Sl. No. :

Register Number

2018

MECHANICAL AND AUTOMOBILE ENGINEERING
(Diploma Standard)

Time Allowed : 3 Hours]   **[Maximum Marks : 300**

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. The applicant will be supplied with Question Booklet 15 minutes before commencement of the examination.

2. This Question Booklet contains **200** questions. Prior to attempting to answer the candidates are requested to check whether all the questions are there in series and ensure there are no blank pages in the question booklet. **In case any defect in the Question Paper is noticed it shall be reported to the Invigilator within first 10 minutes and get it replaced with a complete Question Booklet. If any defect is noticed in the Question Booklet after the commencement of examination it will not be replaced.**

3. Answer **all** questions. All questions carry equal marks.

4. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.

5. An answer sheet will be supplied to you, separately by the Room Invigilator to mark the answers.

6. You will also encode your Question Booklet Number with Blue or Black ink Ball point pen in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, action will be taken as per commission's notification.

7. Each question comprises *four* responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.

8. In the Answer Sheet there are **four** circles Ⓐ , Ⓑ , Ⓒ and Ⓓ against each question. To answer the questions you are to mark with Blue or Black ink Ball point pen ONLY ONE circle of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. *e.g.* If for any item, Ⓑ is the correct answer, you have to mark as follows :

Ⓐ ● Ⓒ Ⓓ

9. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the time of examination. After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.

10. The sheet before the last page of the Question Booklet can be used for Rough Work.

11. Do not tick-mark or mark the answers in the Question Booklet.

12. Applicants have to write and shade the total number of answer fields left blank on the boxes provided at side 2 of OMR Answer Sheet. An extra time of 5 minutes will be given to specify the number of answer fields left blank.

13. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.

1. The process used for relieving the internal stresses in the metal and for improving machinability of steel is

   (A) normalising

   (B) annealing

   (C) spheroidising

   (D) case hardening

2. A steel with 0.8% carbon is known as

   (A) eutectoid steel

   (B) hyper eutectoid steel

   (C) hypo eutectoid steel

   (D) none of the above

3. Mild steel belongs to the following category

   (A) low carbon steel

   (B) medium carbon steel

   (C) high carbon steel

   (D) alloy steel

4. A cold chisel is made of

   (A) Mild steel

   (B) Cast iron

   (C) H.S.S.

   (D) High carbon steel

5. The property of material which allows it to be drawn into a smaller section is called

   (A) Elasticity

   (B) Drawability

   (C) Plasticity

   (D) Ductility

6. For welding heavy parts such as rails, broken machines frames, rebuilding of large gears, the welding process used generally is

