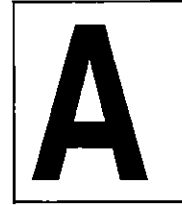


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PRELIMINARY SCREENING  
TEST BOOKLET

TEST BOOKLET SERIES



Time allowed :  $1\frac{1}{2}$  hours

Full marks : 100

Answer *all* the questions.

Questions are of equal value.

Serial No. **10961**.....

Roll No.:

Signature of the Candidate:

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### INSTRUCTIONS

Candidates should read the following instructions carefully before answering the questions:

1. This booklet consists of 28 pages including this front page, containing 100 questions for each Branch (Civil, Mechanical and Electrical). **Verify the Page Nos. and Test Booklet series on each page and bring at once to the Invigilator's notice any discrepancy.**
2. Answers will have to be given in the OMR Sheet supplied for the purpose.
3. Before you proceed to mark in the OMR Sheet in response to various items in the Test Booklet, you have to fill in some particulars in the OMR Sheet. **Do not fold the OMR Sheet as this will result in error in your marks.**
4. All questions are of multiple-choice answer-type. You will find **four** probable answers (A), (B), (C) and (D) against each question. Find out which of the four answers appears to you to be correct or the best. Now darken the circle corresponding to the letter of the selected answer in the OMR Sheet with **Black Ball Point Pen**.
5. One and only one circle is to be fully blackened for answer. Any spot in any other circle (multiple circle) or in wrong circle will be considered as wrong answer. If more than one circle is encoded for a particular answer, it will be treated as a wrong answer. Use of whitener is strictly prohibited.
6. **There will be negative marking of  $\frac{1}{3}$  mark for each wrong answer.**
7. **There are blank pages at the end of this Booklet for Rough Work.**
8. **The OMR Sheet should be handed over to the Invigilator before leaving the Examination Hall. You are permitted to take away the used Test Booklet after completion of the examination.**

## Group-A

## For all Candidates

1. Split the following sentence into two simple sentences:

He thought that he could win the race.

- (A) He could win the race. He thought so.
- (B) He can win the race. He thought so.
- (C) He could win the race. He thought it.
- (D) He thought it. He could win the race.

2. What is the name of India's first antidote against SARS-CoV-2 virus?

- (A) VINCOV-19
- (B) SARSCOV-19
- (C) BIOVEX-19
- (D) SERUM COV-19

3. Section 99 of the Factories Act, 1948 deals with which of the following options?

- (A) Appeal
- (B) Penalty for permitting double employment of a child
- (C) Display of notice
- (D) Penalty for obstructing inspectors

4. Split the following sentence into two simple sentences:

Having been informed of the trouble, the manager left for the factory.

- (A) The manager was being informed of the trouble. He left for the factory.
- (B) The manager left for the factory. He had been informed of the trouble.
- (C) The manager had been informed of the trouble. He left for the factory.
- (D) The manager has been informed of the trouble. He left for the factory.

5. Which country won the title of "Women's FIH Hockey Junior World Cup 2022"?

- (A) Netherlands
- (B) Australia
- (C) Japan
- (D) China

6. Correct the underlined error choosing the appropriate alternative:

Adversity always presents opportunities for introspect.

- (A) introspective
- (B) introspectively
- (C) introspection
- (D) introspectness

7. The state where has the World 1st WHO Traditional Medicine Centre been inaugurated—

- (A) Kerala
- (B) Maharashtra
- (C) Gujarat
- (D) Uttarakhand

8. Who became first Indian to win silver in Asian Track Championship?

- (A) Abhigyan Singh
- (B) Santosh Deshmukh
- (C) Amant Bhatti
- (D) Ronaldo Singh

9. Correct the underlined error choosing the appropriate alternative:

Here comes someone run.

- (A) ran
- (B) would run
- (C) should run
- (D) running

10. Sputnik Light COVID vaccine has been developed in which country?

- (A) UK
- (B) USA
- (C) France
- (D) Russia

11. Who is the author of the book 'The Legend of Birsa Munda'?

- (A) Meena Nayyar
- (B) Tuhin A. Sinha
- (C) Alok Chakrawal
- (D) Jhumpa Lahiri

12. Section 49 of the Factories Act covers

- (A) Welfare Officers
- (B) Weekly hours
- (C) Canteens
- (D) Emergency Standards

13. Split the following sentence into two simple sentences:

Back in Delhi, she felt at sea.

- (A) She came back to Delhi. She felt at sea.
- (B) She felt at sea. She came back to Delhi.
- (C) She was back in Delhi. She felt at sea.
- (D) She felt at sea. She was back in Delhi.

14. Join the following sentences into a single sentence:

I helped him with money. This proved my love for him.

- (A) I proved my love for him by helping him with money.
- (B) I helped him with money to prove my love for him.
- (C) I helped him with money which proved my love for him.
- (D) I helped him with money that proved my love for him.

15. Join the following sentences into a single sentence:

Asoka was the Emperor of India. He was one of the greatest kings of his time.

- (A) Asoka was the Emperor of India who was one of the greatest kings of his time.
- (B) Asoka, the Emperor of India, was one of the greatest kings of his time.
- (C) Asoka who was one of the greatest kings of his time was the Emperor of India.
- (D) Asoka by virtue of being the Emperor of India was the greatest king of his time.

16. Rewrite the following sentence changing the underlined word as a verb without changing the meaning:

He gave the reward to none.

- (A) He made the reward to none.
- (B) He did not give the reward to anybody.
- (C) He rewarded none.
- (D) He rewarded nobody.

17. Join the following sentences into a single sentence:

He has rented this house. It belongs to his friend.

- (A) This house which is rented belongs to his friend.
- (B) This house is the belonging of his friend which he has rented.
- (C) This house belongs to his friend which he has rented.
- (D) This house which he has rented belongs to his friend.

Please Turn Over

18. Rewrite the following sentence changing the underlined word as a noun without changing the meaning:

He should be more attentive to his studies.

- (A) He should pay more attention to his studies.
- (B) He should never be inattentive to his studies.
- (C) He should care for his studies more attentively.
- (D) He should more attend to his studies.

19. Split the following sentence into two simple sentences:

Kapil, who was the captain of the team, scored a century.

- (A) Kapil scored a century. He was the captain of the team.
- (B) Kapil was the captain of the team. He scored a century.
- (C) Kapil had been the captain of the team. He scored a century.
- (D) Kapil had scored a century. He was the captain of the team.

20. Join the following sentences into a single sentence:

He did not help me. He was angry with me.

