Test Booklet No. _____
This booklet consists of 150 questions and 21 printed pages.

RGUPET/2024/__/_

<div align="center">

RGUPET 2024
Common Entrance Test, 2024
DOCTOR OF PHILOSOPHY IN ELECTRONICS AND
COMMUNICATION ENGINEERING

</div>

Full Marks: 150   **Time: 3 Hours**

Roll No.

Day and Date of Examination: _____

Signature of Invigilator(s) _____

Signature of Candidate _____

──

General Instructions:

PLEASE READ ALL THE INSTRUCTIONS CAREFULLY BEFORE MAKING ANY ENTRY.

1. DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO.
2. Candidate must write his/her Roll Number on the space provided.
3. This Test Booklet contains 150 Multiple Choice Questions (MCQs) from the concerned subject. Each question carries 1 mark.
4. Please check the Test Booklet to verify that the total pages and total number of questions contained in the test booklet are the same as those printed on the top of the first page. Also check whether the questions are in sequential order or not.
5. Candidates are not permitted to enter into the examination hall after the commencement of the entrance test or leave the examination hall within two hour.
6. Making any identification mark in the OMR Answer Sheet or writing Roll Number anywhere other than the specified places will lead to disqualification of the candidate.
7. Candidates shall maintain silence inside and outside the examination hall. If candidates are found violating the instructions mentioned herein or announced in the examination hall, they will be summarily disqualified from the entrance test.
8. In case of any dispute, the decision of the Entrance Test Committee shall be final and binding.
9. The OMR Answer Sheet consists of two copies, the Original copy and the Student's copy.

1	Sequence the following sentences (P. Q. R. S) in a coherent passage: P: Shifu's student exclaimed. "Why do you run since the bull is an illusion?" Q: Shifu said, "Surely my running away from the bull is also an illusion." R: Shifu once proclaimed that all life is illusion. S: One day, when a bull gave him chase, Shifu began running for his life.			a)
	a)RSPQ	b)RPQS	c)SPRQ	d)SRPQ	RSPQ
2	"I cannot support this proposal. My_____ will not permit it."			c)
	a) conscious	b) consensus	c) conscience	d) consent	conscience
3	Choose the correct synonym of "Thwart"			a)
	a) Impede	b) Aid	c) Support	d) Face	Impede
4	Choose the correct antonym of "Enigma"			d)
	a)Mystery	b)Charade	c)Make-believe	d)Clarity	Clarity
5	Match the following phrasal verbs with their meanings:			a)

A)	Look after	1.	Wear
B)	Put on	2.	Take care of
C)	Keep on	3.	Cancelled
D)	Called off	4.	Continue

	a) A-2, B-1, C-4, D-3	b) A-2, B-1, C-3, D-4	c) A-1, B-2, C-3, D-4	d) A-4, B-1, C-3, D-2	A-2, B-1, C-4, D-3
6	Five years ago, the ratio of Aman's age to his father's age was 1:4, and five years from now, the ratio will be 2:5. What was his father's age when Aman was born?			c)
	a)35 years	b)28 years	c)30 years	d)32 years	30 years
7	A series is given with one term missing. Choose the correct alternative from the given ones that will complete the series. 81, 64, 100, 125, 121, ?			b)
	a) 169	b) 216	c) 289	d) 225	216
8	A series is given with one term missing term. Choose the correct alternative B,E,H,K,N,?			a)
	a) Q	b) M	c) N	d) W	Q
9	A bag contains 5 brown and 4 white socks. Ram pulls out two socks. What is the probability that both the socks are of the same colour?			d)
	a) 9/20	b) 2/9	c) 3/20	d) 4/9	4/9
10	Find the circum radius of a triangle with sides of 88cm, 105cm, and 137cm			c)
	a) 62.5	b) 67.5	c) 68.5	d) 72.5	68.5
11	In which of the following years was the Second Round Table Conference in London held?			c)
	a) 1925	b) 1939	c) 1931	d) 1941	1931
12	Which of the following places is famous for a copper mine?			d)
	a) Gaya	b) Keonjhar	c) Satna	d) Khetri	Khetri
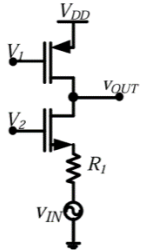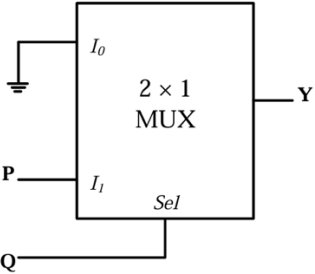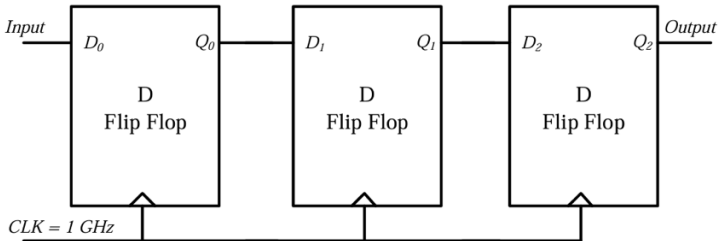
13	Which of the following article is associated with the "Right to Education"?				a)
	a) Article 21A	b) Article 29	c)Article 32	d)Article 226	Article 21A
14	Who is the founder of Telegram?				d)
	a)Brian Acton	b)Kevin Bharti Mittal	c)Jan Koum	d)Pavel Durov	Pavel Durov
15	Match the following:				b)

