

Sl. No. :

TAM/19

Register
Number

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2019
MECHANICAL ENGINEERING
(Diploma Std.)

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 (A), (B), (C) and (D) 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, (B) is the correct answer, you have to mark as follows :
(A) ● (B) ● (C) ● (D) ●
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. **Do not make any marking in the question booklet except in the sheet before the last page of the question booklet, which can be used for rough work. This should be strictly adhered.**
11. 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.
12. 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.

SEAL

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1. Which among the following is correct?

Formula to find the economic ordering quantity where

A – Annual requirement

S – Ordering cost per unit,

Q – Quantity per order,

I – Inventory carrying cost in %,

C – Cost of material per unit

(A) $EOQ = \sqrt{\frac{CI}{2AS}}$

(B) $EOQ = \sqrt{\frac{2AS}{CI}}$

(C) $EOQ = \frac{2AS}{CI}$

(D) $EOQ = \frac{CI}{2AS}$

2. Find the 'ordering cost' when annual requirement A is 500 units with an ordering cost 'S' of Rs. 2 per unit and Quantity per order 'Q' as 100 units.

(A) Rs. 10/-

(B) Rs. 100/-

(C) Rs. 250/-

(D) Rs. 500/-

3. The main aim of 'Total Quality Management' is to _____ errors.

(A) inspect

(B) correct

(C) prevent

(D) check

4. As per total quality management.

Quality is the responsibility of _____ in a company.

(A) Managing Director

(B) Manager

(C) Supervisor

(D) Every one

5. When a company meets the following expenses while producing 100 bearings. Find the total cost.

Fixed cost = Rs. 5,000

Variable cost/unit = Rs. 10/-

(A) Rs. 5,000/-

(B) Rs. 500/-

(C) Rs. 5010/-

(D) Rs. 6,000/-

6. When Machines lose their value due to passage of time and atmospheric conditions, then it is because of the factor called _____.
- (A) Wear and Tear (B) Obsolescence
(C) In adequacy (D) Physical Decay
7. In Break even analysis, at break even point the cost of production is _____ to the cost of buying.
- (A) Same (B) More
(C) Less (D) High
8. Sales overhead depends on _____ for the product.
- (A) Design (B) Depreciation
(C) Demand (D) Profit
9. Profit made while selling a product is the difference between selling price and _____.
- (A) Total cost (B) Prime cost
(C) Factory cost (D) Production cost
10. Which of the following is an example of constant element in time study?
- (A) Tool changing after sometime
(B) Switch on the machine
(C) Dropping workpiece on the floor
(D) Operator receiving instruction
11. In time study, the element for which the basic time changes according to dimension of products is called
- (A) Repetitive element
(B) Constant element
(C) Variable element
(D) Governing element

12. The process in which the product is checked for conformance against specifications is called
 (A) Inspection (B) Quality control
(C) Quality assurance (D) Feed back
13. Which of the following is a personal protective device?
(A) Barrier plates (B) Ear plugs
(C) Fire extinguishers (D) Smoke sensors
14. In TPM, Autonomous maintenance is carried out by
 (A) Operators
(B) Maintenance personnel
(C) Contract personnel
(D) Equipment manufacturer
15. The bottle neck operation that holds up other operations is selected for method study based on its
 (A) Economical aspect
(B) Human aspect
(C) Technical aspect
(D) Environmental aspect
16. The principle of plant layout that optimises the utilization of resources like men, materials and machinery is
 (A) principle of integration
(B) principle of minimum distance
(C) principle of maximum flexibility
(D) principle of flow
17. The layout which can produce a product at lowest cost is
(A) Fixed position layout (B) Functional layout
(C) Process layout (D) Line layout

18. TPM stands for
- (A) Total Preventive Management
 - (B) Total Preventive Maintenance
 - (C) Total Productive Maintenance
 - (D) Total Productive Management
19. Converting metallic powders into articles of definite form is known as
- (A) High pressure pressing
 - (B) Powder metallurgy
 - (C) Hot extrusion
 - (D) Cold rolling
20. Chaplets are made of
- (A) Metal
 - (B) Wood
 - (C) Sand
 - (D) Organic matter
21. Material used for coating the electrode is called
- (A) flux
 - (B) slag
 - (C) protective layer
 - (D) deoxidant
22. Danner process is
- (A) the process by which glass tube is formed
 - (B) the process by which glass sheet is formed
 - (C) the method used to make funnel shaped component
 - (D) the method used to make thick walled pieces
23. The primary source for making glass is
- (A) Na_2CO_3
 - (B) SiO_2
 - (C) CaCO_3
 - (D) CaO

