

Question Booklet No. :

CESME/2023

Register
Number

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2023

Paper – I

MECHANICAL ENGINEERING

(Diploma Standard)

Duration : Three Hours]

[Total Marks : 300

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

IMPORTANT INSTRUCTIONS

1. You will be supplied with this question booklet 15 minutes prior to the commencement of the examination.
2. This question booklet contains 200 questions. Before answering the questions, you shall check whether all the questions are printed serially and ensure that there are no blank pages in the question booklet. **If any defect is noticed in the question booklet, it shall be reported to the invigilator within the first 10 minutes and get it replaced with a complete question booklet. If the defect is reported after the commencement of the examination, it will not be replaced.**
3. Answer all the questions. All the 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 shade the answers. Instructions regarding filling of answers etc., which are to be followed mandatorily, are provided in the answer sheet and in the memorandum of admission (Hall Ticket).
6. You shall write and shade your question booklet number in the space provided on page one of the answer sheet with **BLACK INK BALL POINT PEN**. If you do not shade correctly or fail to shade the question booklet number, your answer sheet will be invalidated.
7. Each question comprises of five responses (answers) : i.e. (A), (B), (C), (D) and (E). You have to select **ONLY ONE** correct answer from (A) or (B) or (C) or (D) and shade the same in your answer sheet. If you feel that there are more than one correct answer, shade the one which you consider the best. **If you do not know the answer, you have to mandatorily shade (E).** In any case, choose **ONLY ONE** answer for each question. If you shade more than one answer for a question, it will be treated as a wrong answer even if one of the given answers happens to be correct.
8. 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 room during the time of the examination. After the examination, 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.
9. You should not make any marking in the question booklet except in the sheets before the last page of the question booklet, which can be used for rough work. This should be strictly adhered to.
10. Failure to comply with any of the above instructions will render you liable for such action as the Commission may decide at their discretion.

SEAL

SPACE FOR ROUGH WORK

1. The most commonly used standard code is
 (A) ASCII (B) EBCDIC
(C) BCD (D) FANUC
(E) Answer not known

2. Which of the following disks can be used for recording multiple times?
(A) CD ROM (B) CD-R
(C) DVD-ROM (D) CD-RW
(E) Answer not known

3. Algorithms should be
(A) Variable (B) Object oriented
 (C) Precise (D) Repetition
(E) Answer not known

4. Diamond shaped symbol in a flow chart indicates
(A) Input/Output (B) Process
 (C) Decision (D) Start
(E) Answer not known

5. Which of the following is not a secondary storage device?
(A) Hard disk drives (B) CD ROM
(C) DVD ROM (D) RAM
(E) Answer not known

6. A set of programs that controls and supervises a computer system's hardware and applications is called
(A) Control panel (B) Operating system
(C) Basic input output system (D) Programming Language
(E) Answer not known

7. Mini computers are often called _____ computers.
- (A) Intermediate (B) Transitional
 (C) Midrange (D) Micro
 (E) Answer not known
8. The ratio between tensions in a belt drive is given by _____ (where T_1 and T_2 – Tensions in belt
 μ – co-efficient of friction
 θ – Angle of contact)
- (A) $(T_1 + T_2) = e^{\mu\theta}$ (B) $T_1 \cdot T_2 = e^{\mu\theta}$
 (C) $\frac{T_1}{T_2} = e^{\mu\theta}$ (D) $T_1 = \frac{e^{\mu\theta}}{T_2}$
 (E) Answer not known
9. The formula to find the length of an open belt drive is _____ where
 r_1 = radius of larger pulley
 r_2 = radius of smaller pulley
 x = centre distance).
- (A) $L = \pi(r_1 - r_2) + 2x + \frac{(r_1 - r_2)^2}{x}$
 (B) $L = \pi(r_1 + r_2) + 2x + \frac{(r_1 + r_2)^2}{x}$
 (C) $L = \pi(r_1 + r_2) + 2x + \frac{(r_1 - r_2)^2}{x}$
 (D) $L = \pi(r_1 - r_2) + 2x + \frac{(r_1 + r_2)^2}{x}$
 (E) Answer not known

10. A cantilever is a beam whose
- (A) one end is fixed and the other end free
 - (B) both ends are fixed
 - (C) both ends are free
 - (D) both ends are simply supported
 - (E) Answer not known
11. A line shaft rotating at 200 rpm and torque is 955 N-m. Find the power transmission
- (A) 20 kW
 - (B) 20×10^3 kW
 - (C) 0.20 kW
 - (D) 20×10^3 Joules
 - (E) Answer not known
12. The ratio between polar moment of inertia and its outer radius of shaft is known as
- (A) Polar modulus of the section
 - (B) Section modulus
 - (C) Torque in that section
 - (D) Young's modulus of the section
 - (E) Answer not known
13. When a solid shaft is subjected to torsion, the shear stress induced in the shaft at it's centre is?
- (A) Zero
 - (B) Minimum
 - (C) Maximum
 - (D) Average
 - (E) Answer not known
14. In a simply supported beam carrying a uniformly distributed load of w per unit run over the whole span, the maximum bending moment is equal to
- (A) $\frac{wl^2}{4}$
 - (B) $\frac{wl^3}{6}$
 - (C) $\frac{wl^2}{6}$
 - (D) $\frac{wl^2}{8}$
 - (E) Answer not known

15. Which one of the following statement is incorrect?
- (A) strength is the ability of a material to resist the externally applied forces without breaking or yielding
 - (B) toughness is the special case of ductility which permits materials to be rolled (or) hammered into thin sheets
 - (C) brittles is the property of material opposite to ductility
 - (D) stiffness is the ability of a material to resist deformation under stress
 - (E) Answer not known
16. Which of the following ductile material is commonly used in Engg. practice in order of diminishing ductility?
- (A) Copper
 - (B) Aluminium
 - (C) Lead
 - (D) Zinc
 - (E) Answer not known
17. For the same material, length and given torque a hollow shaft weighs _____ a solid shaft.
- (A) less than
 - (B) more than
 - (C) equal to
 - (D) either (B) or (C)
 - (E) Answer not known
18. A type of beam which has its both ends are rigidity fixed is known as
- (A) Cantilever beam
 - (B) Fixed beam
 - (C) Continuous beam
 - (D) Simply supported beam
 - (E) Answer not known
19. Which of the following diode used in radio and TV receiver's tuning circuits?
- (A) Zener diode
 - (B) Varactor diode
 - (C) Signal diode
 - (D) Rectifier diode
 - (E) Answer not known