A)	Hirakud Multipurpose project	1.	Chambal
B)	Nagarjuna Sagar Multipurpose project	2.	Chenab
C)	Rana Pratap Sagar Dam	3.	Krishna
D)	Salal project	4.	Mahanadi

	a)A-4, B-3, C-2, D-1	b)A-4, B-3, C-1, D-2	c)A-4, B-2, C-1, D-3	d)A-4, B-1, C-2, D-3	A-4, B-3, C-1, D-2
16	Recently, which organization launched a new edition of the Girl Empowerment Mission?				c)
	a)DRDO	b)ISRO	c)NTPC	d)BHEL	NTPC
17	Khanij Bidesh India Limited (KABIL) recently signed an MoU with which organization for technical and knowledge cooperation for critical minerals?				a)
	a) CSIR-IMMT	b) BHEL	c)IIT Kanpur	d)NTPC	CSIR-IMMT
18	Intelligent Transportation System Endeavor (InTranSE) program, recently seen in the news, comes under which ministry?				c)
	a)Ministry of Information and Broadcasting	b)Ministry of Defence	c)Ministry of Electronics & Information Technology	d)Ministry of Communication	Ministry of Electronics & Information Technology
19	What is the rank of India in the Global Intellectual Property Index 2024?				a)
	a) 42nd	b) 45th	c) 44th	d) 46th	42nd
20	Which of the following provisions have been made by Constitution of India to promote secularism in the country? 1. State observes an attitude of impartiality towards all religions 2. There shall be no state religion in India 3. State shall not compel to pay taxes whose proceeds are used for promotion or maintenance of a particular religion 4. No religious education shall be provided in education institutions running on state funds				d)
	a) Only 1, 2, and 3	b) Only 2, 3, and 4	c) Only 1, 2, and 4	d) 1, 2, 3, and 4	1, 2, 3, and 4
21	The main aim of the scientific method in the research field is to _____				d)

	a)Improve data interpretation	b)Confirm triangulation	c)Introduce new variables	d)Eliminate spurious relations	Improve data interpretation
22	The conclusions/findings of which type of research cannot be generalized to other situations?				b)
	a) Casual Comparative Research	b) Historical Research	c)Descriptive Research	d)Experimental Research	Historical Research
23	How to judge the depth of any research?				c)
	a) By research title	b) By research duration	c)By research objectives	d)By total expenditure on research	By research objectives
24	Which one is called non-probability sampling?				a)
	a)Quota sampling	b)Cluster sampling	c)Systematic sampling	d)Stratified random sampling	Quota sampling
25	Match List I with List II				d)
	a)A-1, B-2, C -3, D -4	b)A-2, B-3, C -4, D - 1	c)A-3, B-4, C -1, D - 2	d)A-4, B-1, C -2, D - 3	A-4, B-1, C -2, D - 3
26	The F-test:				c)
	a)Is essentially a two-tailed test	b)Isessentially a one-tailed test	c)Can be one-tailed as well as two-tailed depending on the hypotheses	d)Can never be one tailed test	Can be one-tailed as well as two-tailed depending on the hypotheses
27	The "Sociogram" technique is used to study _____				b)
	a)Vocational Interest	b)Human Relations	c)Professional Competence	d)Achievement Motivation	Human Relations
28	Given below are two statements: Statement I: All valid tests are reliable but all reliable tests are not valid Statement II: Split-half method is used to determine the reliability of a test. In the light of the above statements, choose the most appropriate answer from the options given below:				a)
	a)Both Statement I and Statement II are correct	b)Both Statement I and Statement II are incorrect	c)Statement I is correct but Statement II is incorrect	d)Statement I is incorrect but Statement II is correct	Both Statement I and Statement II are correct

Within question 25, List items:

Research Perspective	Discipline
A) Phenomenology	1. Anthropology
B) Ethnography	2. Sociology
C) Ethnomethodology	3. Social psychology
D) Symbolic interactionism	4. Philosophy

29	Reliability is the fundamental quality of a' research which also reflects				Answer option (a,b,c or d)
	a)Superiority	b)Purity of data	c)Verifiability	d)Validity	Answer – d)
30	The data of research is _____				Answer option (a,b,c or d)
	a) Qualitative only	b) Quantitative only	c) Both (a) and (b)	d) Neither (a) nor (b)	Answer – c)
31	Which of the following statement is correct?				Answer option (a,b,c or d)
	a) Discoveries are researches	b) Researches lead to discovery	c) Invention and Research are related	d) None of the above	Answer- b)
32	What do you consider as the main aim of inter disciplinary research?				Answer option (a,b,c or d)
	a)To over simplify the problem of research	b)To bring out holistic approach to research	c) To create a new trend in research methodology	d) To reduce the emphasis of single subject in research	Answer – b)
33	Research can be conducted by a person who:				Answer option (a,b,c or d)
	a) Is a hard worker	b) Holds a postgraduate degree	c) Has knowledge about research methodology	d) Possess thinking and reasoning ability	Answer- c)
34	Which of the following is not a "Graphic representation" ?				Answer option (a,b,c or d)
	a)Pie Chart	b)Bar Chart	c)Table	d)Histogram	Answer -c)
35	A systematic literature review is:				Answer option (a,b,c or d)
	a)One which starts in your own library, then goes to on-line databases and, finally, to the internet	b)A replicable, scientific and transparent process	c)One which gives equal attention to the principal contributors to the area	d)A responsible, professional process of time-management for research	Answer -b)
36	What is self-plagiarism?				Answer option (a,b,c or d)
	a) When a person lifts material that they have previously	b) Taking about yourself too much	c) Using somebody else's work and passing it off as your own	d) An epistemologica l stance	Answer – a)

