

**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO**

Booklet Serial No. **834849**

Test Booklet Series

**JUNIOR LABORATORY TECHNICIAN  
OMR Examination - 2025**

**A**

**Time Allowed: 120 Minutes**

**Maximum Marks: 120**

**INSTRUCTIONS**

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET **DOES NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. Please note that it is the candidate's responsibility to encode and fill in the Roll Number, Booklet Serial No. and Test Booklet Series Code A, B, C or D carefully and without any omission or discrepancy at the appropriate places in the OMR Answer /Response Sheet. Any omission/discrepancy will render the Response Sheet liable for rejection.
3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside.  
*DO NOT write anything else* on the Test Booklet.
4. This Test booklet contains **120** items (questions). Each item comprises of four responses (answers). You will select the response which you want to mark on the Answer Sheet/Response Sheet. In case you feel that there is more than one correct response, mark the response which you consider the appropriate. In any case, choose **ONLY ONE** response for each item.
5. You have to mark all your responses **ONLY** on the separate Answer /Response Sheet provided. *See directions in the Response Sheet.*
6. **All** items carry equal marks.
7. After you have completed filling in all your responses on the Response Sheet and the examination has concluded, you should hand over to the Invigilator **only the Answer /Response Sheet**. You are permitted to take away with you the Test Booklet and **Candidate's Copy of the Response Sheet**.
8. Sheets for rough work are appended in the Test Booklet at the end.
9. While writing Centre Code and Roll No. on the top of the Answer Sheet/Response Sheet in appropriate boxes use "**ONLY BLUE/BLACK BALL POINT PEN**".
10. **Penalty for wrong answers:**

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**THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY THE CANDIDATE IN THE WRITTEN TEST (OBJECTIVE TYPE QUESTIONS PAPERS).**

- (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate,  $(\frac{1}{4})$  of the marks assigned to that question will be deducted as penalty.
- (ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above for that question.
- (iii) If a question is left blank, i.e., no answer is given by the candidate, there will be **no penalty** for that question.

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**(Set - A)**

**(Set - A)**

**(2)**

1. Efflorescence of bricks is due to
  - A) Excessive burning of bricks
  - B) High silt content in brick clay
  - C) High porosity of bricks
  - D) Soluble salts present in parent clay
2. The \_\_\_\_\_ establishes a relationship between the radius of curvature to which the beam bends, the bending stresses and its (beam) cross-sectional dimensions.
  - A) bending equation
  - B) torsion equation
  - C) either A or B
  - D) None of the above
3. The strength of the beam mainly depends on
  - A) bending moment
  - B) c.g. of the section
  - C) section modulus
  - D) its weight
4. For getting the beams of uniform strength the sections of the beam may be varied by
  - A) Keeping the width constant throughout and varying depth
  - B) Keeping the depth constant throughout the length and varying the width
  - C) Varying both, i.e., width and depth in a suitable manner
  - D) All of the above
5. A shallow foundation is usually defined as a foundation which has
  - A) Depth less than 0.6 m
  - B) Depth less than its width
  - C) Depth less than 1.0 m
  - D) None of the above
6. The ultimate bearing capacity of a shallow foundation on sand is reduced to about \_\_\_\_\_ when the water table rises to the ground surface.
  - A) 75%
  - B) 50%
  - C) 25%
  - D) None of the above
7. A pile foundation is used when
  - A) The loads are heavy
  - B) The soil stratum near ground surface is weak
  - C) Both A and B
  - D) None of the above
8. The load carrying capacity of a bored pile in sand is about \_\_\_\_\_ times that of a driven pile.
  - A) 1/2 to 2/3
  - B) 2/3 to 3/4
  - C) 3/4 to 1.25
  - D) More than 1.25

9. \_\_\_\_\_ type of machine foundation consists of a pedestal resting on a footing. The foundation has a large mass and a small natural frequency.

- A) Block
- B) Box
- C) Wall
- D) Framed

10. Seasoning of timber for use in construction is done essentially to

- A) Smoothen timber surfaces
- B) Cut timber in right season and geometry
- C) Remove knots from timber logs
- D) Increase strength and durability

11. Which one of the following aggregates gives maximum strength in concrete?

- A) Rounded aggregate
- B) Elongated aggregate
- C) Cubical aggregate
- D) Flaky aggregate

12. The specific gravity of commonly available ordinary Portland cement is

- A) 4.92
- B) 3.15
- C) 2.05
- D) 1.83

13. The following statements are related to special concrete:

**Statement 1:** Density of the light-weight concrete is in the order of 2200 to 2950 kg/m<sup>3</sup>.

**Statement 2:** Factors that affect the properties of Fiber Reinforced Concrete are volume of fiber, aspect ratio of the fiber, Workability, size of coarse aggregate, and mixing.

