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OCT-38226
Paper-II
ELECTRONIC SCIENCE

Series **B**

Question Booklet Serial No.
प्रश्नपत्रिका अनुक्रमांक

Signature and Name of Invigilator

1. (Signature) .....
   (Name) .....
2. (Signature) .....
   (Name) .....

Seat No. | | | | | | | | |
(In figures as in Admit Card)

Seat No. .....
(In words)

OMR Sheet No. | | | | | | |
(To be filled by the Candidate)

Time Allowed : 2 Hours] **[Maximum Marks : 200**

Number of Pages in this Booklet : **20**

Number of Questions in this Booklet : **100**

Instructions for the Candidates

1. Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
2. This paper consists of **100** objective type questions. **Each** question will carry **two** marks. **All** questions of Paper II will be **compulsory**.
3. At the commencement of examination, the question booklet will be given to the student. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as follows :
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. **Do not accept a booklet without sticker-seal or open booklet.**
   (ii) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. **Faulty booklets due to missing pages/questions or questions repeated or not in serial order or any other discrepancy should not be accepted and correct booklet should be obtained from the invigilator within the period of 5 minutes.** Afterwards, neither the Question Booklet will be replaced nor any extra time will be given. The same may please be noted.
   (iii) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
4. Each question has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
   Example : where (B) is the correct response.
   (A) ● (C) (D)
   Following wrong methods should not be used as they are not recognised by scanning machine in digitized assessment. Candidate using such method will be responsible for their loss.

WRONG METHODS
(A) ✓ (C) (D) (A) ✗ (C) (D) (A) ◒ (C) (D) (A) (B) (C) (D)

5. Your responses to the items are to be indicated in the OMR Sheet given inside the Booklet only. If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done at the end of this booklet.
8. If you write your Name, Seat Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, you will render yourself liable to disqualification.
9. You have to return original OMR Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry the Test Booklet and duplicate copy of OMR Sheet on conclusion of examination.
10. **Use only Blue/Black Ball point pen.**
11. Use of any calculator or log table, etc., is prohibited.
12. There is no negative marking for incorrect answers.

विद्यार्थ्यांसाठी महत्त्वाच्या सूचना

1. परीक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या OMR उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
2. सदर प्रश्नपत्रिकेत **100** बहुविकल्प प्रश्न आहेत. प्रत्येक प्रश्नास **दोन** गुण आहेत. या प्रश्नपत्रिकेतील **सर्व** प्रश्न सोडविणे अनिवार्य आहे.
3. परीक्षा सुरू झाल्यावर विद्यार्थ्याला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनिटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्यात :
   (i) प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. **स्टीकर सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्वीकारू नये.**
   (ii) पहिल्या पृष्ठावर नमूद केल्याप्रमाणे प्रश्नपत्रिकेची एकूण पृष्ठे तसेच प्रश्नपत्रिकेतील एकूण प्रश्नांची संख्या पडताळून पहावी. **पृष्ठे कमी असलेली/कमी प्रश्न असलेली/ प्रश्नांचा चुकीचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनिटातच पर्यवेक्षकाला परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी.** त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही तसेच वेळही वाढवून मिळणार नाही याची कृपया नोंद घ्यावी.
   (iii) वरीलप्रमाणे सर्व पडताळून पाहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा क्रमांक लिहावा.
4. प्रत्येक प्रश्नासाठी (A), (B), (C) आणि (D) अशी चार विकल्प उत्तरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळा/निळा करावा.
   उदा. : जर (B) हे योग्य उत्तर असेल तर.
   (A) ● (C) (D)
   खालील चुकीच्या पद्धती वापरू नये, कारण डिजिटाइज्ड (Digitized) मूल्यांकनात स्कॅनिंग मशीन त्यांना ओळखत नाही. त्या पद्धती वापरून नुकसान झाल्यास त्यास विद्यार्थीच जबाबदार असतील.

