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FOR MAHA SET PREPARATION

MAHA SET 2024 Paper II Electronic Science Set A Question Paper

EXAM	YEAR	TYPE
MAHA SET	2024	Question Paper

Test Booklet Code & Serial No.
प्रश्नपत्रिका कोड व क्रमांक

A

Paper-II
ELECTRONIC SCIENCE

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)

APR - 38224

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

Number of Pages in this Booklet : **24** 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 (C) is the correct response.
   (A) (B) ● (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. परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
2. सदर प्रश्नपत्रिकेत 100 बहुपर्यायी प्रश्न आहेत. प्रत्येक प्रश्नास **दोन** गुण आहेत. या प्रश्नपत्रिकेतील **सर्व** प्रश्न सोडविणे अनिवार्य आहे.
3. परीक्षा सुरू झाल्यावर विद्यार्थ्याला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्यात.
   (*i*) प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्विकारू 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 विद्यार्थ्यांनी नोंद घ्यावी.
   (*iii*) वरीलप्रमाणे सर्व पडताळून पाहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा नंबर 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 (C) हे योग्य उत्तर असेल तर.
   (A) (B) ● (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. वर नमूद केलेल्या ठिकाणा व्यतिरीक्त 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.

APR - 38224/II—A

2

APR - 38224/II—A

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. What is the main purpose of a Schottky diode in semiconductor applications ?

   (A) Voltage regulation

   (B) High-speed switching

   (C) Temperature sensing

   (D) Power amplification

2. What is the primary advantage of using a Gallium Nitride (GaN) semiconductor over traditional silicon in power electronics ?

   (A) Higher electron mobility

   (B) Lower bandgap

   (C) Greater thermal stability

   (D) Improved resistance to radiation

3. What type of backlighting is commonly used in LCD displays for improved color reproduction ?

   (A) Fluorescent backlighting

   (B) Incandescent backlighting

   (C) LASER backlighting

   (D) OLED backlighting

4. What is the purpose of connecting a resistor in series with a Zener diode in a voltage regulator circuit ?

   (A) To increase the breakdown voltage

   (B) To limit the forward bias current

   (C) To decrease the reverse bias voltage

   (D) To provide mechanical stability

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5. Which type of low-dimensional semiconductor device is known for its ability to confine charge carriers in all three dimensions ?

(A) Quantum wells

(B) Quantum wires

(C) Quantum dots

(D) Quantum cascade devices

6. What is the role of the series resistance in the I-V characteristics of a solar cell ?

(A) To reduce the open-circuit voltage

(B) To decrease the short-circuit current

(C) To limit the current flow in the external circuit

(D) To maximize the fill factor

7. What is the role of the "Dirac cones" in the electronic structure of graphene ?

(A) They represent the valence and conduction bands

(B) They indicate the presence of a bandgap

(C) They show the dispersion relation of electrons

(D) They enhance the magnetic properties of graphene

8. How does the chirality of a carbon nanotube affect its electronic properties ?

(A) It determines whether the nanotube is metallic or semiconducting

(B) It affects the mechanical strength of the nanotube

(C) It influences the thermal conductivity of the nanotube

(D) It is unrelated to the electronic properties of nanotubes

9. How does ZnO exhibit both semiconducting and piezoelectric properties simultaneously ?

(A) Through the manipulation of doping concentration

(B) Due to its wurtzite crystal structure

(C) By controlling the synthesis temperature

(D) It does not possess piezoelectric properties

10. In an LED, what is the function of the p-n junction ?

(A) To modulate the intensity of light

(B) To amplify the input signal

(C) To emit light when forward-biased

(D) To store electrical charge

11. Which of the following statements is true in case of CMOS fabrication ?

(A) Fabrication of n-mos transistor requires few additional steps compared to p-MOS transistor

(B) Fabrication on n-MOS is same as that of p-MOS transistor

(C) Fabrication on n-MOS is different from that of p-MOS transistor

(D) Fabrication of p-MOS transistor requires few additional steps compared to n-MOS transistor

12. EDAX is a technique used in conjunction with SEM for :

(A) Energy dispersive analysis of X-rays

(B) Energy levels occupied by electrons excited by X-rays

(C) Electron diffraction analysis of X-ray excitations

(D) Obtaining higher magnification levels

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13. The isolated active areas are created by technique known as .....