    (A) Resistance welding

    (B) Gas welding

    (C) Thermit welding ✓

    (D) Spot welding

7. Which of the following operation is first performed?

    (A) Tapping   (B) Boring

    (C) Drilling ✓   (D) Spot facing

8. Which one of the following is a natural abrasives?

    (A) Silicon carbide   (B) Boran carbide

    (C) Aluminium oxide   (D) Diamond ✓

9. The cutting edge of a standard twist drill are called

    (A) Flutes   (B) Wedges

    (C) Lips ✓   (D) Flanks

10. In resistance welding, the heat generated is given by

    (A) $H = \dfrac{I^2 \times R}{T}$ (B) $H = \dfrac{I^2 \times T}{R}$

    (C) $H = I^2 \times R \times T$ ✓   (D) $H = \dfrac{R \times T}{I^2}$

    where

    H = Heat generated

    R = Resistance of metal being welded

    T = Duration of current flow

    I = Current in amperes through weld

11. Compression ratio in diesel engine is of the order of

(A) 5 – 7   (B) 7 – 10

(C) 10 – 12   (D) ✓ 14 – 20

12. Dynamic viscosity has the dimensions as

(A) MLT^{-2} (B) ✓ $ML^{-1}T^{-1}$

(C) $ML^{-1}T^{-2}$ (D) $M^{-1}L^{-1}T^{-1}$

13. The soap bubble (or) falling drops of water acquire spherical shape because of

(A) Cohesion   (B) Adhesion

(C) Viscosity   (D) ✓ Surface tension

14. The constant volume cycle is also called as

(A) Carnot cycle   (B) Joule cycle

(C) ✓ Otto cycle   (D) Diesel cycle

15. A flow is said to be laminar when

(A) The fluid particles moves in a zig zag manner

(B) Reynolds number is high

(C) ✓ Fluid particles move in layers

(D) Vanes directly with distance

16. In MPFI engine, fuel is injected in the port during

(A) ✓ the suction stroke   (B) the beginning of compression stroke

(C) the end of compression stroke   (D) the power stroke

17. In a catalytic convertor, the catalyst Platinum and Palladium are used to oxidise

(A) CO   (B) CO, NO_x

(C) HC, NO_x (D) ✓ CO, HC

18. The firing order is the

   (A) sequence in which the cylinders are numbered

   (B) ✓ sequence in which the cylinders deliver their power strokes

   (C) sequence in which the valves closes

   (D) sequence in which the valves open

19. A thermistor used in an alternator regulator is to

   (A) control maximum voltage

   (B) control maximum current

   (C) control maximum voltage and current

   (D) ✓ compensate for temperature change

20. The colour of positive plate of lead acid battery is

   (A) ✓ Brown   (B) Grey

   (C) White   (D) Black

21. A spark plug having a longer path of heat travel is called as

   (A) ✓ Hot plug

   (B) Cold plug

   (C) Spark plug with resistor

   (D) Spark plug centre electrode

22. What is the purpose of a condenser in a battery coil ignition system?

   (A) To safeguard the primary circuit

   (B) To safeguard the secondary circuit

   (C) To safeguard the cam

   (D) ✓ To safeguard the breaker points

23. In modern vehicles, the headlight dimming switch is mounted on the

   (A) ✓ steering column   (B) dash board

   (C) flour board   (D) side panel

24. Which one of the following is used in trucks?

    (A)   Semi-floating rear axle

    (B)   Fully-floating rear axle ✓

    (C)   Three-quarter floating rear axle

    (D)   Non-floating rear axle

25. Which one of the following is used to reverse the direction of rotation in a gearbox?

    (A)   Main shaft   (B)   Primary drive

    (C)   Lay shaft   (D)   Idler gear ✓

26. By using synchronizing device, the two involved adjacent gears have their speeds

    (A)   increased   (B)   reduced

    (C)   equalized ✓   (D)   unequalized

27. The purpose as a recirculating ball type steering gear box is to reduce the

    (A)   operating friction ✓   (B)   operating cost

    (C)   toe-out during turns   (D)   number

28. Tread distortion is least on ————————— tyres.

    (A)   radial ply tyres ✓   (B)   cross ply tyres

    (C)   cross ply belted tyres   (D)   bias ply tyres

29. Which one of the following is NOT an effect of wheel lock?

    (A)   reduced steerability

    (B)   swings around

    (C)   results in flat spots on tyre

    (D)   increased tread life ✓

30. Lateral bending of the frame side members may be caused on account of

    (A)   weight of passengers   (B)   side wind ✓

    (C)   engine torque   (D)   braking torque

31. If the rear axle has 4 : 1 gear ratio, the pinion gear must turn eight times to cause the ring gear to rotate

    (A) one time   (B) two times ✓

    (C) three times   (D) four times

32. Which one of the following is not a part of a car chassis?

    (A) Wheels   (B) Front axle

    (C) Steering system   (D) Trunk ✓

33. The frame may get distorted to a parallelogram shape due to ————————

    (A) Weight of the vehicle   (B) Weight of the passengers

    (C) Cornering force   (D) Impact with road obstacle ✓

34. Aerodynamic lift force is influenced by

    (A) Pressure difference between lower and upper regions of a car ✓

    (B) Flow over many exterior components of the car

    (C) Pressure difference between frontal and rear regions of a car

    (D) Internal flow through the car

35. In heavy commercial vehicle, the load on the body is supported by

    (A) Suspension system   (B) Axles

    (C) Chassis frame ✓   (D) Tyres

36. The central gear of an epicyclic gear set is called a

    (A) Ring gear

    (B) Sun gear ✓

    (C) Planet gear

    (D) None of these

37. In G82-Drilling or counter boaring cycle, the letter 'K' refers to

    (A)   Distance from I to R level   (B)   Dwell time

    (C)   Feed rate   (D) ✓ No. of repeats

38. M codes in CNC par programs are

    (A) ✓ Switching functions

    (B)   Measurement functions

    (C)   Preparatory functions

    (D)   Compensation functions

39. GUI is the acronym for

    (A)   Graphical Universal Interface

    (B)   Graphical Unique Interaction

    (C) ✓ Graphical User Interface

    (D)   Graphical Unique Interface

40. Dwell is the time

    (A) ✓ For which the contact breaker points remain closed

    (B)   For which the point remain open

    (C)   Time during which intet and exhaust valves are open

    (D)   None of the above

41. Mercury does not wet glass. This is due to property of liquid known as

    (A)   Adhesion   (B)   Cohesion

    (C) ✓ Surface tension   (D)   Viscosity

42. Bin cards are used for —————— in industries

    (A)   Machine Loading   (B) ✓ Stores

    (C)   Accounts   (D)   Inventory control

43. The lower age limit for driving motor vehicles

    (A) 16 years   (B) 18 years

    (C) 21 years   (D) No age limit

44. The fuel cost in road transport costing is

    (A) Fixed cost   (B) Running cost

    (C) Capital cost   (D) Interest cost

45. Trafficators are light signals used for

    (A) Heavy traffic

    (B) Light traffic

    (C) Reversing the car in traffic

    (D) Indicating the direction in which the vehicle is turning

46. A pathline describes

    (A) The velocity direction at all points on the line

    (B) The path followed by the particles in a flow

    (C) The path over a period of times of a single particle that has passed out at a point

    (D) The instantaneous position of all particles that have passed a point

47. Which one of the following material is commonly used for crane hooks?

    (A) Cast iron

    (B) Wrought iron

    (C) Mild steel

    (D) High speed steel

48. Contact breaker points used in ignition system are generally made of

    (A) Plastic   (B) Copper

    (C) Tungsten   (D) Steel

49. The market price of a product is Rs. 2/unit. To make, we need a fixed cost of Rs. 16,000/- and variable cost of Rs. 10/unit. Find the break even point.

