



Booklet Series

B

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Test Booklet

627108

PAPER CODE

PAPER/II-06/EEE

B

Roll No. : _____

Name of the Candidate : _____

Test Duration : 03 Hours

Total Questions : 100

Total Maximum Marks : 200

INSTRUCTIONS TO CANDIDATES

1. Candidates will be admitted to the Examination Hall/Room on production of their Admit Card and Original ID such as **EPIC/Aadhaar/Driving License** with a view to establish the true identity of the candidate.
2. Candidates shall reach the venue of examination at least 30 minutes in advance and admission will be refused to a candidate who is late by 10 minutes from the start of the examination.
3. No candidate shall be permitted to leave the Examination Hall/Room until the time for the examination is over or until permitted to do so but not until the half of the allotted time.
4. Candidates must use a **BLUE/BLACK** ball point pen ONLY to make entries on the OMR Answer Sheet.
5. The candidates should not bring any articles (other than those specified above) such as books, notes, loose sheets, mobile phones, pagers, digital diaries, calculators, smart watches, etc. inside the Examination Hall/Room. Any candidate found in possession of the said articles will be liable to be de-barred from applying all future examinations to be conducted by the Board.
6. After receiving the Test Booklet with OMR inserted, the candidates may pull out the OMR Answer Sheet and fill in the necessary details. However the candidates are not allowed to break open the seal of the Test Booklet until the invigilator informs them to do so.
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8. The entire Test is of Objective Type Questions comprising 100 questions.
9. Candidates must check that the Question Booklet contains 100 multiple choice questions. If any discrepancy found, report to the invigilator immediately.
10. Every question carries a total of 2 marks each. Candidates will also keep in mind that there is negative marking of $1/3^{\text{rd}}$ for every wrong answer.
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12. In the event of a mistake made in marking the Roll Number in the OMR Answer Sheet or the OMR Series the candidates will not be given a new OMR Answer Sheet but he/she will be allowed to use whitener or correcting fluid for correction of the Roll Number and the Booklet Series only.
13. **Change of answer will not be permitted in the OMR Answer Sheet. Using of correcting fluid (of any sort) will be treated as wrong attracting negative marking.**
14. The candidates must abide by such instructions as may be specified on the cover of the Answer Paper or instructions to candidates given at the back of the Admit Card. If a candidate fails to do so or indulges in improper conduct, he/she will render himself/herself liable to expulsion from the examination or such other punishment as the Board deemed fit to impose.
15. At the end of the Test, candidates must submit the OMR Answer Sheet to the invigilator on duty. Candidates shall be allowed to take their Question Booklet only after the end of the examination session.
16. Any candidate found to be intoxicated with alcohol and/or psychotropic substances will be expelled from the Examination Hall/Room.
17. Examination centre once opted cannot be changed.

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PAPER/II-06/EEE

SEAL



1. The EMF equation of an alternator is given by

- (A) $E = 4.44fN\Phi$
- (B) $E = 1.1fN\Phi$
- (C) $E = 2fN\Phi$
- (D) $E = fN\Phi$

2. What is the purpose of voltage regulation in an alternator ?



- (A) To increase speed
- (B) To maintain constant power factor
- (C) To control output voltage under varying load
- (D) To synchronize alternators

3. One Picofarad is equal to

- (A) 10^{-3} Farad
- (B) 10^{-6} Farad
- (C) 10^{-9} Farad
- (D) 10^{-12} Farad

4. Conductance is reciprocal of

- (A) Inductance
- (B) Semi conductance
- (C) Resistance
- (D) None of the above

5. What is the main advantage of using a stepped core in transformers ?



- (A) To increase the flux density
- (B) To reduce the diameter of the circumscribing circle, leading to reduced copper loss
- (C) To improve the cooling efficiency of the transformer
- (D) To make the transformer more compact

6. What is the main reason for laminating the core of a transformer ?

- (A) To reduce the eddy current losses
- (B) To increase the magnetic flux
- (C) To improve cooling
- (D) To reduce the weight of the core

7. What is the energy required to magnetise a specimen in the hard direction referred to as ?



- (A) Hysteresis energy
- (B) Ferromagnetic energy
- (C) Domain wall energy
- (D) Anisotropy energy

8. Which phenomenon is responsible for the deflection of a magnetic needle placed near a current-carrying conductor ?

- (A) Magnetic effect
- (B) Heating effect
- (C) Chemical effect
- (D) Optical effect