24. When crank and slotted link mechanism is used, the cutting time to return time varies between
- (A) 2 : 1 and 2 : 3
 - (B) 2 : 1 and 3 : 2
 - (C) 1 : 2 and 2 : 3
 - (D) 1 : 2 and 3 : 2
25. Internal and external gears can be cut in
- (A) Horizontal shaper
 - (B) Vertical shaper
 - (C) Travelling head shaper
 - (D) Push type shaper
26. Generating a gear by means of a fluted steel worm, equipped with proper clearance for cutting action is
- (A) Rack cutter generating process
 - (B) Pinion cutter generating process
 - (C) Gear hobbing
 - (D) Gear broaching
27. Graphite is
- (A) Natural refractories
 - (B) Basic refractories
 - (C) Acid refractories
 - (D) Not refractories
28. Vulcanization is
- (A) Cross linking process in elastomers
 - (B) A forming process by which rubber compound are spread upm fabric
 - (C) The application of a thin sheet of rubber to a sheet fabric
 - (D) Removing of flash by wire

35. Binary system uses powers of _____ for positional values.
- (A) 2 (B) 8
(C) 10 (D) 16
36. In 1831, _____ showed that electricity should be produced from magnetism.
- (A) Ohm
 (B) Faraday
(C) Kirchoff
(D) Joule
37. The maximum value of alternative quantity is known as its _____.
- (A) Frequency
 (B) Amplitude
(C) Voltage
(D) Current
38. The practical unit of resistance is _____.
- (A) Volt
(B) Amp
 (C) Ohm
(D) Watt
39. Which of the following device is used to determine power consumption?
- (A) Ammeter
(B) Voltmeter
 (C) Wattmeter
(D) Rotometer
40. The unit of current is _____.
- (A) Volt (B) Watt
(C) Ohm (D) Ampere

41. The product of diametral pitch and circular pitch is equal to
- (A) 1 (B) $\frac{1}{\pi}$
 (C) π (D) $\pi \times T$
42. Which one of the following gears having the velocity of 3 m/s to 15 m/s?
- (A) Low velocity gears
 (B) Medium velocity gears
 (C) High speed gears
 (D) Very high speed gears
43. The following stresses are induced in the shafts,
- (A) Shear stresses only
 (B) Bending stresses only
 (C) Stresses due to torsional and bending loads
 (D) All (A), (B) and (C)
44. Which of the following property is necessary for forgings, in stamping images on coins and ornamental work?
- (A) Elasticity (B) Plasticity
 (C) Ductility (D) Stiffness
45. Which one of the following is not the mechanical properties of metals?
- (A) Pressure (B) Strength
 (C) Stiffness (D) Elasticity
46. What is the maximum bending moment of simply supported beam with a point load at its mid point?
- (A) $\frac{wl}{4}$
 (B) $\frac{wl^2}{8}$
 (C) $\frac{wl}{2}$
 (D) $w.l$

47. The modulus of elasticity is the measure of
(A) Elasticity (B) Plasticity
 (C) Stiffness (D) Ductility
48. It is the property of a material to resist fracture due to high impact loads like hammer blows
(A) Malleability (B) Toughness
(C) Machinability (D) Ductibility
49. _____ type of nuclear reactor uses heavy water as moderator, coolant and the neutron reflector.
 (A) CANDU (B) Boiling water reactor
(C) Pressurised water reactor (D) Gas cooled reactor
50. In multi-stage air compressor inter cooling done to
(A) increase temperature
(B) increase volume
(C) reduce mass
 (D) save power required to derive the compressor
51. The thermodynamic cycle on which the petrol engine works, is
 (A) Otto Cycle (B) Joule Cycle
(C) Rankine Cycle (D) Stirling Cycle
52. The efficiency of diesel cycle _____ as cut off ratio increases.
(A) increases (B) decreases
(C) same (D) depends on power
53. The state of the steam at the outlet of the condenser has a dryness fraction of
 (A) zero
(B) 0.5
(C) 1
(D) any value between 0 and 1