- (A) As he did not help me, he was angry with me.
- (B) He did not help me because he was angry with me.
- (C) Because he was angry with me, he did not help me.
- (D) He was angry with me so that he did not help me.

21. Correct the underlined error choosing the appropriate alternative:

The king had it proclaim throughout the kingdom.

- (A) proclamation
- (B) proclaimed
- (C) proclaiming
- (D) proclaims

22. Choose the opposite word of the underlined word:

His was a very secure childhood.

- (A) unsecure
- (B) insecure
- (C) nonsecure
- (D) imsecure

23. Who has been honoured with the "72nd Dadasaheb Phalke Award"?

- (A) Rekha
- (B) Rajnikanth
- (C) Asha Parekh
- (D) Amitabh Bachchan

24. Leave with wages is allowed for employees if they work for \_\_\_\_\_ days in a month.

- (A) 15
- (B) 25
- (C) 20
- (D) 28

25. Choose the opposite word of the underlined word:

I do not recall the exact number of people she fed everyday.

- (A) unexact
- (B) inexact
- (C) disexact
- (D) imexact

26. Which Indian city became first ever tourist and cultural capital as endorsed by the leaders of Shanghai Cooperation Organization?

- (A) Mathura
- (B) Jaipur
- (C) Lucknow
- (D) Varanasi

27. Rewrite the following sentence changing the underlined word as an adjective without changing the meaning:

He was moaning feebly.

- (A) He was moaning with feebleness.
- (B) He was moaning with a feeble manner.
- (C) He was moaning in a feeble manner.
- (D) He was moaning out of a feeble manner.

28. Rewrite the following sentence changing the underlined word as a noun without changing the meaning:

He promised to serve the nation faithfully.

- (A) He promised that he would render service to the nation faithfully.
- (B) He promised that he would be a faithful servant of the nation.
- (C) It was his promise that he would be a faithful servant of the nation.
- (D) He promised serving the nation scrupulously.

29. How many hours in a week can an adult work as per the Factories Act?

- (A) 9 hours
- (B) 56 hours
- (C) 34 hours
- (D) 48 hours

30. Cyclone 'Asani' has been named by which of the following country?

- (A) Thailand
- (B) Bangladesh
- (C) Iran
- (D) Sri Lanka

31. Which one of the following is not welfare provision under Factories Act, 1948?

- (A) Canteen
- (B) Creches
- (C) Alcoholic Beverages
- (D) Drinking water

32. Which Section of the Act covers the topic annual leave with wages?

- (A) Section 27
- (B) Section 5
- (C) Section 86
- (D) Section 79

33. Fitness Certificate granted under "Section 2" of the Factories Act, 1948 is valid for how many months?

- (A) 10 months
- (B) 24 months
- (C) 6 months
- (D) 12 months

34. Section 2(g) under the Act defines

- (A) Factory
- (B) Manufacturing process
- (C) Worker
- (D) Occupants

Please Turn Over

35. Split the following sentence into two simple sentences:

Words of the leader's death had spread through the country like a flame fanned by wind.

- (A) Words spread through the country like a flame fanned by wind. Words of the leader's death had spread.
- (B) Words of the leader's death had spread through the country. Words spread like a flame fanned by wind.
- (C) Words spread through the country like a flame fanned by wind. Words of the leader's death spread through the country.
- (D) Words of the leader's death spread through the country. Words spread like a flame fanned by wind.

36. In which year did the Factories Act, 1948 come into force?

- (A) 23rd September, 1948
- (B) 1st April, 1949
- (C) 4th April, 1949
- (D) 12th September, 1948

37. Correct the underlined error choosing the appropriate alternative:

One must always know the right time to begun everything.

- (A) began
- (B) begin
- (C) begins
- (D) beginning

38. Who is an Adolescent as per the Factories Act, 1948?

- (A) Who has completed 17 years of age
- (B) Who is less than 18 years
- (C) Who has completed 15 years but less than 18 years
- (D) None of the above

39. Choose the opposite word of the underlined word:

His mother's lineage was more distinguished.

- (A) indistinguished
- (B) imdistinguished
- (C) undistinguished
- (D) nondistinguished

40. Who led Indian delegation at World Economic Forum Summit 2022?

- (A) Rama Rao
- (B) Sunil Mittal
- (C) Piyush Goyal
- (D) Nikhat Zareen

**Group-B**  
Civil Engg. Branch

41. Deep beams are designed for  
(A) shear force only  
(B) bending moment only  
(C) both shear force and bending moment  
(D) bearing
42. Net effective cross-sectional area calculated in the steel angle tension member design, accounts for  
(A) the tensile force and bolt holes.  
(B) the eccentricity of the end connections and the bolt holes.  
(C) the effectiveness of the tack connection along the length.  
(D) the effectiveness of the end connection.
43. In ordinary residential and public buildings, the DPC is provided at  
(A) Plinth level  
(B) Ground level  
(C) Roof level  
(D) Lintel level
44. In a sedimentation tank, sedimentation depends on  
(A) Depth of tank  
(B) Surface area of tank  
(C) Both depth and surface area of tank  
(D) None of the above
45. The set of forces, whose resultant is zero, are known as  
(A) equilibrium forces  
(B) collinear forces  
(C) coplanar forces  
(D) concurrent forces
46. In mass concreting, the type of cement which is used is  
(A) Ordinary Portland cement  
(B) Portland Slag cement  
(C) Low Head cement  
(D) Portland Pozzolana cement
47. Bandhara irrigation is  
(A) run-off the river scheme.  
(B) minor scheme.  
(C) unproductive scheme.  
(D) the only efficient scheme.
48. If angular measurements of a traverse are more accurate than the linear measurements, balancing of the traverse is generally done by  
(A) Bowditch's method  
(B) Transit method  
(C) Arbitrary method  
(D) Axis method
49. Before entering a manhole a candle is lowered into the manhole  
(A) to illuminate it.  
(B) to detect toxic gases.  
(C) to give a signal to the adjacent manhole.  
(D) to find out the presence of oxygen.
50. A road connecting one town with another is called  
(A) Highway  
(B) Main road  
(C) Trunk road  
(D) Country road

