

Test Booklet No. _____

This booklet consists of 100 questions and 12 printed pages.

RGUCET/2024/___/___

Series

NIL

RGUCET 2024
Common Entrance Test, 2024
MASTER OF TECHNOLOGY (ELECTRONICS AND
COMMUNICATION ENGINEERING)

Full Marks: 100

Time: 2 Hours

Roll No.

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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 100 Multiple Choice Questions (MCQs) from the concerned subject. Each question carries 1 mark. There shall be negative marking of 0.25 against each wrong attempt.
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 one hour thirty minutes.
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.

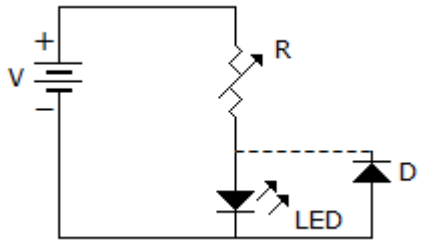
1	EMBEZZLE				a
	a) Misappropriate	b) Balance	c) Remunerate	d) Clear	Misappropriate
2	Choose the one which best expresses the given sentence in Passive/Active voice. “After driving professor Kumar to the museum she dropped him at his hotel.”				a
	a) After being driven to the museum, Professor Kumar was dropped at his hotel.	Professor Kumar was being driven dropped at his hotel.	c) After she had driven Professor Kumar to the museum she had dropped him at his hotel.	d) After she was driven Professor Kumar to the museum she had dropped him at his hotel.	After being driven to the museum, Professor Kumar was dropped at his hotel.
3	Pick out the best one which can complete incomplete stem correctly and meaningfully. 1. Despite his best efforts to conceal his anger.....				c
	a) we could detect that he was very happy	b) he failed to give us an impression of his agony	c) people came to know that he was annoyed	d) he could succeed in doing it easily	people came to know that he was annoyed
4	Choose the correct meaning of proverb/idiom 1. To make clean breast of				c
	a) To gain prominence	b) To praise oneself	c) To confess without of reserve	d) To destroy before it blooms	To confess without of reserve
5	Pick out the most effective word(s) from the given words to fill in the blank to make the sentence meaningfully complete. 1. The miser gazed at the pile of gold coins in front of him.				a
	a) avidly	b) admiringly	c) thoughtfully	d) earnestly	avidly
6	Hitler party which came into power in 1933 is known as				b
	a) Labour Party	b) Nazi Party	c) Ku-Klux-Klan	d) Democratic Party	Nazi party
7	Epsom (England) is the place associated with				a
	a) Horse racing	b) Polo	c) Shooting	d) Snooker	Horse Racing
8	Which union minister has inaugurated RIWATCH Museum in Arunachal Pradesh?				c
	a) Nitin Gadkari	b) Ashok Gajapathi Raju	c) Kiren Rijiju	d) Prakash Javadekar	Kiren Rijiju
9	Grand Central Terminal, Park Avenue, New York is the world's				b
	a) highest railway station	b) largest railway station	c) longest railway station	d) None of the above	largest railway station

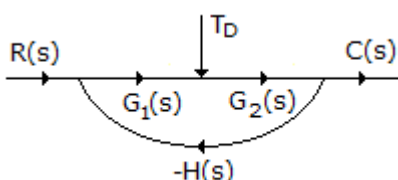
10	Three fair coin are tossed, what is the total outcome?				c
	a. 4	b. 6	c. 8	d. 16	8
11	Find the odd one out from the given set of numbers. 14, 28, 35, 46, 56, 84				d
	a. 56	b. 84	c. 35	d. 46	46
12	A man has Rs. 480 in the denominations of one-rupee notes, five-rupee notes and ten-rupee notes. The number of notes of each denomination is equal. What is the total number of notes that he has ?				d
	a) 45	b) 60	c) 75	d) 90	90
13	A group of 1200 persons consisting of captains and soldiers is travelling in a train. For every 15 soldiers there is one captain. The number of captains in the group is				b
	a)70	b)75	c)80	d)85	75
14	Two unbiased coins are tossed. What is the probability of getting at most one head?				d
	a. $\frac{1}{2}$	b. $\frac{1}{3}$	c. $\frac{1}{6}$	d. $\frac{3}{4}$	$\frac{3}{4}$
15	What is INS Vikrant, recently seen in news?				b
	a)Submarine	b)Aircraft carrier	c)Tankers	d)Frigates	Aircraft carrier
16	Lunar Polar Exploration Mission (LUPEX), recently seen in news, is a joint mission between which two space agencies?				a
	a) ISRO & JAXA	NASA & ISRO	c)CNSA & ROCOSMOS	d)ESA & NASA	ISRO & JAXA
17	Who is the Noble Peace Prize 2023 winner?				a
	a) Narges Mohammadi	b) Louis E. Brus	c)MoungiBawendi	d) Drew Weissman	Narges Mohammadi
18	Where will the FIFA World Cup 2026 be held?				d
	a) United States	b) Canada	c) Mexico	d) All of the Above	All of the above
19	Who is the Governor of Arunachal Pradesh?				a
	a)Lt Gen Kaiwalya Trivikram Parnaik (Retd.)	b)Lt Gen Syam Lal Parnah(Retd.)	c)Lt Gen Prakash Singh (Retd.)	d) Smt. Anusuiya Uikey	Lt Gen Kaiwalya Trivikram Parnaik (Retd.)
20	Where is the permanent secretariat of the SAARC?				a
	a)Kathmandu	b) New Delhi	c) Islamabad	d) Colombo	Kathmandu
21	Which of the given modulator is an indirect way of generating FM?				b
	a) Inductance FET modulator	b) Armstrong modulator	c) Reactance tube modulator	d) Zener diode modulator	Armstrong modulator
22	A modulator is a device used to				d
	a)Differentiates two frequencies	b) Amplify two radio frequency signal	c) Impress the information on to a radio	d) Reduce the modulating	Reduce the modulating