(A) Selective deposition of field-oxide isolation

(B) Local Oxidation of Silicon

(C) Etched field-oxide isolation or Local Oxidation of Silicon

(D) Reverse biased pn junction

14. The gate delay is proportional to :

(A) Ron.Cg

(B) Rs.Cds

(C) Rd.Cgs

(D) Ron.Cox

15. At threshold voltage, the surface potential is :

(A) Negative Fermi potential

(B) Fermi potential

(C) 2 Fermi potential

(D) –2 Fermi potential

16. What does CCD stand for ?

(A) Control Circuit Design

(B) Central Core Database

(C) Charge-Coupled Device

(D) Composite Camera Device

17. As die size shrinks. the complexity of making the photomasks .....

(A) increases

(B) decreases

(C) remains the same

(D) cannot be determined

18. The minimum width of *n*-diffusion and *p*-diffusion layer should be :

(A) 3λ

(B) 2λ

(C) λ

(D) 4λ

19. Where are the silicon wafers placed in the reaction chamber for the epitaxial growth process ?

(A) Cup

(B) Boats

(C) Ingots

(D) Crucible

20. As per lambda design rules for wires minimum width of metal 2 is ..... and separation between two metal 2 layers .....

(A) 4 lambda, 4 lambda

(B) 3 lambda, 3 lambda

(C) 4 lambda, 3 lambda

(D) 3 lambda, 4 lambda

21. In an AC circuit, the power factor is the cosine of the :

(A) Voltage angle

(B) Current angle

(C) Phase angle

(D) Resistance angle

22. In a parallel resonant circuit, the impedance is minimum at :

(A) Resonant frequency

(B) Half the resonant frequency

(C) Double the resonant frequency

(D) Quarter the resonant frequency

23. Norton's equivalent current source is connected in :

(A) Series with the load

(B) Parallel with the load

(C) Series with the source

(D) Parallel with the source

24. The unit step response of a first-order system exhibits :

(A) Oscillations

(B) Exponential rise

(C) Exponential decay

(D) Sine wave behaviour

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25. In network synthesis, what is the role of the Hurwitz criterion ?

(A) To determine the stability of a control system

(B) To check the realizability of a network

(C) To analyze the frequency response of a circuit

(D) To evaluate the accuracy of numerical methods in solving circuits

26. The Smith chart is primarily used for the analysis of :

(A) Transmission lines

(B) Filters

(C) Log Amplifiers

(D) Oscillators

27. What is the purpose of the Bode plot in network analysis ?

(A) To represent the step response of a system

(B) To visualize the frequency response of a system

(C) To analyze the transient behavior of a circuit

(D) To plot the time domain behavior of a network

28. What is the purpose of the Smith predictor in control system design ?

(A) To compensate for time delays in the system

(B) To enhance the transient response of the system

(C) To reduce overshoot in the step response

(D) To improve the frequency response of the system

29. The concept of "duality" in network synthesis refers to :

(A) The relationship between input and output signals in a system

(B) The interchangeability of resistors and capacitors in a network

(C) The dual representation of a network in terms of nodes and branches

(D) The ability of a network to exhibit both series and parallel elements

30. Consider the signal $x[n] = 2^n\ u[n]$ having Z-transform as X(z) with ROC R. The inverse Z transform for X ($2z$) will be :

(A) $u[n]$

(B) $2^n\ u[n]$

(C) $4^u\ u[n]$

(D) $2^{2n}\ u[n]$

31. What does the h_{FE} value represent in the common-emitter configuration ?

(A) Reverse current transfer ratio

(B) Output impedance

(C) Voltage gain

(D) Forward current transfer ratio

32. How does the Schmitt trigger eliminate the erratic operation in the op-amp comparator ?

(A) By reducing the sensitivity

(B) By introducing negative feedback

(C) By using positive feedback

(D) By increasing the reference voltage

33. What is the main disadvantage of half-wave rectifier compared to full wave rectifier ?

(A) Higher cost

(B) Lower efficiency

(C) Limited voltage output

(D) More complex circuitry

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34. In any circuit connections, what is the biasing direction for the emitter and collector of a transistor ?