(A) 1000   (B) 1500

(C) 2000   (D) 2500

50. Which ISO stands for 'Quality Management and quality system elements – Guidelines for services standard'

(A) ISO 9001   (B) ISO 9002

(C) ISO 9003   (D) ISO 9004

51. The Father of Industrial Engineering and Management is

(A) Adam Smith   (B) James Watt

(C) Henry L. Gantt   (D) Frederic Taylor

52. The motivational needs according to Hygiene theory are

(A) Salary   (B) Security

(C) Status   (D) All (A), (B) and (C)

53. A company wants to purchase 5000 kg. Raw material for producing a particular item per year. It is found that cost of placing an order is Rs. 50 and cost of carrying inventory is 20% of inventories investment. The purchase price is Rs. 10 per kg. Determine the optimum lot size

(A) 1000 kg/order   (B) 1500 kg/order

(C) 500 kg/order   (D) 100 kg/order

54. Pareto principle advocates

(A) 60–40 rule   (B) 20–80 rule

(C) 80–20 rule   (D) 40–60 rule

55. What is the total cost in break even analysis?

(A) Fixed Cost   (B) Variable Cost

(C) Fixed Cost + Variable Cost   (D) Fixed Cost + Variable Cost + Overheads

56. In two handed process chart, which symbol denotes hold an object?

   (A) Inspection   (B) Storage

   (C) Delay   (D) Operation

57. The different types of movement in flow diagram are noted by different

   (A) Thickness   (B) Symbols

   (C) Colours   (D) Numberings

58. The symbol below used in method study denotes

                          D

   (A) Operation   (B) Inspection

   (C) Delay   (D) Storage

59. Arrange the steps involved in method study procedure in Ascending order.

   i.   EXAMINE

   ii.   DEVELOP

   iii. RECORD

   iv.   SELECT

   (A) ii, i, iv, iii   (B) iv, iii, i, ii

   (C) i, ii, iii, iv   (D) iii, iv, ii, i

60. In work measurement, which one focuses on recording of delays, interruptions and ineffective time

   (A) Production study   (B) Time study

   (C) Ratio delay study   (D) Analytical estimating

61. If Observed Time = 1 min, Observed Rating = 120% and Standard Rating = 100%. Calculate basic time
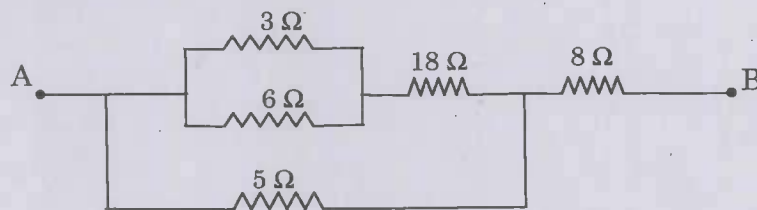
   (A) 1.2 min   (B) 1.5 min

   (C) 2.1 min   (D) 2.4 min

62. Chemical reaction between finely divided aluminium and iron oxide takes place in

   (A)   Oxy Acetylene Welding

   (B)   Spot Welding

   (C)   Percussion Welding

   (D)   Thermit Welding ✓

63. How can you feed the work piece in up milling process?

   (A)   against the rotating cutter ✓

   (B)   at angle of 60° to the cutter

   (C)   in the direction of the cutter

   (D)   at the right angle to the cutter

64. In a shaper, the metal is removed during

   (A)   forward stroke ✓

   (B)   return stroke

   (C)   both the forward and return stroke

   (D)   neither the forward stroke nor return stroke

65. The bottles from thermoplastic material are made by

   (A)   Compression moulding

   (B)   Injection moulding

   (C)   Blow moulding ✓

   (D)   Extrusion moulding

66. A casting defect which results in general enlargement of casting is known as

   (A)   Shift

   (B)   Sand wash

   (C)   Swell ✓

   (D)   Blow hole

67. One Horse power is equal to the power used to lift ————— of for a distance of one meter in one second

   (A) 25 kg   (B) 50 kg

   ✓(C) 75 kg   (D) 100 kg

68. The property which opposes the establishment of magnetic flux in it is called as

   (A) Magneto motive force   (B) Magnetic flux density

   ✓(C) Reluctance   (D) Magnetic flux

69. Find the total resistance in this circuit

   ✓(A) 10   (B) 12

   (C) 14   (D) 8

70. Ohm's law states that V =

   (A) I/R

   (B) I − R

   ✓(C) IR

   (D) I + R

   Where

   V = voltage

   R = Resistance

   I = Current

71. The Electrical potential is defined by

   ✓(A) Work done / Charge

   (B) Work done / Second

   (C) Work done / Volt

   (D) Work done / Resistance

72. Consider the following assumptions in theory of bending

   1. The material of the beam is perfectly homogeneous throughout.

   2. The stress induced is not proportional to the strain

   3. The loads are applied in the plane of bending.

   Which of the above statements are true?