	written and pass it off as their own work				
37	What is an ethics committee?				Answer option (a,b,c or d)
	a) People who like to talk a lot	b) A group of people who think about hypothetical research	c) A group of experienced people who will consider a research proposal and the degree to which ethical issues have been considered appropriately	d) A group of experienced people who are useful to draw on when writing a proposal as an optional extra	Answer- c)
38	Which research method is a bottom-up approach to research?				Answer option (a,b,c or d)
	a)Deductive method	b)Explanatory method	c)Inductive method	d)Exploratory method	Answer – c)
39	An example of scientific knowledge is				Answer option (a,b,c or d)
	a) Laboratory and field experiments	b)Social traditions and customs	c) Authority of the Prophet or great men	d)Religious scriptures	Answer- a)
40	The process not needed in experimental researches is				Answer option (a,b,c or d)
	a) Reference collection	b) Controlling	c) Observation	d)Manipulation and replication	Answer – a)
41	Hypothesis cannot be stated in				Answer option (a,b,c or d)
	a) Declarative terms	b) Null and question form terms	c) General terms	d) Directional terms	Answer – c)
42	Which of the following events are not a part of the Olympic Games but a part of the Commonwealth Games?				Answer option (a,b,c or d)
	a) Lawn Balls	b) Netball	c) Squash	d) All of the above	Answer -d)
43	Who is regarded the father of scientific social surveys ?				Answer option (a,b,c or d)
	a) Best	b) Booth	c) Darwin	d) None of these	Answer -b)
44	The experimental study is based on:				Answer option

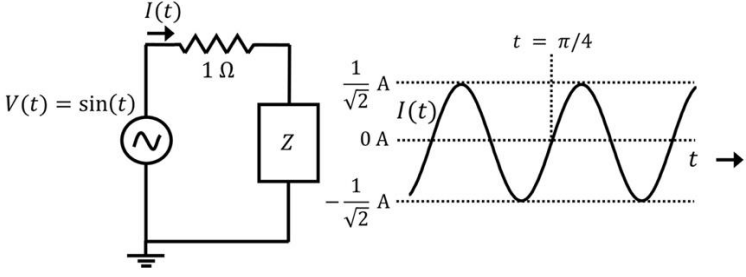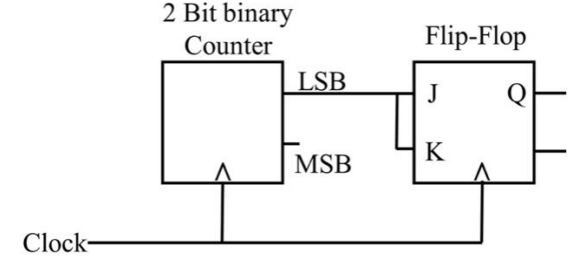|					(a,b,c or d)
	a) Survey of Literature	b) Conceptual parameters	c) Replication of research	d) The manipulation of research	Answer – d)
45	An appropriate source to find out descriptive information is................ .				Answer option (a,b,c or d)
	a)Bibliography	b)Directory	c) Encyclopae dia	d)Dictionary	Answer -c)
46	Which of the following is not true about e journals ?				Answer option (a,b,c or d)
	a)They are distributed through digital methods	b)They also have editors or editorial boards	c)They are publications of serial nature	d)They are always free of cost	Answer – d)
47	"Sampling Cases" can be defined as				d)
	a)Sampling using a sampling frame	b)Identifying people who are suitable for research	c)Literally the researcher's brief case	d)A sampling of people, newspapers, television programs etc.	A sampling of people, newspapers, television programs etc.
48	Which of the following is not the characteristic of a researcher?				Answer option (a,b,c or d)
	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	Answer -d)
49	To read critically means:				Answer option (a,b,c or d)
	a) Taking an opposing point of view to the ideas and opinions expressed	b) Skimming through the material because most of it is just padding	c)Evaluating what you read in terms of your own research questions	d)Being negative about something before you read it	Answer- c)
50	The process not needed in experimental research is				b)
	a) Control ling	b) Observation	c)Reference collection	d)Manipulatio n and replication	Observation
51	A series RLC circuit has a quality factor Q of 1000 at a center frequency of 10^6 rad/s. The possible values of R, L and C are				d)
	a)R=1 Ω, L= 1 μH and C=1 μF	b)R=0.1 Ω, L= 1 μH and C=1 μF	c)R=0.01 Ω, L= 1 μH and C=1 μF	d)R=0.001 Ω, L= 1 μH and C=1 μF	R=0.001 Ω, L= 1 μH and C=1 μF

