COMBINED TECHNICAL SERVICES EXAMINATION

(DIPLOMA / ITI LEVEL)

COMPUTER BASED TEST

DATE OF EXAM: 12.11.2024 AN

PAPER – II – AUTOMOBILE AND MECHANICAL ENGINEERING

(DIPLOMA STANDARD) (CODE: 310)

1. The only way to check the width of the splines in a clutch plate hub is by using

(A) Micro meters
(B) Go and No Go gauges
(C) Vernier Calliper
(D) Slip gauges
(E) Answer not known

2. The type of rear axle on trucks is

(A) Semi-floating
(B) Fully-floating
(C) Three-quarter floating
(D) Non-floating
(E) Answer not known

3. The clutch plate in clutch assembly is splined to the

(A) Pressure plate
(B) Flywheel plate
(C) Gearbox input shaft
(D) Crank shaft
(E) Answer not known

4. ———— enable the power transmission at varied lengths of the propeller shaft.

(A) Clutch
(B) Gearbox
(C) Universal joint
(D) Slip joint
(E) Answer not known

5. ———— connects and disconnects the engine with the rest of the power train.

(A) Crankshaft
(B) Clutch
(C) Universal joint
(D) Final drive
(E) Answer not known

6. The purpose of tyre chords is to

(A) increase tread life
(B) decrease noise level
(C) provide soft ride
(D) increase traction
(E) Answer not known

7. The angle between the wheel inclination and the path taken by the wheel is known as

(A) Slip angle
(B) Caster
(C) Camber
(D) King pin inclination
(E) Answer not known

8. In order to permit the front wheel to swing to one side or the other for steering, each wheel is supported on a

(A) Spindle
(B) Knuckle
(C) Bearing
(D) Frame
(E) Answer not known

9. The whole mechanism of the Ackermann steering gear is on the ———— of the front wheels in Davis steering gear it is in the ———— of the front wheels.

(A) back, back
(B) back, front
(C) front, back
(D) front, front
(E) Answer not known

10. The function of the steering system is to convert the rotary movement of the steering wheel into

(A) Angular turns of the front wheels
(B) Reciprocating motion of the front axle
(C) Rotary motion of the front wheels
(D) Angular turn of the front axle
(E) Answer not known

11. The keyboard shortcut to create chart in Excel

(A) F8 key
(B) F9 key
(C) F10 key
(D) F11 key
(E) Answer not known

12. To add a new slide to the presentation which of the following step is used?

(A) Insert → Add slide
(B) Insert → New slide
(C) File → New slide
(D) File → Add slide
(E) Answer not known

13. If you want to communicate your information and ideas via an on-screen slide show, which program would you choose?

(A) Microsoft Word
(B) Microsoft Powerpoint
(C) Microsoft Excel
(D) Microsoft Access
(E) Answer not known

14. 'Stylus' is the name of a

(A) Reader
(B) Digital pen
(C) Scanner
(D) Touch pad
(E) Answer not known

15. Each symbol in a flowchart represents

(A) a program
(B) an execution
(C) a specific function
(D) a specific condition
(E) Answer not known

16. The first personal computer was introduced by

(A) Intel
(B) Microsoft
(C) IBM
(D) Apple
(E) Answer not known

17. The logic gate that gives an output that is opposite of its input is

(A) AND
(B) OR
(C) NOT
(D) NAND
(E) Answer not known

18. Super computer speed is measured in

(A) Megabytes
(B) Gigabytes
(C) Peta flops
(D) Giga hertz
(E) Answer not known

19. The component of a computer which co-ordinates and supervises the operations is

(A) Input unit
(B) Memory unit
(C) Central processing unit
(D) Output unit
(E) Answer not known

20. In flowchart, processing operation is indicated by the symbol

(A) Circle
(B) Rectangle
(C) Square
(D) Arrows
(E) Answer not known

21. The speed of a DC motor is

(A) inversely proportional to back emf
(B) directly proportional to the back emf and inversely proportional to the field flux
(C) directly proportional to the field flux and inversely proportional to the back emf
(D) directly proportional to field flux
(E) Answer not known

22. The primary purpose of DC motor starter is

(A) To increase the speed of motor
(B) To reduce the starting current
(C) To provide electrical isolation
(D) To control the direction of rotation
(E) Answer not known

23. A BJT (Bipolar Junction Transistor) has consists of ——— PN junction.

(A) One
(B) Two
(C) Three
(D) Four
(E) Answer not known

24. A transistor has three terminals, such as

(A) Anode, cathode, gate
(B) Source, gate, drain
(C) Emitter, base, collector
(D) Collector, base, gate
(E) Answer not known

25. The number of diodes used in bridge rectifier circuit is

(A) One
(B) Two
(C) Three
(D) Four
(E) Answer not known

26. The expression for total equivalent capacitance (C_{eq}) when the capacitance of C_1, C_2, C_3 are connected in parallel is

(A) $C_{eq} = C_1 / (C_2 + C_3)$
(B) $C_{eq} = C_1 + C_2 + C_3$
(C) $C_{eq} = C_2 / (C_1 + C_3)$
(D) $C_{eq} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$
(E) Answer not known

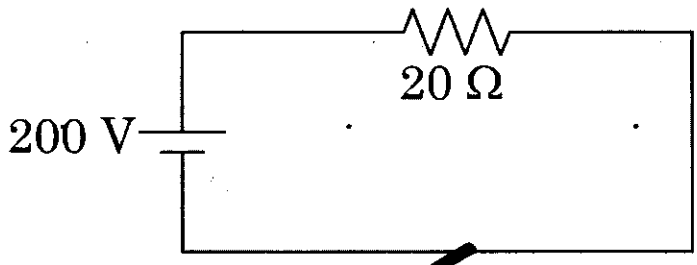
27. The dc series motors are used where

(A) High speed is required
(B) Low speed is required
(C) High torque is required
(D) Low torque is required
(E) Answer not known