(A) Both are forward biased

(B) Both are reverse biased

(C) Emitter is forward, and collector is reverse biased

(D) Emitter is reverse, and collector is forward biased

35. In a CE configuration, an emitter resistor is used for .....

(A) Stabilization

(B) AC signal bypass

(C) Collector bias

(D) Higher gain

36. Explain the concept of phase noise in the context of PLLs :

(A) Phase noise is the phase deviation between the reference and feedback signals

(B) Phase noise is the undesirable random fluctuations in the phase of the output signal

(C) Phase noise is the intentional modulation of the VCO frequency

(D) Phase noise is the difference in phase between the input and output of the phase comparator

37. Oscillators operate on the principles of .....

(A) Signal feedthrough

(B) Positive feedback

(C) Negative feedback

(D) Ultra high gain

38. Following circuits can be used as voltage to frequency converter :

(A) Astable multivibrator

(B) Crystal oscillator

(C) Schmitt trigger

(D) CE amplifier

39. What is the advantage of using IC LM725 ?

(A) Very high gain

(B) Very high BW

(C) High CMRR

(D) High slew rate

40. Which of the following units is used to convert square wave into triangular wave ?

(A) Differentiator

(B) Integrator

(C) Schmitt trigger

(D) Monoshot multivibrator

41. How is the complement nature of NOR represented in its graphic symbol ?

(A) A small square

(B) A small triangle

(C) A small circle

(D) A small diamond

42. What does SPLD stand for in the context described ?

(A) Simple Programming Logic Device

(B) Sequential Programmable Logic Device

(C) Systematic PLD

(D) Structured Programming and Logic Device

43. Which statement accurately describes the programming of an FPGA ?

(A) FPGA programming is permanent and cannot be changed.

(B) FPGA programming is done using machine code

(C) FPGA programming is done using hardware description languages (HDLs) or schematic entry

(D) FPGA programming is only possible in a controlled laboratory environment

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44. What is the role of the Global Clock Network in CPLD ?

(A) It synchronizes all clock signal in the devices

(B) It is responsible for configuring the entire devices

(C) It has no impact on timing constraints

(D) It is used for power consumption

45. For design of 16 : 1 MUX how many select lines are required ?

(A) 1

(B) 2

(C) 3

(D) 4

46. A decoder converts 'n' inputs to ..... outputs.

(A) n

(B) n^2

(C) 2^n

(D) n^n

47. The expression for number of modulo of a ripple counter with 'n' flip-flop is :

(A) 2^n

(B) n

(C) $2^n - 1$

(D) n^2

48. Output values of Moore type FSM are determined by its .....

(A) Clock input

(B) Current state

(C) Input values

(D) Output values

49. VHDL ..... represents a component's external behavior and interface.

(A) Signal

(B) Port

(C) Entity

(D) Architecture

50. Race Around condition can be avoided in digital logic circuits using :

(A) Shift register

(B) Full adder

(C) AND gate

(D) Master slave JK flip-flop

51. The configuration in which each LED receives operating current of 8 mA from power supply while the port lines sink the current on each port line is :

(A) driver configuration

(B) common anode configuration

(C) common cathode configuration

(D) buffer configuration

52. If no key is pressed microcontroller 8051 port will read :

(A) 0

(B) 1

(C) NC

(D) 7

53. What is the status of the carry, auxiliary carry and parity flags after executing following instructions ?

MOV A,#9C

ADD A.#64H

(A) CY = 0, AC = 0, P = 0

(B) CY = 1, AC = l, P = 0

(C) CY = 0, AC = 1, P = 0

(D) CY = l, AC = l, P = 1

54. What is the frequency of the clock that is being used as the clock source for the timer ?

(A) some externally applied frequency f'

(B) controller's crystal frequency f

(C) controller's crystal frequency/12

(D) externally applied frequency/12

55. In 8086 microprocessor, the address bus is ..... bit wide.

(A) 12 bit

(B) 10 bit

(C) 16 bit

(D) 20 bit

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56. The register AX is formed by grouping ..... .

(A) BH & BL

(B) CH & CL

(C) AH & AL

(D) DH & DL

57. A 20-bit address bus allows access to a memory of capacity :

(A) 1 MB

(B) 2 MB

(C) 4 MB

(D) 8 MB

58. What is the Address (SFR) for TCON, SCON, SBUF, PCON and PSW respectively ?

(A) 88H, 98H, 99H, 87H, 0D0H

(B) 98H, 99H, 87H, 88H, 0D0H

(C) 0D0H, 87H, 88H, 99H, 98H

(D) 87H, 88H, 0D0H, 98H, 99H

59. In 8051 which interrupt has highest priority ?

(A) IE1

(B) TF0

(C) IE0

(D) TF1

60. Which of the following should a microcontroller at least consist of :

(A) CPU, ROM, I/O ports and Timers

(B) RAM, ROM, I/O ports and Timers

(C) CPU, RAM, I/O ports and Timers

(D) CPU, RAM, ROM, I/O ports and Timers

61. A non-conducting sphere has uniform charge density in it. The electric field at a point inside the sphere will be .....