9. In 3 phase systems, 3 voltages have same magnitude and frequency but with a phase difference of ____ degrees.
- (A) 30
(B) 60
(C) 90
(D) 120
10. What type of rotor is used in a squirrel cage induction motor ?
- (A) Wound rotor
(B) Commutator rotor
(C) Squirrel cage rotor
(D) None of the above
11. The PVC casing-capping wiring system is also referred to as
- (A) Closed wiring
(B) Concealed wiring
(C) Earthing wiring
(D) Open wiring
12. Which switch is used to control a lamp from more than two locations ?
- (A) One-way switch
(B) Intermediate switch
(C) Flush switch
(D) None of the above
13. The shunt resistance in an ammeter is usually
- (A) Less than meter resistance
(B) Equal to meter resistance
(C) More than meter resistance
(D) None of the above



14. Which instrument records the magnitude of a quantity continuously over a specified period of time ?
- (A) Indicating instrument
(B) Integrating instrument
(C) Recording instrument
(D) Electromechanical indicating instrument
15. The generator works on the principle of
- (A) Statistically induced emf
(B) Mutual induction
(C) Dynamically induced emf
(D) Kirchhoff's law
16. What part of an alternator rotates to generate electricity ?
- (A) Field winding
(B) Commutator
(C) Rotor
(D) None of the above
17. In which of the following types of machines, electric energy is converted to electromagnetic energy ?
- (A) Lamp
(B) Heater
(C) Electric bell
(D) Telegraph machine





18. What type of magnetic materials are preferred for permanent magnets ?

- (A) Soft magnetic materials with low remanence
- (B) Hard magnetic materials with high remanence
- (C) Alloys with carbon
- (D) Nickel-iron alloys

19. In a 3-phase star connection, how is the line voltage related to phase voltage ?



- (A) Equal
- (B) Line voltage is $\sqrt{3}$ times phase voltage
- (C) Line voltage is half of phase voltage
- (D) Line voltage is twice the phase voltage

20. Which of the following describes power factor correctly ?

- (A) Ratio of voltage to current
- (B) Ratio of active power to apparent power
- (C) Ratio of reactive power to real power
- (D) Ratio of RMS to average voltage

21. Which device is used to measure earth resistance ?



- (A) Ammeter
- (B) Ohmmeter
- (C) Earth Tester
- (D) None of the above

22. What are Current Transformer (CT) and Potential Transformer (PT) used for ?

- (A) Energy generation
- (B) Power distribution
- (C) Measurement and protection
- (D) Voltage regulation

23. According to Ohm's law, current flowing in a circuit is inversely proportional to

- (A) Voltage
- (B) Power
- (C) Resistance
- (D) All the above

24. Unit of electric power is



- (A) Ampere
- (B) Watt
- (C) Volt
- (D) Ohm

25. MOSFET stands for

- (A) Metal Oxide Surface Field Effect Transistor
- (B) Metal Oxide Semiconductor Field Effect Transistor
- (C) Metal Oxidized Selenium Field Effect Transistor
- (D) Metal Of Surface Field Effect Transistor



26. The forward breakover voltage of an SCR
- (A) Decreases as the gate current increases
 - (B) Cannot be controlled by gate current
 - (C) Increases as the gate current increases
 - (D) None of the above

27. The direction of induced EMF in generators and alternators (Dynamically induced emf) is known by



- (A) Lenz's law
- (B) Faraday's Law of Electromagnetic Induction
- (C) Fleming's Left Hand Rule
- (D) Fleming's Right Hand Rule

28. What are the three widely used types of thyristors ?

- (A) SCR, TRIAC, DIAC
- (B) BJT, FET, MOSFET
- (C) CMOS, VMOS, JFET
- (D) NPN, PNP, Bipolar

29. What is the range of HF (High Frequency) in the electromagnetic spectrum ?



- (A) 3 kHz to 30 kHz
- (B) 30 MHz to 300 MHz
- (C) 300 MHz to 3 GHz
- (D) 3 MHz to 30 MHz

30. Which of the following is not a class of permanent magnet material used for electric machines ?

- (A) Alnicos
- (B) Ceramics
- (C) Samarium cobalt
- (D) Silicon

31. Machine generating ac emf are called as

- (A) Alternators
- (B) Transformers
- (C) Modulators
- (D) None of these

32. A 6 pole induction motor supplied by a 10 pole alternator which is driven at 600 rpm. If the motor is running at 970 rpm, determine the percentage slip.