28. In Dc circuit, what is the relationship between voltage (v), current (I), and resistance (R) as per ohm's law

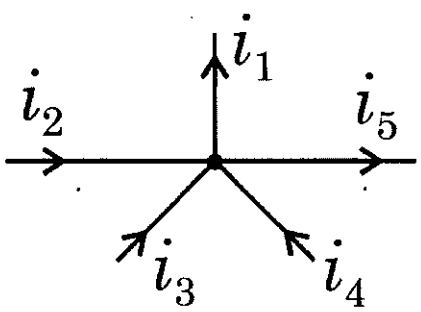
(A) V = IR
(B) V = I/R
(C) V = R/I
(D) V = I + R
(E) Answer not known

29. The power in the 20 ohm resistance is



(A) 2000 kW
(B) 2 kW
(C) 200 kW
(D) 2 W
(E) Answer not known

30. Relation between currents according to KCL law is



(A) $i_1 = i_2 = i_3 = i_4 = i_5$
(B) $i_1 + i_4 + i_3 = i_5 + i_2$
(C) $i_1 - i_5 = i_3 - i_4$
(D) $i_1 + i_5 = i_2 + i_3 + i_4$
(E) Answer not known

31. For the highest dimensional accuracy and surface finish, gear teeth may subsequently be

(A) Honed, ground and lapped
(B) Burnished, lapped and ground
(C) Ground, honed and lapped
(D) Lapped, ground and burnished
(E) Answer not known

32. In powder metallurgy for producing metal powder in which method the molten metal is converted into small particles by rapidly stirring the metal while it is cooling.

(A) Granulation
(B) Shotting
(C) Condensation of metal powder
(D) Reduction
(E) Answer not known

33. Choose the correct milling operation for good surface finish

(A) Conventional milling
(B) Up milling
(C) Plain milling
(D) Climb milling
(E) Answer not known

34. In order to maintain uniform cutting speed during turning operation in a lathe

(A) Spindle speed should be increased with increase in diameter of work

(B) Spindle speed should be reduced with increase in diameter of work

(C) Spindle speed should be uniform for all diameters of work

(D) Spindle speed should be reduced with decrease in diameter of work

(E) Answer not known

35. Assertion [A] : Small lip relief angle increases wear of the twist drill.

Reason [R] : Chisel edge region of a twist drill accounts for half of the thrust force in drilling.

(A) [A] is true but [R] is false

(B) Both [A] and [R] are true; and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] and [R] are true; but [R] is not the correct explanation of [A]

(E) Answer not known

36. Reason and Assertion type:

Assertion [A] : After the welding operation, the residual flux are removed from the metal surface.

Reason [R] : The presence of residual flux will promote corrosion.

(A) [A] is true [R] is false

(B) [A] is false [R] is true

(C) Both [A] and [R] are true but [R] is not the correct explanation of [A]

(D) Both [A] and [R] are true and [R] is the correct explanation of [A] .

(E) Answer not known

37. Match the following:

The temperature attained in the flame in gas welding

(1)	Neutral flame	=	3400°C
(2)	Carburising flame	=	3200°C
(3)	Oxidising flame	=	2700°C

(A) (2), (1), (3) (B) (1), (2), (3)

(C) (3), (2), (1) (D) (2), (3), (1)

(E) Answer not known

38. The use of flux is not required in case of

(A) Manual metal arc welding (B) Submerged arc welding

(C) Electro-slag welding (D) Resistance welding

(E) Answer not known

39. To produce shuttle eye for weaving, wave guide for radars, bolts and triggers for the arms ———— casting process is used

(A) Shell moulding
(B) Permanent mould casting
(C) Precision investment casting
(D) Die casting
(E) Answer not known

40. In a gating system, the ratio of 1:4:4 represents

(A) Sprue base area: runner area: ingate area
(B) Pouring basin area: in gate area: runner area
(C) Sprue basin area: in gate area: casting area
(D) Runner area: casting area: ingate area
(E) Answer not known

41. During plastic deformation, the ———— of the metals are ———— displaced from their original position to take up new positions.

(A) Atoms and longitudinally
(B) Atoms and permanently
(C) Micro structures and temporarily
(D) Surface properties and radially
(E) Answer not known

42. Assertion [A] : The full and partial journal bearings may be called as clearance bearing.

Reason [R] : The diameter of the journal is less than that of bearing.

(A) [A] is true but [R] is false

(B) Both [A] and [R] are true; and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]

(E) Answer not known

43. Antifriction bearings are

(A) Journal bearing

(B) Needle bearing

(C) Pivot bearing

(D) Collar bearing

(E) Answer not known

44. The most common and widely used bearing material is

(A) Mild steel

(B) Aluminium

(C) Babbit metal

(D) Carbon steels

(E) Answer not known

45. In journal bearings, the pressure at which the oil film breaks down and so that metal to metal contact begins, is known as

(A) Maximum operating pressure

(B) Absolute pressure

(C) Critical pressure

(D) Optimum pressure

(E) Answer not known

46. Choose the right answer:

When the length of the journal is equal to the diameter of the journal, then the bearing is said to be a

(A) Square bearing
(B) Short bearing
(C) Medium bearing
(D) Long bearing
(E) Answer not known

47. What is the basis of modern computer-aided design system?

(A) ICG
(B) GCI
(C) GIF
(D) IGC
(E) Answer not known

48. In CAD, Find the purpose of geometric modeling.

(A) To create 2D and 3D
(B) To generate materials
(C) To maintain supply chain
(D) To perform financial analysis
(E) Answer not known

49. What does IGES stands for

(A) International Graphics Exchange Software
(B) Initial Graphics Exchange System
(C) Initial Graphics Exchange Software
(D) Information Graphics Exchange System
(E) Answer not known

50. CAD/CAM is the relationship between ———— and when used together, they provide a number of benefits from increased precision to minimizing waste.

