This booklet consists of <u>100</u> questions and <u>12</u> printed pages.

RGUCET/2023/PG/17

Series

NIL

RGUCET 2023
MASTER OF SCIENCE IN ELECTRONICS

Full Marks: 100   **Time: 2 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 100 Multiple Choice Questions (MCQs). 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 15 minutes after the commencement of the entrance test or leave the examination hall before 30 minutes of end of examination.

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 candidate(s) is/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, RGU shall be final and binding.

9.   The OMR Answer Sheet consists of two copies, the Original copy and the Student's copy.

1	Brass gets discoloured in air because of the presence of which of the following gases in air?					
	a)Oxygen	b) Hydrogen sulphide	c) Carbon dioxide	d) Nitrogen	b	Hydrogen sulphide
2	Which of the following metals forms an amalgam with other metals?					
	a) Tin	b) Mercury	c) Lead	d) Zinc	b	Mercury
3	In the last one decade, which one among the following sectors has attracted the highest foreign direct investment inflows into India?					
	a) Chemicals other than fertilizers	b) Services sector	c) Food processing	d) Telecommunication	d	Telecommunication
4	B. C. Roy Award is given in the field of					
	a)Music	b)Journalism	c)Medicine	d)Environment	c	Medicine
5	The prestigious Ramon Magsaysay Award was conferred was conferred upon Ms. Kiran Bedi for her excellent contribution to which of the following fields?					
	a) Literature	b) Community Welfare	c) Government Service	d) Journalism	c	Government Service
6	Two bus tickets from city A to B and three tickets from city A to C cost Rs. 77 but three tickets from city A to B and two tickets from city A to C cost Rs. 73. What are the fares for cities B and C from A ?					
	a) Rs. 4, Rs. 23	b) Rs. 13, Rs. 17	c) Rs. 15, Rs. 14	d) Rs. 17, Rs. 13	b	Rs. 13, Rs. 17
7	A, B, C, D and E play a game of cards. A says to B, "If you give me three cards, you will have as many as E has and if I give you three cards, you will have as many as D has." A and B together have 10 cards more than what D and E together have. If B has two cards more than what C has and the total number of cards be 133, how many cards does B have ?					
	a)22	b) 23	c) 25	d) 35	c	25
8	Five bells begin to toll together and toll respectively at intervals of 6, 5, 7, 10 and 12 seconds. How many times will they toll together in one hour excluding the one at the start ?					

		a) 7 times	b) 8 times	c) 9 times	d) 11 times	b	8 times
9	A bus starts from city X. The number of women in the bus is half of the number of men. In city Y, 10 men leave the bus and five women enter. Now, number of men and women is equal. In the beginning, how many passengers entered the bus ?						
		a) 15	b) 30	c) 36	d) 45	d	45
10	In a city, 40% of the adults are illiterate while 85% of the children are literate. If the ratio of the adults to that of the children is 2 : 3, then what percent of the population is literate ?						
		a) 20%	b) 25%	c)50%	d)75%	d	75%
11	Look at this series: 2, 1, (1/2), (1/4), ... What number should come next?						
		a) (1/3)	b) (1/8)	c) (2/8)	d) (1/16)	b	1/8
12	Odometer is to mileage as compass is to						
		a) speed	b) hiking	c) needle	d) direction	d	direction
13	Vinesh, Aswanth and Mithul enter into a Partnership with investment in the ratio of (3/2) : (8/5) : (5/3). After six months, Vinesh increases his share by 40%. If the total profit at the end of the year be Rs. 136800, then what will be the share of Aswanth in the profit?						
		a)41500	b)42800	c)43200	d)38900	c	43200
14	Evaluate : sqrt(1 + sqrt(1 + sqrt(64))) = ?						
		a) 65	b) 3	c) 6	d) 2	d	2
15	Find the least four digit number which is a perfect square.						
		a)1025	b)1225	c)1144	d)1024	d	1024
16	Smallest side of a right angled triangle is 13 cm less than the side of a square of perimeter 72 cm. Second largest side of the right angled triangle is 2 cm less than the length of the rectangle of area 112 cm² and breadth 8 cm. What is the largest side of the right angled triangle?						
		a)13 cm	b)14 cm	c)15 cm	d)17 cm	a	13 cm
17	Where the Shirui Lily grows?						