52	Consider a narrow band signal, propagating in a lossless dielectric medium ($\varepsilon_r=4$, $\mu_r=1$), with phase velocity v_p and group velocity v_g. Which of the following statement is true? (c is the velocity of light in vacuum.)				d)
	a)$v_p>c$, $v_g>c$	b)$v_p<c$, $v_g>c$	c)$v_p>c$, $v_g<c$	d)$v_p<c$, $v_g<c$	$v_p<c$, $v_g<c$
53	In the circuit shown below, V_1 and V_2 are bias voltages. Based on input and output impedances, the circuit behaves as a				a)
	a) current controlled current source	b) voltage controlled current source	c) current controlled voltage source	d)voltage-controlled voltage source	current controlled current source
54	Match the following: A) Output of signal generator — 1. Modulated B) Error signal from a synchro — 2. Digital C) Output of a JK flip flop — 3. Analog D) Signal received by radar — 4. Stochastic				b)
	a)A-1, B-3, C-2, D-4	b)A-3, B-1, C-2, D-4	c)A-3, B-1, C-4, D-2	d)A-1, B-3, C-4, D-2	A-3, B-1, C-2, D-4
55	In the circuit shown below, P and Q are the inputs. The logicalfunction realized by the circuit shown below is				a)
	a) Y=PQ	b) Y=P+Q	c)$Y = \overline{PQ}$	d)$Y = \overline{P} + Q$	Y=PQ
56	The synchronous sequential circuit shown below works at a clock frequency of 1 GHz. The throughput, in Mbits/s, and the latency, in ns, respectively, are				a)
	a) 1000, 3	b) 333.33, 1	c) 2000, 3	d) 333.33, 3	1000, 3
57	Match the following:				b)
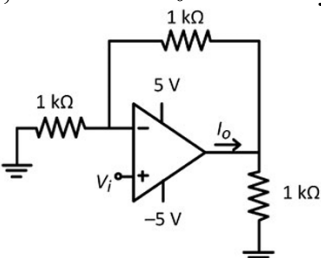
	A)	PIN diode		1.	Microwave amplification	
	B)	GaAs MOSFET		2.	Low noise microwave generation	
	C)	Transferred electron device		3. Electronic tuning of MW oscillator		
	D)	Varactor diode		4. Light wave detection		

	a)A-1, B-2, C-4, D-3	b)A-4, B-1, C-2, D-3	c)A-2, B-3, C-1, D-4	d)A-3, B-4, C-2, D-1	A-4, B-1, C-2, D-3

58	Let $m(t)$ be a strictly band-limited signal with bandwidth B and energy E. Assuming $\omega_0 = 10B$, the energy in the signal $m(t)\cos\omega_0 t$ is				b)
	a)$E/4$	b)$E/2$	c) E	d) 2E	$E/2$

59	Match the following:				

A)	Silicon	1.	trivalent
B)	Arsenic	2.	rarely used as semiconductor
C)	Indium	3.	pentavalent
D)	Germanium	4.	intrinsic semiconductor

	a) A-1, B-2, C-3, D-4	b)A-4, B-3, C-2, D-1	c)A-4, B-3, C-1, D-2	d)A-2, B-1, C-3, D-4	A-4, B-3, C-1, D-2

60	Match the following:				

A) Detection of a periodic signal in noise	1. Increase in bandwidth
B) Recovery of a band limited signal from its uniformly sampled values	2. Slope overload error
C) Finer quantization of signal	3. Nyquist rate
D)Delta modulation	4. Cross correlation

	a)A-4, B-3, C-1, D-2	b)A-3, B-4, C-2, D-1	c)A-4, B-3, C-2, D-1	d)A-4, B-2, C-1, D-3	A-4, B-3, C-1, D-2

61	The value of current through the 1 Farad capacitor of figure is	a)
	a) Zero | b) One | c) Two | d) Three	Zero

62	Match the following:	a)

A)	Electroencephalograph	1.	Diagnostic tool for heart ailment
B)	Electrocardiograph	2.	Diagnostic tool for brain ailment

		C) Sphygmomanometer	3. used for measuring BP			
		D) Stethoscope	4. used to heart pulse/ heart beat			
		a)A-2, B-1, C-3, D-4	b)A-3, B-1, C-2, D-4	c)A-2, B-1, C-4, D-3	d)A-1, B-2, C-3, D-4	A-2, B-1, C-3, D-4
63	Consider the following statements with respect to the feedback of the control systems. i. Feedback can improve stability or be harmful to stability if it is not properly applied. ii. Feedback can always improve stability iii. In many situations the feedback can reduce the effect of noise and disturbance on system performance. iv. In general the sensitivity of the system gain of a feedback system of a parameter variation depends on where the parameter is located.					c)
	a)i, ii, iii and iv only	b)i, ii and iii only	c)i, iii and iv only	d)i, ii and iv only	i, iii and iv only	
64	As compared to the analog systems, the digital processing of signals allow 1) Programmable operations 2) Flexibility in the system design 3) Cheaper systems 4) More reliability					d)
	a) 1, 2 and 3 are correct	b) 1 and 2 are correct	c) 1, 2 and 4 are correct	d) All are correct	All are correct	
65	A 10-ohm resistor, a 1 H inductor and 1 μ,F capacitor are connected in parallel. The combination is driven by a unit step current. Under the steady state condition, the source current flows through:					b)
	a)the resistor	b) the inductor	c)the capacitor only	d)all the three elements	the inductor	
66	A symbol stream contains alternate QPSK and 16-QAM symbols. If symbols from this stream are transmitted at the rate of 1 mega-symbols per second, the raw (uncoded) data rate is _____ mega-bits per second (rounded off to one decimal place).					c)
	a) 1 Mbps	b) 2 Mbps	c) 3 Mbps	d) 4 Mbps	3 Mbps	
67	In direct form for realisation of IIR filters, 1) Denominator coefficients are the multipliers in the feed forward paths 2) Multipliers in the feedback paths are the positives of the denominator coefficients 3) Numerator coefficients are the multipliers in the feed forward paths 4) Multipliers in the feedback paths are the negatives of the denominator coefficients					a)
	a) 3 and 4 are correct	b) 1 and 2 are correct	c) 1, 2 and 3 are correct	d) All are correct	3 and 4 are correct	
68	Consider the circuit shown in the figure with input $V(t)$ in volts. The sinusoidal steady state current $I(t)$ flowing through the circuit is shown graphically (where t is in seconds). The circuit element Z can be _____					b)