(A) Science and engineering
(B) Manufacturing and modeling
(C) ✓ Design and manufacturing
(D) Design and marketing
(E) Answer not known

51. Geometric classification of families is based on

(A) Size of work piece
(B) Shape of work piece
(C) ✓ Size and shape of work piece
(D) Sequence of operations of the work piece
(E) Answer not known

52. Choose the type of information is typically included in a process plan generated by CAPP system.

(A) Market trends a forecasts
(B) Production schedules
(C) ✓ Detailed machining and tool requirements
(D) Customer feedback
(E) Answer not known

53. The imaginary area or volume within which the controlled feature of the manufactured component must be completely contained is called as

(A) Tolerance area
(B) Tolerance volume
(C) Tolerance zone
(D) Feature of tolerance
(E) Answer not known

54. The relationships between dimensions of two mating parts before their assembly is known as

(A) Geometry of basic size
(B) Tolerance
(C) Fits
(D) Limits
(E) Answer not known

55. Find the main purpose of Statistical Process Control (SPC) in manufacturing

(A) To automate production machinery
(B) To monitor and control the quality of production process
(C) To design new product
(D) To manage supply chain
(E) Answer not known

56. In CNC Electric Discharge Machining the gap between the electrode and work piece is in the range of

(A) 0.006 mm to 0.06 mm
(B) 0.004 mm to 0.04 mm
(C) 0.005 mm to 0.05 mm
(D) 0.007 mm to 0.07 mm
(E) Answer not known

57. CNC machine interpolator controls

(A) Spindle speed
(B) Feed to tool
(C) Motion of tools
(D) None of these
(E) Answer not known

58. In part program, if the coordinate values are specified with respect to a floating zero latum, then it is called as a

(A) Absolute coordinate system
(B) Actual coordinate system
(C) Incremental coordinate system
(D) Mixed coordinate system
(E) Answer not known

59. When the flat faced follower is circular in shape, then it is known as

(A) Flat end follower
(B) Spherical follower
(C) Mushroom follower
(D) Roller follower
(E) Answer not known

60. When the motion of the follower is along an axis passing through the centre of the cam, it is known as

(A) Reciprocating follower
(B) Rotating follower
(C) Offset follower
(D) Radial follower
(E) Answer not known

61. In a 4-stroke engine, how many revolutions of the crankshaft are needed to complete one power cycle?

(A) One
(B) Two
(C) Three
(D) Four
(E) Answer not known

62. Which of the following has the highest efficiency?

(A) Otto cycle
(B) Diesel cycle
(C) Carnot cycle
(D) Brayton cycle
(E) Answer not known

63. With reference to the actual value timing diagram of a four stroke engine the inlet valve closes

(A) Before top dead center
(B) After top dead center
(C) Before bottom dead center
(D) After bottom dead center
(E) Answer not known

64. The pressure in the engine cylinder during exhaust stroke will be ———— atmospheric pressure.

(A) Equal to
(B) Slightly greater than
(C) Slightly lower than
(D) Much greater than
(E) Answer not known

65. Choose the right answer:

The ratio of lateral strain to linear strain is known as

(A) Poisson's ratio
(B) Elastic limit
(C) Modulus of rigidity
(D) Modulus of elasticity
(E) Answer not known

66. The value of Poisson's ratio for steel varies from

(A) 0.32 to 0.42
(B) 0.45 to 0.50
(C) 0.23 to 0.27
(D) 0.25 to 0.33
(E) Answer not known

67. Normal stress is the stress, which acts in a direction ———— to the area.

(A) Perpendicular
(B) Parallel
(C) Inclined
(D) Tangential
(E) Answer not known

68. The purpose of the oil filter in a lubricating system is

(A) To increase oil pressure
(B) To regulate oil temperature
(C) To cool the engine
(D) To remove contaminants and particles from the oil
(E) Answer not known

69. Presence of cooling water in oil sump indicates

(A) Worn piston ring
(B) Worn piston pin
(C) Leaking head gasket
(D) Leaking hose pipe
(E) Answer not known

70. SAE has classified lubricating oils according to their viscosity as 10, 15, 20, etc... The viscosity tests of such lubricating oils are made at

(A) 210° C
(B) 210° F
(C) 99° F
(D) 0° F
(E) Answer not known

71. A gas cylinder of internal diameter 40 mm is 5 mm thick. If the tensile stress in the material is not to exceed 40 MPa, find the maximum pressure which can be allowed in the cylinder

(A) 100 MPa
(B) 10 MPa
(C) 1 MPa
(D) 1000 MPa
(E) Answer not known

72. In theory of simple bending, which assumption is not correct

(1) The material of the beam is homogeneous.

(2) The material is stressed within its elastic limit.

(3) The value of young's modulus is different for tension and compression.

(4) The beam is in equilibrium i.e., there is no resultant pull or push in the section.