Please Turn Over

51. Weight of vehicles affect
- (A) Passing sight distance
  - (B) Extra widening
  - (C) Pavement Thickness
  - (D) Width of lanes
52. In a single reinforced beam, if the permissible stress in concrete reaches earlier than that in steel, the beam section is called
- (A) Under-reinforced Section
  - (B) Over-reinforced Section
  - (C) Balanced Section
  - (D) Critical Section
53. The 'surcharge storage' in a dam reservoir is the volume of water stored between
- (A) minimum and maximum reservoir levels.
  - (B) minimum and normal reservoir levels.
  - (C) normal and maximum reservoir levels.
  - (D) None of the above
54. The neutral stress in a soil mass is
- (A) Force per neutral area
  - (B) Force per effective area
  - (C) Stress taken up by the pore water
  - (D) Stress taken up by solid particles
55. Flow at constant rate through a tapering pipe is
- (A) steady and uniform flow.
  - (B) steady and non-uniform flow.
  - (C) unsteady and uniform flow.
  - (D) unsteady and non-uniform flow.
56. The water of a river has an important property called
- (A) Turbidity
  - (B) Self-purification
  - (C) Permeability
  - (D) Infiltration capacity
57. Rainfall hydrograph shows the variation of
- (A) cumulative rainfall with time.
  - (B) rainfall intensity with time.
  - (C) rainfall depth over an area.
  - (D) rainfall intensity with the cumulative rainfall.
58. A wall constructed to retain the earth from slippage on the hill side of a roadway is called
- (A) Breast wall
  - (B) Retaining wall
  - (C) Parapet wall
  - (D) None of the above
59. An Artesian aquifer is the one where
- (A) water surface under the ground is at atmospheric pressure.
  - (B) water is under pressure between two impervious strata.
  - (C) water table serves as upper surface of zone of saturation.
  - (D) None of the above
60. In steel structure design, most economical section for a column is
- (A) Square section
  - (B) Circular section
  - (C) Tubular section
  - (D) Hexagonal section



61. Which of the following is not an excavating equipment?

- (A) Power shovel
- (B) Scraper
- (C) Dragline
- (D) Hoe

62. The time by which the completion of an activity can be delayed without affecting the start of succeeding activities is called

- (A) Total float
- (B) Interfering float
- (C) Independent float
- (D) Free float

63. The traffic conflicts that may occur in rotary intersection are

- (A) Crossing and Merging
- (B) Crossing and Diverging
- (C) Merging and Diverging
- (D) Crossing, Merging and Diverging

64. Lime stabilization is very effective in treating

- (A) Sandy soils
- (B) Silty soils
- (C) Non-plastic soils
- (D) Plastic Clayey soils

65. Which among the following is a temporary dam constructed for facilitating construction works?

- (A) Buttress dam
- (B) Detention dam
- (C) Cofferdam
- (D) Debris dam

66. In hill road, minimum sight distance required is

- (A) Stopping sight distance
- (B) Passing sight distance
- (C) Breaking distance
- (D) None of the above

67. Shear span is defined as the zone where

- (A) Bending moment is zero.
- (B) Shear force is zero.
- (C) Shear force is constant.
- (D) Bending moment is constant.

68. The commonly used lime in white washing is

- (A) Hydraulic Lime
- (B) Fat Lime
- (C) Plain Lime
- (D) None of the above

69. Plaster of Paris is obtained by calcination of

- (A) Gypsum
- (B) Kankar
- (C) Limestone
- (D) Sandstone

70. Natural mineral contaminant in water is

- (A) Calcium
- (B) Fluorine
- (C) Iron
- (D) Sodium

Please Turn Over

71. On the basis of shape the aggregate having the highest workability is

- (A) Rounded
- (B) Angular
- (C) Elongated
- (D) Flaky

72. In laced columns, end tie plates are provided to

- (A) check the buckling of the column.
- (B) keep the column components in position.
- (C) check the distortion of column sections at ends because of unbalanced horizontal force from lacing.
- (D) prevent rotation of elements.

73. Presence of which is not considered dangerous in drinking water?

- (A) Arsenic
- (B) Lead
- (C) Zinc
- (D) Calcium

74. Rate of rise or fall of a road along its alignment is known as

- (A) Gradient
- (B) Camber
- (C) Side slope
- (D) Superelevation

75. A rectangular channel section will be most efficient when

- (A) hydraulic radius is equal to half the depth of flow.
- (B) hydraulic radius is equal to the depth of flow.
- (C) depth of flow is equal to the bottom width.
- (D) depth of flow is equal to half the hydraulic radius.

76. Air permeability test of cement is conducted to find the

- (A) setting time
- (B) specific gravity
- (C) fineness
- (D) soundness

77. A beam is said to be of uniform strength when

- (A) Moment of Inertia is same at every section.
- (B) Deflection is same at all sections of the beam.
- (C) Bending Stress is same at every section.
- (D) Top fibres as well as Bottom fibres experience the same strain.

78. Liquefaction of Foundation soil during an earthquake shall not be the reason for cracking of

- (A) only floors in the building.
- (B) walls and roof in the building.
- (C) beams and columns in the building.
- (D) only balcony in the building.

79. Web crippling generally occurs at the points where

- (A) Bending Moment is maximum.
- (B) Shear force is maximum.
- (C) Concentrated load acts.
- (D) Deflection is maximum.

80. Reynolds number is the ratio of Initial force and

- (A) Viscosity
- (B) Elasticity
- (C) Gravitational force
- (D) Surface tension

81. In a doubly reinforced beam the maximum shear stress occurs at
- (A) along the centroid.
  - (B) along the neutral axis.
  - (C) on planes between neutral axis and the compressive reinforcement.
  - (D) on planes between neutral axis and the tensile reinforcement.
82. In time estimates PERT follows
- (A) Possibility approach
  - (B) Deterministic approach
  - (C) Non-Probabilistic approach
  - (D) Probabilistic approach
83. The property of a material for which a material may be flattened into thin sheets by hammering or rolling is known as
- (A) Malleability
  - (B) Ductility
  - (C) Toughness
  - (D) Resilience
84. In plastic analysis of steel structures, at the location of plastic hinge
- (A) curvature is zero.
  - (B) curvature is infinite.
  - (C) moment is infinite.
  - (D) moment is zero.
85. The best coagulant for removing the colour of water is
- (A) Alum
  - (B) Lime
  - (C) Iron Sulphate
  - (D) Copper Sulphate
86. Centre of pressure on an inclined plane is
- (A) at the centroid.
  - (B) above the centroid.
  - (C) below the centroid.
  - (D) unpredictable.
87. The flow index in soils indicates
- (A) shear strength variation with water content.
  - (B) rate of flow of water through the soil.
  - (C) variation of liquid limit.
  - (D) ratio of the liquid limit to the plastic limit.
88. Two pipe systems in series are said to be equivalent when
- (A) the average diameter in both systems is same.
  - (B) the average friction factor in both the systems is same.
  - (C) the total length of the pipes is the same in both the systems.
  - (D) the discharge under the same head is same in both the systems.
89. A shallow foundation is a foundation that
- (A) has a low bearing capacity.
  - (B) has a depth of embedment less than its width.
  - (C) is resting on the ground surface.
  - (D) causes less settlement.
90. When two plates are placed end to end and are joined by two cover plates, the joints is known as
- (A) Lap joint
  - (B) Butt joint
  - (C) Chain riveted lap joint
  - (D) Double cover butt joint