	a) a capacitor of 1 F	b) an inductor of 1 H	c) a capacitor of √3 F	d) an inductor of √3 H	an inductor of 1 H
69	For the circuit shown, the clock frequency is f_0 and the duty cycle is 25%. For the signal at the Q output of the Flip-Flop, _____				a)
	a) frequency is $f_0/4$ and duty cycle is 50%	b) frequency is $f_0/4$ and duty cycle is 25%	c) frequency is $f_0/2$ and duty cycle is 50%	d) frequency is $f_0/2$ and duty cycle is 25%	frequency is $f_0/4$ and duty cycle is 50%
70	Which one of the following statements is not correct? A) Root loci can be used for analyzing stability and transient performance B) Root loci provide insight into system stability and performance C) Shape of the root locus gives idea of type of controller needed to meet design specification D) Root locus can be used to handle more than one variable at a time				c)
	a)A and B	b)B and D	c)D	d)A	D
71	An antenna with a directive gain of 6 dB is radiating a total power of 16 kW. The amplitude of electric field in free space at a distance of 8 km from the antenna in the direction of 6 dB gain is (Round off to 3 decimal places) _____ V/m.				c)
	a) 0.152	b) 0.182	c) 0.244	d) 0.324	0.244
72	Match the following: <table><tr><td>A) Voltage controlled device</td><td>1. BJT</td></tr><tr><td>B) Current controlled device</td><td>2. UJT</td></tr><tr><td>C) Conductivity modulation device</td><td>3. FET</td></tr><tr><td>D) Negative conductance device</td><td>4. Impatt diode</td></tr></table>				d)
	a) A-2, B-3, C-1, D-1	b) A-2, B-3, C-4, D-1	c) A-3, B-1, C-2, D-4	d) A-3, B-1, C-4, D-2	A-3, B-1, C-4, D-2

73	An 8-bit unipolar (all analog output values are positive) digital-to-analog converter (DAC) has a full-scale voltage range from 0 V to 7.68 V. If the digital input code is 10010110 (the leftmost bit is MSB), then the analog output voltage of the DAC (rounded off to one decimal place) is _____ V.				a)
	a) 4.51	b) 5.51	c) 6.31	d) 7.31	4.51
74	Consider a real-valued base-band signal x(t), band limited to 10 kHz. The Nyquist rate for the signal $y(t) = x(t).x\left(1+\frac{t}{2}\right)$ is				b)
	a) 15 kHz	b) 30 kHz	c) 60 kHz	d) 20 kHz	30 kHz
75	Addressing line of a 32 K×16 memory is.....				d)
	a) 8	b) 32	c) 15	d) 19	19
76	Which of the following quantities give a measure of the transient characteristics of a control system, when subjected to unit step excitation. 1. Maximum overshoot 2. Maximum undershoot 3. Overall gain 4. Delay time 5. Rise time 6. Fall time				d)
	a) 1,3 and 5	b) 2, 4 and 5	c) 2,4 and 6	d) 1,4 and 5	1,4 and 5
77	A 4 kHz sinusoidal message signal having amplitude 4 V is fed to a delta modulator (DM) operating at a sampling rate of 32 kHz. The minimum step size required to avoid slope overload noise in the DM (rounded off to two decimal places) is _____ V				b)
	a) 2.24	b) 3.14	c) 4.12	d) 5.22	3.14
78	Match the following: <table><tr><td>A) RC coupled amplifier</td><td>1. Very low drift</td></tr><tr><td>B) Tuned amplifier</td><td>2. Flat frequency response from zero frequency onwards</td></tr><tr><td>C) Chopper stabilized amplifier</td><td>3. Flat frequency response with upper and lower cut off frequency</td></tr><tr><td>D) DC amplifier</td><td>4. Peak in gain frequency response</td></tr></table>				c)
	a) A-4, B-3, C-1, D-2	b) A-3, B-4, C-2, D-1	c) A-3, B-4, C-1, D-2	d) A-4, B-3, C-2, D-1	A-3, B-4, C-1, D-2
79	Consider a carrier signal which is amplitude modulated by a single-tone sinusoidal message signal with a modulation index of 50%. If the carrier and one of the sidebands are suppressed in the modulated signal, the percentage of power saved (rounded off to one decimal place) is _____.				a)
	a) 94.44	b) 104.45	c) 114.55	d) 124.65	94.44
80	Consider a super heterodyne receiver tuned to 600 kHz. If the local oscillator feeds a 1000 kHz signal to the mixer, the image frequency (in integer) is _____ kHz.				b)
	a) 1200	b) 1400	c) 1600	d) 1800	1400