(A) (1) (B) (2)

(C) (3) (D) (4)

(E) Answer not known

73. If the pressure above the fuel in the float chamber is equal to the ————————, the carburetor is said to be balanced.

(A) Atmospheric pressure (B) Air intake in the air horn

(C) Suction pressure (D) Compression pressure

(E) Answer not known

74. Method of governing used in petrol engine is

(A) Quantity governing (B) Quality governing

(C) Combined governing (D) Partial governing

(E) Answer not known

75. While lapping a value, the lapping compound is applied to

(A) Face (B) Stem

(C) Guide (D) Tip

(E) Answer not known

76. In multiple v-belt drives, when a single belt is damaged, it is preferable to change the complete set to

(A) Ensure proper alignment
(B) Ensure uniform loading
(C) Reduce vibration
(D) Reduce slip
(E) Answer not known

77. The size of a gear is usually specified by

(A) Pressure angle
(B) Circular pitch
(C) Diameteral pitch
(D) Pitch circle diameter
(E) Answer not known

78. A rack is a gear of

(A) Infinite diameter
(B) Infinite module
(C) Large pitch
(D) Zero pressure angle
(E) Answer not known

79. The belt material having highest mass density is

(A) Leather
(B) Convass
(C) Rubber
(D) Balata
(E) Answer not known

80. The open coiled helical spring can take up

(A) Tensile load
(B) Compression load
(C) Tensile and compression load
(D) Shear load
(E) Answer not known

81. The metal that exists in face – centered – cubic form is

(A) Ni
(B) Na
(C) Ba
(D) Cb
(E) Answer not known

82. The material used for making automobile frames and automobile bodies is

(A) Low carbon steel
(B) Plain carbon steel
(C) Medium carbon steel
(D) High carbon steel
(E) Answer not known

83. Cast iron which posses carbon content greater than 4.3% and upto 6.67% are called as

(A) Hyper – Eutectoid Steels
(B) Hypo – Eutectoid Steels
(C) Hypo – Eutectic Cast Iron
(D) Hyper – Eutectic Cast Iron
(E) Answer not known

84. Hooke' Law states that ———— elastic limit, the stress is directly propotional to strain.

(A) Within its
(B) Above the
(C) At the
(D) Irrespective of the
(E) Answer not known

85. The maximum bending stress, in a curved beam having symmetrical section, always occur, at the

(A) Centroidal axis
(B) Neutral axis
(C) Inside fibre
(D) Outside fibre
(E) Answer not known

86. The poisson's ratio of steel varies from

(A) 0.21 to 0.25
(B) 0.25 to 0.33
(C) 0.33 to 0.38
(D) 0.38 to 0.45
(E) Answer not known

87. ———— heat treatment process is used to reduce internal stresses in steel.

(A) Normalizing
(B) Quenching
(C) Annealing
(D) Tempering
(E) Answer not known

88. Which one of the following is not a case hardening process?

(A) Carburising
(B) Cyaniding
(C) Nitriding
(D) Tempering
(E) Answer not known

89. The property of a material by virtue of which it can be drawn into thin wires is known as

(A) Plasticity
(B) Elasticity
(C) Ductility
(D) Malleability
(E) Answer not known

90. Match the following:

(a)	Annealing	1.	Refines grain structure
(b)	Nitriding	2.	Improve hardness of wholeman
(c)	Martempering	3.	Increase surface hardness
(d)	Normalising	4.	Improves ductility

	(a)	(b)	(c)	(d)
(A)	4	3	2	1
(B)	2	3	4	1
(C)	3	1	4	2
(D)	4	1	2	3

(E) Answer not known

91. ABC corporation has placed an order to its supplier LMN for the supply of 10,000 gear boxes. The order has placed on 10th March 2024. ABC corporation has received the gear boxes on 20th March 2024. Then Normal lead time is

(A) 11 days
(B) 10 days
(C) 12 days
(D) 13 days
(E) Answer not known

92. Which of the following is NOT associated with the inventory carrying cost?

(A) Transportation costs
(B) Cost on record keeping
(C) Cost associated with pilferage
(D) Handling costs
(E) Answer not known

93. Which among the following is NOT a type of quality?

(A) Quality of design
(B) Quality of work
(C) Quality of conformance
(D) Quality of performance
(E) Answer not known

94. Which depreciation method neglects maintenance and repair charges?

(A) Straight line method
(B) Reducing balance method
(C) Sinking fund method
(D) None of the above
(E) Answer not known

95. Which of the following are the causes of Depreciation?

(1) Normal physical wear and Tear
(2) Passage of time
(3) Usage
(4) Technological development and changes

(A) (1) and (3)
(B) (1) and (2)
(C) (1), (2) and (3)
(D) (1), (2), (3) and (4)
(E) Answer not known

96. Assertion [A] : In Many cases, the straight line method is unrealistic

Reason [R] : Generally fixed assets do not wear out at exactly the same rate during their economic life

(A) [A] is true but [R] is False

(B) Both [A] and [R] are true, and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]

(E) Answer not known

97. A manufacturing firm incurs a fixed cost of Rs. 18,000. The variable costs accounts Rs. 8 per unit and selling price is Rs. 13. Find the Break Even Point (BEP)

(A) 2000 pieces

(B) 3000 pieces

(C) 3600 pieces

(D) 4800 pieces

(E) Answer not known

98. Which of the following are true about Job evaluation by Ranking method?

(1) In this method, different jobs, depend upon their importance, are ranked from top to bottom.

