

Sl. No. : 10000377

DEME 2012

Register
Number

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2012

**MECHANICAL 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. This Booklet has a cover (this page) which should not be opened till the invigilator gives signal to open it at the commencement of the examination. As soon as the signal is received you should tear the right side of the booklet cover carefully to open the booklet. Then proceed to answer the questions.
2. This Question Booklet contains 200 questions.
3. Answer all questions.
4. All questions carry equal marks.
5. 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.
6. An Answer Sheet will be supplied to you separately by the Invigilator to mark the answers. You must write your Name, Register No., Question Booklet Sl. No. and other particulars with Blue or Black ink Ball point pen on side 2 of the Answer Sheet provided, failing which your Answer Sheet will not be evaluated.
7. You will also encode your Register Number, Subject Code, Question Booklet Sl. No. etc. 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, your Answer Sheet will not be evaluated.
8. 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.
9. In the Answer Sheet there are **four** brackets [A] [B] [C] and [D] against each question. To answer the questions you are to mark with Ball point pen **ONLY ONE** bracket 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] [C] [D]
10. 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 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.
11. 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.
12. Do not tick-mark or mark the answers in the Question booklet.
13. The last sheet of the Question Booklet can be used for Rough Work.



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1. Overhead are
 - (A) Total Direct Material Cost
 - (B) Total Direct Labour Cost
 - (C) Indirect Material Cost alone
 - (D) All expenses other than direct expenses

2. Direct material cost is
 - (A) The amount paid for associated with indirect materials
 - (B) The amount paid for/spent on direct materials
 - (C) The above all
 - (D) None of the above

3. Fixing of Selling Price is
 - (A) Total Cost – Overheads
 - (B) Total Cost \pm Profit or Loss
 - (C) Prime Cost + Factory Cost
 - (D) Total Cost + Overheads

4. Total Cost means
 - (A) Total Material Cost + Overhead
 - (B) Total Labour Cost + Direct expenses
 - (C) Total Factory overhead + Prime Cost
 - (D) Factory Cost + Selling Overhead Distribution and Administrative overhead

5. Management development techniques classified
 - (A) Differentiate the pay scales
 - (B) Conference Programmes and Problem Solving Committees
 - (C) Dissolve all the Committees
 - (D) None of the above

6. In \bar{X} and R chart, R represents
- (A) Repeatability (B) Range
(C) Rejections (D) Randomness
7. Total Sales less cost of manufacturing gives
- (A) Net Price (B) Distributable Profit
(C) Gross Profit (D) Taxable Profit
8. Procedure for Ranking Jobs?
- (A) By random the jobs are evaluated
(B) No committee is formed
(C) No procedure is followed
(D) The ranking is done independently by committee members
9. A graphical device used to determine the break even point and profit potential under varying conditions of output and costs is known as
- (A) Gantt chart (B) Flow chart
(C) Break even chart (D) PERT chart
10. F.W. Taylor introduced a system of working known as
- (A) Line Organisation (B) Line and Staff Organisation
(C) Functional Organisation (D) Effective Organisation
11. In Inventory Control, the economic order quantity is the
- (A) highest level of inventory (B) lowest level of inventory
(C) optimum lot size (D) none of the above
12. Depreciation of machines is categorised under the head
- (A) direct expenses (B) indirect expenses
(C) receipts (D) indirect material cost
13. If the sales revenue is more than total cost, then break-even analysis shows
- (A) Loss (B) Profit
(C) No loss no profit (D) None of the above