81	A transmission line of length 3λ/4 and having a characteristic impedance of 50 Ω is terminated with a load of 400 Ω. The impedance (rounded off to two decimal places) seen at the input end of the transmission line is _____ Ω.	c)
	a) 2.25 | b) 4.25 | c) 6.25 | d) 8.25	6.25
82	A 10-bit D/A converter is calibrated over the full range from 0 to 10 V. If the input to the D/A converter is 13A (in hex), the output (rounded off to three decimal places) is _____ V	d)
	a) 1.50 | b) 1.60 | c) 2.70 | d) 3.07	3.07
83	A single crystal intrinsic semiconductor is at a temperature of 300 K with effective density of states for holes twice that of electrons. The thermal voltage is 26 mV. The intrinsic Fermi level is shifted from mid-bandgap energy level by	d)
	a) 13.45 meV | b) 18.02 meV | c) 26.90 meV | d) 9.01 meV	9.01 meV
84	A binary random variable X takes the value +2 or –2. The probability $P(X = +2) = \alpha$. The value of α (rounded off to one decimal place), for which the entropy of X is maximum, is _____	b)
	a) 0.25 | b) 0.50 | c) 0.75 | d) 1.0	0.50
85	In an 8085 microprocessor, the number of address lines required to access a 16 K byte memory bank is _____	c)
	a) 10 | b) 12 | c) 14 | d) 15	14
86	The loop transfer function of a negative feedback system is $$G(s)H(s) = \frac{K(s + 11)}{s(s + 2)(s + 8)}$$ The value of K, for which the system is marginally stable, is _____	d)
	a) 40 | b) 80 | c) 120 | d) 160	160
87	In the circuit shown below, all the components are ideal. If V_i is +2 V, the current I_0 sourced by the op-amp is _____ mA.	a)
	a) 6 | b) 9 | c) 12 | d) 15	6
88	Match the following: 	A)	Direct addressing	1.	MOV A, M
B)	Register addressing	2.	MOV C, A
C)	Register indirect addressing	3.	LDI 70H
D)	Immediate addressing	4.	STA 3000H		b)
	a)A-1, B-2, C-3, D-4 | b)A-4, B-2, C-1, D-3 | c) A-2, B-3, C-4, D-1 | d) A-3, B-2, C-1, D-4	A-4, B-2, C-1, D-3
89	In the circuit shown below, all the components are ideal and the input voltage is sinusoidal. The magnitude of the steady-state output V_0 (rounded off to two decimal places) is _____ V	b)

	a) 550.4	b) 650.4	c) 750.4	d)850.4	650.4
90	An enhancement MOSFET of threshold voltage 3 V is being used in the sample and hold circuit given below. Assume that the substrate of the MOS device is connected to –10 V. If the input voltage V_i lies between ±10 V. the minimum and the maximum values of V_G required for proper sampling and holding respectively, are				b)
	a) 10 V and – 13 V	b) 13 V and –7 V	c) 10 V and – 10 V	d) 3 V and –3 V	13 V and –7 V
91	Match the following: 	A) Cauer I	1. L in series arm and C in shunt arm of ladder
B) Cauer II	2. C in series arm and L in shunt arm of ladder
C) Foster I	3. Series combination of L and C in parallel D
D) Foster II	4. Parallel combination of L and C in series					a)
	a)A-1, B-2, C-3, D-4	b)A-1, B-2, C-4, D-3	c)A-2, B-1, C-4, D-3	d)A-2, B-1, C-3, D-4	A-1, B-2, C-3, D-4
92	Which of the following statement is true about Feedback control system? A) Equally sensitive to forward feedback path parameter changes B) Insensitive to both forward and feedback path parameter changes C) Less sensitive to feedback path parameter changes than to forward path parameter changes D) Less sensitive to forward path parameter changes than to feedback path parameter changes				d)
	a) A and B	b)B only	c)C only	d)D only	D only
93	A box contains the following three coins (i) A fair coin with head on one face and tail on other face. (ii) A coin with heads on both faces. (iii) A coin with tail on both faces. A coin is picked randomly from box and tossed. Out of the two remaining coins in the box, one coin is then picked randomly and tossed. If the first toss result in a head, the probability of getting a head in the second toss is				b)
	a) 2/5	b) 1/3	c) 1/2	d) 2/3	1/3

94	Match the following:				b)

A) Bolometer	1. Reflection coefficients
B) VSWR meter	2. Half power beam widths
C) Cavity wave meter	3. Microwave power
D) Pattern recorder	4. Microwave frequency

		a) A-2, B-1, C-4, D-3	b) A-3, B-1, C-4, D-2	c) A-2, B-4, C-1, D-3	d) A-3, B-4, C-1, D-2	A-3, B-1, C-4, D-2
95	In the given circuit, the two-port network has the impedance matrix $[Z] = \begin{bmatrix} 40 & 60 \\ 60 & 120 \end{bmatrix}$. The value of Z_L for which maximum power is transferred to the load is _____ Ω.					c)
		a) 40	b) 44	c) 48	d) 52	48
96	P, Q, and R are the decimal integers corresponding to the 4-bit binary number 1100 considered in signed magnitude, 1's complement, and 2's complement representations, respectively. The 6-bit 2's complement representation of (P + Q + R) is					a)
		a) 110101	b) 111101	c) 110010	d) 111001	110101
97	The characteristic equation of a system is $s^3 + 3s^2 + (K + 2)s + 3K = 0$ In the root locus plot for the given system, as K varies from 0 to ∞, the break-away or break-in point(s) lie within					b)
		a) (–2, –1)	b) (–1, 0)	c) (–3, –2)	d) (–∞, –3)	(–1, 0)
98	A pn junction solar cell of area 1.0 cm^2, illuminated uniformly with 100 mW cm^{-2}, has the following parameters: Efficiency = 15%, open circuit voltage = 0.7 V, fill factor = 0.8, and thickness = 200 μm, The charge of an electron is 1.6×10^{-19} C. The average optical generation rate (in cm^{-3} S^{-1}) is					c)
		a) 1.04×10^{19}	b) 83.60×10^{19}	c) 0.84×10^{19}	d) 5.57×10^{19}	0.84×10^{19}
99	Consider a polar non-return to zero (NRZ) waveform, using + 2 V and – 2 V for representing binary '1' and '0' respectively, is transmitted in the presence of additive zero-mean white Gaussian noise with variance 0.4 V^2. If the a priori probability of transmission of a binary '1' is 0.4, the optimum threshold voltage for a maximum a posteriori (MAP) receiver (rounded off to two decimal places) is _____ V.					d)
		a) 0.01	b) 0.02	c) 0.03	d) 0.04	0.04
100	A sinusoidal message signal having root mean square value of 4 V and frequency of 1 kHz is fed to phase modulator with phase deviation constant 2 rad/volt. If the carrier signal is $c(t) = 2\cos(2\pi 10^6 t)$, the maximum instantaneous frequency of the phase modulated signal (rounded off to one decimal place) is _____ Hz.					a)
		a) 1011313.7	b) 1101313.7	c) 1013313.7	d) 1011333.7	1011313.7
101	The low voltage on the gate of p-MOSFET forms:					Answer option (a,b,c or d)