(2) This method is simple

(3) This method is suitable for large organisations

(A) (1) only

(B) (1) and (2)

(C) (1) and (3)

(D) (1), (2) and (3)

(E) Answer not known

99. Which of the following statement(s) is/are true regarding Theory X and Y?

(i) Theory X is a negative approach to human relations

(ii) Theory Y is a positive approach to human relations

(iii) Theory Y promotes good human relations and an atmosphere of good mutual understanding

(A) (i) only
(B) (ii) and (iii) only
(C) (i) and (iii) only
(D) (i), (ii) and (iii)
(E) Answer not known

100. Which of the following statements are true about Theory - Y?

(1) Theory Y is put forward by F.W. Taylor

(2) Theory Y is an essentially positive approach to human relations in which the supervisor integrates the needs of his subordinates with the needs of his organisation

(A) (1) only
(B) (2) only
(C) Both (1) and (2)
(D) Neither (1) nor (2)
(E) Answer not known

101. Chapter 2 of Motor Vehicles Act 1988 deals with

(A) Control of Traffic
(B) Insurance of Vehicle
(C) Licensing of drivers of motor vehicle
(D) Registration of motor vehicle
(E) Answer not known

102. The purpose of "Road Tax" in terms of vehicle running costs

(A) To cover insurance premiums
(B) To contribute to Road maintenance and Infrastructure
(C) To cover the cost of fuel
(D) To pay for vehicle customization
(E) Answer not known

103. Which system in a vehicle helps to absorb bumps in the road and provide a safe and comfortable ride?

(A) Fuel and Exhaust system
(B) Transmission system
(C) Braking system
(D) Suspension system
(E) Answer not known

104. The Circular road sign with a Blue Background generally signifies

(A) Prohibition
(B) Mandatory instruction
(C) Warning
(D) Information
(E) Answer not known

105. Primary characteristic of a "Terminal Bus Stand"

(A) It serves a Primary point for Buses to start and end their routes
(B) It only serves as a stop for local city Buses
(C) It is located on the outskirts of a city
(D) It exclusively handles long - distance freight
(E) Answer not known

106. In break-even analysis, the total cost consists of

(A) fixed cost + variable cost
(B) fixed cost + sales revenue
(C) variable cost + sale revenue
(D) variable cost + operating cost
(E) Answer not known

107. Which Leadership style emphasizes the importance of Building strong relationships and motivating team members through personal connections?

(A) Autocratic
(B) Transformational
(C) Laissez-Faire
(D) Transactional
(E) Answer not known

108. How are category C items typically described in ABC Analysis?

(A) High - Value, low-quantity items
(B) Low - value, high - quantity items
(C) Moderate - value, moderate - quantity items
(D) High - value, high - quantity items
(E) Answer not known

109. The break even point is obtained at the intersection of

(A) The variable cost line and the fixed cost line
(B) The total cost line and total sales line
(C) The variable cost line and selling cost line
(D) The total cost line and the variable cost line
(E) Answer not known

110. Dispatching is a part of

(A) Planning phase
(B) Action phase
(C) Control phase
(D) Development phase
(E) Answer not known

111. Velocity of retraction stroke in a double acting cylinder is calculated using

(A) Velocity = Discharge × Area of piston
(B) Velocity = Discharge × Area of rod
(C) $\text{Velocity} = \frac{\text{Discharge}}{\text{Area}}$
(D) $\text{Velocity} = \frac{\text{Discharge}}{(\text{Area of piston} - \text{Area of rod})}$
(E) Answer not known

112. Spur gear pump delivers hydraulic fluid at ———— angle to the axis of rotation

(A) 45°
(B) 60°
(C) 75°
(D) 90°
(E) Answer not known

113. Choose the right answer:

The specific speed of a centrifugal pump is given by:

(Where, N – Shaft speed in rpm

Q – discharge in m^3 / sec

H – Head in meters)

(A) $\frac{N\sqrt{Q}}{H^{3/4}}$ (B) $\frac{N\sqrt{P}}{H^{5/4}}$

(C) $\frac{N\sqrt{Q}}{H^{5/4}}$ (D) $\frac{N\sqrt{H}}{Q^{3/4}}$

(E) Answer not known

114. The governors in the Kaplan turbine is to control

(A) Movement of guide vanes

(B) Rotation of runner blades

(C) Movement of guide vanes or rotation of runner blades

(D) Movement of guide vanes as well as rotation of runner blades

(E) Answer not known

115. The angular deflection of jet is limited to about ———— to ensure that the water jet leaving one bucket does not strike the back of the succeeding bucket.

(A) 145-150 deg (B) 150-160 deg

(C) 165-170 deg (D) 170-175 deg

(E) Answer not known

116. Choose the relationship between mechanical, efficiency hydraulic efficiency and overall efficiency

(A) Overall efficiency = $\frac{\text{Hydraulic efficiency}}{\text{Mechanical efficiency}}$

(B) Overall efficiency = Hydraulic efficiency – Mechanical efficiency

(C) Overall efficiency = Hydraulic efficiency × Mechanical efficiency

(D) Overall efficiency = Hydraulic efficiency + Mechanical efficiency

(E) Answer not known

117. A Pelton wheel is having a mean bucket diameter of 1m and is running at 1000 r.p.m. Calculate the tangential velocity of the wheel.

(A) 45.86 m/s

(B) 52.36 m/s

(C) 58.96 m/s

(D) 49.24 m/s

(E) Answer not known

118. The actual flow velocity from the exit of mouthpiece is

(A) $0.65\sqrt{2gH}$

(B) $0.855\sqrt{2gH}$

(C) $0.95\sqrt{2gH}$

(D) $0.9\sqrt{2gH}$

(E) Answer not known

119. Which device is used for measuring the pressure, difference between two points or in two different pipes?

(A) Single column Manometer

(B) U-tube Manometer

(C) Piezometer

(D) Differential Manometer

(E) Answer not known

120. Co-efficient of venturimeter is

(A) Less than 1
(B) Less than 10
(C) Greater than 10
(D) Ranges from 1-10
(E) Answer not known

121. The stationary magnetic field in the starting motor is produced by the

(A) Field windings (or) permanent magnets
(B) Brushes and commutator
(C) Armature windings and commutator bars
(D) Relay or solenoid
(E) Answer not known