- (A) 1%
- (B) 2%
- (C) 3%
- (D) 5%

33. How does a slip ring induction motor differ from a squirrel cage induction motor ?

- (A) It uses a laminated core
- (B) It has external resistors connected to the stator
- (C) It allows external resistance to be added to the rotor
- (D) It has a permanent magnet rotor



34. Which formula defines rotor frequency in an induction motor ?

(A) $f_r = s \times f$

(B) $f_r = f/s$

(C) $f_r = f - s$

(D) $f_r = f + s$

35. What is the term used for the average drift velocity of electrons per unit electric field ?



(A) Conductivity

(B) Resistivity

(C) Permeability

(D) Mobility

36. What does Kirchhoff's Voltage



Law (KVL) state ?

(A) The sum of voltages around a closed loop is zero

(B) The sum of currents in a network is zero

(C) The total voltage in a circuit is equal to the sum of resistances

(D) The voltage in a closed circuit is directly proportional to the current

37. Which of the following instruments operates based on the attraction and repulsion of coils ?

(A) Moving Coil Instrument

(B) Moving Iron Instrument

(C) Tong Tester

(D) Megger



38. What is the working principle of a Permanent Magnet Moving Coil (PMMC) instrument ?

(A) Eddy current induction

(B) Electromagnetic repulsion

(C) Lorentz force

(D) Mutual inductance

39. A diode is classed as reverse biased

(A) When both anode and cathode are positive

(B) When both anode and cathode are negative

(C) When anode is more positive than cathode

(D) When anode is more negative than cathode

40. The section on one side of the NPN transistor which supplies carriers and is always forward biased is



(A) Emitter

(B) Collector

(C) Base

(D) All the above



41. What is the frequency of an ac current $i = 100\sin 628t$?

- (A) 50Hz
- (B) 100Hz
- (C) 200Hz
- (D) 628Hz

42. What is the RMS (Root Mean Square) value of a sinusoidal AC voltage with a peak value of 100 V ?



- (A) 100 V
- (B) 50 V
- (C) 70.7 V
- (D) 141 V

43. In a solar cell, the energy from sunlight is converted into

- (A) Heat energy
- (B) Mechanical energy
- (C) Magnetic energy
- (D) Electrical energy

44. Which of the following is used to protect electrical circuits from overload in electrical installations ?



- (A) Miniature Circuit Breaker (MCB)
- (B) Contactor
- (C) Transformer
- (D) None of the above

45. What does slot loading refer to in a DC machine ?

- (A) Ampere conductors per pole
- (B) Ampere conductors per slot
- (C) Conductors per meter
- (D) None of the above

46. A 3 phase, 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. Number of conductors per phase is

- (A) 144
- (B) 1440
- (C) 480
- (D) 48

47. Which factor describes the shape of a waveform and is defined as the ratio of RMS to average value ?

- (A) Peak factor
- (B) Power factor
- (C) Form factor
- (D) Impedance

48. What is the phase difference between voltage and current in a purely inductive AC circuit ?

- (A) 90° lag
- (B) 0°
- (C) 90° lead
- (D) 180°

49. In Bipolar Junction Transistors (BJTs), what are the two types available ?

- (A) NPN and PNP
- (B) NMOS and PMOS
- (C) JFET and MOSFET
- (D) CMOS and VMOS

50. 2's complement of 11001 is

- (A) 10011
- (B) 00110
- (C) 10101
- (D) 00111





51. What is the main disadvantage of concealed wiring ?

- (A) Prone to fire
- (B) Easily damaged
- (C) Poor appearance
- (D) Expensive and hard to customize

52. What type of wiring is ideal for workshops and public buildings due to its safety ?

- (A) Open wiring
- (B) Conduit wiring
- (C) Wooden casing wiring
- (D) None of the above

53. According to Ohm's Law, what is the formula to calculate current ?

- (A) $I = V \times R$
- (B) $I = V/R$
- (C) $I = R/V$
- (D) $I = V^2 \times R$

54. What happens to resistance when the length of a conductor increases ?

- (A) It decreases
- (B) It remains constant
- (C) It becomes zero
- (D) It increases

55. Which force is necessary to deflect the pointer of an electromechanical indicating instrument from its zero position ?