			frequency carrier	power requirement.	power requirement.
23	The power spectral density of a signal is				d
	a) Even negative and complex	b) Odd, complex, and positive	c) Real, odd, and negative	d) Real, even, and non-negative	Real, even, and non-negative
24	Which of the given filter has maximum flatness?				b
	a) Bessel filter	b) Butterworth filter	c) Low pass filter	d) High pass filter	Butterworth filter
25	Analog data with the highest harmonic at 40 kHz generated by a sensor has been digitized using 6 level PCM. Find the rate at which digital signal generated?				b
	a) 300 kbps	b) 240 kbps	c) 450 kbps	d) 600 kbps	240 kbps
26	Properties used to determine stream's fidelity				c
	a) Sampling rate	b) Bit depth	c) Sampling rate & Bit depth	d) None of the mentioned	Sampling rate & Bit depth
27	The major advantage of FM over AM is				a
	a) Reception is less noisy	b) Higher carrier frequency	c) Smaller bandwidth	d) Small frequency deviation	Reception is less noisy
28	Superhertodyne principle refers to				c
	a) Using a large number of amplifier stages	b) Using a push-pull circuit	c) Obtaining lower fixed intermediate frequency	d) None of the above	Obtaining lower fixed intermediate frequency
29	As the frequency increases, the absorption of ground wave by earth's surface				b
	a) decreases	b) increases	c) remains the same	d) either (a) or (c)	increases
30	Whenever a wave is incident on a perfect conductor then the reflection coefficient is				0
	a) 1	b) 0	c) $1 < 180^\circ$	d) depend upon η_1, η_2	B (Rejected)
31	When a wave is incident from the more dense into a less dense medium at an angle equal to or exceeding the critical angle, the wave suffers total internal				refraction
	a) reflection	b) refraction	c) transmission	d) none of the above	b
32	Radiation intensity in a given direction is the				power radiated per unit solid angle in that direction
	a) energy radiated per square metre	b) power radiated per square metre	c) power radiated per unit solid angle in that direction	d) none of the above	c
33	$Z_L = 200 \Omega$ and it is desired that $Z_i = 50 \Omega$. The quarter wave transformer should have a characteristic impedance of				100 Ω

	a) 100 Ω	b) 40 Ω	c) 10000 Ω	d) 4 Ω	a
34	A broadside array operating at 100 cm wavelength consist of 4 half-wave dipoles spaced 50 cm apart. Each element carries radio frequency current in the same phase and of magnitude 0.5 A. The radiated power will be				196 W
	a)196 W	b) 73 W	c) 36.5 W	d) 18.25 W	a
35	A material has conductivity of 10^{-2} mho/m and a relative permittivity of 4. The frequency at which conduction current in the medium is equal to displacement current is				45 MHz
	a) 45 MHz	b) 90 MHz	c) 450 MHz	d) 900 MHz	a
36	A transmission line is feeding 1 watt of power to a horn antenna having a gain of 10 dB. The antenna is matched to the transmission line. The total power radiated by the horn antenna into the free space is				10 watt
	a) 10 watt	b) 1 watt	c)0.1 watt	d)0.01 watt	a
37	Poynting vector is associated with which of the following?				Power flow in electromagnetic field
	a) Power flow in electromagnetic field	b) Flux in magnetic	c) Charge in electrostatic field	d) Current in electrostatic field	a
38	Which of the following antenna is best guided by a waveguide?				Horn
	a) Biconical	b) Horn	c)Helical	d)Dish	b
39	In the below figure the average load current is 15 A. The rms value of transformer secondary current is				10.61 A
	a) 15 A	b) 10.61 A	c) 7.5 A	d) 14.14 A	b
40	A single phase half wave rectifier circuit has a free wheeling diode. The free wheeling diode will conduct only if				load is purely inductive or combination of R and L
	a)load is purely resistive	b)load is purely inductive	c) load is combination of R and L	d)load is purely inductive or combination of R and L	d