122. Ignition timing of an engine is adjusted by

(A) Tachometer
(B) Stroboscopic light
(C) Stop watch
(D) Accurate clock
(E) Answer not known

123. A new spark plugs of the proper heat rinse runs about 2000 miles. Renovates the plug shows the lower end of the caste electrode melted away. The causes for the melting on spark plug is

(A) Cross - firing of engine
(B) Combustion chamber deposits on carbon
(C) Pre-ignition on engine
(D) Excessive oil entering in the combustion chamber
(E) Answer not known

124. Which component in an alternator converts generated alternating current into direct current?

(A) Resistor
(B) Transistor
(C) Diode
(D) Triode
(E) Answer not known

125. The number of cells in a 12 V lead acid battery are

(A) 12 cells
(B) 6 cells
(C) 24 cells
(D) 8 cells
(E) Answer not known

126. The alternator produces an alternating current in its

(A) rotor field coil or rotor winding
(B) stator windings
(C) regulator
(D) load circuit
(E) Answer not known

127. The dynamo in automobile

(A) converts mechanical energy into electrical energy
(B) convert mechanical energy into light energy
(C) convert electrical energy into mechanical energy
(D) converts chemical energy into electrical energy
(E) Answer not known

128. Ignition coil of ignition system acts as

(A) Inductor
(B) Capacitor
(C) Step up transformer
(D) Step down transformer
(E) Answer not known

129. The type of reflector used for automobile head lamp is

(A) Hyperbolic
(B) Parabolic
(C) Spherical
(D) Spiral
(E) Answer not known

130. For identification the colour of a tail lights in a car is _____ in colour.

(A) White
(B) Red
(C) Yellow
(D) Green
(E) Answer not known

131. In a reciprocating compressor, the law of compression is given by PV. For which value of 'n', the work done is minimum?

(A) 1.4
(B) 1.3
(C) 1.2
(D) 1.0
(E) Answer not known

132. The power developed in the engine cylinder is necessarily _____ than that at the crankshaft.

(A) lesser
(B) constant
(C) greater
(D) more or less
(E) Answer not known

133. An engine working on otto cycle has initial volume at the beginnings as 25 m^3 and final volume as 5 m^3. Calculate the compression ratio.

(A) 0.2
(B) 125
(C) 5
(D) 50
(E) Answer not known

134. The compression ratio for diesel engines are kept high because

(i) least possibilities of auto ignition
(ii) air alone inducted during suction
(iii) heat is added at constant volume

(A) (i) only
(B) (iii) only
(C) (i) and (iii) only
(D) (i) and (ii) only
(E) Answer not known

135. Which refrigerant is used in window air conditioners, heat pumps, air conditioners of commercial buildings and large industrial refrigeration systems?

(A) R-11
(B) R-12
(C) R-22
(D) R-115
(E) Answer not known

136. The method to improve the thermal efficiency of the vapour cycle is by

(A) Increasing the condenser pressure

(B) Superheating steam to high temperature

(C) Decreasing the boiler pressure

(D) Increasing the average temperature at which heat is rejected from the working fluid in the condenser

(E) Answer not known

137. The function of a ———————— is to increase the temperature of the steam above its saturation point.

(A) Air preheater

(B) Economiser

(C) Steam separator

(D) Super heater

(E) Answer not known

138. Which is not a boiler accessory?

(A) Economiser

(B) Fusible plug

(C) Super heater

(D) Air preheater

(E) Answer not known

139. The function of a ———————— is to provide a heat transfer surface through which a heat passes from the hot refrigerant vapour to the condensing medium.

(A) evaporator

(B) expansion valve

(C) compressor

(D) condensor

(E) Answer not known

140. The mass of water vapour present in unit mass of dry air is called

(A) Relative humidity
(B) Specific weight
(C) Specific humidity
(D) Specific enthalpy
(E) Answer not known

141. Instruction to the worker to proceed with the operation is given by

(A) Inspection order
(B) Time ticket
(C) Job order
(D) Tool order
(E) Answer not known

142. The main drawback of string diagram is

(A) It cannot study the movement individual operator handling number of machines
(B) It cannot study about a group moving from one machine to another
(C) It cannot be used to study the movement of materials in curvilinear (or) irregular path
(D) It cannot study about materials in an assembly shop
(E) Answer not known

143. Which of the following is also known as fish-bone diagram?

(A) Flow diagram
(B) Cause and effect diagram
(C) Scatter diagram
(D) Histogram
(E) Answer not known

144. The chart in which load is marked against a time scale with one horizontal bar allocated to each machine is

(A) Bar chart
(B) Curve chart
(C) Gantt chart
(D) Mechanical chart
(E) Answer not known

145. The allowed time for a job equals standard time plus

(A) Policy allowance
(B) Interference allowance
(C) Process allowance
(D) Learning allowance
(E) Answer not known

146. A compilation of normal time values for work elements used in tasks that are performed in a given facility is known as

(A) Normal time data
(B) Predetermined motion time systems
(C) Work sampling
(D) Standard data systems
(E) Answer not known

147. The objective of time study is to determine the time required to complete a job by

(A) Fast worker
(B) Average worker
(C) Slow worker
(D) New entrant
(E) Answer not known

148. A drawing or a diagram which is drawn to scale, the paths followed by workers and materials are called as

(A) Flow diagram
(B) Flow process chart
(C) String diagram
(D) Two handed process chart
(E) Answer not known

149. The chart that records the amount of travel by the material in process from one machine to another machine is

(A) Flow chart
(B) Travel chart
(C) Correlation chart
(D) Layout chart
(E) Answer not known

150. Which of the following method is used to locate the warehouses (or) distribution centre, so that maximum number of markets can be covered easily?