	a) Tripura	b) Mizoram	c) Manipur	d) Nagaland	b	Manipur
18	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					
	a)70	b)75	c)80	d)85	b	75
19	**Select the wrongly spelt words**					
	a) career	b) callous	c) calander	d) carriage	c	calander
20	Select the wrongly spelt word in the following words.					
	a) expire	b) explicit	c) explode	d)exploite	d	exploite
21	In each of the following questions, choose the correctly spelt word.					
	a)Bouquete	b) Bouquet	c)) Boquet	d)Bouquette	b	Bouquet
22	One who is not easily pleased by anything					
	a) gullible	b) fastidious	c) innocent	d) amenable	b	fastidious
23	Museum is related to Curator in the same way as Prison is related to ____?					
	a)Warden	b)Jailor	c)Monitor	d)Manager	b	Jailor
24	One who damages public property					
	a) Cynosure	b) Demagogue	c) Epicure	d) Vandal	d	Vandal
25	Find the Error Section in the following sentence "Some of the richest (A) / business magnate (B) / live in Mumbai. (C) / No Error (D)"					

					b	business magnate
a) A	b) B	c) C	d) D			

DOMAIN

26	Give the SI unit of resistivity.					
	a) ohm/metre^2	b) ohm metre^2	c) ohmmetre	d) ohm/metre	c	ohmmetre
27	What is the SI unit of current?					
	a) a. Coulomb (C)	b) b. Ampere (A)	c) c. Farad (F)	d) d. Newton (N)	b	Ampere (A)
28	Give the SI unit of the magnetic field.					
	a. Ampere	b. Tesla	c. Oersted	d. Weber	b	Tesla
29	What is the SI unit of magnetic flux?					
	a) teslas	b) maxwell	c) weber	d) Newton	c	weber
30	Which of these is used to accelerate charged particles or ions to high energies?					
	a. Solenoid	b. Cyclotron	c. Electric motor	d. Toroid	b	Cyclotron
31	What is the relation between Power 'P' , Current ' I' and Resistance 'R'?					
	a. $P = IR^2$	b. $P = 2IR$	c. $P = I\,R$	d. $P = I^2R$	d	$P = I^2R$
32	Current carrier in conductors is _____					
	a. Electron	b. Proton	c. Neutron	d. Positron	a	Electron
33	The band gap between the valence band and conduction band is the measure of _____					

	a. The conductivity of the material	b. The resistivity of the material	c. Charge density	d. Ease of ionization	a	The conductivity of the material
34	Insulation breakdown may occur at _____					
	a. High temperature	b. Low temperature	c. At any temperature	d. Depends on pressure	a	High temperature
35	Superconductors have _____					
	a. Almost zero resistivity	b. Very high resistivity	c. Temperature-dependent resistivity	d. Moderate value of resistivity	a	Almost zero resistivity
36	Give the SI unit of self-inductance.					
	a. Farad	b. Ampere	c. Henry	d. Maxwell	c	Henry
37	An intrinsic semiconductor, at the absolute zero temperature, behaves like which one of the following?					
	a. Insulator	b. Superconductor	c. n-type semiconductor	d. p-type semiconductor	a	Insulator
38	Equivalent of decimal number $(15)_{10}$ is					
	a. $(1000)_2$	b. $(1111)_2$	c. $(1001)_2$	d. $(1100)_2$	b	$(1111)_2$
39	Which one of the command is not used in C programming					
	a. while	b. for	c. if	d. than	d	than
40	In C ++ programming, which command is used to print on the screen					
	a. cout	b. cin	c. out	d. in	a	cout
41	In C ++ programming, which command is used to get input from the user					
	a. cout	b. cin	c. out	d. in	b	cin
42	Which of the following cannot be the Fourier series expansion of a periodic					

	signal?					
	a) x(t)=2cos(t)+3cos(3t)	b) x(t)=2cos(πt)+7cos(t)	c) x(t)=2cos(t)+0.5	d) x(t)=2cos(t)+3cos(3.5t)	b	x(t)=2cos(πt)+7cos(t)
43	The trigonometric Fourier series of an even function of time does not have the					
	a) DC term	b) Cosine Term	c) Sine Term	d) odd harmonic term	c	Sine term
44	The Fourier Series of an odd periodic function, contains only					
	a) Even harmonic	b) Cosine Term	c) Sine Term	d)Odd Harmonic	c	Sine Term

45	$A(A + B) = ?$					
	a)AB	b)1	c) 1+AB	d) A	d)	A
46	A pn junction acts as a _____					
	a) Controlled switch	b) Bidirectional switch	c) Unidirectional switch	d) None of the above	c)	Unidirectional switch
47	If 2 and 4 are the eigen values of square matrix A then the Eigen values of A^T are					
	a) 0.5, 0.25	b) 2, 4	c) 4, 16	d) 3, 2	b)	2, 4
48	If A is skew-Hermitian, then (iA) is					
	a) Skew-symmetric	b) Symmetric	c) Hermitian	d) Skew-Hermitian	c)	Hermitian
49	The function $f(x) = x^3 - 6x^2 + 9x + 25$					
	a) maxima at x = 1 and a minima at x = 3	b) a maxima at x = 3 and a minima at x = 1	c) no maxima, but a minima at x = 1	d) a maxima at x = 1,but no minima	a)	maxima at x = 1 and a minima at x = 3
50	A forward biased pn junction diode has a resistance of the order of					
	a) Ω	b)kΩ	c) MΩ	d) None of the above	a)	Ω