- (A) Controlling force
- (B) Damping force
- (C) Integrating force
- (D) Deflecting force

56. In the electronic ohmmeter, which circuit generates a constant current ?

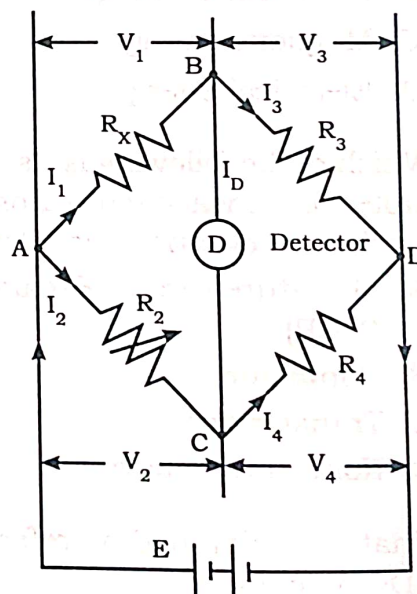
- (A) The first circuit
- (B) The second circuit
- (C) Both circuits
- (D) None of the circuits



57. The material used to separate the plates of a capacitor from each other is

- (A) Dielectric
- (B) Diode
- (C) Inductor
- (D) Resistor

58. Following figure shows a _____ instrument used to measure medium resistance.



- (A) Ohmmeter
- (B) Voltmeter
- (C) Kelvin bridge
- (D) Wheatstone bridge



59. Which of the following is true in a balanced 3-phase system ?

- (A) All line currents are unequal
- (B) Phase voltages are unequal
- (C) Phase currents are equal in magnitude and 120° apart
- (D) One phase carries no current

60. What is the main purpose of the commutator in a DC motor ?

- (A) To convert AC to DC
- (B) To allow the rotor to turn without twisting the wires
- (C) To provide a braking mechanism
- (D) To regulate the speed of the motor

61. Why are analogue instruments considered useful in some measurement applications ?



- (A) They require a constant power supply
- (B) They do not need a power supply
- (C) They are digital devices
- (D) They have a high input impedance

62. In which type of moving iron instrument is the pointer attracted by the fixed coil due to magnetic induction ?



- (A) Attraction type
- (B) Repulsion type
- (C) Both (A) and (B)
- (D) None of the above

63. What type of conductor is typically used in modern PVC wiring systems ?

- (A) VIR insulated wire
- (B) Lead covered cable
- (C) Silver wire
- (D) GI insulated wire

64. Which accessory is used to provide tapping to a pendant lamp holder through a flexible wire ?

- (A) Ceiling rose
- (B) Socket
- (C) Holder
- (D) MCB



65. What does the term "potential difference" refer to in an electrical circuit ?

- (A) The total energy in the circuit
- (B) The difference in current between two points
- (C) The difference in electrical potential between two points
- (D) The resistance between two points

66. What type of current reverses its direction periodically ?

- (A) Alternating Current
- (B) Direct Current
- (C) Static Current
- (D) Balanced Current





67. What is the power factor in the case of two wattmeter method of measuring three phase power if wattmeter reading are equal and opposite ?
- (A) 1
(B) 0
(C) 0.866
(D) 0.5
68. In delta connected system, the relation between the line current I_L and phase current I_{ph} is
- (A) $I_L = I_{ph}$
(B) $I_L = I_{ph}/\sqrt{3}$
(C) $I_L = \sqrt{3} I_{ph}$
(D) $I_L = 3 I_{ph}$
69. Which among the following factors does not directly affect the conductivity of a metal ?
- (A) Temperature
(B) Alloying
(C) Cold work
(D) Color of the metal
70. According to Faraday's first law of electrolysis, the amount of substance deposited at an electrode is proportional to
- (A) Voltage applied
(B) Current passed
(C) Time for which current flows
(D) Both (B) and (C)

71. Magnetization current in a transformer produces _____ in transformer core.
- (A) Eddy current
(B) Flux
(C) Power
(D) None of these
72. Equation for slip speed (n_{slip}) with respect to synchronous speed (n_{sync}) and rotor speed (n_r) is
- (A) $(n_{sync} + n_r)/n_{sync}$
(B) $n_{sync} - n_r$
(C) $(n_r - n_{sync})/n_{sync}$
(D) n_r
73. What component provides a stable reference frequency in a digital counter/timer instrument ?
- (A) Oscillator
(B) Voltage-controlled circuit
(C) Pulse shaper circuit
(D) Phase-sensitive detector
74. What is the primary function of a photometer bench ?
- (A) Measuring voltage
(B) Measuring current
(C) Measuring candle power of a light source
(D) Measuring resistance