(A) Transportation method
(B) Centroidal method
(C) Factor-rating method
(D) Break even analysis
(E) Answer not known

151. Thermit, used in thermit welding, is a mixture of

(A) Charcoal and iron oxide
(B) Charcoal and aluminium
(C) Iron oxide and aluminium
(D) Charcoal, iron oxide and aluminium
(E) Answer not known

152. Choose the one from the following is a common filler metal used in brazing.

(A) Silver
(B) Lead
(C) Nickel
(D) Iron
(E) Answer not known

153. Ceramic tool inserts are fixed to the tool holder by

(A) Casting
(B) Adhesives
(C) Brazing
(D) Soldering
(E) Answer not known

154. The welding process in which heat is produced for welding by exothermal chemical reaction is known as

(A) Forge welding
(B) Resistance welding
(C) Gas welding
(D) Thermit welding
(E) Answer not known

155. In MIG welding process ———— gas(es) is (are) used for welding steel structure.

(A) Pure argon gas
(B) CO_2 - argon
(C) Argon - oxygen
(D) Nitrogen
(E) Answer not known

156. Find the Lathe operation is used to reduce diameter of a work piece.

(A) Turning
(B) Facing
(C) Knurling
(D) Chamfering
(E) Answer not known

157. Sweep patterns used to prepare mould of the following shapes.

(A) Unsymmetrical irregular
(B) Unsymmetrical regular
(C) Symmetrical regular
(D) Symmetrical irregular
(E) Answer not known

158. Long cast-iron pipes of uniform thickness are manufactured effectively by

(A) Centrifugal casting method
(B) Green sand casting method
(C) Lost wax method
(D) Die casting method
(E) Answer not known

159. In a centrifugal casting method

(A) Core is made of sand
(B) Core is made of ferrous metal
(C) Core is made of nonferrous metal
(D) No core is used
(E) Answer not known

160. Choose the casting defect is commonly associated with air entrapment in die casting.

(A) Cold shut
(B) Porosity
(C) Hot tear
(D) Shrinkage cavity
(E) Answer not known

161. Technology that produces part directly from the CAD geometric model

(A) Virtual prototyping
(B) Computer Numerical Control Machines
(C) Rapid Prototyping
(D) Computer workstations
(E) Answer not known

162. In CAD modelling, which model is visually ambiguous and the hidden lines cannot be removed?

(A) Wire frame model
(B) Surface model
(C) Solid models
(D) None of the above
(E) Answer not known

163. Choose the wrong matches among type:

(1) DXF - Drawing Exchange Format
(2) GKS - General Kernel Software
(3) IGES - Initial Graphics Exchange Specification
(4) DMIS - Direct Measurement Interface software

(A) (1) and (2) are correct
(B) (2) and (4) are correct
(C) (2) and (3) are correct
(D) (1) and (3) are correct
(E) Answer not known

164. Choose the right answer:

The general achievement of group technology are

(i) High productivity

(ii) Increases customer service

(iii) Increases effective machine operation

(A) (i) only
(B) (i) and (ii) only
(C) (i) and (iii) only
(D) (i), (ii) and (iii) only
(E) Answer not known

165. In the parts coding scheme, hierarchical structure also called as

(A) Poly code
(B) Mono code
(C) Hybrid code
(D) Chain code
(E) Answer not known

166. In group technology similar parts are arranged into

(A) Manufacturing cells
(B) Part cells
(C) Manufacturing units
(D) Part families
(E) Answer not known

167. Due to the higher cutting speeds and feeds in CNC machines which types of forces developed during the machining operations.

(A) Shear forces
(B) Fluctuating and variable forces
(C) Fatigue loads
(D) Crushing forces
(E) Answer not known

168. Which M-code is used in CNC system for table pallet change is?

(A) M 83
(B) M 84
(C) M 90
(D) M 70
(E) Answer not known

169. For machining a components using incremental mode the co-ordinate data input for every movement is the relative distance from

(A) The datum point
(B) The source point
(C) The previous point
(D) Random point
(E) Answer not known

170. Tool change activity in CNC machine requires the following motion. Arrange in the correct sequence.

(1) Stop the spindle
(2) Tool change arm to index to reach tool magazine
(3) Tool change arm to pick the tool from spindle
(4) Tool change arm to move to the spindle

(A) (1), (4), (3), (2)
(B) (1), (3), (4), (2)
(C) (1), (2), (4), (3)
(D) (1), (4), (2), (3)
(E) Answer not known

171. The most effective vehicle frame section against bending is

(A) Rectangular bar
(B) Round bar
(C) Round hollow tube
(D) Square hollow section
(E) Answer not known

172. The side wind force influences,

(i) Pitching moment
(ii) Yawing moment
(iii) Heaving moment
(iv) Rolling moment

(A) (i), (ii), (iii) only
(B) (ii), (iv) only
(C) (i), (iii) only
(D) (iii), (iv) only
(E) Answer not known

173. ———— type of car has no cant panel.

(A) Pillarless saloon
(B) Four door saloon
(C) Two door saloon
(D) Estate car
(E) Answer not known

174. ———— moment tends to rotate a road vehicle about its vertical axis.