54. Economiser in thermal power plant is used to
(A) cool the feed water
(B) pre-heat the feed water
(C) heat the steam
(D) cool the air
55. The percentage heat lost through cooling water in an IC engine is normally at
(A) 10%
(B) 30%
(C) 60%
(D) 90%
56. The enthalpy of ice at 0°C
(A) 2257 kJ/Kg
(B) zero
(C) 100 kJ/Kg
(D) 336 kJ/Kg
57. Which of the following condenser the condensate does not mix up with the cooling water?
(A) parallel flow jet condenser
(B) counter flow jet condenser
(C) ejector condenser
(D) surface condenser
58. The power actually developed inside the engine cylinder is known as
(A) brake power
(B) fuel power
(C) indicated power
(D) friction power
59. During a refrigeration cycle heat is absorbed by the refrigerant in
(A) condenser
(B) evaporator
(C) compressor
(D) expansion valve
60. The material used for control rod is
(A) graphite
(B) lead
(C) zinc
(D) boron or cadmium
61. Thermal efficiency of an IC engine is in the order of
(A) 10% to 15%
(B) 35% to 40%
(C) 55% to 60%
(D) 85% to 90%

62. Pictorial representation of the steps involved in a procedure with logical sequence is called as
- (A) Flow chart
 - (B) Programming paradigm
 - (C) Logical chart
 - (D) Pseudo code
63. Magnetic tapes, floppy disks, optical disks, flash memory and hard disks are examples of
- ~~(A)~~ primary memory
 - (B) auxiliary memory
 - (C) cache memory
 - (D) flash memory
64. _____ is the computerised version of the hand drafting process.
- (A) Multimedia
 - (C) CAD
 - (B) Interactivity
 - (D) Painting
65. Which keys are used by applications and operating systems to perform specific commands?
- (A) typing keys
 - (B) numeric keys
 - (C) control keys
 - (D) function keys
66. Which type of disk can store up to 17 giga bytes of data?
- (A) floppy disk
 - (B) compact disc
 - (C) optical disc
 - (D) digital video disc
67. Which one of the following is not a computer input units?
- (A) MICR
 - (B) OMR
 - (C) OCR
 - (D) Plotter
68. What is the expansion of DVD?
- (A) Digitally Verified Disc
 - (B) Digital Variable Data
 - (C) Digital Versatile Disc
 - (D) Digitally Variable Disc

69. A set of instructions that makes the computer perform tasks is called
- (A) Data (B) Command
(C) Hardware (D) Software
70. Which of the following is used to measure the difference in pressure between two points in a pipe, or in two different pipes?
- (A) Simple Manometer
(B) Differential Manometer
(C) Piezometer
(D) Single Column Manometer
71. The non-clog pump is
- (A) closed impeller pump
(B) semi-open impeller pump
(C) open-impeller pump
(D) semi closed impeller pump
72. The pressure head of liquid is
- (A) $h = \frac{p}{wg}$
(B) $h = \frac{p}{w}$
(C) $h = p.w$
(D) $h = \frac{w}{p}$
73. With respect to reciprocating pump which of the following statements is incorrect?
- (A) The reciprocating pump is a positive displacement pump
(B) It is obsolete owing to their high capital cost as well as maintenance cost
(C) It is suited for relatively high capacities and high heads
(D) It is suited for small capacities and high heads

74. Which one of the following mouthpiece is not comes under the classification based on the shape of the mouthpiece?

- (A) cylindrical mouthpiece
- (B) convergent mouthpiece
- (C) convergent-divergent mouthpiece
- (D) rectangular mouthpiece

75. Which one of the following is the equation of actual discharge of venturimeter?

(A) $Q_{act} = Cd \times \frac{A_1 A_2}{\sqrt{A_1^2 - A_2^2}} \cdot \sqrt{2gh}$

(B) $Q_{act} = \frac{A_1 A_2}{\sqrt{A_1^2 - A_2^2}} \cdot \sqrt{2gh}$

(C) $Q_{act} = \frac{\sqrt{A_1^2 - A_2^2}}{A_1 A_2} \sqrt{2gh}$

(D) $Q_{act} = Cd \times \frac{\sqrt{A_1 A_2}}{A_1^2 - A_2^2} \cdot \sqrt{2gh}$

76. A differential manometer connected at the two points A and B in a pipe containing an oil of specific gravity of 0.9 shows a difference in mercury levels as 150 mm. Find the difference of pressure in terms of head of water

- (A) 19.05 mm of water
- (B) 1.905 mm of water
- (C) 1.905 m of water
- (D) 19.05 m of water

77. The Kaplan turbine is

- (A) an axial flow and high head turbine
- (B) a mixed flow and high head turbine
- (C) an axial flow and low head turbine
- (D) a mixed flow and low head turbine