   (A) 1 only   (B) 1 and 3

   (C) 2 only   (D) 2 and 3

73. A solid circular shaft transmits 22 kW power at 200 rpm. What is the torque in Nm?

   (A) 400   (B) 700

   (C) 900   (D) 1050

74. The equivalent torque in case of shaft subjected to combined bending moment and torsion is equal to

   (A) $\sqrt{M^2 + T^2}$ (B) $M^2 + T^2$

   (C) $\sqrt{M^2 - T^2}$ (D) $\dfrac{M^2 + T^2}{2}$

75. In laminated spring, the load at which the plates become straight is called as

   (A) Working load   (B) Safe load

   (C) Dead load   (D) Proof load

76. If the work done per cycle in a reciprocating air compressor (single acting) is 2 KJ, then find out the power required to drive the compressor. Take speed, as 120 rpm

   (A) 2 kW   (B) 4 kW

   (C) 60 kW   (D) 120 kW

77. The critical point of water is

   (A) 221.297 bar and 374.15°C

   (B) 101.325 bar and 374.15°C

   (C) 230.297 bar and 100°C

   (D) 101.325 bar and 100°C

78. In a vapour compression refrigeration system, the function of a condenser is

(A) to convert high pressure liquid refrigerant into high pressure vapour refrigerant

(B) to convert high pressure vapour refrigerant into high pressure liquid refrigerant

(C) to convert low pressure liquid refrigerant into low pressure vapour refrigerant

(D) to convert low pressure vapour refrigerant into low pressure liquid refrigerant

79. Find out the name of the cycle based on which the steam turbine works

(A) Diesel cycle

(B) Dual cycle

(C) Otto cycle

(D) Rankine cycle

80. The fuel used in a pressurised water reactor is

(A) Radium

(B) Thorium

(C) Lead

(D) Enriched uranium

81. Which one of following is false related to impulse turbine?

1. The blades are symmetrical

2. The steam pressure is reduced during its flow through moving blades

3. The steam impinges on the bucket with kinetic energy

(A) 1 only

(B) 1 and 2

(C) 2 and 3

(D) 2 only

82. In MS Excel, keyboard short cut for chart creation is

(A) F 11

(B) F 12

(C) F 10

(D) F 9

83. In MS Excel, making No. of cells into one is called

(A) Stretching

(B) Merging

(C) Tracking

(D) Mixing

84. A definite area or space where some thermodynamic process takes place is known as

(A) Thermodynamic system

(B) Thermodynamic cycle

(C) Thermodynamic process

(D) Thermodynamic law

85. What is the formula to find out theoretical discharge through a venturimeter?

a_1 – area of Cross section of pipe

a_2 – area of cross section of venturi

h – difference in head

(A) $\dfrac{\sqrt{a_1^2 - a_2^2}}{a_1 \cdot a_2} \sqrt{2gh}$

(B) $\dfrac{\sqrt{a_1^2 - a_2^2}}{a_1 a_2} + \sqrt{2gh}$

(C) $\dfrac{a_1 a_2}{\sqrt{a_1^2 - a_2^2}} + \sqrt{2gh}$

(D) $\dfrac{a_1 a_2}{\sqrt{a_1^2 - a_2^2}} \sqrt{2gh}$

86. Surface tension is expressed in

(A) N/m

(B) N/m^2

(C) Nm

(D) N

87. Which of the following statements are true about Kaplan turbine?

1. These are low head turbine

2. Blades are adjustable

3. It is a tangential flow type turbine

(A) 1 only

(B) 1 and 2

(C) 3 only

(D) 1, 2 and 3

88. The operation in which the suction pipe, casing of the pump and a portion of the delivery pipe upto the delivery valve is completely filled up with water is called as

   (A)   Cavitation   (B)   Cleaning

   (C)   Casing   (D) ✓ Priming

89. In the "MICLASS" part classification and coding system Ninth and tenth digits represents

   (A)   Main shape   (B)   Shape elements

   (C)   Material code   (D) ✓ Tolerance codes

90. ————————— is a 3D object consists of set of points together with the edges connecting various pairs.