(A) Pitching
(B) Rolling
(C) Yawing
(D) Up thrust
(E) Answer not known

175. The Pitching moment is often accompanied by ———— force.

(A) Drag
(B) Lift
(C) Side wind
(D) Yaw
(E) Answer not known

176. Which of the following Engine location has a poor space in bus?

(A) Under floor engine
(B) Rear engine
(C) Engine behind the front axle
(D) Engine in front of the front axle
(E) Answer not known

177. Two wide doors with large entry and exit platform are present in ———— bus.

(A) town
(B) suburban
(C) long distance
(D) touring
(E) Answer not known

178. A small holes appears on the painted surface is called

(A) Cracking
(B) Pin points
(C) Roughness
(D) Wrinkling
(E) Answer not known

179. Which one of the following mechanism is not a method to unload a tipper?

(A) Hoist mechanism
(B) Hydraulic mechanism
(C) Pneumatic mechanism
(D) Mechanical gears
(E) Answer not known

180. Choose the appropriate angle between the seat squab and backrest of the driver's seat.

(A) 65°
(B) 105°
(C) 165°
(D) 185°
(E) Answer not known

181. A Fluid is said to be an ideal fluid if it has the property of

(A) Incompressible only
(B) Viscous and compressible
(C) Inviscous and in compressible
(D) Inviscous and compressible
(E) Answer not known

182. Surface tension on a hollow bubble is expressed as

(A) $p = \frac{4\sigma}{d}$
(B) $p = \frac{8\sigma}{d}$
(C) $p = \frac{4d}{\sigma}$
(D) $p = \frac{8d}{\sigma}$
(E) Answer not known

183. The diameter of the pipe is 10 cm and the velocity of water flowing through the pipe is 5 m/s. Find the discharge flowing through the pipe.

(A) 0.03927 m^3/s
(B) 0.003927 m^3/s
(C) 0.3927 m^3/s
(D) 3.927 m^3/s
(E) Answer not known

184. Hydraulic accumulator is a device which is used for ———— and supplying it when required.

(A) Storing the energy in the form of potential energy
(B) Storing the energy in the form of pressure energy
(C) Storing the energy in the form of potential and pressure energy
(D) Storing the energy in the form of kinetic and pressure energy
(E) Answer not known

185. Internal diameter of the impeller of a centrifugal pump is 200 mm and is running at 1200 rpm. Find the tangential velocity of the impeller.

(A) 125.56 m/s
(B) 125.56 cm/s
(C) 12.56 m/s
(D) 1.256 m/s.
(E) Answer not known

186. The violent sound pulsations within the cylinder of an IC engine are due to

(A) Detonation
(B) Turbulence
(C) Pre-ignition
(D) Complete combustion
(E) Answer not known

187. Mean effective pressure of Otto cycle is

(A) Inversely propotional to pressure ratio
(B) Directly propotional to pressure ratio
(C) Does not depend on pressure ratio
(D) Propotional to square root of pressure ratio
(E) Answer not known

188. Volumetric efficiency of a compressor usually varies from ———— due to the presence of clearance volume.

(A) 60% to 85%
(B) 45% to 60%
(C) 85% to 100%
(D) 70% to 85%
(E) Answer not known

189. Find the brake specific fuel consumption in Kg/kWh of a diesel engine whose fuel consumption is 5 grams per second when the power output is 80 kW.

(A) 0.225
(B) 0.0625
(C) 2.25
(D) 0.625
(E) Answer not known

190. An engine runs at 3000 rpm and produce a torque of 6000 Nm. determine the brake power produced.

(A) $6\pi \times 10^5 W$
(B) $6\pi \times 10^5 KW$
(C) $\pi \times 10^5 W$
(D) $\pi \times 10^5 KW$
(E) Answer not known

191. Unit of magnetic flux is

(A) Ampere turn
(B) Weber
(C) Tesla
(D) Columb
(E) Answer not known

192. The total work per unit charge associated with the motion of charge between any two points is called

(A) Current
(B) Capacitance
(C) Voltage
(D) Resistance
(E) Answer not known

193. Pick out the odd one related to power factor

(A) $\frac{R}{2}$ = Resistance/Impedence
(B) $\frac{W}{VA}$ = Watts/Volt amperes
(C) True power/apparent power
(D) $\frac{\text{reactance}}{\text{Resistance}}$
(E) Answer not known

194. A sine wave has a frequency of 50 HZ. It's angular frequency is

(A) $50/\pi$ radians/second
(B) $50/2\pi$ radians/second
(C) 50π radians/second
(D) 100π radians/second
(E) Answer not known

195. Form factor can be defined as the ratio of

(A) RMS Value / Average Value

(B) Peak Value / RMS Value

(C) Average Value / RMS Value

(D) $\sqrt{\text{RMS Value / Average Value}}$

(E) Answer not known

196. Choose the right answer among type as compared to voltage regulators made up of discrete components, IC Regulators have much improved performance of

(i) remote control operation

(ii) current limiting

(iii) self-protection against over-temperature

(A) (i) and (ii) only

(B) (i) and (iii) only

(C) (ii) and (iii) only

(D) (i), (ii) and (iii) only

(E) Answer not known

197. The amount of charge required to create a unit potential difference between plates is

(A) Resistance

(B) Capacitance

(C) Inductance

(D) Dielectric

(E) Answer not known

198. The basic reason why a Full-Wave rectifier has twice the efficiency of a Half-Wave rectifier is that

(A) It makes the use of a transformer

(B) It's ripple factor is much less

(C) It utilizes both half cycle of AC input

(D) It's output frequency is double the line frequency

(E) Answer not known

199. Which of the following is the correct rule for binary addition in Boolean Algebra?

(A) 1 + 1 = 0

(B) 0 + 1 = 0

(C) 0 + 0 = 1

(D) 1 + 0 = 1

(E) Answer not known

200. A capacitor is

(i) also called as commutator

(ii) an energy storing element

(iii) consisting of two conductors separated by a dielectric medium

(A) (i) only

(B) (i) and (ii) only

(C) (ii) and (iii) only

(D) (i) and (iii) only

(E) Answer not known
