the output is logic 1, is					
	a) 4	b) 6	c) 8	d) 10	C	6
79	What is an activation value?					
	a) weighted sum of inputs	b) threshold value	c) main input to neuron	d) none of the mentioned	A	weighted sum of inputs
80	How is the brightness of a pixel on the screen increased?					
	a) Increasing the amount of light directed on the screen	b) Using mirrors	c) Using sound waves	d) None of the above	A	Increasing the amount of light directed on the screen
81	The different types of machine learning are?					
	a) Supervised	b) Unsupervised	c) Reinforcement	d) All of the above	D	All of the above

82	What is meant by a “Complete Algorithm”?						
	a) If a solution exists, the algorithm will find it before terminating.	b) It will find the solution in a finite amount of time.	c) Both A and B.	d) None of the above.	C	Both A and B.	
83	Which of the following are informed search methods?						
	a) Best First Search	b) A* Search	c) Memory Bound Heuristic Search	d) all of the above	D	All of the above	
84	The “Father of Artificial Intelligence” is:						
	a) Alan Turing	b) Charles Babbage	c) John McCarthy	d) None of the above	C	John McCarthy	
85	Which one of the following processes is preferred to from the gate dielectric (SiO ₂) of MOSFETs?						
	a) Sputtering	b) Molecular Beam Epitaxy	c) Wet Oxidation	d) Dry Oxidation	D	Dry Oxidation	
86	In MOSFET fabrication, the channel length is defined during the process of						
	a) Isolation Oxide Growth	b) Channel Stop implantation	c) Polysilicon gate patterning	d) Lithography step leading to the contact pads	C	Polysilicon gate patterning	
87	The Ebers-Moll model of a BJT is valid						

	a) only in active mode	b) only in active and saturation modes	c) only in active and cut-off modes	d) in active, saturation and cut-off modes.	D	in active, saturation and cut-off modes.	
88	If the base width in a bipolar junction transistor is doubled, which one of the following statements will be TRUE?						
	a) Current gain will increase	b) Unity gain frequency will increase	c) Emitter base junction capacitance will increase.	d) Early Voltage will increase	D	Early Voltage will increase	
89	An increase in the base recombination of a BJT will increase						
	a) the common emitter dc current gain β	b) the breakdown voltage BV_{ceo}	c) the unity gain cut off frequency f_T	d) the trans-conductance g_m	B	b) the breakdown voltage BV_{ceo}	
90	A thin P-type silicon sample is uniformly illuminated with light which generates excess carriers. The recombination rate is directly proportional to						
	a) the minority carrier mobility	b) the minority carrier recombination lifetime	c) the minority carrier concentration	d) the excess minority carrier concentration	D	the excess minority carrier concentration	
91	Drift current in the semiconductors depends upon						
	a) only the electric field	b) only the carrier concentration gradient	c) both the electric and carrier concentration	d) both the electric and carrier concentration gradient	C	both the electric and carrier concentration	
92	The concentration of minority carriers in an extrinsic semiconductor under equilibrium is:						
	a) direct proportional to the doping concentration	b) inversely proportional to the doping concentration	c) directly proportional to the intrinsic concentration	d) inversely proportional to the intrinsic concentration.	B	inversely proportional to the doping concentration	

93	In an 8085 microprocessor, the shift registers which store the result of an addition and the overflow bit are, respectively.					
	a) A & B	b) A & F	c) C & A	d) B & F	B	A & F
94	In an 8085 microprocessor, which one of the following instructions changes the content of the accumulator?					
	a) MOV B, M	b) PCHL	c) RNZ	d) SBI BEH	D	SBI BEH
95	An instruction used to set the carry flag in a computer can be classified as					
	a) Data Transfer	b) arithmetic	c) logical	d) program control	C	logical
96	The total number of memory accesses involved (inclusive of the op-code fetch) when an 8085 processor executes, the instruction LDA 2003 is					
	a) 1	b) 2	c) 3	d) 4	D	4
97	<p>The following sequence of instructions are executed by an 8085 microprocessor:</p> <p>1000: LXI SP 27FF</p> <p>1003: CALL 1006</p> <p>1006: POP H</p> <p>The contents of the stack pointer (SP) and the HL register pair on completion or execution of these instructions are.</p>					
	a) SP=22FF, HL=1003	b) SP=22FD, HL=1003	c) SP=22FF, HL=1006	d) SP=22FD, HL=1006	C	d) SP=22FD, HL=1006
98	In a microprocessor, the register which holds the address of the next instruction to be fetched is					
	a) Accumulator	b) Program Counter	c) Stack Pointer	d) Instruction Register	B	Program Counter
99	In register index addressing mode the effective address is given by					
	a) the index register value	b) the sum of the register value and the operand	c) the operand	d) the difference of the index value and the	A	the index register value

				operand		
100	<p>The following five instructions were executed on an 8085 microprocessor.</p> <p>MVI A, 33H MVI B, 78H ADD B CMA ANI 32H</p> <p>The Accumulator value immediately after the execution of the fifth instruction is</p>					
	a) 00H	b) 10H	c) 11H	d) 32H	B	10H