**Choose the correct option:**

- A) Statement 1 is correct and Statement 2 is incorrect
- B) Statement 2 is correct and Statement 1 is incorrect
- C) Statement 1 and 2 are correct
- D) Statement 1 and 2 are incorrect

14. Consider the following statements about lime:

- 1. Calcination of limestone results in quick lime
- 2. Lime produced from pure variety of chalk is hydraulic lime
- 3. Hydrated lime is obtained by treating quick lime with water

**Which of the above statement are not correct?**

- A) 1 only
- B) 2 only
- C) 3 only
- D) 1 and 3

15. The following statements are related to Workability of concrete:

**Statement 1:** The time required for the shape of concrete to change from slump cone shape to cylindrical shape in seconds is known as Vee Bee Degree.

**Statement 2:** The size of aggregate, shape of aggregate, water content, and grading of aggregates affect the workability of concrete. But the surface texture of aggregate is not affecting the workability of concrete.

**Choose the correct options:**

- A) Statement 1 is correct and Statement 2 is incorrect
- B) Statement 2 is correct and Statement 1 is incorrect
- C) Statement 1 and 2 are correct
- D) Statement 1 and 2 are incorrect

16. Consider the following statements for selecting building stones:

- 1. Porosity of stone affects its durability
- 2. Seasoning of stones is important and is done by soaking in water

**Choose the correct option:**

- A) Statement 1 is correct and Statement 2 is incorrect
- B) Statement 2 is correct and Statement 1 is incorrect
- C) Statement 1 and 2 are correct
- D) Statement 1 and 2 are incorrect

17. Consider the common methods related to testing of concrete:

- 1. Consistency test
- 2. Compacting factor test
- 3. Vee-Bee Consistometer test
- 4. Setting time test
- 5. Slump test

**Which of these methods refer to measuring workability of concrete?**

- A) 1, 2 and 3
- B) 2, 3 and 5
- C) 1, 3 and 5
- D) 1, 3 and 4

18. Match List - I with List-II and select the correct answer using the codes given below the lists:

**List - I (Components of staircase)**

- i. Tread
- ii. Riser
- iii. Nosing
- iv. Strings

**List - II (Definition)**

- 1. It is a vertical portion of a step providing support to the tread.
- 2. It is an upper horizontal portion of a step upon which foot is placed while ascending or descending.
- 3. These are the sloping members which support the steps in a stair
- 4. It is the projecting part of the tread beyond the face of the riser.

**Choose the correct options:**

- A) i-3, ii-4, iii-1, iv-2
- C) i-2, ii-1, iii-4, iv-3

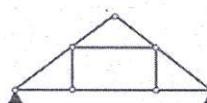
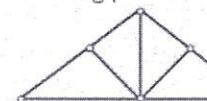
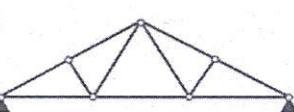
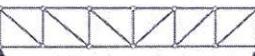
- B) i-2, ii-4, iii-3, iv-1
- D) i-2, ii-1, iii-3, iv-4

19. Match List - I with List-II and select the correct answer using the codes given below the lists:

**List - I (Type of Truss)**

- i. King post truss
- ii. Queen post truss
- iii. Fink truss
- iv. Flat truss

**List - II (Picture of Truss)**

- 1. 
- 2. 
- 3. 
- 4. 

**Choose the correct options:**

- A) (i) - 3, (ii) - 4, (iii) - 1, (iv) - 2
- B) (i) - 2, (ii) - 4, (iii) - 3, (iv) - 1
- C) (i) - 2, (ii) - 1, (iii) - 4, (iv) - 3
- D) (i) - 2, (ii) - 1, (iii) - 3, (iv) - 4

20. Match List - I with List-II and select the correct answer using the codes given below the lists:

**List - I (Property of Cement)**

- i. Specific gravity
- ii. Setting time
- iii. Soundness
- iv. Fineness

**List - II (Testing Apparatus)**

- 1. Blain's apparatus
- 2. Le Chatelier's flask
- 3. Autoclave
- 4. Vicat's apparatus

**Choose the correct options:**

- A) i-3, ii-4, iii-1, iv-2
- B) i-2, ii-4, iii-3, iv-1
- C) i-2, ii-1, iii-4, iv-3
- D) i-2, ii-1, iii-3, iv-4

21. Match List - I with List-II and select the correct answer using the codes given below the lists:

**List - I (Admixtures)**

- i. Water reducing admixture
- ii. Air entraining agent
- iii. Superplasticiser
- iv. Accelerator

**List - II (Chemicals)**

- 1. Sulphonatedmelanin formaldehyde
- 2. Calcium chloride
- 3. Lignosulphonate
- 4. Neutralised vinsol resign