   (A) ✓ Wire frame modeling

   (B)   Surface frame modeling

   (C)   Solid frame modeling

   (D)   Hybrid frame modeling

91. In graphic standards, GKS stands for

   (A)   Geometric Kernal System

   (B) ✓ Graphics Kernal System

   (C)   Geometric Kernal Standard

   (D)   Graphics Kernal Standard

92. Which one is a design attribute in parts classification and coding system.

   (A)   Operation sequence

   (B) ✓ Length to diameter ratio

   (C)   Surface finish

   (D)   Batch size

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

   (A) Short bearing

   (B) Long bearing

   (C) Medium bearing

   (D) Square bearing

94. In a full journal bearings, the angle of contact of the bearing with the journal is

   (A) 120°   (B) 180°

   (C) 270°   (D) 360°

95. 18–4–1 High Speed steel contains

   (A) 18% chromium, 4% tungston and 1% vanadium

   (B) 18% vanadium, 4% tungston and 1% chromium

   (C) 18% tungston, 4% chromium and 1% vanadium

   (D) 8% tungston, 14% chromium and 1% vanadium

96. The ability of a material to resist deformation under stress is called

   (A) Strength   (B) Ductility

   (C) Malleability   (D) Stiffness

97. According to Indian Standard specification, 100 H6/g5 means basic size is 100 mm and

   (A) Tolerance grade for the hole is 6 and for shaft is 5

   (B) Tolerance grade for the shaft is 6 and for hole is 5

   (C) Tolerance grade for the shaft is 4 to 8 and for the hole is 3 to 6

   (D) Tolerance grade for the hole is 4 to 8 and for the shaft is 3 to 7

98. When a tensile or compressive force (P) acts on a body, the change in its length is given by

(A) ✓ $\dfrac{Pl}{AE}$

(B) $\dfrac{AE}{Pl}$

(C) $\dfrac{PE}{Al}$

(D) $\dfrac{PA}{lE}$

99. Babbilt metal is a

(A) lead base alloy

(B) copper base alloy

(C) ✓ tin base alloy

(D) cadmium base alloy

100. Rankine's theory is used for

(A) ductile materials

(B) elastic materials

(C) plastic materials

(D) ✓ brittle materials

101. The ratio of the ultimate stress to the design stress is known as

(A) ✓ Factor of safety

(B) Elastic limit

(C) Bulk modulus

(D) Youngs modulus

102. The ability of the material by which it can be flattened into thin sheets by hammering or rolling is known as

(A) plasticity

(B) elasticity

(C) ✓ malleability

(D) ductility

103. Work pieces which are heavy, irregular, unsymmetrical or bulky can be conveniently held and machined using

  (A) Jig boring machine

  (B) Drilling machine

  (C) Horizontal boring machine

  (D) Plain milling machine

104. The following operation are possible on vertical boring machine

  (A) Machines a cylindrical surface and turning a flat surface

  (B) Cutting off and rearing operation for downward movement of the saddle

  (C) Machines flat surface and turning cylindrical surface

  (D) Taper boring and taper turning operation by down feed movement of the tool head

105. ————— does not influence wheel wander.

  (A) excessive caster

  (B) loose steering linkages

  (C) worn steering gears

  (D) excessive side thrust

106. In arc welding processes, penetrates is least for

  (A) Direct current reverse polarity

  (B) Direct current straight polarity

  (C) Direct Current

  (D) Alternative current

107. When large number of components are machined from a bar on a automatic machine, the bar is held in

  (A) magnetic chuck

  (B) collect chuck

  (C) four jaw chuck

  (D) three jaw chuck

MVIMA/18
[Turn over

108. The knocking tendency in spark ignition engines may be decreased by

   (A)   controlling the air-fuel mixture

   (B)   controlling the ignition timing

   (C)   reducing the compression ratio ✓

   (D)   increasing the compression ratio

109. A low specific speed Francis turbine is —————————.

   (A)   axial flow turbine   (B)   tangential flow turbine

   (C)   mixed flow turbine   (D)   radial flow turbine ✓

110. The dimensionless specific speed of a centrifugal pump is

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

   (C) $\dfrac{N\sqrt{Q}}{(gH)^{3/4}}$ ✓   (D) $\dfrac{N\sqrt{Q}}{H^{3/4}}$

111. A series of operations, which takes place in a certain order and restore the initial condition is known as

   (A)   reversible cycle   (B)   irreversible cycle

   (C)   thermodynamic cycle ✓   (D)   thermodynamic system

112. Air standard Otto cycle efficiency is expressed as

   (A) $1-\left(\dfrac{1}{R}\right)^{\frac{\gamma-1}{\gamma}}$ (B) $1-\left(\dfrac{1}{R}\right)^{\frac{\gamma+1}{\gamma}}$

   (C) $\left(\dfrac{1}{R}\right)^{\frac{1}{\gamma-1}}$ (D) $1-\left(\dfrac{1}{R}\right)^{\gamma-1}$ ✓

   $\gamma = \dfrac{C_P}{C_V}$,

   R = Compression ratio.

113. Super chargers connected in SI engines will increase

(A) pressure of air
(B) pressure of fuel
(C) pressure of air-fuel mixture ✓
(D) temperature of air-fuel mixture

114. The direction of air-flow in a Solex carburettor is

(A) up-draft
(B) down draft ✓
(C) semi-down draft
(D) side draft

115. A thermostat valve in a water cooling system generally allows water to flow just above

(A) 50°C
(B) 55°C
(C) 60°C
(D) 80°C ✓

116. In a 4-stroke IC engine, how many revolutions of crank shaft produces power in each cycle?

(A) One
(B) Two ✓
(C) Three
(D) Four

117. In a CRDI diesel engine, the function of common rail is to

(A) collect the excess fuel
(B) pump the fuel
(C) inject the fuel
(D) store the fuel and maintain its pressure ✓