14. In process inspection is carried out by

(A) Rest time

(B) Workers doing the job

(C) Stop the machines

(D) After completing the job

15. Preventive maintenance inspection and service function classified into

(A) Non-periodic inspection

(B) Periodic inspection

(C) Periodic-delay inspection

(D) Idle time

16. Scheduled maintenance can be

(A) Dangerous to life

(B) Not dangerous to anybody

(C) Cause of decreasing profit

(D) All the above

17. Causes of equipment break down

(A) Lack of lubrication

(B) Proper lubrication

(C) Good working condition

(D) Proper drinking facilities

18. Product completes in lesser time

(A) Product layout

(B) Process layout

(C) Both

(D) None of the above

19. Effective utilization of men, material and machinery involved

(A) Method study

(B) Material handling

(C) All the above

(D) None of the above

20. Which of the following is not a factor influencing plant location?
- (A) Availability of labour
 - (B) Availability of fuel, power and water
 - (C) Availability of MP (Member of Parliament) fund
 - (D) Availability of raw material
21. Which of the following is not a Process Chart technique?
- (A) Operation Process Chart
 - (B) P-Chart
 - (C) String diagram
 - (D) Flow diagram
22. Which of the following allowance is given by the discretion of management in the stop watch time study calculation method?
- (A) Personal allowance
 - (B) Fatigue allowance
 - (C) Delay allowance
 - (D) Policy allowance
23. Which of the following is not concerned with forecasting?
- (A) Statistical sampling
 - (B) Regression or correlation analysis
 - (C) Trend lines
 - (D) Scheduling
24. Material utilization and labour utilization activities are carried out by which one of the following functions?
- (A) Planning function
 - (B) Scheduling function
 - (C) Control function
 - (D) Dispatching function
25. Which one of the following maintenance methods is used to maintain the atomic power stations?
- (A) Schedule maintenance method
 - (B) Breakdown maintenance method
 - (C) Preventive maintenance method
 - (D) Capital replacement maintenance method
26. Production control becomes difficult
- (A) Product Layout
 - (B) Process Layout
 - (C) All the above
 - (D) None of the above
27. Safety Guards on machines should be
- (A) Always in position
 - (B) Put in position as desired by the operator
 - (C) Used if they do not reduce the production
 - (D) Never used

28. If 'V' is the volume of metal in a casting and 'A' its surface area, then time of solidification will be proportional to
- (A) $V, \frac{1}{A}$ (B) $V, \frac{1}{A^2}$
 (C) $V^2, \frac{1}{A}$ (D) $V^2, \frac{1}{A^2}$
29. The operation of milling two sides of a workpiece simultaneously is called
- (A) Gang milling (B) Climb milling
 (C) Square milling (D) Straddle milling
30. Thin gears from sheet metal can be produced commercially by
- (A) Gear hobbing (B) Gear shaping
 (C) Extruding (D) Stamping
31. Which moulding process is preferable for large and heavy casting?
- (A) Green sand moulding (B) Skin dried moulding
 (C) Pit moulding (D) Shell moulding
32. At what temp. does ferrite transforms to austenite?
- (A) 1100°C (B) 700°C
 (C) 912°C (D) 802°C
33. Value of coefficient of friction in cold forming
- (A) 0.5 (B) 0.2
 (C) 0.1 (D) 0.6
34. The sintered properties in powder metallurgy depend upon
- (A) porosity (B) volume
 (C) density (D) all the above
35. Very long holes of relatively smaller diameter to be drilled by
- (A) Deep hole drilling (B) Hand drilling
 (C) Vertical drilling (D) None of these

36. With increase in pressure the temperature of steam formation will
 (A) increase (B) decrease
 (C) remain constant (D) becomes zero

37. List of typical shrinkage allowances for various metals are given below :
 Match and select the correct one.

List I (Metals)				List II (Allowances)			
(a)	C.I.			1.	15.3 mm/m		
(b)	Aluminium			2.	20.8 mm/m		
(c)	Brass			3.	17 mm/m		
(d)	Steel			4.	10.4 mm/m		
	(a)	(b)	(c)	(d)			
(A)	4	3	1	2			
(B)	1	2	4	3			
(C)	1	2	3	4			
(D)	2	1	4	3			

38. The size of a blank required to flow out a cup can be calculated from

(A) $D = \sqrt{d^2 + 4h}$ (B) $D = \sqrt{d^2 + 4dh}$
 (C) $D = d^2 + 4dh^2$ (D) $D = \sqrt{d + 4dh}$

39. Match List I with List II and select the correct answer using the codes given below the List :

List I (Material)				List II (Coolants and lubricant for turning operation)			
(a)	Cast iron			1.	Kerosene		
(b)	Hard steel			2.	Mixture of lard oil and turpentine		
(c)	Aluminium			3.	Mineral lard oil		
(d)	Copper			4.	Dry		
	(a)	(b)	(c)	(d)			
(A)	4	2	1	3			
(B)	4	3	1	2			
(C)	1	2	3	4			
(D)	1	3	4	2			

40. Assertion (A) : In sheet metal blanking operation, clearance must be given to the die.
 Reason (R) : The blank should be of required dimensions.