**Choose the correct options:**

- A) i-2, ii-4, iii-1, iv-3
- B) i-1, ii-3, iii-4, iv-2
- C) i-3, ii-4, iii-2, iv-1
- D) i-3, ii-4, iii-1, iv-2

22. Match List - I with List-II and select the correct answer using the codes given below the lists:

**List - I (Material Characteristics)**

- i. Water cement ratio
- ii. Water content
- iii. Minimum cement content
- iv. Segregation

**List - II (Property of Concrete)**

- 1. Durability
- 2. Compressive strength
- 3. Stability of mix
- 4. Workability

**Choose the correct options:**

- A) i-4, ii-1, iii-3, iv-2
- B) i- 2, ii-4, iii-3, iv-1
- C) i- 4, ii-1, iii-2, iv-3
- D) i- 2, ii-4, iii-1, iv-3

23. The two criteria for the determination of allowable bearing capacity of a foundation are

- A) Tensile failure and compression failure
- B) Tensile failure and settlement
- C) Bond failure and shear failure
- D) Shear failure and settlement

24. Consider the following methods of preservation of timber:

- I. Dipping
- II. Open tank treatment
- III. Brushing
- IV. Spraying

The correct sequence of these methods in the increasing order of their effectiveness is

- A) IV, I, III, II
- B) III, II, i, IV
- C) III, IV, I, II
- D) IV, I, II, III

25. What instrument is used to measure gauge length?

- A) Impact apparatus test
- B) Perceived stress scale
- C) Extensometer
- D) Elastimeter

26. What do you mean by proportional limit?

- A) The stress at which the stress-strain curve begins to continue in straight line
- B) The point at which the maximum stress is reached
- C) The maximum stress at which the elongation occurs without increase in the load
- D) The stress at which the stress-strain curve begins to deviate from the straight line.

27. The factor of safety is
- Allowable stress / Failure stress
  - Working load / Failure load
  - Failure stress / Allowable stress
  - Failure stress / Failure load
28. Consider the following statement
- If a system is isolated from its surroundings, the internal energy of a closed system remains unchanged
  - If a system is isolated from its surroundings, the change in internal energy is equal to zero
  - If a system is isolated from its surroundings, both heat and work are not equal to zero
  - If a system is isolated from its surroundings, the change in internal energy is not equal to zero
- Which of the following statement is/are correct:**
- I and II
  - II and IV
  - II and III
  - III and IV
29. Which of the following is correct with respect to first law of thermodynamics
- $\int dW = \int dQ$
  - $\int dW \neq \int dQ$
  - $dW = dQ$
  - $\oint dW = \oint dQ$
30. Consider the following pairs
- |            |   |
|------------|---|
| i. Process | 1. The system comes to its original state after passing through a sequence of processes                                     |
| ii. Cycle  | 2. Energy transferred across a boundary between systems without transfer of mass by reason of the difference in temperature |
| iii. Heat  | 3. Energy transferred across a boundary between systems by reason of the difference in pressure                             |
| iv. Work   | 4. It is said to occur when the system undergoes a change of state  |

**Which of the pairs given above is/are correctly matched?**

- i-1, ii-2, iii-4, iv-3
- i-4, ii-3, iii-1, iv-2
- i-3, ii-1, iii-2, iv-4
- i-4, ii-1, iii-2, iv-3

31. A cyclic process is executed by a system during which there are four transfers of heat as given below:  
 $Q_{12} = 880\text{ kJ}$ ,  $Q_{23} = 100\text{ kJ}$ ,  $Q_{34} = -720\text{ kJ}$  and  $Q_{41} = 200\text{ kJ}$   
 $W_{12} = 60\text{ kJ}$ ,  $W_{23} = -40\text{ kJ}$ ,  $Q_{34} = 80\text{ kJ}$   
What is  $W_{41}$ ?  
A) 120kJ B) 140kJ  
C) 160kJ D) 180kJ

32. Consider the following statements:

  - I. Energy Performance Ratio (E.P.R) is the same as Coefficient of Performance (C.O.P) of a refrigerator system
  - II. The Coefficient of Performance (COP) of a refrigerator system is the ratio of heat supplied to the work done
  - III.  $E.P.R = C.O.P + 1$
  - IV.  $E.P.R = C.O.P - 1$

**Which of the following statement is/are correct:**



33. Consider the following statements:

An ideal refrigerant should possess

- I. High freezing point
  - II. High specific heat and low latent heat
  - III. Low specific volume
  - IV. Should be non-flammable and non-explosive

**Which of the following statement is/are correct:**



34. A Carnot refrigerator extracts 400kJ of heat per minute from a cold room which is maintained at  $-15^{\circ}\text{C}$  and it is discharged to atmosphere which is at  $30^{\circ}\text{C}$ . The ideal Indicated power (I.P) is



35. Which of the following statement is correct in connection with the ideal conditions of Bell-Coleman air refrigeration system