**Please Turn Over**

91. A document containing detailed description of all the items of work (but their quantities are not mentioned) together with their current rates is called

- (A) Tender
- (B) Schedule of Rates
- (C) Analysis of Rate
- (D) Abstract Estimate

92. Methane is

- (A) odourless.
- (B) heavier than air.
- (C) soluble in water.
- (D) All of the above

93. Cost of a property minus the accumulated depreciation is known as

- (A) Scrap value
- (B) Salvation value
- (C) Junk value
- (D) Book value

94. Aluminium powder in concrete is used as

- (A) Retarder
- (B) Air-entraining agent
- (C) Accelerator
- (D) Super plasticizer

95. In which of the following types of bituminous construction is proportionating of materials determined from laboratory tests?

- (A) Ground Macadam
- (B) Premix Carpet
- (C) Bituminous or Asphaltic Concrete
- (D) Bituminous Macadam

96. The stiffness method in structural analysis is also known as

- (A) Unit Load method
- (B) Consistent deformation method
- (C) Force method
- (D) Displacement method

97. The gaseous pollutants such as hydrocarbons and carbonmonoxides can be effectively controlled by

- (A) Combustion or Incineration
- (B) Gravity settling chambers
- (C) Electrostatic precipitators
- (D) Fabric filters

98. A septic tank is

- (A) Aerobic method of on-site sewage treatment.
- (B) Anaerobic method of on-site sewage treatment.
- (C) Physical method of water treatment.
- (D) Physico-chemical method of water treatment.

99. The vane shear test is used for the in-situ determination of the undrained strength of the intact fully saturated

- (A) Sands
- (B) Clays
- (C) Highly organic soils
- (D) Gravels

100. Shear reinforcement in R.C.C. is provided to resist

- (A) Vertical shear
- (B) Horizontal shear
- (C) Oblique shear
- (D) Diagonal tension

## Group-C

## Mechanical Engineering Branch

41. Lubricating oil used in hydrodynamic bearing has total flow rate of 0.340 l/min and side leakage of 0.1520 l/min. If mass density of oil is 600 kg/m<sup>3</sup> and specific heat is 1.05 kJ/kg °C, what is the rise in temperature if power lost in friction is 0.05 kW?
- (A) 11.23°C  
(B) 15.11°C  
(C) 18.03°C  
(D) 22.23°C
42. The purpose of normalizing steel is to
- (A) remove induced stresses.  
(B) improve machinability.  
(C) soften the steel.  
(D) increase the toughness and reduce brittleness.
43. A completely constrained motion can be transmitted with
- (A) 1 link with pin joint  
(B) 2 link with pin joints  
(C) 3 link with pin joints  
(D) 4 link with pin joints
44. The purpose of gate is to
- (A) feed the casting at a rate consistent with the rate of solidification.  
(B) act as reservoir for molten metal.  
(C) help feed the casting until all solidification takes place.  
(D) feed molten metal from pouring basin to gate.
45. Normalising of steel is done to
- (A) refine the grain structure.  
(B) remove strains caused by cold working.  
(C) remove dislocations caused in the internal structure due to hot working.  
(D) All of the above
46. The thermodynamic difference between a Rankine cycle working with saturated steam and the Carnot cycle is that
- (A) Carnot cycle can't work with saturated steam  
(B) Heat is supplied to water at temperature below the maximum temperature of the cycle  
(C) A Rankine cycle receives heat at two places  
(D) Rankine cycle is hypothetical
47. A feed gear box for a screw cutting lathe is designed on the basis of
- (A) geometric progression  
(B) arithmetic progression  
(C) harmonic progression  
(D) None of the above
48. Which of the following elements of electrical engineering cannot be analyzed using Ohm's law?
- (A) Capacitors  
(B) Inductors  
(C) Transistors  
(D) Resistance
49. For machining a cast iron workpiece by a high speed steel tool, the average cutting speed is
- (A) 10 m/min  
(B) 15 m/min  
(C) 22 m/min  
(D) 30 m/min
50. Fuel oil consumption guarantees for I. C. engine are usually based on
- (A) low heat value of oil  
(B) high heat value of oil  
(C) net calorific value of oil  
(D) calorific value of fuel

Please Turn Over

51. Octane number is determined by comparing the performance of the petrol with the following hydrocarbons

- (A) Iso-octane
- (B) Alpha methyl naphthalene
- (C) mixture of normal hepten and iso-octane
- (D) mixture of paraffins and aromatics

52. Which belt conveyor prevents sliding down of material at an inclination of  $55^\circ$  with horizontal?

- (A) Flat belt conveyor
- (B) Troughed belt conveyor
- (C) Blanket belt conveyor
- (D) Woven wire belt conveyor

53. The cutting tool removes the metal from workpiece in the form of

- (A) solid blocks
- (B) powder
- (C) chips
- (D) all of the above

54. Which of the following impurity in cast iron makes it hard and brittle?

- (A) Silicon
- (B) Sulphur
- (C) Manganese
- (D) Phosphorus

55. Which among the following provides the third principle in fluid mechanics?

- (A) Conservation of heat
- (B) Conservation of volume
- (C) Conservation of linear momentum
- (D) Conservation of mass

56. A drill bit of 20 mm diameter rotating at 500 rpm with a feed rate of 0.2 mm/revolution is used to drill a through hole in a mild steel plate 20 mm thickness. The depth of cut in this drilling operation is

- (A) 0.2 mm
- (B) 10 mm
- (C) 20 mm
- (D) 100 mm

57. The forces required for metal cutting operation

- (A) increase with increase in the feed of the tool and decreases with increase in the depth of cut.
- (B) decrease with increase in the feed of the tool and increases with increase in the depth of cut.
- (C) increase with increase in both the feed of the tool and the depth of cut.
- (D) decrease with increase the depth of cut in both the feed of the tool and the depth of cut.

58. Scavenging air in diesel engine means

- (A) air used for combustion sent under pressure.
- (B) forced air for cooling cylinder.
- (C) burnt air containing products of combustion.
- (D) air used for forcing burnt gases out of engine's cylinder during the exhaust period.