78. A neutral file of the model created by a preprocessor of a source system is transferred to a target system whose post processor is used to re-create the model on target system. This test is known as
- (A) Reflection test
 (B) transmission test
 (C) loop back test
 (D) universal coding test
79. The basic mathematical element used to create a composite surface is known as
- (A) primitive (B) entities
 (C) patch (D) operators
80. The B-spline surface that blends two surfaces together by which the two original surfaces may or may not be trimmed is known as
- (A) Fillet Surface (B) Offset Surface
 (C) Coons Surface (D) Bezier surface
81. The other name given to the retrieval approach type of CAPP is
- (A) Variant CAPP (B) Generative CAPP
 (C) PLM (D) PDM
82. The surface generated by translating a planed curve at a certain distance along a specified direction is known as
- (A) plane surface (B) surface of revolution
 (C) tabulated cylinder (D) ruled surface
83. The preparatory function used to choose a convenient point or position on the part as datum, called as floating datum is given by
- (A) G 90 (B) G 91
 (C) G 92 (D) G 93
84. The ball screws in the actuation system of CNC can be _____ to eliminate the axial displacement which consequently reduces the back lash.
- (A) Removed (B) preloaded
 (C) hardened (D) softened

85. In the IGES file structure, the identification character for the IGES file sections are given in the column number
- (A) 71 (B) 72
 (C) 73 (D) 74
86. The combinatorial structure used to define the connectivity and associativity of the object entities is known as
- (A) geometry (B) topology
(C) patch (D) loft
87. In the data exchange between two dissimilar systems, the transfer of data from native data base to IGES file is done by
- (A) preprocessor
(B) post processor
(C) machine controller
(D) visual display unit.
88. The detailed list of instenctions that need to be executed by the machine controller unit to achieve the final component shape is known as
- (A) Part family
(B) Part group
 (C) Part program
(D) Part coding and classification
89. The high-performance motors used as prime movers in NC machine tools, with accurate start and stop operations, light weight and having quick response to excitation voltage changes are
- (A) AC servomotors
(B) Stepper motors
(C) Linear motors
 (D) DC servomotors





90. The thermal conductivity of babit metal based bearings are
- (A) excellent
 - (B) good
 - (C) fair
 - (D) poor
91. Which displacement diagram gives better dynamic performance of a cam follower mechanism?
- (A) simple harmonic motion
 - (B) parabolic motion
 - (C) cycloidal motion
 - (D) uniform acceleration and retardation
92. In a cam system, if the follower reciprocates or oscillates in a direction perpendicular to the cam axis, then it is called as
- (A) radial cam
 - (B) cylindrical cam
 - (C) spherical cam
 - (D) flat cam
93. When a material is subjected to repeated stresses, it fails at stresses below the yield point stresses such type of failure of a material is known as
- (A) creep
 - (B) resilience
 - (C) stiffness
 - (D) fatigue
94. In the manufacturing print of view, the preferred limit system is
- (A) hole basis system
 - (B) shaft basis system
 - (C) unit basis system
 - (D) systematic limit system

95. The property of bearing material to accommodate the shaft deflections and bearing inaccuracies by the plastic deformation without excessive wear and heating is called as
- (A) conformability
 - (B) Embeddability
 - (C) bondability
 - (D) thermal conductivity
96. Offset is provided to a cam follower mechanism to
- (A) minimise the size thrust
 - (B) accelerate
 - (C) avoid jerk
 - (D) maximize the side thrust
97. The point on the pitch curve having the maximum pressure angle is known as
- (A) trace point
 - (B) pitch point
 - (C) dedendum point
 - (D) pitch circle
98. A fit having basic size as 100 mm, the tolerance grade for the hole as 6 and for the shaft as 5 is designated as
- (A) 100 H6/g5
 - (B) 100 g5/H6
 - (C) 100 h6/G5
 - (D) 100 G5/h6

99. In a company 'cost' is the _____ made during manufacturing and sales of a product.
- (A) profit (B) loss
 (C) expenditure (D) income
100. ISO stands for _____.
- (A) Indian Standards organisation
(B) Institute of Standards Organisation
 (C) International Organisation for Standards
(D) International Standards for objects
101. Quality, cost and _____ are the three major factors that make product or service more competitive.
- (A) Delivery schedule
(B) Service
(C) Durability
(D) Reliability
102. PDCA cycle can also be called as _____ wheel.
- (A) Juran's (B) Deming
(C) Ishikawa (D) Tachuchi
103. The mechanism involved in positive motivation is _____.
- (A) Pull mechanism
(B) Push mechanism
(C) Rush mechanism
(D) Crush mechanism
104. According to McGregor's 'X' theory a man was _____ at work.
- (A) optimistic (B) pessimistic
(C) interested (D) good