20. The output of a 2 input OR gate is zero only when its
- (A) both inputs are 0 (B) both inputs are 1
 (C) either input is 0 (D) either input is 1
 (E) Answer not known
21. The Root mean square value of the voltage is
- (A) $\frac{V_{\max}}{2}$ (B) $\frac{V_{\max}}{\sqrt{2}}$
 (C) $\frac{V_{\max}}{3}$ (D) $\frac{V_{\max}}{\sqrt{3}}$
 (E) Answer not known
22. Fleming's left hand rule is used to determine the direction of
- (A) induced e.m.f. (B) force experienced
 (C) flux produced (D) resistance induced
 (E) Answer not known
23. In 3ϕ AC, if dissimilar ends of three phases are joined together to form a common junction is called
- (A) Star connection (B) Series connection
 (C) Wye connection (D) Delta connection
 (E) Answer not known
24. In parallel circuit _____ is constant.
- (A) Current (B) Voltage
 (C) Resistance (D) Frequency
 (E) Answer not known
25. In 3ϕ AC, the relation between line current and phase current in star connection
- (A) $I_L = I_{ph}$ (B) $I_L = \sqrt{2}I_{ph}$
 (C) $I_L = \sqrt{3}I_{ph}$ (D) $I_L = I_{ph} \sin \phi$
 (E) Answer not known

26. Safety stock in Economic Order Quantity is calculated by
- (A) $(\text{Maximum lead time} - \text{Normal lead time}) \times \text{Consumption rate}$
 - (B) $(\text{Maximum lead time} + \text{Normal lead time}) \times \text{Consumption rate}$
 - (C) $(\text{Maximum lead time} \div \text{Normal lead time}) \times \text{Consumption rate}$
 - (D) $(\text{Maximum lead time} \times \text{Normal lead time}) \times \text{Consumption rate}$
 - (E) Answer not known
27. Machines or equipments losing their value because of its usage is due to a factor called
- (A) Physical decay
 - (B) Obsolescence
 - (C) Inadequacy
 - (D) Wear and Tear
 - (E) Answer not known
28. Which one of the following is NOT a depreciation method?
- (A) Sinking fund method
 - (B) Ranking method
 - (C) Straight line method
 - (D) Diminishing value method
 - (E) Answer not known
29. Some machines become outdated due to technological developments. Those machines are called as _____ machines.
- (A) Approximate
 - (B) Inadequate
 - (C) Absolute
 - (D) Obsolete
 - (E) Answer not known
30. In straight line method of depreciation the amount is calculated once in
- (A) Monthly
 - (B) Weekly
 - (C) Quarterly
 - (D) Yearly
 - (E) Answer not known

31. Payment made to a person for the service rendered by him is called as
- (A) Enumeration (B) Numeration
 (C) Remuneration (D) Recognition
(E) Answer not known
32. Henri Fayol evolved _____ number of principles regarding Scientific Management.
- (A) Ten (B) Twelve
(C) Thirteen (D) Fourteen
(E) Answer not known
33. Frederic Taylor's scientific approach to Management is to improve
- (A) Labour efficiency (B) Manager efficiency
(C) Machine efficiency (D) Mechanical efficiency
(E) Answer not known
34. Frederic Taylor's contribution on Management principles do not include the
- (A) Constitution of day's work (B) Wage payment system
 (C) Formation of unions (D) Elimination of waste
(E) Answer not known
35. Theory X in Industrial Management is a
- (A) Negative approach on Labour
(B) Positive approach on Supervisor
(C) Negative approach on Manager
(D) Positive approach on Labour
(E) Answer not known

36. A plan taken from existing Master plan in CAPP is
- I. Retrieval type
 - II. Generative type
- (A) I (B) II
- (C) Both I and II (D) Neither I nor II
- (E) Answer not known
37. The feedback device used to measure the absolute position reached by the slide, in a direct way is called as
- (A) Absolute encoder (B) Incremental encoder
 - (C) Linear scale (D) Tacho generator
 - (E) Answer not known
38. APC in a CNC machine stands for
- (A) Automatic Program Changer
 - (B) Automatic Part Changer
 - (C) Automatic Pallet Changer
 - (D) Automatic Product Changer
 - (E) Answer not known
39. The preparatory function used to execute the cutter radius compensation offset left is given by
- (A) G40 (B) G41
 - (C) G42 (D) G80
 - (E) Answer not known
40. The feed drive motors usually used in open-loop control systems are
- (A) AC Servomotor (B) DC Servomotor
 - (C) Stepper motor (D) Linear motor
 - (E) Answer not known

41. The modelling technique used to clearly define the solid form of an object from the manufacturing point of view but has no interior details of the object for manufacturing is known as
- (A) 2D modelling (B) Wireframe modelling
 (C) Surface modelling (D) Solid modelling
(E) Answer not known
42. The curve which uses the vertices as control points for approximating the generated curve that passes through the first and last point is known as
- (A) Bezier curve (B) Single curved surface
(C) Double curved surface (D) Polygon
(E) Answer not known
43. In the CSG, method the basic set operators used to combine the primitives to form the complex solid are called as
- (A) Logical operators (B) Arithmetic operators
 (C) Boolean operators (D) Trigonometric operators
(E) Answer not known
44. Boolean operations like union, difference and intersection are used in
- (A) Wireframe modelling
(B) Surface modelling
 (C) Constructive solid geometry
(D) Boundary-rep method
(E) Answer not known