(A) Zero

(B) Only due to the charge inside that point

(C) Only due to the charge outside that point

(D) Due to the entire charge of the sphere

62. What happens to the current in a coil while accelerating a magnet inside it ?

(A) Increases

(B) Decreases

(C) Remains constant

(D) Reverses

63. In an electromagnetic wave, the electric field of amplitude 6.2 V/m oscillates with a frequency of 2.4×10^{10} Hz. Estimate energy density of the wave :

$(\varepsilon = 8.85 \times 10^{-12}\ C^2 / Nm^2)$

(A) $1.4 \times 10^{-10}\ J/m^3$

(B) $2.4 \times 10^{-10}\ J/m^3$

(C) $3.4 \times 10^{-10}\ J/m^3$

(D) $4.4 \times 10^{-10}\ J/m^3$

64. The ratio of conduction to displacement current density is referred to as :

(A) Attenuation constant

(B) Propagation constant

(C) Loss tangent

(D) Dielectric constant

65. Which component of the electric field intensity is always continuous at the boundary ?

(A) Tangential

(B) Normal

(C) Horizontal

(D) Vertical

66. Calculate the skin depth of a material with attenuation constant of 2 units.

(A) 2

(B) 1

(C) 0.5

(D) 4

67. The expression for velocity of a wave in the conductor is :

(A) $V = \sqrt{(2\omega / \mu\sigma)}$

(B) $V = \sqrt{(2\omega\mu\sigma)}$

(C) $V = (2\omega / \mu\sigma)$

(D) $V = (2\omega\mu\sigma)$

68. The standing wave ratio of short circuited and open circuited lines will be :

(A) 0

(B) 1

(C) –1

(D) ∞

69. In a good conductor the phase relation between the tangential components of electric E and the magnetic field H is as follows :

(A) E and H are in phase

(B) E and H are out of phase

(C) H leads E by 90

(D) E leads H by 45

70. Consider a transmission line of characteristic impedance 50 ohm. Let it be terminated at one end by + j50 ohm. The VSWR produced by it in the transmission line will be :

(A) 1

(B) 0

(C) Infinity

(D) + j

71. The phase shift keying is a modulation technique used for transmitting :

(A) digital data over analog channel

(B) analog data over digital channel

(C) binary signals only

(D) FM signals

72. A PLL maintains lock by comparing :

(A) The phase of two signals

(B) The frequency of two signals

(C) The amplitude of two signals

(D) The amplitude of input signal with a fixed threshold

73. To increase level of very weak radio signals from an antenna, you would use :

(A) an RF oscillator

(B) an audio oscillator

(C) an RF amplifier

(D) an audio amplifier

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74. Which is the true statement about frequency deviation in frequency modulation ?

(A) frequency deviation is proportional to carrier signal frequency

(B) frequency deviation is proportional to amplitude of carrier signal

(C) frequency deviation is proportional to modulating frequency

(D) frequency deviation is proportional to amplitude of modulating signal

75. The equivalent noise temperature of a network given the noise figure of the network or system is :

(A) T_0 (F – 1)

(B) T_0 (F + 1)

(C) T_0 (F)

(D) T_0/F

76. Which is called as on-off keying ?

(A) Frequency shift keying

(B) Uni-polar PAM

(C) Amplitude shift keying and Uni-polar PAM

(D) Phase shift keying

77. Which of the following technology distributes the coverage of the cell and extends the cell boundary to hard-to-reach places ?

(A) Sectoring

(B) Cell splitting

(C) Micro cell zone concept

(D) Scattering

78. A planar LED is fabricated from GaAs is having a optical power emitted, which is 0.018% of optical power generated internally which is 0.6 P. Determine external power efficiency :

(A) 0.18%

(B) 0.32%

(C) 0.65%

(D) 0.9%

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79. A technique used for determining the total fiber attenuation per unit length is ..... method.