105. "QMS" as per ISO is referred to _____.
- (A) Quantity Management system
 - (B) Quality Management System
 - (C) Quality Measurement System
 - (D) Quality Management standards
106. Total inventory is the summation of _____.
- (A) (Inventory carrying cost – Ordering cost)
 - (B) (Inventory carrying cost + Ordering cost)
 - (C) (Inventory carrying cost + Material cost)
 - (D) (Inventory carrying cost – Material cost)
107. The numbers of items grouped under 'B' category in ABC analysis will be about _____% of total items in stock.
- (A) 10%
 - (B) 70%
 - (C) 80%
 - (D) 20%
108. In ABC analysis 'A' items are classified as _____ valued items
- (A) Nil
 - (B) Low
 - (C) Medium
 - (D) High
109. Choose the correct formula to find depreciation 'D' amount to be deposited every year. When 'V' is original value, 'S' is scrap value, 'N' is life of machine in years 'r' is rate of interest.
- (A) $D = \frac{(1+r)^N - 1}{r(V-S)}$
 - (B) $D = \frac{(1+r)^N + 1}{r(V-S)}$
 - (C) $D = \frac{r(V-S)}{(1+r)^N - 1}$
 - (D) $D = \frac{r(V-S)}{(1+r)^N + 1}$

110. In motion study, ballistic movements means
- (A) slow movement
 - (B) repeated movement
 - (C) free swinging movement
 - (D) restricted movement
111. Which of the following is not a heading for principles of motion economy?
- (A) Arrangement of workplace
 - (B) Design of tools and equipments
 - (C) Use of human body
 - (D) Preparation of proposal to management
112. In method study, string diagrams are used to record
- (A) activities performed by worker's two hands
 - (B) activities of men and machines
 - (C) path of movement of men
 - (D) Sequence of activities performed on materials
113. In method study, the technique used for recording path of movement of men and materials is
- (A) outline process chart
 - (B) flow process chart
 - (C) block diagram
 - (D) flow diagram
114. The maintenance of boilers in large sugar mills comes under
- (A) Break down maintenance
 - (B) Planned maintenance
 - (C) Preventive maintenance
 - (D) Routine maintenance
115. The layout that is best suited for a steel rolling mill is
- (A) process layout
 - (B) line layout
 - (C) functional layout
 - (D) fixed position layout

116. Which of the following location will not attract subsidies and tax benefits from Government?
- (A) Forest area
 - (B) Industrial area
 - (C) Rural area
 - (D) Hill area
117. The work measurement technique used to study several operators or machines simultaneously by a single observer is
- (A) Work sampling
 - (B) Predetermined motion time analysis
 - (C) Stop watch time study
 - (D) Method time measurement
118. In method study, SIMO chart is used to record the activities of
- (A) men and machine on a common time scale
 - (B) two hands of worker on common time scale
 - (C) worker's hands, legs and body on a common time scale
 - (D) movement of men and material between stations
119. Taking measurements while the part is being produced on the machine is known as
- (A) Real-time inspection
 - (B) Floor inspection
 - (C) Spot inspection
 - (D) Central inspection
120. The operation of checking the diameter of a component is denoted in a process chart using
- (A) 
 - (B) 
 - (C) 
 - (D) 

121. The process employed to smooth, coat or thin a material is called
- (A) continuous extrusion
 - (B) calendering
 - (C) thermo forming
 - (D) drap vacuum forming
122. Lamellar pearlite is transformed into globular pearlite in the process
- (A) Spheroidise annealing
 - (B) Isothermal annealing
 - (C) Homogenising
 - (D) Austempering
123. The dense structure of grinding wheel is denoted by numbers
- (A) From 1 to 8
 - (B) From 9 to 15
 - (C) From 16 to 30
 - (D) From 31 to 45
124. Pick the odd one out.
- (A) Gear Shaving
 - (B) Gear Burnishing
 - (C) Gear Hobbing
 - (D) Gear Honing
125. Hot tear is a
- (A) Heat treatment process
 - (B) Casting defect
 - (C) Fabrication process
 - (D) Hot working process
126. In negative rake milling, usual value of negative rake is
- (A) 10°
 - (B) 17°
 - (C) 5°
 - (D) 15°

127. Mostly used broaching method for internal broaching is
- (A) Pull broaching
 - (B) Push broaching
 - (C) Continuous broaching
 - (D) Surface broaching
128. Milling machine which can duplicate job, in smaller than, equal to, or greater than the size of template is
- (A) Pantograph milling machine
 - (B) Planetary milling machine
 - (C) Drum milling machine
 - (D) Tracer controlled milling machine
129. In rolling process, "manipulators" are used
- (A) to adjust space between the rolls
 - (B) to turn in got 90° C
 - (C) as finishing rolls
 - (D) to reverse the direction of rolling
130. Wax patterns are excellent for
- (A) Centrifugal casting
 - (B) Die casting
 - (C) Investment casting
 - (D) Slush casting
131. _____ is used to readily solve the electrical networks.
- (A) Ohm's law
 - (B) Kirchoff's law
 - (C) Faraday's law
 - (D) Charle's law
132. The value of voltage generated, does not depend on _____.
- (A) Number of turns in the coil
 - (B) Fluid friction
 - (C) Strength of field
 - (D) Speed at which the coil or magnetic field rotates