  - A) The compression and expansion process follow the isentropic laws
  - B) The compression and expansion process follow polytropic laws
  - C) There are some pressure losses in the system
  - D) Inter-cooling is not possible

- 36.** Which of the following is an intensive property?
- A) Kinetic energy      B) Enthalpy  
C) Density              D) Momentum
- 37.** Consider the following pairs:
- |                      |  |
|----------------------|--|
| i. Strain rate       | 1. A fluid property directly related to density of the fluid       |
| ii. Specific gravity | 2. Plays a primary role in the generation of turbulence            |
| iii. Viscosity       | 3. The ratio of the density of a substance to the density of water |
| iv. Specific weight  | 4. The rate at which a fluid element deforms                       |
- Which of the pairs given above is/are correctly matched?**
- A) i-2, ii-1, iii-4, iv-3      B) i-4, ii-3, iii-2, iv-1  
C) i-3, ii-1, iii-2, iv-4      D) i-4, ii-3, iii-1, iv-2
- 38.** If force, length, and time are selected as three fundamental dimensions, the unit of viscosity in SI system is
- A)  $\text{FT}^2/\text{L}$       B)  $\text{FT}/\text{L}^2$   
C)  $\text{N}\cdot\text{s}^2/\text{m}^2$       D)  $\text{N}\cdot\text{s}^2/\text{m}$
- 39.** Which of the following is incorrect?
- A) Viscosity is the internal stickiness of a fluid  
B) Viscosity is a property of the fluid  
C) Viscosity is directly proportional to the strain rate  
D) The effect of viscosity causes fluid to adhere to a surface which is slip condition.
- 40.** Consider the following pairs
- |                     |   |
|---------------------|---|
| i. Reaction turbine | 1. The flow energy is converted into kinetic energy through a nozzle before the liquid impacts the runner |
| ii. Impulse turbine | 2. Moving component of a turbine  |
| iii. Runner         | 3. Extract useful energy from the water flowing in a piping system  |
| iv. Turbines        | 4. Uses both flow energy and kinetic energy   |
- Which of the pairs given above is/are correctly matched?**
- A) i-2, ii-1, iii-4, iv-3      B) i-4, ii-3, iii-2, iv-1  
C) i-3, ii-1, iii-2, iv-4      D) i-4, ii-1, iii-2, iv-3

- 41.** Which of the statement is incorrect with respect to Francis turbine
- A) The incoming flow through the guide vanes is radial
  - B) Contains significant tangential velocity component at the entrance to the runner vanes
  - C) The pressure at the exit of the runner is always above atmospheric.
  - D) As the fluid leaves the runner, the fluid velocity is primarily axial
- 42.** Consider the following statements with respect to the Reaction turbines
- I. The flow is contained in a volute
  - II. Adjustable guide vanes are situated downstream of the runner
  - III. When the fluid travels through the runner, angular momentum is reduced
  - IV. There is no diffuser in this turbine
- Which of the following statement is/are correct:**
- A) I and II
  - B) I and III
  - C) II and III
  - D) III and IV
- 43.** From design considerations, cast iron offers
- A) Lower compressive strength
  - B) Low resistance to wear
  - C) Complex shapes without costly machining operations
  - D) Higher tensile strength
- 44.** Consider the following pairs
- |                          |  |
|--------------------------|--|
| i. Low carbon steel      | 1. Carbon content in the range of 0.3% to 0.5%                             |
| ii. High carbon steel    | 2. Available in the form of bar, tube, plate, sheet and wire               |
| iii. Medium carbon steel | 3. Very soft and very ductile  |
| iv. Plain carbon steel   | 4. When heat treated very high strength combined with hardness is achieved |
- Which of the pairs given above is/are correctly matched?**
- A) i-3, ii-4, iii-1, iv-2
  - B) i-4, ii-3, iii-2, iv-1
  - C) i-3, ii-1, iii-2, iv-4
  - D) i-4, ii-1, iii-2, iv-3
- 45.** Aluminium alloys offer which of the following advantage?
- A) High specific gravity
  - B) Low resistance to corrosion
  - C) Face-centered cubic crystal structure
  - D) High strength compared to steel

**46.** Which of the pair is having Degrees of Freedom as 2 based on relative motion between pairing elements:

- A) Siding pair
- B) Turning pair
- C) Cylindrical pair
- D) Rolling pair

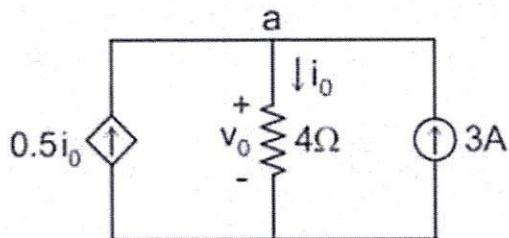
**47.** Match the following

- |                   |   |
|-------------------|---|
| i. Kinematics     | 1. All points move in planes which are parallel to some reference plane       |
| ii. Dynamics      | 2. The slider in the slider crank mechanism has rectilinear motion            |
| iii. Plane motion | 3. Forces acting on the machine parts and motions resulting from these forces |
| iv. Translation   | 4. Study of the relative motion of machine parts                              |