चुकीची पद्धती
(A) ✓ (C) (D) (A) ✗ (C) (D) (A) ◒ (C) (D) (A) (B) (C) (D)

5. या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे **ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत**. इतर ठिकाणी लिहिलेली उत्तरे तपासली जाणार नाहीत.
6. आत दिलेल्या सूचना काळजीपूर्वक वाचाव्यात.
7. प्रश्नपत्रिकेच्या शेवटी जोडलेल्या कोऱ्या पानावरच कच्चे काम करावे.
8. जर आपण ओ.एम.आर. उत्तरपत्रिकेवर नमूद केलेल्या ठिकाणाव्यतिरिक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खूण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमार्गांचा अवलंब केल्यास विद्यार्थ्याला परीक्षेस अपात्र ठरविण्यात येईल.
9. परीक्षा संपल्यानंतर विद्यार्थ्याने मूळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांकडे परत करणे आवश्यक आहे. तथापि, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्याबरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
10. **फक्त निळ्या किंवा काळ्या बॉल पेनचाच वापर करावा.**
11. कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.
12. चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.

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OCT-38226–B

Electronic Science

Paper II

Time Allowed : 120 Minutes] **[Maximum Marks : 200**

Note : This Paper contains **Hundred (100)** multiple choice questions. Each question carrying **Two (2)** marks. Attempt *All* questions.