133. The unit used to measure the inductive reactances is
- (A) Amperes (B) Henrys
 (C) Ohms (D) Farads
134. In a circuit having only a resistor, the phase difference between the applied voltage and current is
- (A) 0° (B) 90°
(C) 180° (D) 360°
135. The direction of three phase motor can easily be reversed by
- (A) Changing voltage
(B) Changing current
 (C) Interchanging any two terminals
(D) Changing resistance
136. Fleming's right hand rule is used to determine the direction of
- (A) Induced e.m.f.
(B) Force experienced
(C) Flux produced
(D) Resistance induced
137. A 100 W bulb burns on an average of 10 hours a day for one week. The weekly consumption of energy will be
- (A) 0.70 unit (B) 7 units
(C) 70 units (D) 7000 units
138. Kirchoff's voltage law is concerned with
- (A) IR drops
(B) Battery e.m.fs
(C) Junction voltages
 (D) IR drops and battery e.m.fs

139. Which one of the following beam whose both the ends are supported (or) resting freely on the walls (or) columns?
- (A) Cantilever beam
 (B) Fixed beam
 (C) Continuous beam
 (D) Simply supported beam
140. The moment of inertia of a circular section of diameter (d) is given by the relation
- (A) $\frac{\pi d^4}{32}$ (B) $\frac{\pi d^4}{64}$
 (C) $\frac{\pi d^4}{16}$ (D) $\frac{\pi d^3}{46}$
141. What is the centre of gravity of the hemisphere lies when it is measured from its base along the vertical radius?
- (A) $\frac{3r}{8}$ (B) $\frac{3}{8r}$
 (C) $\frac{8r}{3}$ (D) $\frac{8}{3r}$
142. The most common way of keeping the beam of uniform strength is by keeping the
- (A) Width uniform and uniform depth
 (B) Varying width and uniform depth
 (C) Varying width and varying depth
 (D) Width uniform and varying the depth
143. For the maximum power, the velocity of the belt will be
 (Where m = mass of the belt in kg/m length)
- (A) $\frac{3m}{T}$ (B) $\frac{T}{3}$
 (C) $\frac{2T}{3}$ (D) $\sqrt{\frac{T}{3m}}$

144. The moment of inertia of a triangular section of base (b) and height (h) about an axis through its centre of gravity and parallel to the base is given by the relation
- (A) $\frac{bh^3}{12}$ (B) $\frac{b^3h}{12}$
 (C) $\frac{bh^3}{36}$ (D) $\frac{h^3b}{36}$
145. If the area of a section is in mm^2 and the distance of the centre of area from a line is in mm, then units of the moment of inertia of the section about the line is expressed in
- (A) mm^3 (B) mm^2
 (C) mm^4 (D) mm^5
146. The term deformation per unit length is called as
- (A) Stress (B) Strain
 (C) Modulus of elasticity (D) Elasticity
147. Which one of the following statement is not under the advantages of the 'v'-belt drive?
- (A) Durable than flat belt
 (B) Compactness
 (C) Longer life
 (D) Operation is quiet
148. The minimum number of teeth on the pinion in order to avoid interference for 20° full depth involute
- (A) 12 (B) 18
 (C) 32 (D) 14
149. It is the distance measured on the circumference of the pitch circle from a point of one tooth to the corresponding point on the next tooth. Which is that?
- (A) Circular pitch (B) Diametral pitch
 (C) Pitch circle (D) Pitch point
150. Henri Fayol recommended _____ of work in order to achieve specialisation.
- (A) Division (B) Integration
 (C) Innovation (D) Initiative

151. In a multi-stage compression the intermediate pressure is the
- (A) average of suction and delivery pressures
 - (B) difference between suction and delivery pressures
 - (C) geometric mean of the two pressures
 - (D) sum of the two pressures
152. The process of keeping constant engine speed under varying load conditions is known as
- (A) scavenging
 - (B) supercharging
 - (C) governing
 - (D) accelerating
153. The difference between DBT and WBT is known as
- (A) dry bulb depression
 - (B) wet bulb depression
 - (C) dew point depression
 - (D) saturation temperature
154. Cooling of air, without any change in its specific humidity is known as
- (A) sensible cooling
 - (B) sensible heating
 - (C) humidification
 - (D) dehumidification
155. In Otto cycle heat supplied at
- (A) constant pressure
 - (B) constant volume
 - (C) partially constant pressure and then constant volume
 - (D) partially constant volume and then constant pressure
156. Thermometer works based on the following law
- (A) Zeroth Law of Thermodynamics
 - (B) First Law of Thermodynamics
 - (C) Second Law of Thermodynamics
 - (D) Newton's Third Law