118. The volume that the piston displaces as it moves from BDC to TDC is the

(A) Clearance volume
(B) Cylinder volume
(C) Piston volume
(D) Stroke volume ✓

119. The device that controls the amount of air entering the spark-ignition engines is the

(A) Exhaust manifold
(B) Throttle valve ✓
(C) Air filter
(D) Intake manifold

120. Rotation of the reluctor

    (A) ✓ moves a magnetic field through the pickup coil

    (B)   trips the contacts in the distributor

    (C)   controls the secondary voltage

    (D)   limits vacuum advance

121. In the speed control (or) cruise control system, an actuator motor (or) vacuum servo connects to the

    (A)   transmission linkage   (B) ✓ throttle linkage

    (C)   speedometer cable   (D)   brake cable

122. In the working principle of a generator the direction of flow of current is determined by

    (A)   Ohm's law

    (B)   Kirchoff's law

    (C) ✓ Fleming's left hand rule

    (D)   Fleming's right hand rule

123. A discharged lead-acid battery has ——————— on its plates.

    (A) PbO_2 (B) ✓ $PbSO_4$

    (C) Pb (D) Pb_3O_4

124. The gap between the electrodes in a spark plus is approximately

    (A)   0.2 mm   (B)   1.5 mm

    (C) ✓ 0.8 mm   (D)   0.1 mm

125. The smallest gears in the differential caring are

    (A) ✓ planet gears   (B)   sun gears

    (C)   side gears   (D)   annulus

126. Air can enter into the hydraulic brake system because of

    (A)   self adjusters not working

    (B)   failure of one section of hydraulic system

    (C)   linings contaminated with oil or brake fluid

    (D)   low brake oil level in the reservoir of master cylinder

127. An epicyclic gear box includes the following except

    (A)   a sun gear   (B)   a worm gear

    (C)   a ring gear   (D)   a planet-pinion carrier

128. ——————— is termed as the interior roof of a passenger car.

    (A)   Firewall   (B)   Tunnel

    (C)   Headliner   (D)   Parcel tray

129. Choose the incorrect statement with respect to construction of a moped.

    (A)   The frame itself acts as a vehicle body

    (B)   Fuel tank is not an integral part of the frame

    (C)   Components are mounted on the body

    (D)   Bench type seat for passenger and pillion

130. Pick the suitable choice for the given statement.

    Statement : The rear position is joined to the main vehicle body by covered pilot allowing easy access between the two reactions.

    (A)   Micro bus

    (B)   Double deck bus

    (C)   Articulated bus

    (D)   Two level single deck bus

131. Which one of the following vehicle is not an LCV?

    (A)   Isuzu D-max   (B)   Mahindra Jeeto

    (C)   Tata Indigo   (D)   Ashok Leyland Dost

MVIMA/18

[Turn over

132. Some preparatory functions need not be explicitly stated, after defined in the previous block are called —————— 'G' functions

    (A) Fashion   (B) Modal

    (C) Digital   (D) Miscellaneous

133. Primitive instances are combined using Boolean set operations to create complex objects is called

    (A) Constructive solid geometry

    (B) Boundary representation

    (C) All of the above

    (D) None of the above

134. The software that controls computer's work flow, organize its data and perform house keeping function is

    (A) Operating software

    (B) Graphics software

    (C) Application software

    (D) Programming software

135. In the CNC part program, the function G01 represents

    (A) Rapid Positioning

    (B) Linear Interpolation

    (C) Circular Interpolation CW

    (D) Circular Interpolation CCW

136. In CAD, the representation by which the primitive instances are combined using Boolean set operations to create complex objects is known as

    (A) Spatial enumeration

    (B) Constructive solid geometry

    (C) Cell decomposition

    (D) Boundary representation

137. Gantt chart is used for

(A) Inventory control   (B) Material handling

(C) Production schedule   (D) Routing

138. In materials management, when you order the economic ordering quantity Q, then

(A) Ordering cost will be more

(B) Carrying cost will be more

(C) Total cost will be more

(D) Total cost will be minimum

139. According to FW Taylor's principles of management which among the following factors will not improve motivation of employees

(A) Participative management

(B) Job enrichment

(C) Good personnel policy

(D) Unfair wages and salary

140. Choose the correct one among the following indicators as a sign of motivation

(A) Low output

(B) Increase in accident rate

(C) Indiscipline

(D) Sense of belonging to the organisation

141. 'Make' (or) 'Buy' Decision is related with

(A) Demand forecasting   (B) Routing

(C) Scheduling   (D) Product planning

142. Identify which one of the following functions of PPC department is not under planning

(A) Demand forecasting   (B) Routing

(C) Scheduling   (D) Despatching

143. Ferro magnetic Alpha iron transforms to paramagnetic alpha iron at the following temperature on heating.

(A) 723°C
(B) 777°C ✓
(C) 910°C
(D) 1400°C

144. The unit of conductance is ————— and it is denoted by symbol —————.

(A) Henry, C
(B) Farad, G
(C) Ohms, C
(D) Siemen, G ✓

145. Unit of energy is

(A) Joule ✓
(B) Newton
(C) Watt
(D) Henry

146. The dry cell is a

(A) Primary cell ✓
(B) Secondary cell
(C) Voltaic cell
(D) Polarised cell

147. Four capacitors each of 50 μF are connected in parallel. The equivalent capacitance will be

(A) 40 μF
(B) 80 μF
(C) 120 μF
(D) 160 μF ✓

148. The purpose of using laminations in the armature core of a DC generator is

(A) to increase the resistance
(B) to reduce the current
(C) to increase the e.m.f.
(D) to reduce eddy current loss ✓