51	A reverse bias pn junction has _____					
	a) Very narrow depletion layer	b) Almost no current	c) Very low resistance	d) Large current flow	b)	Almost no current
52	When a LED has 2 V applied to its terminals, it draws 100 mA and produces 4 mW of optical power. The LED conversion efficiency from electrical to optical power is:-					
	a)3%	b)4%	c)5%	d)2%	d)	2%
53	Number of electron-hole pairs generated divided by the number of photons is:-					
	a) Dark current	b) Quantum efficiency	c) Photo sensitivity	d) Quantum response	b)	Quantum efficiency
54	If the flux density in a certain magnetic material is 0.25 T and the area of the material is 25 mm^2. The magnetic flux through material is: -					
	a) 6.25 µWb	b) 2.5 µWb	c) 0.5 µWb	d) 25 µWb	a)	6.25 µWb
55	In a digital system, if $(211)_x = (152)_8$, then the value of base x is					
	a)7	b)5	c)6	d)9	a)	7
56	How many AND gates are required to realize Y = CD+EF+G					
	a)3	b)4	c)2	d)5	c)	2
57	Parameters for RLC circuits are R= 2 Ω, L= 1 H and C= 1 F. If these are connected in parallel. The system response will be:-					
	a) Critically damped	b) Overdamped	c) Undamped	d) Underdamped	d)	Underdamped
58	In the negative logic system,					
	a) The more negative of the two logic levels represents a logic '1' state	b) The more negative of the two logic levels represents a logic '0' state	c) All input and output voltage levels are negative	d) The output is always complement of the intended logic function	a)	The more negative of the two logic levels represents a logic

						'1' state

59	Positive logic in a logic circuit is one in which					
	a) logic 0 and 1 are represented by 0 and positive voltage respectively	b) logic 0 and 1 are represented by negative and positive voltages respectively	c)logic 0 voltage level is higher than logic 1 voltage level	d) logic 0 voltage level is lower than logic 1 voltage level	d)	logic 0 voltage level is lower than logic 1 voltage level

60	How is inversion achieved using Ex-OR gate ?					
	a) Giving input signal to the two input lines of the gate tied together	b) Giving input to one input line and logic zero to the other line	c) Giving input to one input line and logic one to the other line	d) Inversion cannot be achieved using Ex-OR gat	c)	Giving input to one input line and logic one to the other line

61	The following switching functions are to be implemented using a decoder: $f1 = \sum m(1, 2, 4, 8, 10, 14)$ $f2 = \sum m(2, 5, 9, 11)$ $f3 = \sum m(2, 4, 5, 6, 7)$ The minimum configuration of decoder will be ….............					
	a) 2 to 4 line	b) 3 to 8 line	c) 4 to 16 line	d) 5 to 32 line	c)	4 to 16 line

62	How many NAND gates are used to form an AND gate?					
	a)1	b)2	c)3	d)4	b)	2

63	In which of following base system a number 321 is not valid					
	a) Base 5	b) Base 8	c) Base 3	d) Base 10	c)	Base 3

64	A full adder can be constructed from….............					
	a) 2 Full adder and 1 OR Gate	b) 2 Full adders and 1 AND Gate	c) 2 Full adders	d) 2 Full adder and 1 XOR Gate	a)	2 Full adder and 1 OR Gate

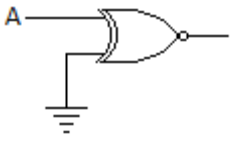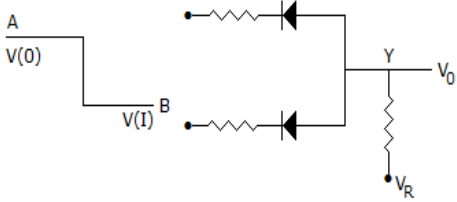| 65	MOSFET stands for					

	a) Metal Oxygen Semiconductor Field effect transistor	b) Metal Oxide Semiconductor Field effect transistor	c) Metal Oxidised Semiconductor Field effect transistor	d) None	b	Metal Oxide Semiconductor Field effect transistor
66	FET Operates in					
	a) depletion mode	b) enhancement mode	c) both	d) None	c	both
67	At what voltage does a MOSFET turn on?					
	a)3-5 V	b) 12 V	c)0.5- 1 V	d) 20 V	a	3-5 V
68	How many terminals a MOSFET has?					
	a) 3	b)5	c)4	d)6	c	4
69	In which regions a MOSFET works as a 'Switch"					
	a)Saturation, Linear	b) Cut off, linear	c) Saturation, Cut off	d) Cutoff, Cutoff	c	Saturation, Cut off
70	MOSFET is a …………. device					
	a)Current controlled	b)voltage controlled	c)both	d)none	b	voltage controlled
71	BJT is a …………. Device					
	a)Current controlled	b)voltage controlled	c)both	d)none	a	Current controlled
72	n- type semiconductor is doped with					
	a)acceptor	b)doner	c)both	d)neutral	b	doner
73	Depletion region consists of					