45. The reference point on the cam follower which is used to generate the pitch curve is known as
- (A) Pitch print (B) Pitch circle
~~(C)~~ Trace print (D) Prime circle
(E) Answer not known
46. The periods during which the follower of a cam system remains at rest are known as
- ~~(A)~~ Dwell periods (B) Forward periods
(C) Return periods (D) Rise periods
(E) Answer not known
47. The working contour or working curve of a CAM is known as
- (A) Pitch curve ~~(B)~~ Cam profile
(C) Prime circle (D) Pitch circle
(E) Answer not known
48. The largest permissible size for a dimension is
- ~~(A)~~ Upper limit (B) Upper deviation
(C) Lower limit (D) Lower deviation
(E) Answer not known

49. $20_{-0.025}^{+0.035}$, mm what is the tolerance here?
- (A) 0.075 mm ✓(B) 0.060 mm
(C) 0.015 mm (D) 0.070 mm
(E) Answer not known
50. Which one of the bearing used for combined radial and axial loads
- (A) Cylindrical roller bearing
(B) Spherical roller bearing
✓(C) Taper roller bearing
(D) Needle roller bearing
(E) Answer not known
51. Which one of the following bearing used in the piston pin bearings in heavy duty diesel engine?
- (A) Taper roller bearings
✓(B) Needle roller bearings
(C) Spherical roller bearings
(D) Cylindrical roller bearings
(E) Answer not known
52. If Z =absolute viscosity of the lubricant in kg/m-s, N =speed of the journal in rpm, and P = bearing pressure in N/mm², then the bearing characteristics number is
- ✓(A) $\frac{ZN}{P}$ (B) $\frac{ZP}{N}$
(C) $\frac{Z}{PN}$ (D) $\frac{PN}{Z}$
(E) Answer not known

53. Which impurity makes the steel brittle?

- (A) Silicon
- (B) Sulphur
- (C) Manganese
- (D) Phosphorus
- (E) Answer not known

54. Wrought Iron is

- (A) Tough, Malleable, ductile
- (B) Very hard and brittle
- (C) Iron ore
- (D) With 3% – 4% carbon
- (E) Answer not known

55. The melting point temperature of tungsten is _____ °C

- (A) 2410
- (B) 2810
- (C) 3410
- (D) 3810
- (E) Answer not known

56. Match the following :

Metal	Properties
(a) Ductility	1. Spring steel
(b) Stiffness	2. Diamond
(c) Hardness	3. Steel
(d) Strength	4. Copper

- | | (a) | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A) | 1 | 2 | 3 | 4 |
| <input checked="" type="checkbox"/> (B) | 4 | 1 | 2 | 3 |
| (C) | 2 | 4 | 1 | 3 |
| (D) | 3 | 1 | 2 | 4 |
| (E) | Answer not known | | | |

57. The theoretical discharge of a single acting reciprocating pump is given by the relation

(A) $Q = \frac{LAN}{60} m^3/s$

(B) $Q = \frac{2LAN}{60} m^3/s$

(C) $q = \frac{LAN}{120} m^3/s$

(D) $Q = \frac{4LAN}{60} m^3/s$

(E) Answer not known

58. In a centrifugal pump the sum of suction head and delivery head is known as

(A) Manometric head

(B) Total head

(C) Static head

(D) Dynamic head

(E) Answer not known

59. For turbines, the ratio between power delivered to runner to power supplied at inlet is known as

(A) Mechanical efficiency

(B) Overall efficiency

(C) Speed ratio

(D) Hydraulic efficiency

(E) Answer not known

60. Which of the following water turbine does not require draft tube?

(A) Propeller turbine

(B) Pelton turbine

(C) Kaplan turbine

(D) Francis turbine

(E) Answer not known

61. Pelton wheel belongs to the following type

(A) Axial flow Impulse turbine

(B) Axial flow Reaction turbine

(C) Tangential flow Impulse turbine

(D) Tangential flow Reaction turbine

(E) Answer not known

62. Which one of the following turbine having less number of blades?
- (A) Francis turbine (B) Pelton wheel
(C) Impulse turbine ~~(D) Kaplan turbine~~
(E) Answer not known
63. Which of the following statement is correct in case of a pelton wheel?
- (A) It is a reaction turbine and is used for high head and low discharge
(B) It is a reaction turbine and is used for low head and high discharge
(C) It is impulse turbine and is used for low head and high discharge
~~(D) The pressure energy of water in converted into kinetic energy when passing through the nozzle~~
(E) Answer not known
64. A venturimeter measures the values based on the principle of _____ equation.
- (A) Quadratic ~~(B) Bernoulli's~~
(C) Cubic (D) Buoyancy
(E) Answer not known
65. Differential manometers are used for measuring
- (A) Velocity at a point in a fluid
(B) Pressure at a point in a fluid
~~(C) Difference of pressure between two points~~
(D) Density at a point in a fluid
(E) Answer not known
66. The inlet length of venturimeter is
- (A) equal to the outlet length
(B) more than the outlet length
~~(C) less than the outlet length~~
(D) equal to the pipe diameter
(E) Answer not known

67. The coil efficiency in case of sensible cooling of air is equal to
- (A) $1 - \text{By pass factor}$ (B) $1 + \text{By pass factor}$
 (C) $\text{By pass factor} - 1$ (D) $\text{By pass factor} + 1$
 (E) Answer not known
68. In a vapour compression system, COP of a refrigerating system is given by
- (A) $\frac{\text{Heat rejected in condenser}}{\text{Work done}}$ (B) $\frac{\text{Work done}}{\text{Heat rejected in condenser}}$
 (C) $\frac{\text{Refrigerating effect}}{\text{Work done}}$ (D) $\frac{\text{Work done}}{\text{Refrigerating effect}}$
 (E) Answer not known
69. Wet bulb depression is zero when relative humidity is equal to
- (A) 0 % (B) 50 %
 (C) 75 % (D) 100 %
 (E) Answer not known
70. The term PWR stands for
- (A) Power Water Reactor (B) Power Welding Rod
 (D) Pressurised water Reactor
 (C) Power Work Reaction
 (E) Answer not known
71. Due to nuclear fission process
- (A) Heavy atom divides into lighter atoms
 (B) Lighter atoms combine into heavier atom
 (C) High heat energy is absorbed
 (D) Two hydrogen atoms combine and forms helium
 (E) Answer not known