**Which of the pairs given above is/are correctly matched?**

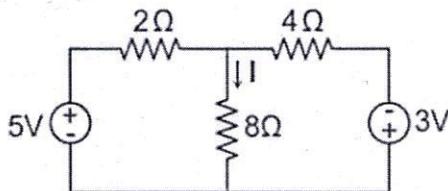
- |                           |                           |
|---------------------------|---------------------------|
| A) i-3, ii-4, iii-1, iv-2 | B) i-4, ii-3, iii-1, iv-2 |
| C) i-2, ii-3, iii-4, iv-1 | D) i-4, ii-1, iii-2, iv-3 |
- 48.** Which is incorrect with respect to link or element
- A) Any body which has motion relative to another.
  - B) All materials have some elasticity
  - C) Quaternary link is connected to other links at four points
  - D) A rigid link is one where deformation is too large
- 49.** What will be the self-inductance of a coil of 200 turns in which a current of 2A produces a magnetic flux of 4 mWb?
- |          |          |
|----------|----------|
| A) 0.4 H | B) 0.2 H |
| C) 0.1 H | D) 0.3 H |
- 50.** Which of the following statements is/are correct?
- I. Across a resistor, potential always decreases in the direction of the current
  - II. Across an inductor, the potential always decreases in the direction of the current
- Choose the correct option.**
- A) I and II are both incorrect
  - B) I is correct and II is incorrect
  - C) I and II are both correct
  - D) I is incorrect and II is correct

51. Find the voltage  $V_0$  across the  $4\Omega$  resistor in the following circuit



- A) 12 V      B) 24 V  
C) 21 V      D) 23 V

52. In the circuit shown below, find the current flowing through the  $8\Omega$  resistance.



- A) 0.35 A      B) 0.50 A  
C) 0.80 A      D) 0.25 A

53. Which of the following is true for a star-connected three-phase AC circuit?
- A) Phase voltage is equal to line voltage and phase current is three times the line current  
B) Phase voltage is square root three times line voltage and phase current is equal to line current  
C) Phase voltage is equal to line voltage and line current is equal to phase current  
D) Phase voltage is three times line voltage and phase current is equal to line current
54. An induction motor running at 1000 RPM at 50Hz, will have:
- A) 10 poles      B) 6 poles  
C) 4 pole      D) 5 poles

55. Consider the following pairs.
- |                            |                            |
|----------------------------|----------------------------|
| I. Arsenic- Pentavalent    | II. Bismuth- Quadrivalent  |
| III. Antimony- Pentavalent | IV. Aluminium- Pentavalent |

**Which of the above pairs are correctly matched?**

- A) I and II only      B) I and III only  
C) II and IV only      D) All of the above

56. Which of the following is correct for an unbiased PN junction?
- The junction current is due to minority carriers only
  - The junction current at equilibrium is zero as equal but opposite carriers are crossing the junction
  - The junction current reduces with the rise in temperature
  - The junction current at equilibrium is zero as charges do not cross the junction

57. If properly biased, JFET may act as a
- Voltage-controlled current source
  - Voltage-controlled voltage source
  - Current-controlled current source
  - Current-controlled voltage source

58. Match the two lists and choose the correct answer from the code given below

**List -I (BJT configurations)**

- Current gain in common base
- Input impedance in common base
- Voltage gain in common collector
- Output impedance in common base

**Choose the correct options:**

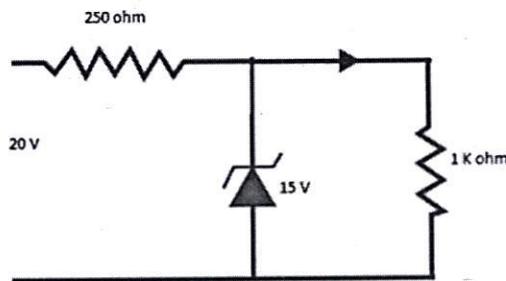
- w-i, x-ii, y-iii, z-iv
- w-iv, x-iii, y-ii, z-i

**List-II**

- 1
- Less than unity
- Very High (2 Mega Ohm)
- Low

- w-iii, x-i, y-iv, z-ii
- w-ii, x-iv, y-i, z-iii

59. A Zener diode, having a breakdown voltage equal to 15 V, is used in a voltage regulator circuit shown in the figure. The current through the diode is:



- 10 mA
- 15 mA
- 5 mA
- 8 mA

60. In a core type transformer, the coils are wound in helical layers, each layer being insulated from the other by using which of the following:
- Paper
  - Cloth
  - Cooling ducts
  - All of these

61. Buchholz's relay will give warning and protection against \_\_\_\_\_
- A) Electrical fault inside the transformer itself
  - B) Electrical fault outside the transformer in the outgoing feeder
  - C) For both outside and inside faults
  - D) Cannot be determined
62. The full-load copper loss of the transformer is 1600W. At half-load, the copper loss will be
- A) 6400 W
  - B) 1600 W
  - C) 800 W
  - D) 400 W
63. A 500 VA transformer operates with a primary voltage of 240 V and a secondary voltage of 120 V. What is the secondary current at full load?
- A) 4.16 A
  - B) 2.08 A
  - C) 10 A
  - D) 20 A
64. A 200 V DC motor having an armature resistance of 0.8 ohms draws an armature current of 10 A. What will the value of back emf be induced?
- A) 190 V
  - B) 192 V
  - C) 185 V
  - D) 198 V
65. A 220 V DC motor has an armature resistance of  $1 \Omega$  and is running at a speed of 1200 rpm with a back EMF of 200 V. Calculate the armature current.
- A) 10 A
  - B) 20 A
  - C) 30 A
  - D) 40 A
66. What will happen if the supply voltage to a three-phase induction motor is reduced?
- A) Speed will increase
  - B) Efficiency will increase
  - C) Torque will decrease
  - D) Motor will stop
67. When will a synchronous motor always stop?
- A) Excitation winding gets disconnected
  - B) Supply voltage fluctuates
  - C) Supply voltage frequency changes
  - D) Load in motor varies
68. Arrange the following power plants in ascending order based on their efficiency.
- I. Hydro Power station
  - II. Nuclear Power station
  - III. Solar Power Plant
- Choose the correct options:**
- A) I, II, III
  - B) II, III, I
  - C) II, I, III
  - D) III, II, I

69. Balanced voltage magnitude & phase shift in three-phase induction machine means,  
\_\_\_\_\_ & \_\_\_\_\_ respectively

- A) Equal RMS value of all phases and Equal phase shift ( $150^\circ$ ) between any phases
- B) Equal Peak value of all phases and Equal phase shift ( $120^\circ$ ) between all phases
- C) Equal DC value of all phases and Equal phase shift ( $180^\circ$ ) between all phases
- D) Equal Peak value of all phases and Equal phase between all phases

70. Which of the following is a renewable source of energy used in power plants?

- I. Natural gas
- II. Wind
- III. Uranium

**Choose the correct options:**

- A) I and II
- B) Only I
- C) Only II
- D) II and III

71. Match the two lists and choose the correct answer from the code given below

**List -I (Name of Power Plant)**

- w. Thermal
- x. Nuclear
- y. Hydro
- z. Diesel

**List-II (Plant Features)**

- i. High operating cost
- ii. High capital cost
- iii. High plant life
- iv. High fuel transportation cost

**Choose the correct options:**

- A) w-iii, x-i, y-iv, z-ii
- B) w-iv, x-ii, y-iii, z-i
- C) w-iii, x-ii, y-iv, z-i
- D) w-iv, x-i, y-iii, z-ii

72. When a transformer is first energised, the transient current during the first few cycles is

- A) Less than full load current
- B) Equal to full load current
- C) Equal to no-load current
- D) Much higher than the full load current

73. In a diode, an energy band is referred to

- A) a set of continuous energies
- B) a set of closely spaced allowed energy levels
- C) a set of orbit shells
- D) none of the above

74. Fermi energy level for p-type extrinsic semiconductors lies

- A) At the middle of the band gap
- B) Closer to the conduction band
- C) Closer to the valence band
- D) None of the above

75. A semiconducting device is connected in a series circuit with a battery and a resistance. A current is found to pass through the circuit. If the polarity of the battery is reversed, the current drops to almost zero. The device may be
- A p-n junction
  - An intrinsic semiconductor
  - A p-type semiconductor
  - An n-type semiconductor
76. A transistor has a current gain of 0.99 in the common base mode. Its current gain in the common collector mode is \_\_\_\_\_.
- |        |         |
|--------|---------|
| A) 100 | B) 1.01 |
| C) 99  | D) 0.99 |
77. Consider the following circuit configurations:
- Common emitter
  - Common base
  - Emitter follower
- The correct sequence in increasing order of the input resistances of these configurations is-**
- |               |               |
|---------------|---------------|
| A) II, I, III | B) I, III, II |
| C) III, I, II | D) I, II, III |
78. Match the two lists and choose the correct answer from the code given below
- | <b>List -I (Characteristic of the device)</b> | <b>List-II (Device)</b>        |
|---|--------------------------------|
| w. Voltage controlled device                  | i. Bipolar junction transistor |
| x. Current controlled device                  | ii. Uni-junction transistor    |
| y. Modulation device                          | iii. Field effect transistor   |
| z. Negative resistance device                 | iv. Gunn Diode                 |
- Choose the correct options:**
- |                           |                           |
|---------------------------|---------------------------|
| A) w-ii, x-iii, y-i, z-iv | B) w-ii, x-iii, y-iv, z-i |
| C) w-iii, x-i, y-ii, z-iv | D) w-iii, x-i, y-iv, z-ii |
79. Transformer utilization factor for a half-wave rectifier and centre tapped full wave rectifier is \_\_\_\_\_ and \_\_\_\_\_, respectively.
- |                 |                 |
|-----------------|-----------------|
| A) 28.6%, 81%   | B) 40.6%, 81.2% |
| C) 28.6%, 57.2% | D) 57.2%, 81%   |