(A) Frank

(B) Cut-off

(C) Cut-back

(D) OSA

80. Global Sensor Network is built for :

(A) Reducing cost and time for development

(B) Reducing cost and increasing time for development

(C) Increasing cost and increasing time for development

(D) Increasing cost and decreasing time for development

81. The turn-off time of thyristor is 30 m sec at 50°C. Its turn-off time at 100° is :

(A) same

(B) 15 m sec

(C) 60 m sec

(D) 100 m sec

82. A six pulse thyristor rectifier bridge is connected to a balanced 50 Hz three-phase ac source. Assuming that the dc output current of the rectifier is constant, the lowest harmonic component in the ac source line current is :

(A) 100 Hz

(B) 150 Hz

(C) 250 Hz

(D) 300 Hz

83. In a thyristor dc chopper, which type of commutation results in best performance ?

(A) current commutation

(B) load commutation

(C) voltage commutation

(D) supply commutation

84. Consider the following statements :

The diodes in a voltage source inverter (McMurray Inverter) should be able to :

(1) Withstand a large voltage in the reverse direction

(2) Carry the commutating current excess of load current

(3) Provide the required reverse-bias to the outgoing thyristor

(4) Feedback the reactive current to the source.

Of these statements :

(A) (1), (2) and (3) are correct

(B) (1), (3) and (4) are correct

(C) (2), (3) and (4) are correct

(D) (1), (2) and (4) are correct

85. In a dc motor, if the field coils get opened, the speed of the motor will :

(A) decrease

(B) come to a stop

(C) increase

(D) become zero

86. Voltage induced in the rotor of the induction motor when it runs at synchronous speed is :

(A) very near input voltage to stator

(B) slip time the input voltage

(C) zero

(D) very near input voltage to rotor

87. Which of the following is an open loop control system ?

(A) Field controlled D.C. motor

(B) Wardleonard control

(C) Metadyne

(D) Stroboscope

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88. Any externally introduced signal affecting the controlled output is called a :

(A) feedback

(B) stimulus

(C) signal

(D) gain control

89. For a type one system. the steady-state error due to step input is equal to :

(A) Infinite

(B) Zero

(C) 0.25

(D) 0.5

90. In a control system the output of the controller is given to :

(A) final control element

(B) amplifier

(C) comparator

(D) sensor

91. Match List I with List II :

List I

(*a*) Sensors

(*b*) Networks

(*c*) Augmented intelligence

(*d*) Standards

List II

(*i*) Analytical tools that improve the ability to describe phenomenon

(*ii*) Commonly accepted prescriptions for action

(*iii*) A device that generates an electronic signal from a physical condition

(*iv*) A mechanism for communicating an electronic signal

Choose the correct answer from the options given below :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*ii*)	(*i*)	(*iii*)	(*iv*)
(B)	(*iii*)	(*iv*)	(*ii*)	(*i*)
(C)	(*iii*)	(*iv*)	(*i*)	(*ii*)
(D)	(*ii*)	(*i*)	(*iv*)	(*iii*)

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92. Semiconductor strain gauges depend upon ..... for their action.

(A) Piezoelectric effect

(B) Piezo-resistive effect

(C) Ferro-magnetic

(D) Superconductivity

93. On applying mechanical stresses, a material gets electrically polarized. It must be a :

(A) Superconducting material

(B) Piezoelectric material

(C) Ferro-magnetic material

(D) Ferroelectric material

94. ..... of a measuring system refers to its ability to follow instant by instant the measured with time.

(A) Bandwidth

(B) Fidelity

(C) Measurement lag

(D) Settling time

95. What will be the ratio of amplitudes of largest (maximum) signal to smallest (minimum) signal to which the system is subjected ?

(A) Time constant

(B) Settling period

(C) Dynamic range

(D) Bandwidth

96. The sweep generator of a CRO is used to produce :

(A) sinusoidal voltage for the horizontal deflection of electron beam

(B) sawtooth voltage for the vertical deflection of electron beam

(C) sinusoidal voltage for the vertical deflection of electron beam

(D) sawtooth voltage for the horizontal deflection of electron beam

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97. Digital voltmeters can be used to measure .....

(A) voltage only

(B) voltage, temperature. pressure etc.

(C) voltage and current

(D) voltage and resistance

98. What is the relation between scale factor and sensitivity of a transducer ?

(A) Scale factor is double of sensitivity

(B) Scale factor is inverse of sensitivity

(C) Sensitivity is inverse of scale factor

(D) Sensitivity is equal to scale factor

99. Needle electrode is used to measure .....

(A) EKG

(B) EEG

(C) EOG

(D) EMG

100. Which rhythm is the principal component of the EEG that indicates the alertness of the brain ?

(A) Theta rhythm

(B) Gamma rhythm

(C) Beta rhythm

(D) Alpha rhythm

ROUGH WORK

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ROUGH WORK