41	McMurray Bedford full bridge inverter uses				complementary commutation
	a) natural commutation	b) auxiliary commutation	c) complementary commutation	d) any of the above	c
42	An n pulse rectifier is fed by a source having an inductance L . If load current is I_0 , the voltage drop due to overlap is				$\frac{n \omega L}{2\pi} I_0$
	a) $\frac{n \omega L}{2\pi} I_0$	b) $\frac{n \omega L}{\pi} I_0$	c) $\frac{n^2 \omega L}{\pi} I_0$	d) $\frac{n \omega L}{3\pi} I_0$	a
43	For the system in the given figure the characteristic equation is				
					$1 + \frac{K(s+1)(s+3)}{s(s+2)} = 0$
	a) $1 + \frac{K(s+1)(s+3)}{s(s+2)}$	b) $1 + \frac{K(s-1)(s-3)}{s(s-2)}$	c) $K(s+1)(s+3) = 0$	d) $s(s+2) = 0$	a
44	For the system in the given figure. The transfer function $C(s)/R(s)$ is				
					$G_1 G_2 + G_2 + 1$
	a) $G_1 + G_2 + 1$	b) $G_1 G_2 + 1$	c) $G_1 G_2 + G_2 + 1$	d) $G_1 G_2 + G_1 + 1$	c
45	Whether a linear system is stable or unstable that it				is a property of the system only
	a) is a property of the system only	b) depends on the input function only	c) both (a) and (b)	d) either (a) or (b)	a
46	At room temperature the current in an intrinsic semiconductor is due to				holes and electrons
	a) holes	b) electrons	c) ions	d) holes and electrons	d
47	In which of these is reverse recovery time nearly zero?				Schottky diode
	a) Zener diode	b) Tunnel diode	c) Schottky diode	d) PIN diode	c
48	A transistor has a current gain of 0.99 in the CB mode. Its current gain in the CC mode is				0.99
	a) 100	b) 0.99	c) 1.01	d) 0.99	a
49	In $p-n-p$ transistor the current I_E has two components viz. I_{Ep} due to injection of holes from p -region to n -region and I_{En} due to injection of electrons from n -region to p -region. Then				$I_{Ep} \gg I_{En}$
	a) I_{Ep} and I_{En} are almost equal	b) $I_{Ep} \gg I_{En}$	c) $I_{En} \gg I_{Ep}$	d) either (a) or (c)	b
50	In an n channel JFET, the gate is				P type

	a) n type	b) p type	c) either n or p	d) partially n & partially p	b
51	<p>Assertion (A): A p-n junction has high resistance in reverse direction.</p> <p>Reason (R): When a reverse bias is applied to p-n junction, the width of depletion layer increases.</p>				Both A and R are true and R is correct explanation of A
	a) Both A and R are true and R is correct explanation of A	b) Both A and R are true but R is not a correct explanation of A	c) A is true but R is false	d) A is false but R is true	a
52	<p>In the circuit of figure the function of resistor R and diode D are</p> 				to limit the current and protect LED against reverse breakdown voltage.
	a) to limit the current and to protect LED against over voltage	b) to limit the voltage and to protect LED against over current	c) to limit the current and protect LED against reverse breakdown voltage.	d) none of the above.	c
53	In bipolar transistors dc current gain is				$\frac{I_C}{I_B}$
	a) $\frac{I_C}{I_E}$	b) $\frac{I_C}{I_B}$	c) $\frac{I_E}{I_B}$	d) $\frac{I_E}{I_C}$	b
54	For an P-channel enhancement type MOSFET determine the drain current if $K = 0.278 \times 10^{-3} \text{A/V}^2$, $V_{GS} = -4\text{V}$, $V_T = -2\text{V}$, Voltage equivalent at $27^\circ\text{C} = 26 \text{mV}$.				1.11 mA
	a) 10 mA	b) 1.11 mA	c) 0.751 mA	d) 46.98 mA	b
55	Between which regions does BJT act like switch?				Cut off and saturation
	a) Cut off and saturation	b) Cut off and forward active	c) Forward active and cut off	d) Saturation and active	a
56	A stepper motor is				is an electromechanical device which actuates a train of step angular movements in response to a train of input pulses on one to one basis