- 80.** If the peak voltage for a half-wave rectifier circuit is 5V and the diode cut-in voltage is 0.7, then the peak inverse voltage of the diode is

A) 5.7 V    B) 4.9 V  
C) 6.7 V    D) 4.3 V

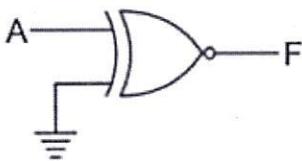
- 81.** Identify the device(s) that can be used to regulate voltage in an electrical system.

- I. MOSFET  
II. Snubber Circuit  
III. JFET  
IV. Zener Diode

**Choose the correct options:**

A) I and III    B) III and IV  
C) Only IV    D) Only II

- 82.** The output of the logic gate is-



A) 1    B)  $A'$   
C) A    D) 0

- 83.** Which of the following is an example of distributive law?

A)  $a+0 = 0+a = a$     B)  $1+a = a+1 = 1$   
C)  $a+bc = (a+b)(a+c)$     D)  $a+(b+c) = (a+b)+c$

- 84.** How many 2-input NOR gates are required to implement a 2-input NAND gate?

A) 2    B) 3  
C) 4    D) 5

- 85.** A gate, which cannot be used as an inverter is-

- I. XNOR  
II. NAND  
III. AND  
IV. NOR

**Choose the correct options:**

A) I and II    B) II and III  
C) III and IV    D) Only III

- 86.** The input to a logic gate is  $A = 1100$  &  $B = 1010$ . If the logic gate is a NAND gate then what will be the output?

A) 1011    B) 0111  
C) 0110    D) 1000

- 87.** A standard ASCII code is a
- A) 7-bit code
  - B) 5-bit code
  - C) 11-bit code
  - D) 9-bit code
- 88.** Match the two lists and choose the correct answer from the code given below
- | <b>List X (Octal)</b> | <b>List Y (Binary)</b> |
|-----------------------|------------------------|
| w. 75                 | i. 010110              |
| x. 65                 | ii. 110101             |
| y. 37                 | iii. 111101            |
| z. 26                 | iv. 011111             |
- Choose the correct options:**
- A) w-iii, x-i, y-iv, z-ii
  - B) w-iii, x-ii, y-iv, z-i
  - C) w-i, x-ii, y-iii, z-iv
  - D) w-iv, x-i, y-ii, z-iii

- 89.** Which one of the following is NOT a valid BCD code?
- A) 0111 1001
  - B) 0100 1000
  - C) 0101 1011
  - D) 0100 1001
- 90.** A microprocessor contains ALU, \_\_\_\_\_
- A) and register unit on a single chip
  - B) and memory on a single chip
  - C) register unit and I/O device on a single chip
  - D) register unit and control unit on a single chip
- 91.** Consider the following:
- |                  |                          |
|------------------|--------------------------|
| I. Sign flag     | II. Trap flag            |
| III. Parity flag | IV. Auxiliary carry flag |
- Which of the above flags is/are present in 8085 microprocessors?**
- A) I only
  - B) II and III
  - C) I and II
  - D) I, III and IV
- 92.** Consider the following statements:

**Statement (I):** The program counter is a register that contains the address of the next instruction to be executed

**Statement (II):** Instruction Register is not accessible to the programmer

**Choose the correct options:**

- A) Both I and II are true and II is the correct explanation of I
- B) Both I and II are true but II is not the correct explanation of I
- C) I is true but II is false
- D) I is false but II is true