72. If the temperature of air leaving the inter cooler is equal to the original atmospheric air temperature in a multistage air compressor, then the inter cooling is known as
- (A) Perfect inter cooling (B) Imperfect inter cooling
 (C) Partial inter cooling (D) Adiabatic inter cooling
 (E) Answer not known
73. _____ is a machine, which converts mechanical energy into pressure energy.
- (A) An IC engine (B) A compressor
 (C) A turbine (D) A boiler
 (E) Answer not known
74. The work done per kg of air in multistage compression with inter cooler is _____ as compared to single stage compression for the same delivery pressure.
- (A) Reduced (B) Increased
 (C) Constant (D) First Increased then constant
 (E) Answer not known
75. Volumetric efficiency of a compressor is given by the ratio
- (A) $\frac{\text{Clearance Volume}}{\text{Swept Volume}}$ (B) $\frac{\text{Swept Volume}}{\text{Clearance Volume}}$
 (C) $\frac{\text{Effective Swept Volume}}{\text{Swept Volume}}$ (D) $\frac{\text{Swept Volume}}{\text{Effective Swept Volume}}$
 (E) Answer not known
76. The process of increasing mass of air into the cylinder in an IC engine by using compressor is known as
- (A) Supercharging (B) Compressing
 (C) Expansion (D) Combustion
 (E) Answer not known

77. During normalizing process of steel, the specimen is heated
- (A) between the upper and lower critical temperature and cooled in still air
 - (B) above the upper critical temperature and cooled in furnace
 - (C) above the upper critical temperature and cooled in still air
 - (D) between the upper and lower critical temperature and cooled in furnace
 - (E) Answer not known
78. Tempering temperature for Surgical instruments
- (A) 270°C
 - (B) 200°C
 - (C) 310°C
 - (D) 230°C
 - (E) Answer not known
79. The process of impregnating the surface of steel with other elements is
- (A) Diffusion coating
 - (B) Flame hardening
 - (C) Cyaniding
 - (D) Carburising
 - (E) Answer not known
80. Producing number of holes evenly spaced in a regular pattern is
- (A) Curling
 - (B) Notching
 - (C) Lancing
 - (D) Perforating
 - (E) Answer not known
81. In presses, the value of punch clearance is _____ of plate thickness
- (A) 1 – 5%
 - (B) 5 – 8%
 - (C) 8 – 10%
 - (D) does not depend on plate thickness
 - (E) Answer not known

82. In helical plain milling cutter the helix angle of the teeth ranges from
- (A) 45° to 60° (B) 5° to 15°
(C) 10° to 20° (D) 50° to 75°
(E) Answer not known
83. For making elastic wheels
- (A) Silicate bond is used (B) Shellac bond is used
(C) Rubber bond is used (D) Resinoid bond is used
(E) Answer not known
84. Polyvinylchloride (PVC) is a _____ material.
- (A) thermoplastic (B) thermosetting
(C) heat-setting (D) phenolic resin
(E) Answer not known
85. Natural rubber is
- (A) cellulosics (B) polymide
 (C) elastomer (D) polyethylene resin
(E) Answer not known
86. Which of the following statements is/are true related to thermo setting plastics?
1. It will soften when heated
 2. It can be reused
 3. It has cross-linked structure
- (A) 1 only (B) 2 only
 (C) 3 only (D) 1 and 2
(E) Answer not known

87. The purpose of riser in casting is to
- (A) Provides a passage for the gases to get released from the mould space
 - (B) Deliver molten metal into the mould cavity
 - (C) Deliver molten metal from pouring basin to gate
 - (D) Compensate the solidification shrinkage
 - (E) Answer not known
88. Sweep pattern is used to prepare mould of which of the following shape?
- (A) Unsymmetrical and irregular
 - (B) Unsymmetrical and regular
 - (C) Symmetrical and regular
 - (D) Very small and rectangular
 - (E) Answer not known
89. TPM stands for
- (A) Total Preventive Maintenance
 - (B) Total Preventive Management
 - (C) Total Productive Maintenance
 - (D) Total Productive Management
 - (E) Answer not known
90. The type of maintenance that identifies the root causes for a failure before it occurs and eliminates damage is called
- (A) Preventive Maintenance
 - (B) Breakdown Maintenance
 - (C) Corrective Maintenance
 - (D) Predictive Maintenance
 - (E) Answer not known
91. The planned maintenance that involves minor jobs at regular intervals such as cleaning, inspection and lubrication of parts is called
- (A) Predictive Maintenance
 - (B) Condition based Maintenance
 - (C) Routine Maintenance
 - (D) Breakdown Maintenance
 - (E) Answer not known

92. The study which finds the percentage of occurrence of an activity
- (A) Production study ~~(B) Ratio delay study~~
(C) Analytical Estimating (D) Time study
(E) Answer not known
93. The standard time determined using stop watch time study is sum of
- (A) normal time and observed time
(B) observed time and allowances
~~(C) normal time and allowances~~
(D) normal time and normal rating
(E) Answer not known
94. In time study, the observed time for an operation is 10 mins and the observed rating of operator is 110 %. The Normal time of that operation is
- ~~(A) 11 mins~~ (B) 9.09 mins
(C) 1.1 mins (D) 9 mins
(E) Answer not known
95. Which element of time study is occupying longer time?
- (A) Constant element ~~(B) Governing element~~
(C) Foreign element (D) Machine element
(E) Answer not known
96. String diagram is used mostly to measure the
- ~~(A) Movement of a worker~~ (B) Movement of a tool
(C) Movement of a job (D) Movement of a Record
(E) Answer not known

97. Which one is NOT a Layout Improving technique?
- (A) Flow process chart
 - (B) Operation chart
 - (C) Flow diagram
 - (D) String diagram
 - (E) Answer not known
98. Where the Non sparking shoes without nails are provided as safety device?
- (A) Machine shop
 - (B) Explosive factory
 - (C) Forging factory
 - (D) Flour Mill
 - (E) Answer not known
99. Match the following regarding accident in an Industry
- | Type of factor | Example |
|-------------------|---------------------|
| (a) Personal | 1. Poor ventilation |
| (b) Mechanical | 2. Storms |
| (c) Environmental | 3. Fear complex |
| (d) Natural | 4. Defective layout |
- (a) (b) (c) (d)
- (A) 2 1 4 3
 - (B) 1 3 4 2
 - (C) 3 4 1 2
 - (D) 4 2 1 3
 - (E) Answer not known