1. Which of the following statements is true for a PNP transistor ?

   (A) The majority current carriers are free electrons in the base

   (B) The collector region is heavily doped

   (C) The emitter region is lightly doped

   (D) The majority current carriers are holes in the emitter and collector

2. What is the maximum frequency range of 741 operational amplifiers can be used to amplify signals ?

   (A) 0 Hz to 1 MHz

   (B) 1 MHz to 10 MHz

   (C) 0 Hz to 100 Hz

   (D) 100 kHz to 1 GHz

3. What components are typically *not* used in active filter networks to achieve the desired filtering effect ?

   (A) Inductors

   (B) Resistor

   (C) Capacitor

   (D) Diode

4. Which class of amplifiers does *not* require correction for distortion in input signal ?

   (A) Class A

   (B) Class B

   (C) Class C

   (D) Class AB

5. BC 147 transistor indicates that it is made of

   (A) Germanium

   (B) Silicon

   (C) Carbon

   (D) GaN

6. When tuning in a superhet receiver is changed from one RF carrier to another

   (A) The IF changes by an amount equal to the Local Oscillator (LO) frequency

   (B) The IF remains the same

   (C) The LO frequency changes by an amount equal to audio frequency

   (D) Both the LO and IF frequencies change

7. The gain of a certain amplifier decreases by 6 dB when the frequency is reduced from 1 kHz to 10 Hz. The roll-off is

   (A) – 3 dB/decade

   (B) – 6 dB/decade

   (C) – 3 dB/octave

   (D) – 6 dB/octave

8. The intelligence to be transmitted usually consists of an audio modulating signal with frequencies in the range

   (A) DC to several MHz

   (B) 20 Hz to 20 kHz

   (C) 20 kHz to 20 MHz

   (D) DC to 20 Hz

9. That portion of radiation which is directly affected by surface of the earth is called

   (A) Tropospheric wave

   (B) Ionospheric wave

   (C) Inverted wave

   (D) Ground wave

10. Which noise occurs due to equilibrium fluctuations ?

    (A) Thermal noise

    (B) Johnson noise

    (C) Thermal and Johnson noise

    (D) Quantization noise

11. CRO gives the visual representation of time varying signals. The display of the signal is

    (A) One dimensional

    (B) Two dimensional

    (C) Three dimensional

    (D) Four dimensional

12. In terms of the division on screen, the voltage of the waveform in CRO is

    (A) average voltage

    (B) rms voltage

    (C) peak to peak voltage

    (D) maximum voltage

13. Which of the following is *not* a characteristic of ideal transducer ?

(A) High dynamic range

(B) Low linearity

(C) High repeatability

(D) Low noise

14. Impedance pneumography is a commonly-used technique to monitor a person's

(A) Respiration rate

(B) Heart rate

(C) Pulse rate

(D) Skin impedance

15. MRI stands for

(A) Mechanical Resonance Imaging

(B) Magnetic Resonance Imaging

(C) Mutually Related Imaging

(D) Magnetic Resultant Imaging

16. Laplace transform helps to analyse in electrical circuits

(A) Voltage

(B) Current

(C) Time-domain behaviour

(D) Frequency-domain behaviour

17. The characteristic equation of a network is used to find

(A) Transfer function

(B) Eigenvalues

(C) Laplace transform

(D) Reciprocal theorem

18. The poles of a transfer function are the roots of the

(A) Numerator polynomial

(B) Denominator polynomial

(C) Coefficient matrix

(D) Laplace transform

19. In a balanced three-phase system, the line voltage is related to the phase voltage by a factor of

(A) $\sqrt{2}$

(B) $\sqrt{3}$

(C) $2/\sqrt{3}$

(D) $3/\sqrt{2}$

20. The Laplace transform of a constant 1 is

(A) 1/s

(B) s

(C) 1

(D) e^(–st)

21. In an a.c. motor control, the ratio of voltage to frequency is maintained at constant value

(A) To make maximum use of magnetic circuit

(B) To make minimum use of magnetic circuit

(C) To maximise the current from the supply to provide torque

(D) To minimize the current drawn from the supply to provide torque

22. Electrical time-constant of an armature-controlled dc servo motor is

(A) Equal to mechanical time-constant

(B) Smaller than mechanical time-constant

(C) Larger than mechanical time-constant

(D) Not related to mechanical time-constant

23. A good control system has all the following features except

(A) Good stability

(B) Slow response

(C) Good accuracy

(D) Sufficient power handling capacity

24. The steady-state error of a feedback control system with an acceleration input becomes finite in a

(A) Type 0 system

(B) Type 1 system

(C) Type 2 system

(D) Type 3 system

25. In a stable control system backlash can cause which of the following ?

(A) Underdamping

(B) Overdamping

(C) Poor stability at reduced values of open loop gain

(D) Low-level oscillations

26. Which dielectric layer used as gate material in Fabrication of MOSFET ?

(A) Aluminium oxide

(B) Silicon nitride

(C) Silicon dioxide

(D) Silicon

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27. Which of the following is used in electron microscope ?

(A) Electron beams

(B) Magnetic fields

(C) Light waves

(D) Electron beams and electromagnetic fields

28. What is Lithography ?

(A) Process used to produce the chip

(B) Process used to transfer a pattern to a layer on the chip

(C) Process used to develop an oxidation layer on the chip

(D) Process used to develop a metal layer on the chip

29. The dopants are introduced in the active areas of silicon by using which process ?

(A) Physical Vapour Deposition Process

(B) Wet Chemical Etching Process

(C) Chemical Vapour Deposition

(D) Either Diffusion or Ion Implantation Process

30. In Constant field model, the scaling factor of switching energy per gate would be

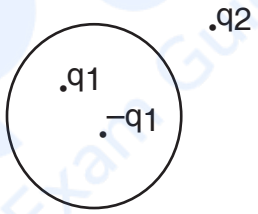
(A) $1/\beta.\alpha^2$

(B) $1/\alpha^3$

(C) $1/\alpha^2$

(D) $1/\alpha$

31. Electric field outside this Gaussian surface will be



(A) Only due to q2

(B) Only due to positive charges

(C) Zero

(D) For all the charges

32. Poisson equation can be derived from which of the following equations ?

(A) Point form of Gauss law

(B) Integral form of Gauss law

(C) Point form of Ampere law

(D) Integral form of Ampere law

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33. If a conductor 0.2 m long moves with a velocity of 0.3 m/s in a magnetic field of 5 T, calculate the emf induced if magnetic field, velocity and length of conductor are mutually perpendicular to each other.

(A) 0.3 V

(B) 0.03 V

(C) 30 V

(D) 3 V

34. The unit vector to the points p1(0,1,0), p2(1,0,1), p3(0,0,1) is

(A) (–j – k)/1.414

(B) (–i – k)/1.414

(C) (–i – j)/1.414

(D) (–i – j – k)/1.414

35. Compute the refractive index when the dielectric constant is 256 in air.

(A) 2562

(B) 16

(C) 256

(D) 64

36. How many AND gates are required for 1- to 8 - Multiplexer ?

(A) 6

(B) 2

(C) 5

(D) 8

37. In SR flip-flop, input labelled 'S' stands for

(A) Systematic

(B) Set

(C) Stable

(D) Static

38. Output frequency of decade counter, which is clocked from 50 kHz signal is

(A) 50 kHz

(B) 5000 kHz

(C) 5 kHz

(D) 500 kHz

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39. The process of validating that a digital design satisfies its functional and performance criteria is referred to as