149. Which one of the following is known as the operation of smoothing and squaring the surface around a hole?

(A) Counter sinking
(B) Counter boring
(C) Trepanning
(D) Spot facing ✓

150. ABC analysis deals with

    (A)   Analysis of process chart

    (B)   Flow of material

    (C)   Ordering schedule of job

    (D)   Controlling inventory cost

151. Malcolm Baldrige National Quality Award (MBNQA) is for

    (A)   Total Quality Management

    (B)   Total Quality Control

    (C)   International Standard Organization

    (D)   Total Productive Maintenance

152. Which one of the following is the objective of ISO-9000 family of quality management?

    (A)   Employee Satisfaction

    (B)   Skill enhancement

    (C)   Customer satisfaction

    (D)   Environmental issues

153. What is the correct sequence of operations in production planning control?

    (A)   Routing – Scheduling – Dispatching – Controlling

    (B)   Scheduling – Routing – Dispatching – Controlling

    (C)   Dispatching – Routing – Scheduling – Controlling

    (D)   Routing – Scheduling – Controlling – Dispatching

154. In cumulative type of stop watch time study, the hands of stop watch returned to zero at

    (A)   End of every element

    (B)   End of every complete process

    (C)   Half the element

    (D)   Half the process

155. Which one of the following is the mechanical factor of accident?

    (A)   Long Working Hours

    (B)   Poor Lighting

    (C)   High Temperature

    (D)   Ungaurged Moving Parts ✓

156. Which of principle of plant layout reduces the production cost?

    (A)   Principle of Integration

    (B)   Principle of Movement ✓

    (C)   Principle of Flow

    (D)   Principle of Cubic Space Usage

157. Cold working of steel is defined as working

    (A)   at its recrystallisation temperature

    (B)   above its recrystallisation temperature

    (C)   below its recrystallisation temperature ✓

    (D)   at two thirds of the melting temperature of the metal

158. The equation $VT^n = C$ is known as Taylor's equation. The value of 'n' for High speed tool is

    (A)   0.1 ✓   (B)   0.20 to 0.25

    (C)   0.28 to 0.30   (D)   0.40 to 0.55

159. The operation of finishing and sizing a hole is called as

    (A)   Boring   (B)   Reaming ✓

    (C)   Counter boring   (D)   Taper boring

160. Which of the following material is traded in the name of "BOROZON"?

    (A)   Coated carbide tools

    (B)   Cubic boron nitride ✓

    (C)   High speed steels

    (D)   Cemented carbide tools

161. State the purpose of riser

(A) Deliver molten metal into the mould cavity

(B) Feed the molten metal to the casting in order to compensate for the shrinkage

(C) Act as a reservoir for the molten metal

(D) Deliver molten metal from pouring basin to gate

162. Which one happens during charging of battery?

(A) The anode becomes dark chock late brown and cathode becomes grey metallic lead

(B) Specific gravity of acid decreases

(C) Voltage of cell decreases

(D) The cell gives out energy

163. Which type of motor can be brought to rest immediately to rest?

(A) Induction motor

(B) Stepper motor

(C) Servo motor

(D) Universal motor

164. In 3ϕ AC, the relation between line voltage and phase voltage in star connection

(A) $V_L = V_{Ph}$

(B) $V_L = \sqrt{3}\, V_{Ph}$

(C) $V_L = \sqrt{2}\, V_{Ph}$

(D) $V_L = \sqrt{3}\, V_{Ph} \cos\phi$

165. In 3ϕ AC, if similar ends of three phases are joined together to form a common junction is called

(A) Delta connection

(B) Mesh connection

(C) Series connection

(D) Star connection

166. The value of form factor is always

(A) 1

(B) 0

(C) 1.11

(D) 0.57

MVIMA/18

[Turn over

167. Find out the correct relationship among Young's moduls (E), Bulk modulus (K) and modulus of rigidity (C)

(A) ✓ $E = \dfrac{9\,KC}{3K + C}$

(B) $C = \dfrac{9\,EK}{3K + E}$

(C) $K = \dfrac{9\,EC}{3E + C}$

(D) $K = \dfrac{9\,EC}{E + 3C}$

168. The ratio between "Moment of Inertia about the neutral axis" and " Distance of the most distant point of the section from the neutral axis" is known as

(A) Bulk modulus

(B) Rigidity modulus

(C) ✓ Section modulus

(D) Young's modulus

169. The ratio of linear stress to linear strain is known as

(A) Poisson's Ratio

(B) Modulus of Rigidity

(C) Bulk modulus

(D) ✓ Modulus of Elasticity

170. The corrosion resistance property of steel is improved by adding

(A) Tungsten

(B) Silicon

(C) Sulphur

(D) ✓ Chromium

171. Robert Hooke discovered experimentally that within elastic limit

(A) Stress = Strain

(B) ✓ $\dfrac{\text{Stress}}{\text{Strain}} = \text{Constant}$

(C) Stress = 3 × Strain

(D) Strain = 3 × Stress

172. The bending equation is written as

(A) $\dfrac{M}{I} = \dfrac{Y}{\sigma} = \dfrac{E}{R}$

(B) $\dfrac{M}{I} = \dfrac{\sigma}{Y} = \dfrac{R}{E}$

(C) ✓ $\dfrac{M}{I} = \dfrac{\sigma}{Y} = \dfrac{E}{R}$

(D) $\dfrac{M}{I} = \dfrac{Z}{d} = \dfrac{C}{R}$

173. In summer air-conditioning the process used is known as

    (A)   De Humidification

    (B)   Cooling and DeHumidification

    (C)   Humidification

    (D)   Heating and Humidification

174. The temperature of air recorded by thermometer, when the moisture present in it begins to condense is called

    (A)   Dry Bulb temperature

    (B)   Wet Bulb temperature

    (C)   Dew Point temperature

    (D)   Wet Bulb Depression

175. Consider the following statements related to multistage compression

    1.   Improves volumetric efficiency for the given pressure ratio

    2.   It reduces the leakage loss considerably

    3.   It gives more uniform torque.

Which of the above statements are correct?