100. In MS Office, Selecting text can be done by
- (A) By dragging the right mouse button
 - (B) Using the arrow key while holding CTRL key
 - (C) Using the arrow key while holding SHIFT key
 - (D) Using the arrow key while holding TAB key
 - (E) Answer not known
101. Which of the following about open software and free ware is incorrect?
- (A) Open source software is not free of charge
 - (B) Have the freedom to modify and redistribute the source code
 - (C) The source code of freeware is free
 - (D) Can be used only in the trial period
 - (E) Answer not known
102. What is the option available, if a mail sent to no.of persons, all should know whomever received the mail?
- (A) There is no such option
 - (B) Carbon Copy (CC)
 - (C) Blind Carbon Copy (BCC)
 - (D) Visible to all option
 - (E) Answer not known
103. What is the basic file of MS-Excel?
- (A) Presentation
 - (B) Slide
 - (C) Bit Map
 - (D) Workbook
 - (E) Answer not known
104. Word processors contain tools for creating _____ based documents.
- (A) Drawing
 - (B) Chart
 - (C) Text
 - (D) Published
 - (E) Answer not known

105. Which of the following is not a component of CPU?
- (A) Arithmetic logic unit (B) Control unit
(C) Microprocessor ~~(D) Keyboard~~
(E) Answer not known
106. Which device converts the data (or) instructions given to a computer into electrical signals?
- ~~(A) Input devices~~ (B) Output devices
(C) Both (A) and (B) (D) Memory devices
(E) Answer not known
107. All computers must have
- (A) Word Processing Software ~~(B) An operating System~~
(C) A printer attached (D) A web camera
(E) Answer not known
108. Restarting a computer while it is running, is called
- (A) Cold Booting ~~(B) Warm Booting~~
(C) Hot Booting (D) Child Booting
(E) Answer not known
109. 1 MB =
- (A) 1000 KB (B) 1000 Bytes
~~(C) 1024 KB~~ (D) 1024 Bytes
(E) Answer not known
110. The _____ standard promises to provide enough characters to cover all the world's languages.
- ~~(A) ASCII~~ (B) ROM
(C) RAM (D) C-language
(E) Answer not known

111. The standard pressure angles in gear drives are
- (A) $14\frac{1}{2}^\circ$ and 23° (B) $14\frac{1}{2}^\circ$ and 20°
(C) 14° and $20\frac{1}{2}^\circ$ (D) $14\frac{1}{2}^\circ$ and $20\frac{1}{2}^\circ$
(E) Answer not known
112. When the speed of belt increases?
- (A) The coefficient of friction between the belt and pulley increases
(B) The coefficient of friction between the belt and pulley decreases
(C) The power transmitted will decrease
 (D) The power transmitted will increase
(E) Answer not known
113. The double helical gears are known as
- (A) bevel gears (B) spiral gearing
(C) skew bevel gears (D) herringbone gears
(E) Answer not known
114. What type of belt drive is suitable to transmit power between two shafts, arranged in parallel and rotating in opposite directions?
- (A) Open belt drive (B) Crossed belt drive
(C) Stepped cone pulley drive (D) Fast and loose pulley drive
(E) Answer not known
115. The _____ is not an example of machine shaft.
- (A) crank shaft (B) spline shaft
(C) spindle (D) levers
(E) Answer not known
116. The strength of the team mainly depends on
- (A) bending moment (B) C.G. of the section
 (C) section modulus (D) its weight
(E) Answer not known

117. The point of contraflexure is a point where

- (A) Shear force changes sign
- (B) Shear force is maximum
- (C) Bending moment changes in sign
- (D) Bending moment is maximum
- (E) Answer not known

118. The bending equation is

- (A) $\frac{I}{M} = \frac{\sigma}{Y} = \frac{R}{E}$
- (B) $\frac{M}{I} = \frac{\sigma}{Y} = \frac{E}{R}$
- (C) $\frac{M}{I} = \frac{Y}{\sigma} = \frac{E}{R}$
- (D) $\frac{I}{M} = \frac{Y}{\sigma} = \frac{R}{E}$
- (E) Answer not known

119. The ratio of the mean diameter of the coil to the diameter of wire is called as

- (A) Spring stiffness
- (B) Spring pitch
- (C) Spring index
- (D) Spring modulus
- (E) Answer not known

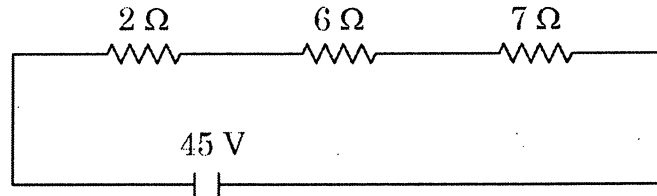
120. The combined effect of external forces acting on a body is called

- (A) Stress
- (B) Strain
- (C) Load
- (D) Yield stress
- (E) Answer not known

121. A load of 5 kN is to be raised with the help of a steel wire. Find the minimum diameter of the steel wire, if the stress is not to exceed 100 MPa?