(A) Simulation

(B) Verification

(C) Implementation

(D) Synthesis

40. Generics are declared in the _____ declaration part of a VHDL design.

(A) Component

(B) Port declaration

(C) Entity

(D) Configuration

41. The SCR is turned-off when the anode current falls below

(A) Forward current rating

(B) Break over voltage

(C) Holding current

(D) Latching current

42. The di/dt capability of a thyristor increases

(A) When the gate current is zero

(B) When the gate current increases

(C) When the gate current decreases

(D) When the anode to cathode voltage rating increases

43. In dc choppers, if T_{on} is the on-period and f is the chopping frequency, then output voltage in terms of the input voltage V_S is given by

(A) $V_S.f/T_{on}$

(B) $V_S/(f/T_{on})$

(C) $V_S.f, T_{on}$

(D) $V_S.T_{on}/f$

44. A single phase voltage-source-square wave inverter feeds pure inductive load. The waveform of the load current will be

(A) Sinusoidal

(B) Rectangular

(C) Trapezoidal

(D) Triangular

45. A motor armature supplied through phase controlled SCR receives a smoother voltage shape of

(A) High motor speed

(B) Low motor speed

(C) Rated motor speed

(D) Very low motor speed

46. In semiconductor physics, what is the significance of the term “bandgap” ?

(A) It defines the energy difference between the valence and conduction bands

(B) It refers to the energy difference between p-type and n-type semiconductors

(C) It indicates the energy gap between the depletion and enhancement modes

(D) It represents the energy difference between the fermi level and the valence band

47. What is the significance of the term “heterojunction” in semiconductors ?

(A) It refers to the boundary between p-type and n-type semiconductors

(B) It represents the interface between two different semiconductor materials

(C) It denotes the transition region in a Bipolar Junction Transistor (BJT)

(D) It defines the boundary between the valence and conduction bands

48. Which semiconductor device is commonly used for voltage regulation in power supply circuits ?

(A) Zener diode

(B) Light-Emitting Diode (LED)

(C) Schottky diode

(D) Tunnel diode

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49. What is the role of liquid crystals in an LCD panel ?

(A) To emit light

(B) To modulate the polarization of light

(C) To generate electrical signals

(D) To control the temperature of the display

50. What is the primary advantage of using low-dimensional semiconductor devices over traditional bulk semiconductor devices ?

(A) Higher operating voltage

(B) Enhanced thermal stability

(C) Quantum confinement effects

(D) Increased resistivity

51. In a PLL, what does the loop bandwidth refer to ?

(A) The range of frequencies the VCO can generate

(B) The rate at which the PLL locks onto a frequency

(C) The range of frequencies the phase comparator can handle

(D) The frequency deviation allowed for proper tracking

52. How does PLL compensate for phase and frequency errors in the input signal ?

(A) By adjusting the loop bandwidth

(B) By modifying the VCO gain

(C) Through the use of a phase frequency detector

(D) By introducing an adaptive low pass filter

53. _____ output waveforms are produced by relaxation oscillator.

(A) Sine, triangle and saw-tooth

(B) Square, triangle and sine

(C) Saw-tooth, sine and square

(D) Saw-tooth, triangle and square

54. Which of the following IC belongs to multivibrator class ?

(A) NE 351

(B) LM725

(C) 74121

(D) 7490

55. In an instrumentation amplifier using a transducer bridge, which device measures the change in physical energy ?

(A) Resistive transducer

(B) Digital panel meter

(C) Capacitive transducer

(D) Inductor circuit

56. Calculate the magnetic field intensity due to a toroid of turns 50, current 2 A and radius 159 mm.

(A) 50

(B) 75

(C) 100

(D) 200

57. Skin depth phenomenon is found in which materials ?

(A) Insulators

(B) Dielectrics

(C) Conductors

(D) Semiconductors

58. The power of a wave of with voltage of 140 V and a characteristic impedance of 50 ohm is

(A) 1.96

(B) 19.6

(C) 196

(D) 19600

59. The depth of penetration of a wave in a lossy dielectric increases with increasing

(A) Conductivity

(B) Permeability

(C) Wavelength

(D) Permittivity

60. For an electromagnetic wave incident from one medium to a second medium, total internal reflection takes place when

(A) Angle of incidence is equal to the Brewster angle with E field perpendicular to the plane of incidence

