Test Booklet No. _____
**This booklet consists of 100 questions and 11 printed pages.**

**RGUCET/2024/__/_**

**Series** | NIL

**RGUCET 2024**
**Common Entrance Test, 2024**

**MASTER OF SCIENCE (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) 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 | He said to me, I have often told you not to play with fire | | | | b |
|---|---|---|---|---|---|
| | a) He said that he has often been telling me not to play with fire. | b) He told me that he had often told me not to play with fire. | c) He reminded me that he often said to me not to play with fire. | d) He said to me that he often told me not to play with fire. | He told me that he had often told me not to play with fire. |
| 2 | "I wish _____ to your notice the faulty product you have recently launched." Complete the sentence by choosing the appropriate non-finite from the following. | | | | d |
| | a)bring | b) to bringing | c)to brought | d) to bring | to bring |
| 3 | Contaminating? | | | | b |
| | a) investing | b) polluting | c)containing | d)encompassing | polluting |
| 4 | They _____ her and trusted her for years | | | | c |
| | a) know | b) had known | c) knew | d) known | knew |
| 5 | Identify the correct transformation of the sentence given containing the adverb "too".<br><br>He is too young to get a driving license. | | | | d |
| | a) He is young so he cannot get a driving license | b) He is young due to which he cannot get driving license | c) He cannot get driving license because he is very young | d) He is so young that he cannot get a driving license | He is so young that he cannot get a driving license |
| 6 | The theory of relativity is associated with | | | | c |
| | a) Galileo Galilei | b) Johannes Kepler | c)Albert Einstein | d) Isaac Newton | Albert Einstein |
| 7 | Which Hindi movie got the first National Award? | | | | c |
| | a) Shree 420 | b)Jagriti | c) Mirza Ghalib | d) None of these | Mirza Ghalib |
| 8 | PVC is a polymer of__ | | | | b |
| | a) Propane | b) Vinyl chloride | c) Styrene | d) Carbonates | Vinyl chloride |
| 9 | Which of the following events are not a part of the Olympic Games but a part of the Commonwealth Games? | | | | d |

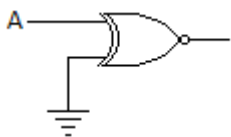| | a) Lawn Balls | b) Netball | c) Squash | d) All of the above | All of the above |
|---|---|---|---|---|---|
| 10 | Consider the following states:<br>1. Arunachal Pradesh<br>2. Nagaland<br>3. Manipur<br>4. Mizoram<br>The inner line permit (ILP) is required by Indian citizens to enter Which among the above states? | | | | d |
| | a) Only 1, 2 & 3 | b) Only 1, 2 & 4 | c) Only 2, 3 & 4 | d) 1, 2, 3 & 4 | 1, 2, 3 & 4 |
| 11 | Which company is collaborating with OpenAI to construct the 'Stargate' AI supercomputer? | | | | c) |
| | a) Apple | b) Google | c) Microsoft | d) IBM | Microsoft |
| 12 | Which city is being transformed into India's inaugural tri-service common defence station? | | | | c) |
| | a) Delhi | b) Bangalore | c) Mumbai | d) Chennai | Mumbai |
| 13 | Who has assumed charge as the Principal Director General of the Press Information Bureau? | | | | c) |
| | a) Manish Desai | b)Neha Sharma | c) Sheyphali B. Sharan | d)Rajiv Kumar Sharma | Sheyphali B. Sharan |
| 14 | In the context of vaccines manufactured to prevent COVID-19 pandemic, consider the following statements:<br>1. The Serum Institute of India produced COVID-19 vaccine named Covisheild using mRNA platform.<br>2. Sputnik V vaccine is manufactured using a vector-based platform.<br>3. COVAXIN is an inactivated pathogen-based vaccine.<br>Which of the statements given above are correct? | | | | b) |
| | a)1 and 2 only | b)2 and 3 only | c)1 and 3 only | d)1, 2 and 3 | 2 and 3 only |
| 15 | Consider the following pairs: Wetland/Lake Locations<br><br>Lake / Location<br>A) Hokera Wetland / Punjab<br>B) Renuka Wetland / Himachal Pradesh<br>C) Rudrasagar Lake / Tripura<br>D) Sasthamkotta Lake / Tamil Nadu<br>How many pairs given above are correctly matched? | | | | b) |
| | a)Only one pair | b)Only two pairs | c)Only three pairs | d)All four pairs | Only two pairs |
| 16 | Suppose a series is 6, 11, 21, 36, 56, ? the number comes at the place of question mark in the given series is – | | | | d) |
| | a) 91 | b) 21 | c) 52 | d) 81 | 81 |