- (A) 8 cm
- (B) 80 mm
- (C) 8 m
- (D) 8 mm
- (E) Answer not known

122. Calculate the Total Resistance 'R' in the following circuit.



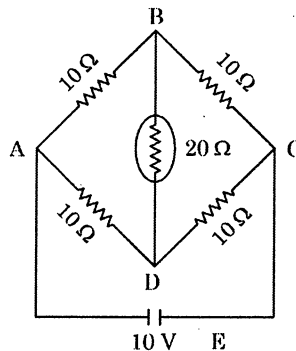
- (A) 15 Ω
- (B) 30 Ω
- (C) 3 Ω
- (D) 10 Ω
- (E) Answer not known

123. Match the following :

- | | |
|----------------|------------|
| (a) Current | 1. Ohm |
| (b) Charge | 2. Ampere |
| (c) Resistance | 3. Volt |
| (d) Voltage | 4. Coloumb |

- | | (a) | (b) | (c) | (d) |
|---|-----|-----|-----|-----|
| (A) | 2 | 1 | 3 | 4 |
| (B) | 1 | 4 | 2 | 3 |
| <input checked="" type="checkbox"/> (C) | 2 | 4 | 1 | 3 |
| (D) | 1 | 2 | 3 | 4 |
- (E) Answer not known

124. Calculate the current through the galvanometer of given Wheatstone bridge



- (A) 0.01
- (B) 0.02
- (C) 0.03
- (D) 0.04
- (E) Answer not known

125. Which ISO certification stands for modes for quality assurance in final inspection and test?

- (A) ISO 9001 (B) ISO 9002
~~(C) ISO 9003~~ (D) ISO 9004
(E) Answer not known

126. The main focus of TQM is

- (A) effective management (B) efficient control
(C) higher productivity ~~(D) customer satisfaction~~
(E) Answer not known

127. Which among the following is the correct one to find inventory carrying cost, where

if

Q – Quantity/order

C – Cost of material per unit

I – % Inventory carrying cost

- ~~(A)~~ Total Inventory Carrying Cost = $\frac{Q}{2} \times C \times I$
(B) Total Inventory Carrying cost = $\frac{Q}{3} \times C \times I$
(C) Total Inventory Carrying Cost = $\frac{Q}{2} \times (C + I)$
(D) Total Inventory Carrying Cost = $\frac{Q}{2} \times (C - I)$
(E) Answer not known

128. Reorder level in Economic order quantity is calculated by

- (A) Safety stock \times (lead time \times consumption rate)
(B) Safety stock – (lead time \times consumption rate)
~~(C)~~ Safety stock + (lead time \times consumption rate)
(D) Safety stock \div (lead time \times consumption rate)
(E) Answer not known

129. While calculating depreciation, when the depreciation amount is assumed to be constant for every year, then that method is called as
- (A) Straight line method
 - (B) Cross line method
 - (C) Sinking fund method
 - (D) Percentage on diminishing value method
 - (E) Answer not known
130. Which one of the following prefers buy decision than make decision?
- (A) Secrecy
 - (B) Protection of Patent
 - (C) Protection of Right
 - (D) Lower volume of production
 - (E) Answer not known
131. A company producing burners incurs a fixed cost of Rs. 4,000 for a quantity of 100 units batch. The variable cost per unit is Rs. 5/-. Find the Total cost.
- (A) Rs. 4,050/-
 - (B) Rs. 4,105/-
 - (C) Rs. 4,500/-
 - (D) Rs. 4,005/-
 - (E) Answer not known
132. In ABC analysis groupings of items are done according to the _____ of the items.
- (A) Quality
 - (B) Process complexity
 - (C) Money value
 - (D) Maintenance cost
 - (E) Answer not known
133. Scalar chain is referred to _____ according to Henri Fayol.
- (A) Line of authority
 - (B) Degree of centralization
 - (C) Line of unity
 - (D) Line of integrity
 - (E) Answer not known

134. According to Abraham Maslow people get motivated by _____ number of needs in order of ascendance.
- (A) Five (B) Six
(C) Seven (D) Eight
(E) Answer not known
135. According to Maslow's hierarchical theory 'Physiological' needs are placed in _____ order of ascendance.
- (A) Second (B) First
(C) Third (D) Fifth
(E) Answer not known
136. In CNC machines, the secondary slide motions are labeled as _____ as per EIA standards.
- (A) X, Y and Z (B) U, V and W
(C) a, b and c (D) A, B and C
(E) Answer not known
137. The type of tool magazine used to store a large number of tools, having high flexibility in operation and can be duplicated is known as
- (A) Turret type magazine (B) Drum type magazine
(C) Disc type magazine (D) Chain type magazine
(E) Answer not known
138. IN CNC turning centers, the diameter programming is mostly used to define the movement along X axis, the tool approaches for machining only
- (A) Radially (B) Diametrically
(C) Diagonally (D) Spherically
(E) Answer not known

139. Combination of Hierarchical and chain type structure of coding in GT is called as
- (A) Open structure (B) Closed structure
 (C) Hybrid structure (D) Multi structure
(E) Answer not known
140. The part program word, N075 G00X0Y0 Z50 ; means
- (A) Circular interpolation clockwise
(B) Circular interpolation anticlockwise
(C) Linear interpolation
 (D) Rapid movement to set point
(E) Answer not known
141. In CNC machines, the faster movement of slides are achieved by
- (A) V-shaped slide ways (B) Linear scales
(C) Rotary encoding systems (D) Linear motion systems
(E) Answer not known
142. The manufacturing Philosophy in which similar parts are identified and grouped together is called as
- (A) Isolation Technology (B) Group Technology
(C) Random Grouping (D) Orderly Grouping
(E) Answer not known
143. Coons Patches are used in _____ Modeling.
- (A) Wireframe (B) Surface
(C) Solid (D) Hybrid
(E) Answer not known

144. A solid which is represented as a volume contained in a set of faces together with topological information which defines the relationships between the faces is known as
- (A) Constructive Solid Geometry ~~(B) Boundary representation~~
(C) Cell decomposition (D) Spatial Enumeration method
(E) Answer not known
145. The geometric modelling in which the object is represented by the edges is called
- (A) Surface modelling
~~(B) Wireframe modelling~~
(C) Solid modelling
(D) Constructive solid geometry
(E) Answer not known
146. In Marine Vehicles design, the following modeling is used
- (A) Wire frame ~~(B) Surface~~
(C) Solid (D) Hybrid
(E) Answer not known
147. In cams, the smallest circle that can be drawn to the cam profile is called as
- ~~(A) Base circle~~ (B) Prime circle
(C) Pitch circle (D) Pitch curve
(E) Answer not known

148. The difference between upper limit and lower limit of a dimension is called as

- (A) Allowance
- (B) Tolerance
- (C) Basic size
- (D) Nominal size
- (E) Answer not known