	a)Electrons	b)holes	c)neutral atoms	c)none	c	neutral atoms
74	Width of depletion region increases in					
	a)Forward bias	b)reverse bias	c) in both bias	d)does not change	b	reverse bias
75	A line which cuts a pair of parallel lines is called					
	a)tangent	b)chord	c)transversal	d)intersector	c	transversal
76	There is no hole current in good conductors because they					
	a)Are full of electron gas	b)have large forbidden energy gap	c)have no valance band	d)have overlapping valance and conduction band	d	have overlapping valance and conduction band

77	A semiconductor is formed by ……… bonds.					
	a) Covalent	b) Electrovalent	c) Co-ordinate	d) None of the above	a	Covalent
78	A semiconductor has ………… temperature coefficient of resistance					
	a) Positive	b) Zero	c) Negative	d) None of the above	c	Negative
79	The most commonly used semiconductor is ………..					
	a) Germanium	b) Silicon	c) Carbon	d) Sulphur	b	Silicon
80	A transistor has …………………					
	a) one pn junction	b) two pn junctions	c) three pn junctions	d) four pn junctions	b	two pn junctions
81	In a pnp transistor, the major current carriers are ………….					

	a) acceptor ions	b) donor ions	c) free electrons	d) holes	d	holes
82	In a transistor, the base current is about ………….. of emitter current					
	a) 25%	b) 20%	c) 35 %	d) 5%	d	5%
83	The input impedance of a transistor in active mode is ………….					
	a) high	b) low	c) very high	d) almost zero	b	low
84	$I_c = \alpha IE +$ ………….					
	a) I_B	b) I_{CEO}	c) I_{CBO}	d) βI_B	c	I_{CBO}
85	In a transistor, $I_C = 100$ mA and $I_E = 100.2$ mA. The value of β is …………					
	a) 100	b) 50	c) about 1	d) 200	d	200
86	The relation between β and α is …………..					
	a) $\beta = 1 / (1 - \alpha)$	b) $\beta = (1 - \alpha) / \alpha$	c) $\beta = \alpha / (1 - \alpha)$	d) $\beta = \alpha / (1 + \alpha)$	c	$\beta = \alpha / (1 - \alpha)$
87	An oscillator converts ……………..					
	a) a.c. power into d.c. power	b)d. c. power into a.c. power	c) mechanical power into a.c. power	d) none of the above	b	d. c. power into a.c. power
88	In an LC transistor oscillator, the active device is ……………					
	a) LC tank circuit	b) Biasing circuit	c) Transistor	d) None of the above	c	Transistor
89	Hartley oscillator is commonly used in ………………					
	a) Radio receivers	b) Radio transmitters	c) TV receivers	d) None of the above	a	Radio receivers
90	Modulation is done in …………..					
	a) Transmitter	b) Radio	c) Between transmitter	d) None of the above	a	Transmitte

		receiver	and radio receiver			r
91	In an AM wave useful power is carrier by ………….					
	a) Carrier	b) Sidebands	c) Both sidebands and carrier	d) None of the above	b	Sidebands
92	As the modulation level is increased, the carrier power …………..					
	a) Is increased	b) Remains the same	c) Is decreased	d) None of the above	b	Remains the same
93	In radio transmission, the medium of transmission is ……………..					
	a) Space	b) An antenna	c) Cable	d) None of the above	a	Space
94	Superhertodyne principle refers to					
	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	c	Obtaining lower fixed intermediate frequency
95	The major advantage of FM over AM is …………..					
	a) Reception is less noisy	b) Higher carrier frequency	c) Smaller bandwidth	d) Small frequency deviation	a	Reception is less noisy
96	A switch has ………………					
	a) One state	b) Two states	c) Three states	d) None of the above	b	Two states
97	2's complement of binary number 0101 is ………..					
	a) 1011	b) 1111	c) 1101	d) 1110	a	1011
98	A decade counter skips ………..					
	a) binary states 1000 to 1111	b) binary states 0000 to 0011	c) binary states 1010 to 1111	d) binary states 1111 to higher	c	binary states 1010 to 1111
99	For the gate in the given figure the output will be ………..					

a) 1	b)0	c)A	d) $\bar{A}$		d	$\bar{A}$

100	The circuit in the given figure is a ………… gate. 					
	a) positive logic OR gate	b) negative logic OR gate	c) negative logic AND gate	d) positive logic AND gate	b	negative logic OR gate

SPACE FOR ROUGH WORK