59. Lead angle in the single point cutting tool is the angle between

- (A) the end cutting edge and the normal to the tool shank.
- (B) the portion of side shank immediately below the side cutting edge and the line perpendicular to the base of the tool.
- (C) the tool face and the parallel to the base of the tool.
- (D) side cutting edge and the side of the tool shank.

60. A shaft of 50 mm has to be rough turned to diameter 42 mm in one pass. When will you check to ensure the set depth of cut is correct?
- After the tool travelled the full length
  - After the tool travelled half way
  - Just after the cut is taken at the tailstock end
  - After the tool has travelled a distance more than the angular shoulder
61. If the intake air temperature of I. C. engine increases, its efficiency will
- increase
  - decrease
  - remain same
  - unpredictable
62. Corioli's component is encountered in
- quick return mechanism of shaper
  - four bar chain mechanism
  - slider crank mechanism
  - (A) and (C) above
63. If the compression ratio of an engine working on Otto cycle is increased from 5 to 7, the % increase in efficiency will be
- 2%
  - 4%
  - 8%
  - 14%
64. Which of the following according to fundamentals of electrical energy is correct about alternating current?
- Frequency is zero
  - Magnitude changes with time
  - Can be transported to larger distances with less loss in power
  - Flows in both directions
65. Which fixtures are used for machining parts which must have machined details evenly spaced?
- Profile fixtures
  - Duplex fixtures
  - Indexing fixtures
  - Tapping Fixtures
66. A solid sphere rolls down two different inclined planes of the same heights but different angles of inclination. In each case, the ball will reach the bottom
- with the same speed.
  - with different speed.
  - with different speed but same time.
  - immediately.
67. The gas turbine cycle with regenerator improves
- thermal efficiency
  - work ratio
  - avoids pollution
  - thermal effectiveness
68. For a machine to be self-locking, its efficiency should be \_\_\_\_\_.
- 100%
  - less than 67%
  - less than 50%
  - more than 50%
69. A V-belt pulley has belt velocity 20 m/s and mass 0.7 kg per meter. If allowable tension in the belt is 600 N then what will be the power transmitting capacity of belt? (Assume  $\mu = 0.5$  &  $\theta = 2.5$  rad)
- 3.75 kW
  - 3.2 kW
  - 4.5 kW
  - 5.23 kW
70. In lathe, the carriage and tail stock are guided on
- same guideways
  - different guideways
  - any of the above
  - not guided on guideways

Please Turn Over

71. When coal is first dried and then crushed to a fine powder by pulverizing machine, the resulting fuel is called

- (A) wood charcoal
- (B) bituminous coal
- (C) briquetted coal
- (D) None of the above

72. H.S.S. is tempered at

- (A) 220°C to 230°C
- (B) 230°C to 270°C
- (C) 280°C to 400°C
- (D) 550°C to 600°C

73. Half nut is connected with

- (A) milling machine
- (B) locking device
- (C) jigs and fixture
- (D) thread cutting on lathe

74. The maximum temperature in the I. C. engine cylinder is of the order of

- (A) 500-1000°C
- (B) 1000-1500°C
- (C) 1500-2000°C
- (D) 2000-2500°C

75. Which of the following is a formula for the friction factor of circular pipes?

- (A)  $\frac{Re}{64}$
- (B)  $\frac{16}{Re}$
- (C)  $\frac{64}{Re}$
- (D)  $\frac{Re}{16}$

76. The value of specific heat at constant pressure ( $C_p$ ) is \_\_\_\_\_ that of at constant volume ( $C_v$ ).

- (A) less than
- (B) equal to
- (C) more than
- (D) None of the above

77. When cut-off ratio is \_\_\_\_\_ the efficiency of diesel cycle approaches to otto cycle efficiency.

- (A) zero
- (B)  $\frac{1}{5}$
- (C)  $\frac{4}{5}$
- (D) 1

78. A coarse grained steel

- (A) is less tough and has a greater tendency to distort during heat treatment.
- (B) is more ductile and has a less tendency to distort during heat treatment.
- (C) is less tough and has a less tendency to distort during heat treatment.
- (D) is more ductile and has a greater tendency to distort during heat treatment.

79. In reaction turbine, function of the draft tube is

- (A) to increase the flow rate.
- (B) to reduce water hammer effect.
- (C) to convert kinetic energy of water to potential energy by a gradual expansion in divergent part.
- (D) None of the above

80. Liquid compressed in a cylinder has a volume of 0.04 m<sup>3</sup> at 50 N/cm<sup>2</sup> and a volume of 0.039 m<sup>3</sup> at 150 N/cm<sup>2</sup>. The bulk modulus of elasticity of liquid is

- (A) 400N/cm<sup>2</sup>
- (B) 4000N/cm<sup>2</sup>
- (C) 40000 N/m<sup>2</sup>
- (D) 40N/cm<sup>2</sup>



81. Which of the following is not a hoisting equipment with lifting gear?
- Cage elevators
  - Jib cranes
  - Pulleys
  - Troughed belts
82. Oldham's coupling is the
- second inversion of double slider crank chain.
  - third inversion of double slider crank chain.
  - second inversion of single slider crank chain.
  - third inversion of single slider crank chain.
83. Which of the following process can be made reversible with the help of a regenerator?
- Constant pressure process
  - Constant volume process
  - Constant  $pV^n$  process
  - All of the above
84. The gravitational force between two objects is  $F$ . If masses of both the objects are halved without altering the distance between them, then the gravitational force would become
- $\frac{f}{4}$
  - $\frac{f}{2}$
  - $f$
  - $2f$
85. Sheradising is
- zinc diffusion process.
  - an oxidising process used for aluminium and magnesium articles.
  - a process used for making thin phosphate coating on steel to act as a base or primer for enamels and paints.
  - the process of coating of zinc by hot dipping.
86. All perfect gases change in volume by  $\frac{1}{273}$ rd of its original volume at  $0^\circ\text{C}$  for every  $1^\circ\text{C}$  change in temperature, when the pressure remains constant. This statement is called
- Boyle's law
  - Charles'law
  - Gay-Lussac law
  - Joule's law
87. Where does electro-static shielding occur in a charged spherical shell?
- When electrical potential outside spherical shell is zero.
  - When electrical potential inside the spherical shell is zero.
  - When electrical field outside the spherical shell.
  - When Electrical field inside the spherical shell.
88. If the surface of the liquid is convex, the
- cohesion pressure is negligible.
  - cohesion pressure is decreased.
  - cohesion pressure is increased.
  - cohesion pressure is initially increased after that decreased.
89. Dielectric is used in
- Electrochemical machining
  - Ultrasonic machining
  - Electro discharge machining
  - Laser machining
90. The distance between two bodies becomes 6 times more than the usual distance. Then the  $F$  becomes
- 36 times
  - 6 times
  - 12 times
  - $\frac{1}{36}$  times