| 17 | If PINK is coded as 1691411, then RED will be coded as – | | | | c) |
|---|---|---|---|---|---|
| | a) 1854 | b)1853 | c) 1854 | d) 1963 | 1854 |
| 18 | Statement 1: John runs faster than George<br>Statement 2: Tom runs faster than John<br>Statement 3: George runs faster than Tom<br>If statement 1 and statement 2 are true, statement 3 will be - | | | | b) |
| | a) True | b) False | c) Uncertain | d) None of the above | False |
| 19 | A can finish the job at the same time in which B and C together do it. If A and B together can finish the work in 10 days and C alone can do the work in 50 days, how many days B will take to complete the same job? | | | | d) |
| | a)20 days | b)22 days | c)23 days | d)25 days | 25 days |
| 20 | A can finish a work in 10 days and B can finish the same work in 15 days. If they work alternatively, find the time taken to finish the job | | | | c) |
| | a) 14 days | b) 15 days | c) 12 days | d) 14.5 days | 12 days |
| 21 | Find the transpose of the given Matrix. $$\begin{bmatrix} 1 & 3 & -2 \\ -1 & 7 & 0 \\ 1 & 0 & 8 \end{bmatrix}$$ | | | | a |
| | a. $\begin{bmatrix} 1 & -1 \\ 3 & 7 \\ -2 & 0 \end{bmatrix}$ | b. $\begin{bmatrix} 1 & 1 & 1 \\ 3 & 7 & 0 \\ -2 & 0 & 8 \end{bmatrix}$ | c. $\begin{bmatrix} 1 & 1 & 1 \\ 3 & 7 & 0 \\ -2 & 0 & 8 \end{bmatrix}$ | d. $\begin{bmatrix} 1 & 1 & 1 \\ 3 & 7 & 0 \\ -2 & 0 & 8 \end{bmatrix}$ | $\begin{bmatrix} 1 & -1 \\ 3 & 7 \\ -2 & 0 \end{bmatrix}$ |
| 22 | 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. $\begin{bmatrix} 8 & -2 \\ -1 & 3 \end{bmatrix}$ | $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ |
| 23 | The velocity of light in a fluid is $(C/\sqrt{3})$, where C is the speed of the light. What is the polarizing angle of incidence in degree? | | | | c |
| | a. 30 | b. 45 | c. 60 | d. 90 | 60 |
| 24 | Zeroth law of thermodynamics helped in the creation of which scale? | | | | a |
| | a. Temperature | b. Heat energy | c. Pressure | d. Internal energy | Temperature |
| 25 | **A satellite's period in a circular orbit near a planet is unaffected by** | | | | c |
| | a. Planet's mass | b. Planet's radius | c. Satellite's mass | d. All the mentioned | Satellite's mass |