157. In an Otto cycle thermal efficiency _____ with increase of compression ratio.
- (A) increases
 - (B) decreases
 - (C) does not change
 - (D) depends on type of loading
158. OCR means
- (A) Optical Character Reading
 - (B) Optical Character Recognition
 - (C) Optimised Character Recognition
 - (D) Output Character Recognition
159. The first mechanical computer designed by Charles Babbage was called
- (A) Abacus
 - (B) Analytical Engine
 - (C) Calculator
 - (D) Processor
160. Any computer is controlled by
- (A) Hardware
 - (C) Instructions
 - (B) Information
 - (D) Software
161. Peripheral devices can be connected to the CPU by using _____ bus.
- (A) additional
 - (C) expansion
 - (B) supplementary
 - (D) internal
162. USB means
- (A) Universal Standard Bus
 - (B) Uniform Serial Bus
 - (C) Universal Serial Bus
 - (D) Uniform Standard Bus
163. The bar that allows the user to move the document up and down in word processing software is called
- (A) scroll bar
 - (B) tool bar
 - (C) ruler
 - (D) status bar

164. The file extension used for storing spread sheet application in MS Office is
- (A) .doc (B) .sls
(C) .ppt (D) .xls
165. MICR means
- (A) Magnetic Ink Character Reference
(B) Magnetic Input Character Reader
 (C) Magnetic Ink Character Recognition
(D) Magnetic Input Character Recognition
166. When you send an e-mail message, it is stored on a _____ until the recipient can retrieve it?
- (A) protocol (B) backbone
(C) mail box (D) server
167. In a work sheet, a _____ is the intersection of a row and a column.
- (A) formula bar (B) ruler
 (C) cell (D) frame
168. Select the pointing devices from the following options
- (A) keyboard
(B) bar code reader
 (C) joystick
(D) touch screen
169. Which of the following is a magnetic type storage device?
- (A) CD ROM
(B) DVD ROM
 (C) Hard Disk
(D) Optical Disc

170. The essential purposes of the casing is
- (A) to guide water to and from the impeller
 - (B) to fully convert the kinetic energy
 - (C) to fully convert the pressure energy
 - (D) to increase flow
171. A single acting reciprocating pump running at 500 rpm, delivers $700 \text{ m}^3/\text{s}$ of water and the theoretical discharge is $800 \text{ m}^3/\text{s}$, find the co-efficient of discharge.
- (A) 0.87
 - (B) 1.1
 - (C) 5.5
 - (D) 8.7
172. A surge tank is used to
- (A) reduce the pressure swings
 - (B) prevent occurrence of hydraulic jump
 - (C) smoothen the flow
 - (D) avoid reversal of flow
173. Which one of the following is the impulse turbine?
- (A) Francis Turbine
 - (B) Kaplan Turbine
 - (C) Pelton Wheel
 - (D) Propeller Turbine
174. What is the use of hydraulic turbines?
- (A) It converts mechanical energy into hydraulic energy
 - (B) It converts hydraulic energy into mechanical energy
 - (C) It converts mechanical energy into chemical energy
 - (D) It converts hydraulic energy into magnetic energy
175. Which type of the mouth piece having the co-efficient of discharge is unity?
- (A) convergent – divergent mouth piece
 - (B) convergent mouth piece
 - (C) internal mouth piece
 - (D) cylindrical mouth piece

176. The water after passing through the runner, flows down through a tube called
- (A) pitot tube
 - (B) draft tube
 - (C) turbine runner
 - (D) mixed flow tube
177. An impulse turbine is used for
- (A) high head of water
 - (B) low head of water
 - (C) medium head of water
 - (D) high discharge of water
178. If a convergent mouthpiece is replaced by a convergent-divergent mouthpiece, the discharge through the mouthpiece will
- (A) decrease
 - (B) increase
 - (C) depends upon the head of the water
 - (D) remain the same
179. The loss of head due to sudden enlargement in a pipe is equal to
- (A) $\frac{v_1 - v_2}{2g}$
 - (B) $\frac{v_1^2 - v_2^2}{2g}$
 - (C) $\frac{(v_1 - v_2)^2}{2g}$
 - (D) $\frac{v_1^2 + v_2^2}{2g}$
180. The absolute pressure is equal to
- (A) Atmospheric pressure + gauge pressure
 - (B) Gauge pressure – atmospheric pressure
 - (C) Gauge pressure + vacuum pressure
 - (D) Atmospheric pressure – gauge pressure