    (A)   1 and 2

    (B)   2 and 3

    (C)   3 only

    (D)   1, 2 and 3

176. Which of the following is a water tube boiler?

    (A)   Lancashire boiler

    (B)   Locomotive boiler

    (C)   Cochran boiler

    (D)   Babcock and Wilcox boiler

177. Otto cycle is also known as

    (A)   Constant pressure cycle   (B)   Constant entropy cycle

    (C)   Constant volume cycle   (D)   Constant temperature cycle

178. Find the odd-man out
    (A) Bit map
    (B) JPEG
    (C) GIF
    (D) DOC ✓

179. WAN stands for
    (A) Wide Area Network ✓
    (B) World Area Network
    (C) Wide Artificial Network
    (D) Wide Access Network

180. An operating system is
    (A) Integrated software
    (B) Application software
    (C) CD-ROM software
    (D) System software ✓

181. In a computer, the ———————— subsystem serves as a manager of the other systems
    (A) ALU
    (B) Input/Output
    (C) Memory
    (D) Control Unit ✓

182. The speed of a dot matrix printer is measured
    (A) Lines per inch
    (B) Lines per second
    (C) Characters per second ✓
    (D) Characters per inch

183. CPU stands for
    (A) Central Production Unit
    (B) Central Processing Unit ✓
    (C) Critical Power Unit
    (D) Control Processing Unit

184. Which one of the following computer is the extremely fast computer?
    (A) Mini computer
    (B) Mainframe computer
    (C) Personal computer
    (D) Super computer ✓

185. Hydraulic press works based on

(A) Pascal's law   (B) Buoyancy law

(C) Continuity equation   (D) Bernoulli's theorem

186. According to Bernoulli's theorem

(A) $Z + \dfrac{P}{w} + \dfrac{V^2}{g} = $ const.   (B) $Z + \dfrac{P}{w} + \dfrac{V^2}{2g} = $ const.

(C) $Z - \dfrac{P}{w} + \dfrac{V^2}{2g} = $ const.   (D) $Z + \dfrac{P}{w} - \dfrac{V^2}{g} = $ const.

187. The simplest form of manometer is called

(A) U–tube Manometer

(B) Single column Manometer

(C) Differential Manometer

(D) Piezometer

188. The ratio between weight of a fluid to its volume is called

(A) Specific gravity   (B) Specific weight

(C) Mass Density   (D) Specific volume

189. The latent heat of vapourisation at critical point is

(A) Less than zero   (B) Greater than zero

(C) Equal to zero   (D) Equal to unity

190. Which one of the following statement is true?

(A) Ideal Fluid is compressible

(B) Ideal Fluid has no viscosity

(C) Real fluid does not have viscosity

(D) The unit for dynamic viscosity is cm^2/S

191. The degree of tightness or looseness between the two mating parts is called as

    (A)   Tolerance   (B)   Fits

    (C)   Interference   (D)   Allowance

192. The heat generated in journal bearing is termed as :

    (Where μ = coefficient of friction

            W = Load on the bearing

            V = Rubbing Velocity)

    (A) $Q_g = \mu V$

    (B) $Q_g = \dfrac{\mu W}{V}$

    (C) $Q_g = \mu W$

    (D) $Q_g = \mu WV$

193. The bearing which can support steady loads without any relative motion between the journal and bearing is called as

    (A)   Thick film bearing

    (B)   Thin film bearing

    (C)   Zero film bearing

    (D)   Hydro static bearing

194. What is the difference between the upper limit and lower limit of a dimension?

    (A)   Nominal size

    (B)   Basic size

    (C)   Actual size

    (D)   Tolerance

195. In CNC system, MCU stands for

    (A)   Modem Computer Unit

    (B)   Machine Computer Unit

    (C)   Machine Control Unit

    (D)   Modem Control Unit

196. 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

197. In CNC Electric Discharge Machining, the amount of heat produced due to spark is about

    (A) $1100°C$ (B) $1200°C$

    (C) $1500°C$ (D) $1700°C$

198. The time required to change a tool in a CNC Machine using ATC is around

    (A)   4 – 6 Seconds   (B)   3 – 7 Seconds

    (C)   1 – 3 Seconds   (D)   8 – 10 Seconds

199. In CNC Machine, the principle motion of cutting tool or the work piece designated by

    (A)   A Axis   (B)   X Axis

    (C)   Y Axis   (D)   B Axis

200. In CNC Programming G76 is for

    (A)   Finish turning canned cycle

    (B)   Multiple facing cycle

    (C)   Multiple thread cutting cycle

    (D)   Peck drilling cycle

SPACE FOR ROUGH WORK