Please Turn Over

91. When the fluid is called laminar?  
(A) Low viscosity  
(B) The density of the fluid is high  
(C) Reynolds number is greater than 2000  
(D) Reynolds number is less than 2000
92. Two particles A and B, initially at rest, move towards each other under mutual force of attraction. At the instant when the speed of A is  $v$  and the speed of B is  $2v$ , what is the speed of mass of the system?  
(A)  $3v$   
(B)  $v$   
(C) Zero  
(D)  $1.5v$
93. Which among the following is referred to as the temperature at a stagnation point in the flow of fluids in fluid mechanics and thermodynamics.  
(A) Absolute temperature  
(B) Maximum temperature  
(C) Stagnation temperature  
(D) Hydraulic temperature
94. The efficiency of diesel cycle depends upon  
(A) temperature limits  
(B) pressure ratio  
(C) compression ratio  
(D) cut-off ratio and compression ratio
95. The specific fuel consumption per BHP hour for diesel engine is approximately  
(A) 0.15 kg  
(B) 0.2 kg  
(C) 0.25 kg  
(D) 0.3 kg
96. In centreless grinding, the surface speed of regulating wheel is  
(A) 5 to 15 m/min  
(B) 15 to 60 m/min  
(C) 60 to 90 m/min  
(D) 90 to 120 m/min
97. The workpiece motion and tool motion respectively in vertical boring machine are  
(A) stationary and rotational  
(B) rotational and translational  
(C) translational and rotational  
(D) stationary and rotational with translation
98. Hemming is the operation of  
(A) in which the edges of sheet are turned over to provide stiffness and a smooth edge.  
(B) of producing contours in sheet metal and of bending previously roll formed sections.  
(C) in which a series of impact blows are transferred on dies so that solid or tubular work changes in cross-section or geometric shape.  
(D) employed to expand a tubular or cylindrical part.
99. Amorphous material is one  
(A) In which atoms align themselves in a geometric pattern upon solidification.  
(B) In which there is no definite atomic structure and atoms exist in a random pattern just as in a liquid.  
(C) Which is not attacked by phosphorus.  
(D) Which emits fumes on melting.
100. A journal of 120 mm diameter rotates in a bearing at a speed of 1000 rpm. What is the power lost during friction if 8 kN radial load acts on the journal and coefficient of friction is  $2.525 \times 10^{-3}$ ?  
(A) 0.126 kW  
(B) 0.253 kW  
(C) 2.365 kW  
(D) 7.615 kW

## Group-D

## Electrical Engineering Branch

41. Consider the differential equation  $\frac{dy}{dt} + ay = e^{-bt}$  with the initial condition  $y(0) = 0$ , then the Laplace transform  $Y(s)$  of the solution  $y(t)$  is

- (A)  $\frac{1}{(s+a)(s+b)}$   
 (B)  $\frac{1}{b(s+a)}$   
 (C)  $\frac{1}{a(s+b)}$   
 (D)  $\frac{e^{-a} - e^{-b}}{b-a}$

42. Find  $n$  for the following data if  $f(1.8)$  is asked:

X	0	0.5	1	1.5	2
$f(X)$	0.3989	0.3521	0.2420	0.1295	0.0540

- (A) 2.4  
 (B) 3.4  
 (C) 2.6  
 (D) 3.6

43. Which of the following band is just above the intrinsic Fermi level for n-type semiconductor?

- (A) Valence band  
 (B) Donor band  
 (C) Acceptor band  
 (D) Conduction band

44. In a split-phase motor

- (A) both windings have equal  $\frac{X}{R}$  ratio.  
 (B) the starting winding has less  $\frac{X}{R}$  ratio than running winding.  
 (C) the starting winding has more  $\frac{X}{R}$  ratio than main winding.  
 (D) both windings have only resistance and no reactance.

45. A body of moment of inertia  $160 \text{ kg-m}^2$  is rotating with an angular velocity of  $5 \text{ rad./sec}$ . The angular momentum of the body is

- (A)  $800 \text{ kg-m}^2/\text{sec}$ .  
 (B)  $600 \text{ kg-m}^2/\text{sec}$ .  
 (C)  $200 \text{ kg-m}^2/\text{sec}$ .  
 (D)  $32 \text{ kg-m}^2/\text{sec}$ .

46. The value of  $\int \log x \, dx$  is

- (A)  $x - \log x$   
 (B)  $x \log x - 1$   
 (C)  $x \log x - x$   
 (D)  $1 - x \log x$

47. Lightning arrestors are used in power systems to protect electrical equipments against

- (A) direct strokes of lightning  
 (B) over-voltages due to indirect lightning stroke  
 (C) power-frequency over-voltages  
 (D) over-currents due to lightning

48. A car travels on a horizontal circular track of radius  $9 \text{ m}$ , starting from rest at a constant tangential acceleration of  $3 \text{ m/s}^2$ . What is the resultant acceleration of the car,  $2 \text{ sec}$ . after starting?

- (A)  $7 \text{ m/sec}^2$   
 (B)  $3 \text{ m/sec}^2$   
 (C)  $5 \text{ m/sec}^2$   
 (D)  $4 \text{ m/sec}^2$

49. A 3-phase, alternator has 4-pole, 48 slots and runs at  $1500 \text{ rpm}$ . Its coils are short-pitched (or short-chorded) by one-sixth of the pole-pitch. The coil span factor and breadth factor are

- (A) 0.966 and 0.9577  
 (B) 0.896 and 0.900  
 (C) 0.927 and 0.896  
 (D) 0.866 and 0.896

Please Turn Over

50. A lamp takes 10 amp. at 250V and emits 16000 lumens. Its Mean Spherical Candle Power (MSCP) is

- (A) 8000  $\Pi$   
 (B) 2000  $\Pi$   
 (C) 4000  $\Pi$   
 (D)  $\frac{4000}{\Pi}$

51. Which one among the following bulbs consumes less power for light of same intensity?

- (A) Incandescent bulb  
 (B) CFL tube bulb  
 (C) Light Emitting Diode (LED) bulb  
 (D) Fluorescent tube bulb

52. In a three phase balanced star-connection with RYB phase sequence, if phase voltage  $V_R = 400\angle 0^\circ$ , then the value of  $V_B$  is