181. The process of creating a process plan from scratch for each component without human intervention is known as
- (A) Optiz system
 - (B) Coding system
 - (C) Variant approach
 - (D) Generative approach
182. The method of identifying part families and associated machine tool groupings by analysing the route sheets for parts produced in a given shop is known as
- (A) visual inspection method
 - (B) production flow analysis
 - (C) parts classification and coding system
 - (D) optiz classification system
183. A complex surface formed as a sum of different types of parametric surfaces and blending surfaces to get the smooth transition across the surfaces is called as
- (A) tabulated surfaces
 - (B) sculptured surfaces
 - (C) beizer surface
 - (D) coons surface
184. The curve which utilizes the algebraic ratio of two polynomials is called as
- (A) Hermite cubic spline
 - (B) Normal Bezier curve
 - (C) Normal B-spline
 - (D) Rational curve
185. If the three modelling modes are found to exist in a representation of an object, then it is known as
- (A) wire frame modelling
 - (B) surface modelling
 - (C) solid modelling
 - (D) heterogeneous modelling

186. The technique which uses a GT code to select a generic process plan from the existing master process plans developed for each part family and edits to suit the requirement of the part is known as
- (A) generative approach
 - (B) variant approach
 - (C) optiz coding system
 - (D) MICLASS
187. In the process of grouping the parts based on their similarities either in their geometric size and shape or because of manufacturing attributes, the collection of parts are called as
- (A) part design
 - (B) part manufacturing
 - (C) part design and manufacturing
 - (D) part family
188. In the solid modelling technique, if the dimensions of the model is given interms of equations that represent some design requirement, then the technique is called as
- (A) constraint-based modelling
 - (B) feature based modelling
 - (C) pick and drop modelling
 - (D) free-form modelling
189. The three dimensional method which uses the height of an object to extend the model from its 2D representation is called as
- (A) rotational sweep
 - (B) extension
 - (C) draft
 - (D) round
190. At high speeds, the _____ causes the balls to be forced out of the races in the thrust ball bearings and hence it is not recommended for high speed applications
- (A) centrifugal force
 - (B) centrifetal force
 - (C) sliding force
 - (D) gravitational force

191. A deviation conveniently chosen to define the position of the tolerance zone in relation to zero line is known as
- (A) actual deviation
 - (B) mean deviation
 - (C) zero line
 - (D) fundamental deviation
192. In a journal bearing, to avoid high friction, wear and heating, the bearing should be designed for a value of ZN/p at least _____ the minimum value of K .
- (A) 2 times
 - (B) 3 times
 - (C) 4 times
 - (D) 8 times
193. When a part is subjected to a constant stress at high temperature for a long period of time, it will undergo a slow and permanent deformation which is called as
- (A) resilience
 - (B) creep
 - (C) hardness
 - (D) malleability
194. Thick film bearings are
- (A) hydro dynamic lubricated bearing
 - (B) boundary lubricated bearing
 - (C) zero film bearing
 - (D) are the bearings which can support steady load without any relative motion between shafts and journal
195. Piston pin bearings in heavy duty diesel engines are
- (A) needle roller bearing
 - (B) tapered roller bearing
 - (C) spherical roller bearing
 - (D) cylindrical roller bearing

196. The size of a part specified in a drawing as a matter of convenience is called as
- (A) Mean size
 - (B) Actual size
 - (C) Zero size
 - (D) Nominal size
197. In a bearing, if the working surfaces are completely separated from each other by the lubricant, then it is called as
- (A) Hydrodynamic lubricated bearings
 - (B) Boundary lubricated bearings
 - (C) Zero film bearings
 - (D) Hydrostatic lubricated bearings
198. In thrust bearings
- (A) the load acts along the axis of rotation
 - (B) the load acts perpendicular to the direction of motion of the moving element
 - (C) the load acts parallel to the direction of motion of the moving element
 - (D) the load acts perpendicular to axis of rotation
199. _____ has excellent corrosion resistance
- (A) copper lead
 - (B) silver
 - (C) lead bronze
 - (D) lead base babbitt
200. In bearing, the term ZN/P is called as
- (A) bearing characteristics number
 - (B) bearing number
 - (C) sommerfeld number
 - (D) coefficient of friction

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