(B) Angle of incidence is equal to the Brewster angle with E field parallel to the plane of incidence

(C) Angle of incidence is equal to the critical angle with the wave moving from the denser to rarer medium

(D) Angle of incidence is equal to the critical angle with the wave moving from the rarer to denser medium

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61. The 16 bit flag of 8086 microprocessor is responsible to indicate

(A) The condition of result of ALU operation

(B) The condition of memory

(C) The result of addition

(D) The result of subtraction

62. To interface memory with the microprocessor, connect register the lines of the address bus must be added to address lines of the _____ chip.

(A) Single

(B) Memory

(C) Multiple

(D) Triple

63. After reset, SP register is initialized to address

(A) 8H

(B) 9H

(C) 7H

(D) 6H

64. Which of the following are bit operations ?

i. SP

ii. P2

iii. TMOD

iv. SBUF

v. IP

(A) ii, v only

(B) ii, iv, v only

(C) i, v only

(D) iii, ii only

65. What is the function of watchdog timer ?

(A) The watchdog timer is an external timer that resets the system if the software fails to operate properly.

(B) The watchdog timer is an internal timer that sets the system if the software fails to operate properly.

(C) The watchdog timer is an internal timer that resets the system if the software fails to operate properly.

(D) Return to program under execution after interrupt servicing.

66. For enhancement mode n-MOSFET, the threshold voltage is

(A) Equal to 0

(B) Greater than zero or positive quantity

(C) Negative voltage or lesser than zero

(D) Determined by applied gate voltage

67. Stick diagrams are those which convey layer information through

(A) thickness

(B) color

(C) shapes

(D) layers

68. What is the design flow of VLSI system ?

i. architecture design

ii. market requirement

iii. logic design

iv. verification

v. HDL coding

(A) ii – i – iii – v – iv

(B) iv – i – iii – ii – v

(C) iii – ii – i – v – iv

(D) i – v – ii – iii – iv

69. Aluminium has been discarded as gate metal in MOSFET because

(A) It is difficult to deposit Al

(B) Al has a lower conductivity than polysilicon

(C) Al gets easily oxidised

(D) Al cannot withstand high temperature

70. Oxidation process in silicon planar technology is also called as

(A) Photo oxidation

(B) Encapsulation

(C) Vapour oxidation

(D) Thermal oxidation

71. Which of the following communication technologies has highest data rate ?

(A) Mi-Wi

(B) 4G

(C) LoRa

(D) Weightless – W

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72. Calculate the gauge factor of a strain gauge, if the value of resistance is 152 ohms, which changes by 5 ohms for 5000 microstrain.

(A) 5.58

(B) 6.58

(C) 3.68

(D) 4.58

73. Which of the following transducers is used for transmitting as well as receiving acoustic energy in a ultrasonic flow meter ?

(A) LVDT

(B) RTD

(C) Piezoelectric crystals

(D) Thermistor

74. Which of the following is caused by careless handling ?

(A) Systematic error

(B) Gross error

(C) Random error

(D) Absolute error

75. What is the span of an instrument, operating under a bias which reads value for 230 V to 450 V ?

(A) 450

(B) 220

(C) 230

(D) 400

76. What are the primary operations used to express Boolean functions ?

(A) NAND, XOR, NOR

(B) AND, OR, NOT

(C) Addition, Subtraction, Multiplication

(D) IF, ELSE, END

77. What type of logic device is ROM considered to be ?

(A) Random-Access Device (RAD)

(B) Programmable Logic Device (PLD)

(C) Central Processing Unit (CPU)

(D) Memory Processing Unit (MPU)

78. What role does interconnect resources play in a CPLD ?

(A) They control the power supply to the device.

(B) They manage the communication between different CPLDs.

(C) They provide the routing for signals between logic elements.

(D) They store the programming data for the CPLD.