149. A straight line corresponding to basic size through which deviations are measured is

- (A) Basic line
- (B) Neutral line
- (C) Central line
- (D) Zero line
- (E) Answer not known

150. According to Indian standards, total number of tolerance grades are

- (A) 10
- (B) 14
- (C) 18
- (D) 22
- (E) Answer not known

151. Measured dimension of the part is called as

- (A) Basic size
- (B) Actual size
- (C) Standard size
- (D) Minimum size
- (E) Answer not known

152. The type of bearing used in cam shafts is

- (A) Thrust bearings
- (B) Roller bearings
- (C) Journal bearings
- (D) Ball bearings
- (E) Answer not known

153. Why Teflon is used for bearings?

- (A) Low coefficient of friction
- (B) Better heat dissipation
- (C) Smaller space consideration
- (D) High co-efficient of friction
- (E) Answer not known

154. In the case of journal bearing, when the length of the journal (l) is equal to the diameter of the journal (d) then the bearing is called as

- (A) Square bearing
- (B) Short bearing
- (C) Long bearing
- (D) Full journal bearing
- (E) Answer not known

155. When a part is subjected to constant stress at high temperature for a long period of time, it will undergo a slow and permanent deformation. Such type of property is known as

- (A) Resilience
- (B) Creep
- (C) Fatigue
- (D) Machinability
- (E) Answer not known

156. Ability of the material to resist scratches and indentation is called
 (A) Strength
 (B) ~~Hardness~~
 (C) Toughness
 (D) Stiffness
 (E) Answer not known
157. To produce high head, the impellers of centrifugal pump are connected in
 (A) ~~Series only~~
 (B) Parallel only
 (C) Either Series or Parallel
 (D) Not possible
 (E) Answer not known
158. The delivery valve, while starting centrifugal pump, is kept
 (A) ~~fully closed~~
 (B) fully open
 (C) half open
 (D) one fourth open
 (E) Answer not known
159. Discharge through a double-acting reciprocating pump is given as
 (A) $\frac{ALN}{60}$
 (B) $\frac{ALN}{120}$
 (C) $\frac{2ALN}{30}$
 (D) ~~$\frac{2ALN}{60}$~~
 (E) Answer not known
160. Which one of the following is not a rotodynamic pump?
 (A) ~~Positive displacement pump~~
 (B) Radial flow pump
 (C) Axial flow pump
 (D) Mixed flow pump
 (E) Answer not known

161. Match List I correctly with List II select your answer using the codes.

List I

List II

- | | |
|-----------------------|--------------------------------------|
| (a) Pelton wheel | 1. Low head turbine with fixed blade |
| (b) Francis turbine | 2. High head turbine |
| (c) Kaplan turbine | 3. Low head with adjustable blade |
| (d) Propeller turbine | 4. Medium head turbine |

- | | | | | |
|----------------|------------------|-----|-----|-----|
| | (a) | (b) | (c) | (d) |
| (A) | 2 | 1 | 3 | 4 |
| (B) | 3 | 1 | 4 | 2 |
| (C) | 1 | 3 | 2 | 4 |
| (D) | 2 | 4 | 3 | 1 |
| (E) | Answer not known | | | |

162. Match the following :

- | | |
|---------------------|--|
| (a) Pelton turbine | 1. Tangential flow impulse turbine |
| (b) Francis turbine | 2. Inward flow reaction turbine with radial discharge at a outlet. |
| (c) Kaplan turbine | 3. Axial flow reaction turbine |

- | | | | |
|----------------|------------------|-----|-----|
| | (a) | (b) | (c) |
| (A) | 2 | 3 | 1 |
| (B) | 2 | 1 | 3 |
| (C) | 1 | 2 | 3 |
| (D) | 3 | 2 | 1 |
| (E) | Answer not known | | |

163. The low ratio for Francis turbine Varies from

- | | |
|-----------------------------|------------------|
| (A) 0.15 to 0.30 | (B) 0.30 to 0.45 |
| (C) 0.60 to 0.90 | (D) 0.91 to 0.94 |
| (E) | Answer not known |

164. The specific speed (SI unit) of pelton wheel with single jet varies from

- | | |
|--------------------------|------------------|
| (A) 8.5 to 30 | (B) 30 to 51 |
| (C) 51 to 225 | (D) 225 to 860 |
| (E) | Answer not known |

165. The prime consideration of inverted tube differential manometer is
- (A) difference of low pressure and accuracy
 - (B) difference of high pressure and accuracy
 - (C) difference of very high pressure
 - (D) both (B) and (C)
 - (E) Answer not known
166. The ratio of weight density of a fluid to the weight density of a standard fluid is termed as
- (A) mass density
 - (B) specific Gravity
 - (C) specific volume
 - (D) weight density
 - (E) Answer not known
167. Any pressure measured above the absolute zero of pressure is termed as
- (A) Atmospheric pressure
 - (B) Gauge pressure
 - (C) Absolute pressure
 - (D) Vacuum pressure
 - (E) Answer not known
168. If the pressure head at the venturimeter throat falls below the 2.5 m of water, then there will be a tendency of _____ of the liquid flow.
- (A) Priming
 - (B) Cavitation
 - (C) Separation
 - (D) Declaration
 - (E) Answer not known
169. The atmospheric air at dry bulb temperature 14°C enters a heating coil maintained at 38°C . If the air leaving the heating coil is at 26°C , The bypass factor of the heating coil would be
- (A) 0.4
 - (B) 0.5
 - (C) 0.6
 - (D) 0.7
 - (E) Answer not known
170. At 100% RH, DBT, WBT, DPT and saturation temperature are
- (A) all equal
 - (B) all are different
 - (C) two different and two equal
 - (D) cannot be determine
 - (E) Answer not known