| 26 | **According to the first law of Kepler, the shape of the orbit of the planets are:** | | | | d |
|---|---|---|---|---|---|
| | a. Perfect circle | b. Square | c. Triangle | d. Ellipse | Ellipse |
| 27 | What is the order of the differential equation, y"+y'-3xy=sinx? | | | | b |
| | a. 1 | b. 2 | c. 3 | d. 4 | 2 |
| 28 | What is the degree of the equation, $4x^3-6x^2 y^3+2y=0$? | | | | d |
| | a. 2 | b. 3 | c. 4 | d. 5 | 5 |
| 29 | Give the SI unit of resistivity. | | | | c |
| | a. ohm/metre$^2$ | b. ohm metre$^2$ | c. ohm metre | d. ohm/metre | ohmmetre |
| 30 | What is the SI unit of current? | | | | b |
| | a. Coulomb (C) | b. Ampere (A) | c. Farad (F) | d. Newton (N) | Ampere (A) |
| 31 | Give the SI unit of the magnetic field. | | | | b |
| | a. Ampere | b. Tesla | c. Oersted | d. Weber | Tesla |
| 32 | What is the instrument used in Faraday's experiment? | | | | a |
| | a. Galvanometer | b. Ammeter | c. Voltmeter | d. Meter Bridge | Galvanometer |
| 33 | The energy by virtue of its position is known as: | | | | b |
| | a. Kinetic energy | b. Potential energy | c. Internal energy | d. Heat energy | Potential energy |
| 34 | What should be the angle between force and displacement for maximum work to be done? | | | | a |
| | a. 0° | b. 90° | c. 180° | d. 30° | 0° |
| 35 | A train with a whistle frequency 'f'. What will be the frequency heard by a person sitting in the train? Speed of the train is 'v'. | | | | a |
| | a. f | b. f(330+ v)/330 | c. fv/(330-v) | d. fv/(330+ v) | f |
| 36 | What is the SI unit of magnetic flux? | | | | c |
| | a. teslas | b. maxwell | c. weber | d. Newton | weber |
| 37 | What is the relation between Power 'P' , Current ' I' and Resistance 'R'? | | | | d |
| | a. $P = IR^2$ | b. $P = 2IR$ | c. $P = I R$ | d. $P = I^2R$ | $P = I^2R$ |
| 38 | Which one of the following is similar between electrostatic force and gravitational force? | | | | d |
| | a. Force can be attractive or repulsive | b. The force depends on the medium between the bodies | c. Both the forces are strong forces | d. Force is inversely proportional to the distance between the bodies | Force is inversely proportional to the distance between the bodies |
| 39 | The total capacitance of capacitors connected in parallel is given by _____ | | | | b |
| | a. product of the individual | b. sum of all the individual | c. sum of their reciprocals | d. product of their reciprocals | sum of all the individual |

| | | | | | |
|---|---|---|---|---|---|
| | capacitors in parallel | capacitors in parallel | | | capacitors in parallel |
| 40 | Current carrier in conductors is ___ | | | | a |
| | a. Electron | b. Proton | c. Neutron | d. Positron | Electron |
| 41 | Insulation breakdown may occur at _____ | | | | a |
| | a. High temperature | b. Low temperature | c. At any temperature | d. Depends on pressure | High temperature |
| 42 | Superconductors have _____ | | | | a |
| | a. Almost zero resistivity | b. Very high resistivity | c. Temperature-dependent resistivity | d. Moderate value of resistivity | Almost zero resistivity |
| 43 | Give the SI unit of self-inductance. | | | | c |
| | a. Farad | b. Ampere | c. Henry | d. Maxwell | Henry |
| 44 | An intrinsic semiconductor, at the absolute zero temperature, behaves like which one of the following? | | | | a |
| | a. Insulator | b. Superconductor | c. n-type semiconductor | d. p-type semiconductor | Insulator |
| 45 | Equivalent of decimal number $(15)_{10}$ is | | | | b |
| | a. $(1000)_2$ | b. $(1111)_2$ | c. $(1001)_2$ | d. $(1100)_2$ | $(1111)_2$ |
| 46 | Equivalent of decimal number $(15)_{10}$ is | | | | c |
| | a. $(10)_{16}$ | b. $(0A)_{16}$ | c. $(0F)_{16}$ | d. None of these | $(0F)_{16}$ |
| 47 | A source of sound moves towards an observer. What happens to the speed of sound in the medium? | | | | c |
| | a. Increases | b. Decreases | c. Remains the same | d. Depends on speed with which source moves | Remains the same |
| 48 | $$\int_{-1}^{1}\int_{0}^{z}\int_{x-z}^{x+z}(x+y+z)dydxdz \text{ is equal to}$$ | | | | c |
| | a. 4 | b. -4 | c. 0 | d. none | 0 |
| 49 | $\int_0^1 \int_{y^2}^1 \int_0^{1-x} x \, dz \, dx \, dy$ | | | | b |
| | a. 2/35 | b. 4/35 | c. 4/17 | d. 2/17 | 4/35 |
| 50 | Compute the divergence of the vector xi + yj + zk. | | | | d |
| | a. 0 | b. 1 | c. 2 | d. 3 | 3 |
| 51 | Find the divergence of the vector yi + zj + xk. | | | | b |
| | a. -1 | b. 0 | c. 1 | d. 3 | 0 |
| 52 | Find the divergence of the field, $P = x^2yz \, i + xz \, k$ | | | | b |
| | a. xyz + 2x | b. 2xyz + x | c. xyz + 2z | d. 2xyz + z | 2xyz + x |
| 53 | Friction can be reduced by changing from | | | | b |
| | a) rolling to sliding | b) sliding to rolling | c) dynamic to static | d) potential energy to kinetic energy | sliding to rolling |
| 54 | What is the formula of kinetic energy | | | | a |
| | a. $0.5mv^2$ | b. mgh | c. 0.5mgh | d. $mv^2$ | $0.5mv^2$ |