79. Which logic gate produces a high output for different inputs ?

(A) XOR

(B) OR

(C) AND

(D) NOR

80. For designing an 8-bit ring counter we need _____ flip-flops.

(A) 4

(B) 2

(C) 8

(D) 5

81. How error detection and correction is done ?

(A) By passing it through equalizer

(B) By passing it through filter

(C) By amplifying it

(D) By adding redundancy bits

82. The transmitter-receiver combination in the satellite is known as a

(A) Relay

(B) Repeater

(C) Transponder

(D) Duplexer

83. Disturbance along the fiber such as vibrations, discontinuities, connectors, splices, source/detectors coupling result in

(A) Modal noise

(B) Inter-symbol interference

(C) Infrared interference

(D) Pulse broadening

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84. In optical fiber communication, the electrical signal dropping to half its constant value due to modulated portion of optical signal corresponds to

(A) 6 dB

(B) 3 dB

(C) 4 dB

(D) 5 dB

85. What is IoT ?

(A) Network of physical objects embedded with sensors

(B) Network of virtual objects

(C) Network of objects in the ring structure

(D) Network of sensors

86. The concept of "Q factor" in resonant circuits is related to

(A) Bandwidth

(B) Transfer function

(C) Attenuation

(D) Damping ratio

87. In the context of network analysis, what is the dual of a network ?

(A) A network with reversed component values

(B) A network with inverted voltage sources

(C) A network with interchanged resistors and capacitors

(D) A network derived by interchanging nodes and branches

88. What is the primary advantage of using the Laplace transform in circuit analysis ?

(A) It simplifies linear time-invariant differential equations

(B) It enhances the accuracy of numerical simulations

(C) It eliminates the need for mesh and nodal analysis

(D) It is applicable to both linear and nonlinear systems

89. The term “modal analysis” in control systems is associated with

(A) Analyzing the mode shapes of mechanical structures

(B) Determining the modes of operation in power systems

(C) Evaluating the modulation frequency in communication systems

(D) Studying the modal gain in feedback control systems

90. The z-transform of e-t sampled at 10 Hz will be

(A) $z/(z - 10)$

(B) $z/(z - 0.1)$

(C) $z/(z - 0.9)$

(D) $z/(z - 1.1)$

91. What is the significance of the “I-V characteristic curve” of a solar cell ?

(A) It represents the current-voltage relationship under dark conditions

(B) It shows the power output of the solar cell at different voltages

(C) It indicates the efficiency of the solar cell

(D) It represents the relationship between irradiance and voltage

92. What property of graphene makes it particularly attractive for electronic applications ?

(A) Direct bandgap

(B) High thermal conductivity

(C) Strong piezoelectric effect

(D) Low electrical conductivity

93. What determines whether a carbon nanotube exhibits metallic or semiconducting behaviour ?

(A) Chirality

(B) Diameter

(C) Length

(D) Temperature

94. What makes ZnO a desirable material for optoelectronic applications ?

(A) High electron mobility

(B) Low thermal conductivity

(C) Large bandgap

(D) Weak piezoelectric properties

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95. What is the semiconductor material commonly used in the construction of LEDs ?

(A) Silicon

(B) Germanium

(C) Gallium arsenide

(D) Carbon nanotubes

96. The open drain bidirectional (input or output) port with internal pullups is

(A) Port 0

(B) Port 1

(C) Port 2

(D) Port 3

97. How can we control the speed of a stepper motor ?

(A) By controlling its switching rate

(B) By controlling its torque

(C) By controlling its wave drive 4 step sequence

(D) By controlling the drive voltage source

98. What is the difference between UART and USART communication ?

(A) They are the names of the same particular thing, just the difference of A and S is there in it

(B) One uses asynchronous means of communication and the other uses synchronous means of communication

(C) One uses asynchronous means of communication and the other uses asynchronous and synchronous means of communication

(D) One uses angular means of the communication and the other uses linear means of communication

99. If the processor is executing the main program that calls a subroutine, then after executing the main program upto the CALL instruction, the control will be transferred to

(A) Address of main program

(B) Subroutine address

(C) Address of CALL instruction

(D) RESET address

100. The intel 8051 microprocessor is a _____ processor.

(A) 16 bit

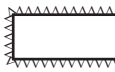
(B) 8 bit

(C) 32 bit

(D) 4 bit

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