	a) Channel of negative carriers	b) Channel is not formed	c) Channel is clipped	d) Channel of positive carriers	Answer – d)
102	What is the SI unit of electron diffusion constant?				Answer option (a,b,c or d)
	a) cm^2/s	b) m^2/s	c) m/s	d) none	Answer- b)
103	Bandwidth of amplifier is _____				Answer option (a,b,c or d)
	a) Difference between upper cut-off frequency and lower cut-off frequency	b) Sum of upper cut-off frequency and lower cut-off frequency	c) Average of upper cut-off frequency and lower cut-off frequency	d)Independent to cut off frequency	Answer – a)
104	Ripple factor of half wave rectifier is _____				Answer option (a,b,c or d)
	a) 1.414	b) 1.21	c) 1.3	d) 0.48	Answer – b)
105	The normal operation of JFET is				Answer option (a,b,c or d)
	a)constant voltage region organizations etc.	b)constant current region	c) both constant voltage and constant current regions	d)either constant voltage or constant current region	Answer- b)
106	Which of the below mentioned statements is false regarding a p-n junction diode?				Answer option (a,b,c or d)
	a) Diode are uncontrolled devices	b) Diodes are rectifying devices	c) Diodes are unidirectional devices	d) Diodes are bidirectional devices	Answer – d)
107	Which of the following is true in case of an unbiased p-n junction diode?				Answer option (a,b,c or d)
	a) Diffusion does not take place	b) Diffusion of electrons & holes goes on infinitely	c) There is zero electrical potential across the junctions	d) Charges establish an electric field across the junctions	Answer- d)
108	Which of the following expressions doesn't represent the correct formula for Drift current density?				Answer option (a,b,c or d)
	e) $J=\sigma E$	f) $J=qn\mu E$	g) $J=\mu E$	h) None	Answer- c)
109	PVC is a polymer of__?				Answer option (a,b,c or d)

	a) Propane	b) Vinyl chloride	c) Styrene	d) Carbonates	Answer – b)
110	_____ is a direct band gap material.				Answer option (a,b,c or d)
	a) Copper Indium Gallium Selenide	b)Copper Selenide	c)Copper Gallium Telluride	d)Copper Indium Gallium Diselenide	Answer -a)
111	In General Semiconductors possess ………………….. temperature coefficient of Resistance.				Answer option (a,b,c or d)
	a) Zero	b) Negative	c)Positive	d)None of the above	Answer- b)
112	In an RLC circuit, which of the following is always used as a vector reference?				Answer option (a,b,c or d)
	a)Voltage	b)Resistance	c)Impedance	d)Current	Answer – a)
113	What is the intrinsic electrons concentration at T=300K in Silicon?				Answer option (a,b,c or d)
	a)$1.5*10^{10} cm^{-3}$	b) $1.5*10^{-10} cm^{-3}$	c) $2.5*10^{19} cm^{-3}$	d) $2.5*10^{-19} cm^{-3}$	Answer -a)
114	The output characteristics of a MOSFET, is a plot of				Answer option (a,b,c or d)
	a)Id as a function of Vgs with Vds as a parameter	b)Id as a function of Vds with Vgs as a parameter	c)Ig as a function of Vgs with Vds as a parameter	d)Ig as a function of Vds with Vgs as a parameter	Answer -b)
115	The amount of photoelectric emission current depends on				Answer option (a,b,c or d)
	a)frequency of incident radiation	b)intensity of incident radiation	c)both frequency and intensity of incident radiation	d)none of the above	Answer -b)
116	The number of doped regions in PIN diode is				Answer option (a,b,c or d)
	a)1	b)2	c)3	d)1 or 2	Answer – b)
117	When drain voltage equals the pinch-off-voltage, then drain current …………. with the increase in drain voltage				Answer option (a,b,c or d)
	a) Decreases	b) Increases	c)remains constant	a) none of the above	Answer – c)
118	A counter circuit is usually constructed of _____				Answer option (a,b,c or d)
	a)A number of latches	b)A number of NAND gates	c)A number of flip-flops	d)A number of NOR gates	Answer – c)