93. Which of the following is a 16-bit register in 8085 microprocessor?
- A) Stack pointer
  - B) Accumulator
  - C) Register B
  - D) Register C
94. The size of internal RAM in 8051 microcontroller is
- A) 128 Bytes
  - B) 128 Bits
  - C) 64 Bytes
  - D) 64 Bits
95. Which of the four ports of 8051 needs a pull-up resistor for using it as an input or an output port?
- A) PORT 0
  - B) PORT 1
  - C) PORT 2
  - D) PORT 3
96. Which pin number in 8051 acts as ALE?
- A) 28
  - B) 34
  - C) 32
  - D) 30
97. The system unit that contains the most vital part of a personal computer is called
- A) Keyboard
  - B) BIOS chip
  - C) Motherboard
  - D) Monitor
98. The Central Processing Unit in a computer consists of which major components?
- A) Arithmetic Logic Unit (ALU) and Control Unit
  - B) Control Unit (CU)
  - C) Registers
  - D) ALU, Control Unit, and Registers
99. Which among the following is the fastest memory in a computer that holds information?
- A) Register
  - B) Cache
  - C) Main memory
  - D) RAM
100. Which bus is used to carry data to and from the memory?
- A) Address bus
  - B) Data bus
  - C) Control bus
  - D) None of the above
101. Which of the following sets does NOT include input devices?
- A) Keyboard, trackball, light pen
  - B) Barcode reader, OMR, OCR, MICR
  - C) Biometric sensor, scanner, Mic
  - D) Plotter, projector, headphones

- 102.** Which keys are also known as toggle keys?
- A) Caps lock, Num lock      B) Control key, Enter key  
C) Shift, Esc      D) Both (A) and (B)
- 103.** A uniform interval of CPU time allocated for performing a task is called
- A) real-time      B) seek time  
C) time slice      D) unit time
- 104.** Which of the following is a real-time operating system?
- A) Windows      B) Unix  
C) RTOS      D) Linux
- 105.** What is the purpose of the kernel in an operating system?
- A) To manage the system's resources  
B) To provide a user interface  
C) To manage files  
D) To manage the network
- 106.** Consider the following statements comparing static RAM with dynamic RAM:
- I. In static RAM, a typical cell requires more number of transistors than in dynamic RAM  
II. Power consumption per bit of static RAM is less than that of dynamic RAM  
III. Dynamic RAM is less expensive than the static RAM
- Which of the above statements is/are correct?**
- A) I, II and III      B) I and II only  
C) II and III only      D) I and III only
- 107.** Which of the following is the default file extension for a workbook in Microsoft Excel?
- A) .docx      B) .xlsx  
C) .csv      D) .xlsm
- 108.** Which of the following is not a valid data type in MS Excel?
- I. Number      II. Character  
III. Label      IV. Time/Data
- Choose the correct options:**
- A) I and II      B) II and III  
C) Only II      D) Only IV

**109.** Maximum font size of MS Word is:

- A) 1638
- B) 72
- C) 1024
- D) 96

**110.** Which program opens when you insert a new chart into MS PowerPoint?

- A) Chart Maker
- B) Excel
- C) Power Charts
- D) Spreadsheets

**111.** Which of the following is/are types of sound files?

- A) LOG files
- B) DAT files
- C) WAV files
- D) DRV files

**112.** What are lines, curves, free form, and scribbles in MS powerpoint?

- A) Emphasis effects that can be applied to animations
- B) Predefined entrance and exit effects
- C) Types of Custom Motion Paths
- D) All of the above

**113.** The "S" in HTTPS stands for

- A) Selected
- B) Software
- C) Secure
- D) System

**114.** Which of the following programs are designed by the attackers to gain root or administrator access to your computer?

- A) Anti-ware
- B) Malware
- C) Backdoor
- D) Rootkits

**115.** How does information technology contribute to transparency in governance?

- A) By limiting access to government information
- B) By encrypting all government data
- C) By facilitating the easy access and dissemination of information to the public
- D) By providing a secure channel for confidential communication

**116.** Choose the best matching between GROUP-I and GROUP-II

**GROUP-I**

- w. Data Link Layer
- x. Network Layer
- y. Transport Layer

**GROUP-II**

- i. Ensures reliable transport of bits over a Physical point-to-point link
- ii. Encodes/decodes data for physical transmission
- iii. end-to-end communication between two processes
- iv. Routes data from one network node to the next

**Choose the correct options:**

- A) w-i, x-iv, y-iii
- B) w-ii, x-iv, y-i
- C) w-ii, x-iii, y-i
- D) w-i, x-iii, y-ii

**117.** Which of the following is NOT a client-server application?

- A) Internet chat
- B) Web browsing
- C) E-mail
- D) Ping

**118.** The digital signature service that has been launched on the Aadhaar platform is called

- A) DigiSign
- B) OnlineSign
- C) GoogleSign
- D) eSign

**119.** Which of the following languages is the most suitable for artificial intelligence programming?

- A) Fortran
- B) Prolog
- C) Basic
- D) "C"

**120.** Which of the following is an Internet protocol?

- A) Transmission Control Protocol
- B) Hypertext Preprocessor
- C) HTML
- D) Modem

# **ROUGH WORK**