| 55 | What is the formula of potential energy | | | | b |
|---|---|---|---|---|---|
| | a. $0.5mv^2$ | b. mgh | c. 0.5mgh | d. $mv^2$ | mgh |
| 56 | Which of the following cannot be the Fourier series expansion of a periodic signal? | | | | b |
| | 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) | x(t)=2cos(πt)+7cos(t) |
| 57 | 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 |
| 58 | 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 |
| 59 | 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 |
| 60 | What is Eigen value? | | | | c |
| | a. A vector obtained from the coordinates | b. A matrix determined from the algebraic equations | c. A scalar associated with a given linear transformation | d. It is the inverse of the transform | A scalar associated with a given linear transformation |
| 61 | A semiconductor has ………… temperature coefficient of resistance | | | | Negative |
| | a) Positive | b) Zero | c) Negative | d) None of the above | c |
| 62 | The most commonly used semiconductor is ……….. | | | | Silicon |
| | a) Germanium | b) Silicon | c) Carbon | d) Sulphur | b |
| 63 | The random motion of holes and free electrons due to thermal agitation is called …… | | | | Diffusion |
| | a) Diffusion | b) Pressure | c) Ionisation | d) None of the above | a |
| 64 | The relation between β and α is ………….. | | | | $β = α / (1 − α)$ |
| | a) $β = 1 / (1 − α)$ | b) $β = (1 − α) / α$ | c) $β = α / (1 − α)$ | d) $β = α / (1 + α)$ | c |
| 65 | IC = αIE + …………. | | | | ICBO |
| | a) IB | b) ICEO | c) ICBO | d) βIB | c |
| 66 | In an LC transistor oscillator, the active device is …………… | | | | Transistor |

| | | | | | |
|---|---|---|---|---|---|
| | a) LC tank circuit | b)Biasing circuit | c) Transistor | d) None of the above | c |
| 67 | Hartley oscillator is commonly used in ……………… | | | | Radio receivers |
| | a)Radio receivers | b)Radio transmitters | c)TV receivers | d) None of the above | a |
| 68 | In an AM wave useful power is carrier by …………. | | | | Sidebands |
| | a) Carrier | b) Sidebands | c)Both sideband and carrier | d) None of the above | b |
| 69 | Superhertodyne principle refers to | | | | Obtaining lower fixed intermediate frequency |
| | 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 |
| 70 | The binary number 10101 is equivalent to decimal number ………….. | | | | 21 |
| | a) 19 | b)12 | c)27 | d)21 | d |
| 71 | Which of the following parameter is same for molecule of all gases at a given temperature? | | | | kinetic energy |
| | a) Speed | b) momentum | c) kinetic energy | d) mass | c |
| 72 | The phenomenon of thermal conductivity is due to the transport of | | | | Energy |
| | a) Energy | b) mass | c) momentum | d) electron | a |
| 73 | Cyclotron can accelerate | | | | Proton |
| | a) Proton | b) neutron | c) electron | d)all particle | a |
| 74 | According to Kirchhoff's law where the algebraic sum of current is zero | | | | at a junction |
| | a) In a linear network | b) in closed circuit | c) at a junction | d) none of these | c |
| 75 | At series resonance the circuit acts as pure | | | | resistive |
| | a) Inductive | b) capacitive | c) resistive | d) all of the above | c |
| 76 | Sharpness of resonance in series LCR circuit depends on the value of | | | | resistance |
| | a) Inductance | b) capacitance | c) resistance | d) none of these | c |
| 77 | Series resonant circuit is known as | | | | acceptor circuit |
| | a) Rejector circuit | b) acceptor circuit | c) tank circuit | d) all of the above | b |
| 78 | At series resonance the phase difference between voltage and current is | | | | zero |
| | a) Infinity | b) zero | c) finite | d) none of the above | b |
| 79 | Ultrasonic waves are | | | | Longitudinal |
| | a) Longitudinal | b) Progressive | c) Transverse | d) Inverse | a |
| 80 | Which op-amp circuit uses a resistance in series with input and capacitor in feedback path? | | | | Integrating amplifier |