	connected in cascade form	connected in cascade form	connected in cascade	connected in cascade form	
119	BCD counter is also known as _____				Answer option (a,b,c or d)
	a) Parallel counter	b) Decade counter	c) Synchronous counter	d) VLSI counter	Answer- b)
120	Latches constructed with NOR and NAND gates tend to remain in the latched condition due to which configuration feature?				Answer option (a,b,c or d)
	a)Low input voltages	b)Synchronous operation	c)Gate impedance	d)Cross coupling	Answer -d)
121	When a high is applied to the Set line of an SR latch, then _____				Answer option (a,b,c or d)
	a)Q output goes high	b)Q' output goes high	c)Q output goes low	d) Both Q and Q' go high	Answer -a)
122	The time required to complete the conversion of Analog to Digital is _____ the duration of the hold mode of S/H.				Answer option (a,b,c or d)
	a)Greater than	b)Equals to	c) Less than	d)Greater than or Equals to	Answer – c)
123	Delta modulation uses _____ bits per sample.				Answer option (a,b,c or d)
	a) One	b) Two	c) Four	d) Eight	Answer – a)
124	Which of the following can easily convert to a non-volatile memory?				Answer option (a,b,c or d)
	a) SRAM	b) DRAM	c) DDR SRAM	d)Asynchronous DRAM	Answer – a)
125	The microprocessor of a computer can operate on any information if it is present in _____ only.				Answer option (a,b,c or d)
	a) Program Counter	b) Flag	c)Main Memory	d)Secondary Memory	Answer – c)
126	Which system among the following is a time invariant system?				Answer option (a,b,c or d)
	a) $y(n) = n x(n)$	b) $y(n) = x(n) - x(n-1)$	c) $y(n) = x(-n)$	d) $y(n) = x(n) \cos 2nf$	Answer – b)
127	Power spectral density function is a?				Answer option (a,b,c or d)
	a) Real and even function	b) Non negative function	c) Periodic	d) All of the mentioned	Answer- d)
128	The skin effect is a phenomenon observed in				Answer option (a,b,c or d)
	a) Insulators	b) Dielectrics	c) Conductors	d)Semiconductors	Answer- c)
129	Identify the type of modulation where the frequency of the modulated wave is equal to that of the carrier wave.				Answer option (a,b,c or d)
	a)Frequency modulation	b)Amplitude modulation	c)Carrier modulation	d)Phase modulation	Answer – b)

130	A carrier of peak voltage 15 V is used to transmit a message signal. If the modulation index is 70%, then what will be the peak voltage of the modulating signal?				Answer option (a,b,c or d)
	a)25 V	b)11V	c)10.5V	d)30V	Answer -c)
131	If there are 8 nodes in network, we can get ____ number of equations in the nodal analysis.				Answer option (a,b,c or d)
	a) 9	b) 8	c)7	d)6	Answer – c)
132	Find the voltage at node 2 of the circuit shown below.				Answer option (a,b,c or d)
	a) 13V	b) 14V	c) 15V	d) 16V	Answer – b)
133	Euler form of momentum equations does not involve this property.				Answer option (a,b,c or d)
	a) Stress	b)Friction	c)Strain	d)Temperature	Answer- b)
134	Entropy of a random variable is				Answer option (a,b,c or d)
	a) 0	b) 1	c) Infinite	d) Cannot be determined	Answer- c)
135	What is the minimal Hamming distance between any two correct codewords?				Answer option (a,b,c or d)
	a) 1	b) 2	c) 3	d) 4	Answer- c)
136	Quantization noise can be reduced by _____ the number of levels.				Answer option (a,b,c or d)
	a) Decreasing	b) Increasing	c)Doubling	d)Squaring	Answer – b)
137	Which of the following is the main factor which determines the memory capacity?				Answer option (a,b,c or d)
	a)number of transistors	b) number of capacitors	c)size of the transistor	d) size of the capacitor	Answer- a)
138	A LTI system is characterized by _____				Answer option (a,b,c or d)
	a) Unit impulse response	b)Time shifted impulses	c)Unit step response	d)Response to any signal(bounded)	Answer- a)
139	White noise has _____ power spectral density.				Answer option (a,b,c or d)

	a)Constant	b)Variable	c)Constant & Variable	d)None of the mentioned	Answer – a)
140	When the source of light is not sun light then the photo voltaic cell is _____ used _____ as _____				Answer option (a,b,c or d)
	a)Photo diode	b)Photo voltaic cell	c)Photo detector	d)Photo transmitter	Answer -c)
141	Photoresist layer is formed using				Answer option (a,b,c or d)
	a)high sensitive polymer	b)light sensitive polymer	c)polysilicon	d)silicon di oxide	Answer – b)
142	In a Zener diode				Answer option (a,b,c or d)
	a)the forward current is very high	b)sharp breakdown occurs at a certain reverse voltage	c)the ratio v-i can be negative	d)there are two p-n junctions	Answer- b)
143	At very high temperatures the extrinsic semiconductors become intrinsic because				Answer option (a,b,c or d)
	a)drive in diffusion of dopants and carriers	b)band to band transition dominants over impurity ionization	c)impurity ionization dominants over band to band transition	d)band to band transition is balanced by impurity ionization	Answer- b)
144	A mux is a _____ component?				Answer option (a,b,c or d)
	a) Data Selector	b) Data Distributor	c) Data Destroyer	d) All of these	Answer – a)
145	In CMOS logic circuit the p-MOS transistor acts as:				Answer option (a,b,c or d)
	a)Pull down network	b)Pull up network	c)Load	d)Short to ground	Answer – b)
146	If the system is represented by G(s) H(s) = k (s+7) / s (s +3) (s + 2), what would be its magnitude at $\omega = \infty$?				Answer option (a,b,c or d)
	a) 0	b) ∞	c) 7/10	d)21	Answer – a)
147	What is the ROC of the signal x(n)=δ(n-k), k>0?				Answer option (a,b,c or d)
	a)z=0	b) z=∞	c)Entire z-plane, except at z=0	d) Entire z-plane, except at z=∞	Answer- c)
148	The unit of average mutual information is				Answer option (a,b,c or d)
	a)Bits	b)Bytes	c)Bits per symbol	d)Bytes per symbol	Answer – a)
149	In which MOSFET amplifier the output voltage is out of phase from input voltage				Answer option (a,b,c or d)

	a)Common Source	b) Common drain	c)Common gate	d) Source Follower	Answer- a)
150	Select the Boolean function(s) equivalent to $x+yz$, where x,y, and z are Boolean variables, and $+$ denotes logical OR operation				c)
	a)$x+z+xy$	b)$(x+y)(x+z)$	c)$x+xy+yz$	d)$x+xz+xy$	$x+xy+yz$