- (A)  $400\angle -120^\circ$   
 (B)  $400\angle 120^\circ$   
 (C)  $400\angle -240^\circ$   
 (D) Either (B) or (C)

53. The energy density of a magnetic field  $H$  is

- (A)  $\frac{\mu H^2}{2}$   
 (B)  $\frac{\mu\sqrt{H}}{2}$   
 (C)  $\frac{\mu}{H}$   
 (D)  $\mu H$

54. The unit of moment of inertia of an area is

- (A) kg/m  
 (B)  $m^4$   
 (C)  $kg/m^2$   
 (D)  $m^3$

55. The unit of stress is

- (A)  $Kg\ m^{-2}$   
 (B)  $N\ Kg^{-1}$   
 (C)  $N\ m^{-2}$   
 (D) N

56. An equipment has a per unit impedance of 0.9 pu to a base of 20MVA, 33kV. The pu impedance to the base of 50MVA and 11 kV will be

- (A) 4.7  
 (B) 0.9  
 (C) 10.5  
 (D) 20.25

57. The force  $F$  experienced by a small test charge  $q$  placed in static electric field of intensity  $E$  is given by the expression.

- (A)  $F = \frac{E}{q}$   
 (B)  $F = E^2/q^2$   
 (C)  $F = Eq^2$   
 (D)  $F = Eq$

58. The applied input a.c. power to a half-wave rectifier is 100 watts. The d.c. output power obtained is 40 watts. The rectification efficiency is

- (A) 40%  
 (B) 50%  
 (C) 60%  
 (D) 20%

59. A solenoid of 20 cm long and 1 cm diameter has 100 turns winding. If this is placed in uniform magnetic field of strength 2 wb/m<sup>2</sup> and current of 10 amp. Calculate the maximum torque of the solenoid:

- (A) 0.5 Nm  
 (B) 4.0 Nm  
 (C) 2.0 Nm  
 (D) 6.0 Nm

60. For the protection of stator winding of an alternator against internal fault involving ground, the relay used is a

- (A) biased differential relay  
 (B) directional over-current relay  
 (C) plain impedance relay  
 (D) buchholz relay

61. A person suffering from myopia can see upto 3 mt. The power of lens required to rectify is

- (A)  $-1.75$  dioptre
- (B)  $-4.00$  dioptre
- (C)  $-0.33$  dioptre
- (D)  $-3.33$  dioptre

62. What is the forbidden gap voltage for silicon material?

- (A) 1.46 Volt
- (B) 1.56 Volt
- (C) 10.00 Volt
- (D) 1.21 Volt

63. For the circuit shown in Fig.-1, voltage drop across series resistance is

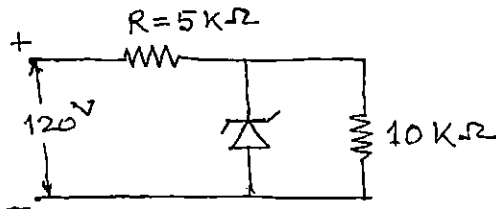


Fig.-1

- (A) 50V
- (B) 60V
- (C) 70V
- (D) 40V

64.  $\vec{a} = 2\vec{i} - 3\vec{j} - \vec{k}$ ,  $\vec{b} = -\vec{i} + \vec{k}$ ,  $\vec{c} = 2\vec{j} - \vec{k}$ , then the area of parallelogram, whose diagonals are  $(\vec{a} + \vec{b})$  and  $(\vec{b} + \vec{c})$  is —

- (A) 1 sq. unit
- (B) 2 sq. unit
- (C)  $\frac{1}{2}$  sq. unit
- (D)  $\frac{1}{4}$  sq. unit

65. The total voltage across three resistors in series is 24 volts. If one of the resistors becomes open, the voltage across it would become

- (A) 24 volts
- (B) 8 volts
- (C) 16 volts
- (D) 0 volt

66. The relay used for feeder protection is

- (A) under voltage relay
- (B) translay relay
- (C) thermal relay
- (D) Buchholz relay

67. The value of 'c' in Rolle's Theorem for the function  $f(x) = \cos \frac{x}{2}$  on  $[\pi, 3\pi]$  will be

- (A) 0
- (B)  $2\pi$
- (C)  $\frac{\pi}{2}$
- (D)  $\frac{3\pi}{2}$

68. The mobility of holes is \_\_\_\_\_ mobility of electrons in intrinsic semiconductors.

- (A) less than
- (B) greater than
- (C) twice
- (D) equal

69. Select the correct option:

*Statement-I* : Protons are the subatomic particles of an atom with a negative charge.

*Statement-II* : The nucleus of an atom is filled with tightly packed protons and neutrons.

- (A) *Statement I* and *II* are true
- (B) *Statement I* and *II* are false
- (C) *Statement I* – true, *II* – false
- (D) *Statement I* – false, *II* – true

70. When a 100 kVA, single-phase transformer was tested, the following results were obtained:

On open circuit the power consumed was 1300 W and on short circuit at full-load current the power consumed was 1200 W. The efficiency of transformer on full-load and half-load when working at unity power factor are

- (A) 0.9756 pu and 0.969 pu
- (B) 0.8756 pu and 0.869 pu
- (C) 0.8956 pu and 0.969 pu
- (D) 0.969 pu and 0.9750 pu