| | | | | | |
|---|---|---|---|---|---|
| | a) Differentiating amplifier | b)Integrating amplifier | c)Logarithmic amplifier | d) Exponential amplifier | b |
| 81 | Which of the following is non-sinusoidal oscillator? | | | | Multivibrator |
| | a) Multivibrator | b) Relaxation oscillator using UJT | c)Relaxation oscillator using tunnel diode | d) Any of the above | a |
| 82 | A dc amplifier can operate | | | | at zero frequency |
| | a) at zero frequency | b) only at low frequency | c) only at high frequencies | d) both at low and high frequencies | a |
| 83 | **Assertion (A):** In a common source amplifier with source terminal at ac ground the voltage gain is about $g_m\, r_d$ <br> **Reason (R):** A common source amplifier is a source follower circuit | | | | A is correct R is wrong |
| | a) Both A and R are correct and R is correct explanation for A | b)Both A and R are correct but R is not correct explanation for A | c)A is correct R is wrong | d)A is wrong R is correct | c |
| 84 | In a P-N-P transistor, with normal bias, the emitter junction | | | | offers a low resistance |
| | a) is always reverse biased | b) offers very high resistance | c) offers a low resistance | d) remains open | c |
| 85 | The most widely used LC oscillator is | | | | Hartley oscillator |
| | a) Hartley oscillator | b) Crystal oscillator | c)Colpitt's oscillator | d)Clapp's oscillator | a |
| 86 | **Assertion (A):** A demultiplexer can be used as a decoder. <br> **Reason (R):** A demultiplexer can be built by using AND gates only. | | | | A is true, R is false |
| | a) Both A and R are correct and R is correct explanation of A | b) Both A and R are correct but R is not correct explanation of A | c) A is true, R is false | d) A is false, R is true | c |
| 87 | 2's complement of binary number 0101 is ……….. | | | | 1011 |
| | a) 1011 | b) 1111 | c) 1101 | d) 1110 | a |
| 88 | For the gate in the given figure the output will be ……….. <br>  | | | | $\bar{A}$ |
| | a) 1 | b)0 | c)A | d) $\bar{A}$ | d |
| 89 | The basic storage element in a digital system is …………. | | | | flipflop |

9

| | | | | | |
|---|---|---|---|---|---|
| | a) flipflop | b) counter | c) multiplexer | d) encoder | a |
| 90 | The universal gate is ……………… | | | | NAND gate |
| | a) NAND gate | b)AND gate | c) E-xor gate | d) OR gate | a |
| 91 | Find the Eigen values for the following 2×2 matrix. $A=\begin{bmatrix}1 & 8 \\ 2 & 1\end{bmatrix}$ | | | | -3 |
| | a) -3 | b) 2 | c) 6 | d) 4 | a |
| 92 | If the function f(x) is even, then which of the following is zero? | | | | $b_n$ |
| | a) $a_n$ | b) $b_n$ | c) $a_0$ | d) nothing is zero | b |
| 93 | The number of bits in ASCII is | | | | 7 |
| | a) 12 | b) 10 | c) 9 | d) 7 | d |
| 94 | The initial permeability of an iron rod is | | | | the permeability almost in non magnetized state |
| | a) the highest permeability of the iron rod | b) the lowest permeability of the iron rod | c) the permeability at the end of the iron rod | d) the permeability almost in non magnetized state | d |
| 95 | Magnetism of a magnet can be destroyed by | | | | by all above methods |
| | a) heating | b) hammering | c) by inductive action of another magnet | d) by all above methods | d |
| 96 | For which of the following materials the saturation value is the highest? | | | | Ferrites |
| | a) Ferromagnetic materials | b) Paramagnetic materials | c) Diamagnetic materials | d) Ferrites | d |
| 97 | Two long parallel conductors carry 100A. If the conductors are separated by 20 mm the force per meter of length of each conductor will be | | | | 0.1 N |
| | a) 100 N | b) 10 N | c) 0.1 N | d) 1 N | c |
| 98 | Unit for quantity of electricity is | | | | coulomb |
| | a) ampere-hour | b) watt | c) joule | d) coulomb | d |
| 99 | A keeper is used to | | | | provide a closed path for flux |
| | a) provide a closed path for flux | b) amplify flux | c) restore lost flux | d) change the direction of magnetic lines | a |
| 100 | When a magnet is in motion relative to a coil the induced e.m.f. does not depend upon | | | | resistance of the coil |
| | a)resistance of the coil | b)motion of the magnet | c)number of turns of the coil | d)pole strength of the magnet | a |