	a) a two phase induction motor	b) is a kind of rotating amplifier	c) is an electromagnetic transducer used to convert an angular position of shaft into electrical signal	d) is an electromechanical device which actuates a train of step angular movements in response to a train of input pulses on one to one basis	d
57	The gain margin for a stable system				has a positive decibel value
	a) has a positive decibel value	b) has a negative decibel value	c) has a large negative decibel value	d) has a large negative decibel value	a
58	The signal flow graph of a system is shown in the given figure. The effect of disturbance T_D can be reduced by				increasing $G_1(s)$
					
	a) increasing $G_2(s)$	b) decreasing $G_2(s)$	c) increasing $G_1(s)$	d) decreasing $G_1(s)$	c
59	In root locus analysis the breakaway and break in points				either lie on the real axis or occur in complex conjugate pairs
	a) lie on the real axis	b) either lie on the real axis or occur in complex conjugate pairs	c) always occur in complex conjugate pairs	d) none of the above	b
60	In control systems the output of sensor usually, is				analog or digital electrical signal
	a) analog electrical signal	b) digital electrical signal	c) mechanical signal	d) analog or digital electrical signal	D (Rejected)
61	Which of the following cannot be the Fourier series expansion of a periodic signal?				B
	a) $x(t)=2\cos(t)+3\cos(3t)$	b) $x(t)=2\cos(\pi t)+7\cos(t)$	c) $x(t)=2\cos(t)+0.5$	d) $x(t)=2\cos(t)+3\cos(3.5t)$	$x(t)=2\cos(\pi t)+7\cos(t)$
62	The trigonometric Fourier series of an even function of time does not have the				C

	a) DC term	b) Cosine Term	c) Sine Term	d) odd harmonic term	Sine term
63	The Fourier Series of an odd periodic function, contains only				C
	a) Even harmonic	b) Cosine Term	c) Sine Term	d)Odd Harmonic	Sine Term
64	To obtain very high input and output impedances in a feedback Amplifier, the mostly used is				B
	a) Voltage Series	b) Current Series	c) Voltage Shunt	d) Current Shunt	Current Series
65	Crossover distortion behavior is characteristic of				B
	a) class A output stage	b) class B output stage	c) class AB output stage	d) common base output stage	class B output stage
66	A class-A transformer coupled, transistor power Amplifier is required to deliver a power rating of the transistor should not be less than.				B
	a) 5W	b) 10W	c) 20 W	d) 40W	10 W
67	Consider the following two statements. Statement 1: Astable Multivibrator can be used for generating Square Wave. Statement 2: Bistable Multivibrator can be used for storing binary information.D				B
	a) only statement 1 is correct	b) only statement 2 is correct	c) both statement 1 & 2 are correct	d) both statement 1 & 2 are incorrect	only statement 2 is correct
68	A network has 7 nodes and 5 independent loops. The number of branches in the network is				C
	a)13	b)12	c)11	d)10	11
69	The Fourier series of a real periodic function has only P. Cosine terms if it is even Q. Sine terms if it is even R. Cosine terms if it odd S. Sine terms if it is odd Which of the above statement are correct?				A
	a) P & S	b) P & R	c) Q & S	d) Q & R	P & S
70	The number of comparators required in a 3-bit comparator type ADC is				C
	a) 2	b)3	c)7	d)8	7
71	The number of comparators in 4-bit flash ADC is				C
	a) 4	b) 5	c)15	d) 16	15
72	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				D
	a)1011	b)1101	c)1100	d)1110	1110
73	In an 8085 microprocessor, the shift registers which store the result of an addition and the overflow bit are, respectively.				B
	a) A & B	b) A & F	c) C &A	d) B & F	A & F
74	Which of the following matrix is Skew Symmetric?				A