Please Turn Over

71. The value of  $\int_a^b \sqrt{a^2 - x^2} dx$  is
- (A)  $\pi a^2$   
 (B)  $\frac{1}{4}\pi a^2$   
 (C)  $\frac{1}{4}\pi a$   
 (D)  $\pi a$
72. Which statement is used to branch to a specific line of code in FORTRAN?
- (A) SKIP  
 (B) BRANCH  
 (C) JUMP  
 (D) GOTO
73. Efficiency of a transformer for a given power factor is maximum when
- (A) variable copper loss =  $\frac{1}{4}$  constant iron loss.  
 (B)  $\frac{1}{4}$  variable copper loss = constant iron loss.  
 (C) variable copper loss =  $\frac{1}{2}$  constant iron loss.  
 (D) variable copper loss = constant iron loss.
74. Which type of transformers is used in A.C. welding?
- (A) Equal turns ratio type  
 (B) Step down type  
 (C) Ferrite core type  
 (D) Step up type
75. When a rope is pulled on either side. What is the stress acting on it?
- (A) Compressive stress  
 (B) Tensile stress  
 (C) Normal stress  
 (D) Tangential stress
76. Solution of  $\cos x \frac{dy}{dx} + y \sin x = 1$  is
- (A)  $y \sec x = \tan x + c$   
 (B)  $y = \tan x + c$   
 (C)  $y \tan x = \sec x + c$   
 (D)  $y = \sec x + c$
- where,  $c$  is the constant of integration.
77.  $y = e^{ax}$   
 If  $n$  is positive integer  
 then,  $D^n (e^{ax})$  will be
- (A)  $e^{ax}$   
 (B)  $e^{nax}$   
 (C)  $ae^{nax}$   
 (D)  $a^n e^{ax}$
78. What is the moment of inertia of a rod, of mass 1 kg and length 6 mt., about an axis perpendicular to rod's length and at a distance of 1.5 m from one end?
- (A) 0.75  $\text{kgm}^2$   
 (B) 14.25  $\text{kgm}^2$   
 (C) 3.00  $\text{kgm}^2$   
 (D) 5.25  $\text{kgm}^2$
79. A three phase 33 kV, oil-circuit breaker is rated 1500 A, 2000 MVA, 2 Sec. The symmetrical breaking current for this breaker would be
- (A) 40 kA  
 (B) 25 kA  
 (C) 35 kA  
 (D) 50 kA
80. For a beam of length ' $L$ ' fixed at ends  $A$  and  $B$ , the maximum bending moment for uniformly distributed, load ' $W$ ' per unit length will be
- (A)  $\frac{WL^2}{12}$   
 (B)  $\frac{WL^2}{4}$   
 (C)  $\frac{WL^2}{8}$   
 (D)  $\frac{WL^2}{24}$

81. The efficiency in case of maximum power theorem is

- (A) 100%
- (B) 50% – 100%
- (C) Less than 50%
- (D) 50%

82. The blue colour of the sky is due to

- (A) scattering of light
- (B) reflection of light
- (C) refraction of light
- (D) partial reflection of light

83. The value of  $\int \frac{dx}{x\sqrt{(x^2 - a^2)}}$  is

- (A)  $a \sec^{-1}(x/a)$
- (B)  $a \sec^{-1}(a/x)$
- (C)  $(1/a) \sec^{-1}(x/a)$
- (D)  $(1/a) \sec^{-1}(a/x)$

where,  $\int$  indicates integration.

84. Centrifugal pump acts as a reverse of

- (A) inward radial flow reaction turbine.
- (B) outward radial flow reaction turbine.
- (C) Pelton turbine.
- (D) Axial flow turbine.

85. A three phase, 50-Hz, induction motor has a full-load speed of 950 r.p.m. Its slip will be

- (A) 50 Hz
- (B) 50 r.p.m.
- (C) 2.5 Hz
- (D) 5.0 Hz

86. If  $x$  is expressed in radian, then the value of

$$\lim_{x \rightarrow 0} \frac{\sin x}{x}$$

- (A) Less than 1
- (B) 0
- (C) 1
- (D) Greater than 1

87. A 30 gm bullet leaves a rifle with a velocity of 300 m/sec. and the rifle recoils with a velocity of 0.6 m/sec. The mass of the rifle is

- (A) 15 kg
- (B) 1.5 kg
- (C) 3 kg
- (D) 30 kg

88. Electromagnetic field theory deals directly with

- (A) Electric field vector  $E$
- (B) Magnetic field vector  $H$
- (C) Both (A) and (B)
- (D) Voltage  $V$  and current  $I$  vectors

89. The relation between fusing current ( $I$ ) and diameter ( $d$ ) of fuse wire is

- (A)  $I \propto d$
- (B)  $I \propto \frac{1}{d}$
- (C)  $I \propto d^{\frac{3}{2}}$
- (D)  $I \propto d^{\frac{1}{2}}$

90. Solve the equations using Gauss-Jordan method

$$x + 2y + 6z = 22$$

$$3x + 4y + z = 52$$

$$6x - y - z = 38$$

and the solution is

- (A)  $x = 8, y = 4, z = 6$
- (B)  $x = 8, y = 6, z = 4$
- (C)  $x = 4, y = 8, z = 6$
- (D)  $x = 8, y = 6, z = 2$

91. Consider a simple gear train consisting of three gear wheels with 15, 10 and 30 teeth respectively. The velocity ratio of third wheel to first wheel would be

- (A)  $\frac{1}{2}$  and same direction
- (B)  $\frac{1}{2}$  and opposite direction
- (C) 2 and same direction
- (D) 2 and opposite direction

Please Turn Over

92. Consider the following:

- (i) Surface Tension
- (ii) Stress
- (iii) Viscosity
- (iv) Strain

Which one of the following affects the efficiency of oil transportation through pipeline?

- (A) (i) and (iv) only
- (B) (ii) and (iii) only
- (C) (i), (ii), (iii) and (iv)
- (D) (iii) only

93. An engine drives the line shaft through a belt of thickness  $t$ . If  $d_1$  and  $d_2$  are the diameter of the follower and driver respectively, the velocity ratio is

- (A)  $d_1/d_2$
- (B)  $\frac{d_1 - t}{d_2 - t}$
- (C)  $\frac{d_2 + t}{d_1 + t}$
- (D)  $\frac{d_1 + t}{d_2 + t}$

94. If  $u = e^{xyz}$ , then  $\frac{\partial^3 u}{\partial x \partial y \partial z}$  at (1, 1, 1) is

- (A)  $2e$
- (B)  $3e$
- (C)  $4e$
- (D)  $5e$

95. In a FET, the change in gate voltage of 0.1 volt causes a change in drain current of 0.3 mA, then trans conductance of the FET is

- (A) 1000  $\mu$  mhos
- (B) 2000  $\mu$  mhos
- (C) 4000  $\mu$  mhos
- (D) 3000  $\mu$  mhos

96. A 3-phase  $\frac{11}{66}$  kV delta/star transformer, protected by Merz-price scheme has CT ratio of  $\frac{400}{5}$  on lt side. Ratio of CT on ht side will be equal to

- (A) 1 : 23
- (B) 23 :  $\sqrt{3}$
- (C) 23 : 1
- (D)  $\sqrt{3}$  : 23

97. Voltage stress is maximum in a cable at the surface of the

- (A) Sheath
- (B) Conductor
- (C) Insulator
- (D) None of the above

98. The emf induced in the armature of a dc motor is

- (A) equal to the supply voltage
- (B) more than the supply voltage
- (C) less than the supply voltage
- (D) less than 220 volts

99. Neuton's universal law of gravitation applies to

- (A) both small and big bodies.
- (B) only valid for solar system.
- (C) small bodies only.
- (D) planets only.

100. If the temperature changes,  $h$  parameters of a transistor

- (A) may or may not change.
- (B) do not change.
- (C) also change.
- (D) None of the above