75. Which starting method is commonly used for small three-phase squirrel cage motors ?

- (A) Rotor resistance starter
- (B) Star-Delta starter
- (C) Direct-On-Line (DOL) starter
- (D) Auto transformer starter

76. A 250 kVA, 11000/415 V,



50 Hz single phase transformer has 80 turns on the secondary. The number of primary turns are approximately

- (A) 415
- (B) 80
- (C) 800
- (D) 2120

77. In electrolysis, the anode is

- (A) The electrode where oxidation occurs
- (B) The electrode where reduction occurs
- (C) Always negatively charged
- (D) None of the above

78. The battery used in electric



vehicles and Aerospace applications is

- (A) Lead acid cell battery
- (B) Lithium-ion battery
- (C) UPS battery
- (D) Charger battery

79. What type of instrument is used to measure the total energy consumed over time ?

- (A) Ammeter
- (B) Wattmeter
- (C) Energy Meter
- (D) Megger

80. Which instrument is used for measuring high resistance and testing insulation ?

- (A) Ohmmeter
- (B) Megger
- (C) Ammeter
- (D) Tong Tester

81. What is the potential difference if 10 J of work is done to move 2 C of charge ?



- (A) 5 V
- (B) 20 V
- (C) 0.2 V
- (D) 12 V

82. Which metal has the highest electrical conductivity ?

- (A) Aluminium
- (B) Gold
- (C) Silver
- (D) None of the above



83. Which measuring instrument is used to measure electrical resistance ?

- (A) Voltmeter
- (B) Wattmeter
- (C) Ohmmeter
- (D) Ammeter



84. What does a wattmeter measure ?

- (A) Resistance
- (B) Voltage
- (C) Power
- (D) Frequency

85. Which type of conduit is made using a thick steel sheet of high gauge ?



- (A) PVC conduit
- (B) Class A conduit
- (C) Wooden conduit
- (D) Class B conduit

86. What is the relationship between wavelength (λ), frequency (f), and the speed of light (c) ?

- (A) $\lambda = f/c$
- (B) $f = c/\lambda^2$
- (C) $\lambda = c/f$
- (D) None of the above

87. Separators in battery is a _____ material.

- (A) Conductive
- (B) Non - Conductive
- (C) Partly Conductive
- (D) Heavy Conductive

88. In a parallel connection of cells, the total current supplied is

- (A) The sum of currents from all cells
- (B) Equal to the current of one cell
- (C) Half the current of one cell
- (D) Equal to the smallest current among all cells

89. Which type of winding is used in a Series DC motor ?

- (A) High resistance winding
- (B) Low resistance winding
- (C) No winding is used
- (D) Variable resistance winding

90. What is the role of the yoke in a DC generator ?



- (A) To conduct electricity
- (B) To provide mechanical strength and carry magnetic flux
- (C) To induce electromagnetic force
- (D) To connect the external circuit

91. Which configuration is referred to as a complementary MOSFET arrangement in computer logic design ?



- (A) CMOS
- (B) VMOS
- (C) DMOS
- (D) EMOS



92. What happens when an appropriate value of the gate current is passed in an SCR ?
(A) It remains in the OFF state
(B) It switches to the ON state and remains there
(C) It oscillates between ON and OFF states
(D) It becomes a triac
93. What happens to the electrical resistance of most metals with an increase in temperature ?
(A) Decreases
(B) Remains constant
(C) Becomes zero
(D) Increases
94. What is the effect of alloying on the electrical conductivity of a metal ?
(A) Increases conductivity
(B) No change in conductivity
(C) Makes the metal superconductive
(D) Decreases conductivity
95. Unknown frequency can be measured using
(A) Anderson's bridge
(B) Maxwell's bridge
(C) De Sauty's bridge
(D) Wien's bridge
96. What is the main cause of low power factor in AC circuits ?
(A) Resistive loads
(B) Inductive loads
(C) DC circuits
(D) None of these
97. If four 1.5 V cells are connected in series, what is the total voltage ?
(A) 1.5 V
(B) 3 V
(C) 4.5 V
(D) 6 V
98. If three 2 V cells are connected in parallel, what is the total voltage of the combination ?
(A) 2 V
(B) 4 V
(C) 6 V
(D) 8 V
99. The top and bottom horizontal portion of the transformer core is
(A) Limb
(B) Yoke
(C) Winding
(D) Conservator
100. A transformer operates at maximum efficiency when
(A) Core losses minimum
(B) Iron losses minimum
(C) Copper losses minimum
(D) Copper loss = iron loss