	a. $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$	b. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$	c. $\begin{bmatrix} 0 & 3 \\ -1 & 9 \end{bmatrix}$	d. $\begin{bmatrix} 8 & -2 \\ -1 & 3 \end{bmatrix}$	$\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$
75	What is the summation of the probability of all the events.				B
	a. 0	b. 1	c. Not defined	d. Insufficient data	1
76	A 3 phase induction motor is fed by a 3 phase ac regulator to change the stator voltage. The variation in speed will be more if				load torque increases with increase in speed
	a) load torque is constant	b) load torque increases with increase in speed	c) load torque decreases with increase in speed	d) either (a) or (b)	b
77	A fair coin is tossed thrice, what is the probability of getting all 3 same outcomes?				B
	a. 1/2	b. 1/4	c. 1/6	d. 1/8	1/4
78	An instruction used to set the carry flag in a computer can be classified as				C
	a) Data Transfer	b) arithmetic	c) logical	d) program control	logical
79	What is the period of the Fourier transform $X(\omega)$ of the signal $x(n)$?				D
	a) π	b) 1	c) Non-periodic	d) 2π	2π
80	Maxwell's fourth equation is based on _____				B
	a) Ohm's law	b) Ampere's circuital law	c) Coulomb's law	d) Faraday's law	Ampere's circuital law
81	Maxwell's first equation is based on _____.				A
	a) Gauss's law for electrostatic	b) Ampere's circuital law	c) Coulomb's law	d) Faraday's law	Gauss's law for electrostatic
82	PROM stands for _____				A
	a) Programmable Read Only Memory	b) Pre-fed Read Only Memory	c) Pre-required Read Only Memory	d) Programmed Read Only Memory	Programmable Read Only Memory
83	In general, the solution of the Schrodinger wave equation is-				C
	a) Real	b) Imaginary	c) Complex	d) None	Complex
84	The Schrodinger wave equation is a mathematical depression describing-				D
	a) energy of the electron,	b) momentum of the electron,	c) position of the electron,	d) All of them	All of them
85	A potentiometer wire of length 100 cm has a resistance of 30 ohms. It is connected in series with a resistance of 20 ohms and accumulator of emf 8V having negligible internal resistance. A source of 1.2V is balanced against a length L of the potentiometer wire. What is the value of L?				B

	a) 20	b) 25	c) 30	d) 35	25
86	Which of the following biosensors function by the production of a current when a potential is applied between two electrodes?				D
	a) Calorimetric biosensor	b) Potentiometric biosensor	c) Optical biosensor	d) Amperometric biosensor	Amperometric biosensor
87	In calorimetric biosensor, the temperature changes are measured by means of				C
	a) Ion-selective electrodes	b) Clark oxygen electrode	c) Thermistors	d) Colorimetric test strips	Thermistors
88	Which of these is not true for thermistors?				D
	a) Low sensitivity	b) Low range	c) Increasing the heat output	d) generation or absorption hydrogen ions	generation or absorption hydrogen ions
89	How many address line is used by 8085 during I/O mapping?				A
	a) 8	b) 12	c) 14	d) 16	8
90	A region of negative differential resistance is observed in the current voltage characteristics of a silicon PN junction if				A
	a) Both the P and N region are heavily doped	b) N region is heavily doped compared to the p region	c) P region is heavily doped compared to N region	d) An intrinsic silicon region is inserted between the P region and N region	Both the P and N region are heavily doped
91	Drift current in the semiconductors depends upon				C
	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	both the electric and carrier concentration
92	Which one of the following processes is preferred to form the gate dielectric (SiO ₂) of MOSFETs?				D
	a) Sputtering	b) Molecular Beam Epitaxy	c) Wet Oxidation	d) Dry Oxidation	Dry Oxidation
93	In MOSFET fabrication, the channel length is defined during the process of				C
	a) Isolation Oxide Growth	b) Channel Stop implantation	c) Polysilicon gate patterning	d) Lithography step leading to the contact pads	Polysilicon gate patterning
94	The concentration of minority carriers in an extrinsic semiconductor under equilibrium is:				B
	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.	inversely proportional to the doping concentration
95	A single phase full wave regulator feeds R-L load. The best gating signal is				pulse train
	a) short duration pulses	b) long duration pulses	c) pulse train	d) either (a) or (b)	c
96	The total number of byte in MOV A, B instruction in 8085 is				A

	a) 1	b) 2	c) 3	d) 4	1
97	In a microprocessor, the register which holds the address of the next instruction to be fetched is				B
	a. Accumulator	b. Program Counter	c. Stack Pointer	d. Instruction Register	Program Counter
98	In register index addressing mode the effective address is given by				A
	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 operand	the index register value
99	<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>				B
	a. 00H	b. 10H	c. 11H	d. 32H	10H
100	Which of the following analog modulation scheme requires the minimum transmitted power and minimum channel bandwidth?				C
	a. VSB	b. DSB-SC	c. SSB	d. AM	SSB