171. Combining of light nuclei to form a single heavy nucleus is called
(A) Fission (B) Fusion
(C) Solidification (D) Atomization
(E) Answer not known
172. _____ is fitted on the boiler to improve the boiler efficiency.
(A) Pressure gauge (B) Water level indicator
(C) Super heater (D) Safety valve
(E) Answer not known
173. Name of the part fitted on the fire box crown plate or over the combustion chamber (above the furnace) is called as
(A) Fusible plug (B) Pressure gauge
(C) Safety valve (D) Water level indicator
(E) Answer not known
174. A boiler is said to be fire tube boiler if
(A) Water is contained inside the tubes which is surrounded by hot gases
(B) Hot products of combustion passes through tubes which is surrounded by water
(C) Free circulation takes place
(D) Forced circulation takes place
(E) Answer not known
175. The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called as
(A) Equivalent evaporation (B) Evaporative capacity
(C) Boiler efficiency (D) Heat ratio
(E) Answer not known
176. In reaction turbine, the expansion of steam over the blades represents
(A) free expansion process (B) isothermal process
(C) adiabatic process (D) throttling process
(E) Answer not known

177. Two stroke petrol engine consists of

- (A) No valves (B) Two valves
(C) Four valves (D) Six valves
(E) Answer not known

178. The process of removing burnt gases from the combustion chamber of the engine cylinder is known as

- (A) Supercharging (B) Exhaust
 (C) Scavenging (D) Combustion
(E) Answer not known

179. Write down the formula to find the Break power of an IC engine when.

N – Speed in rpm

T – Torque in N-M.

- (A) $\frac{NT}{2\pi \times 60}$ Watts (B) $\frac{2\pi}{NT \times 60}$ Watts
(C) $\frac{2NT}{60}$ Watts (D) $\frac{2\pi NT}{60}$ Watts
(E) Answer not known

180. Temperature at the end of combustion process in diesel engine is about

- (A) 5000°C (B) 4000°C
(C) 1800°C (D) 2800°C
(E) Answer not known

181. Otto cycle is also called as

- (A) Isenthalpic cycle (B) Constant pressure cycle
(C) Constant temperature cycle (D) Constant volume cycle
(E) Answer not known

182. It is desired to perform series of operations like drilling reaming, counter boring, etc. on a workpiece. Which of the following machine will be used?
- (A) Sensitive drilling machine (B) Radial drilling machine
 (C) Gang drilling machine (D) Multispindle drilling machine
(E) Answer not known
183. In helical milling, the indexing method that cannot be performed is
- (A) Direct indexing method (B) Differential indexing method
(C) Simple indexing method (D) Plain indexing method
(E) Answer not known
184. Milling machine reproduces irregular or complex shapes of dies, moulds, etc., by servomechanism is
- (A) Pantograph milling machine
 (B) Tracer controlled milling machine
(C) Profiling machine
(D) Drum milling machine
(E) Answer not known
185. The type of chucks used for quick setting and accurate centering is
- (A) Drill Chuck (B) Magnetic Chuck
 (C) Collet Chuck (D) Combination Chuck
(E) Answer not known
186. In 'Planning machine'.
- (A) Cutting tool is stationary, work rotates
 (B) The work reciprocates, cutting tools is stationary
(C) Cutting tool reciprocates, work in stationary
(D) Both work as well as cutting tool reciprocates
(E) Answer not known

187. How the compressibility of metal powder is defined as

- (A) the ratio of unpacked volume of the powder to the final volume after compression
- (B) the mass per unit volume of loose (or) unpacked powder
- (C) volume of powder after compression
- (D) the rate of packed volume of powder
- (E) Answer not known

188. Cold working operation carried out

- (A) above recrystallisation temperature
- (B) below recrystallisation temperature
- (C) at room temperature
- (D) at melting point
- (E) Answer not known

189. Which of the following gases are used in Tungsten inert gas welding?

- (A) Helium or Argon or mixture of two
- (B) Helium and neon mixture
- (C) Hydrogen and oxygen
- (D) Carbondioxide and hydrogen
- (E) Answer not known

190. Projection welding refers to

- (A) Pressure welding
- (B) Submerged arc welding
- (C) TIG welding
- (D) Resistance welding
- (E) Answer not known

191. Gantt chart gives the details of

- (A) Process plan
- (B) Routing of operations
- (C) Master schedule
- (D) Demand forecast
- (E) Answer not known

192. The set of operational techniques used to fulfill requirements for quality is called

- (A) Quality assurance
- (B) Quality control
- (C) Inspection
- (D) Quality focus
- (E) Answer not known

193. Routing is the process to show the route followed by

- (A) Worker
- (B) Product
- (C) Tool
- (D) Supervisor
- (E) Answer not known

194. Gantt charts are used for

- (A) Production schedule
- (B) Schedule and routing
- (C) Linear programming
- (D) Forecasting sales
- (E) Answer not known

195. Basic tool used in work study is

- (A) Graph paper
- (B) Production chart
- (C) Planning chart
- (D) Stop watch
- (E) Answer not known

196. Percentage of idle time for men or machines is calculated by

- (A) Time study
- (B) Method study
- (C) Ratio delay study
- (D) Production study
- (E) Answer not known

197. Method study is used to

- (A) Study the workers efficiency
- (B) Examine the present method of work
- (C) Study the Time required to do work
- (D) Examine the Machine efficiency
- (E) Answer not known

198. Which one of the following chart given simultaneously information about the progress of work and machine loading?

- (A) Process chart
- (C) Man-machine chart
- (E) Answer not known
- (B) Machine load chart
- (D) Gantt chart

199. _____ is not a tangible cost factor while selecting a land for plant location.

- (A) Labour
- (C) Transport facilities
- (E) Answer not known
- (B) Materials
- (D) Environmental factors

200. Match the following

Respirator (or) Mask Type	Purpose
(a) Class A	1. Fumes
(b) Class B	2. Impurities
(c) Class C	3. Dusts
(d) Class D	4. Mists

- | | | | | |
|---|------------------|-----|-----|-----|
| | (a) | (b) | (c) | (d) |
| (A) | 1 | 2 | 3 | 4 |
| (B) | 4 | 1 | 2 | 3 |
| <input checked="" type="checkbox"/> (C) | 3 | 1 | 4 | 2 |
| (D) | 2 | 3 | 4 | 1 |
| (E) | Answer not known | | | |

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

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SEAL