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A)
 (B) Both (A) and (R) are true but (R) is not a correct explanation of (A)
 (C) (A) is true but (R) is false
 (D) (A) is false but (R) is true

41. A slotting machine table have the following feed movements :

- I. Longitudinal
 II. Cross
 III. Circular
 (A) I and II only (B) I, II and III only
 (C) II and III only (D) I and III only

42. Buffing is

- (A) a process of electroplating
 (B) covering a metal part with soft materials to prevent damage
 (C) a finishing operation in broaching
 (D) the process of bringing out the luster of metal

43. The device that does not have a gate terminal is _____.
- (A) Triac (B) FET
(C) SCR (D) Diac
44. For the same compression ratio and the same heat input, the correct sequence of the increasing order of the thermal efficiencies of the given cycle is
- (A) otto, diesel, dual (B) diesel, dual, otto
(C) dual, diesel, otto (D) dual, otto, diesel
45. Most of the single phase induction motors are _____ machines.
- (A) 2 pole (B) 6 pole
(C) 8 pole (D) 4 pole
46. The resistance between any two terminals of a balanced delta-connected load is 12Ω the resistance of each phase is _____.
- (A) 12Ω (B) 18Ω
(C) 6Ω (D) 36Ω
47. The torque on the rotor of a 3 phase motor is more constant than that of a single phase motor because
- (A) single phase motors are not self starting
(B) single phase motors are small in size
(C) 3-phase power is of constant value
(D) none of the above
48. The distance between two magnetic pole is doubled and their pole strengths are also doubled. The forces between them
- (A) increases four times (B) decreases four times
(C) remains unchanged (D) none of the above
49. _____ methods of grouping of cells to form a battery.
- (A) Series grouping (B) Parallel grouping
(C) Series-parallel grouping (D) All of the above
50. In series grouping of cells is
- (A) the negative terminal of one cell is connected to the positive terminal of the next cell and so on
(B) the positive terminal of one cell is connected to the positive terminal of the next cell and so on
(C) none of these
(D) all the above

51. The electrons emitted by a thermionic emitter are called
(A) free electrons (B) loose electrons
(C) thermionic electrons (D) bound electrons
52. A 900 mm diameter pipe contains a fluid at a pressure of 25 N/mm². If the safe stress in tension is 100 N/mm². Find the minimum thickness of the pipe.
(A) 11 mm (B) 11.25 mm
(C) 11.5 mm (D) 11.75 mm
53. The ultimate tensile stress is the ratio of
(A) maximum area and load (B) maximum load and area
(C) maximum stress and strain (D) none of the above
54. The centre of area of figures having no mass is known as
(A) neutral axis (B) moment of inertia
(C) centroid (D) reference axis
55. If the driver and the follower rotate in the same direction, the drive is
(A) crossed belt drive (B) open Belt drive
(C) gear drive (D) none of the above
56. 'When a material is loaded, within its elastic limit, stress is proportional to strain'. This law is known as
(A) Hook's law (B) Avagadro's law
(C) Newton's law (D) Young's law
57. The unit of Young's modulus is
(A) Kg/sec (B) N/mm²
(C) N-m² (D) N/mm
58. The unit of strain is
(A) mm/mm (B) mm²
(C) mm (D) None of the above

59. Polar moment of Inertia of a solid shaft of Diameter 'D' is
 (A) $\pi/16 D^3$ (B) $\pi/16 D^4$
 (C) $\pi/32 D^3$ (D) $\pi/32 D^4$
60. Carriage springs are also known as
 (A) Open coiled spring (B) Closely coiled spring
 (C) Semi-elliptical type leaf spring (D) Fully elliptical type spring
61. Strain energy stored in a spring when load is 'W' and deflection is 'd'
 (A) d/W (B) W/d
 (C) $1/2 Wd$ (D) $2 Wd$
62. When two shafts are perpendicular to each other the gears used is
 (A) Herring bone drive (B) Rack and pinion drive
 (C) Helical gear drive (D) Bevel Gears drive
63. For harden steel alloys the point angle of drill is
 (A) increased (B) decreased
 (C) kept at 118° (D) none of the above
64. Example for ductile material is
 (A) Cast iron (B) Concrete
 (C) Copper (D) Glass
65. The radial distance of the tooth, from the pitch circle to top of the tooth is called
 (A) Addendum (B) Dedendum
 (C) Circular pitch (D) Module
66. Leaf springs are also called as
 (A) Bending springs (B) Stored springs
 (C) High springs (D) Wear springs

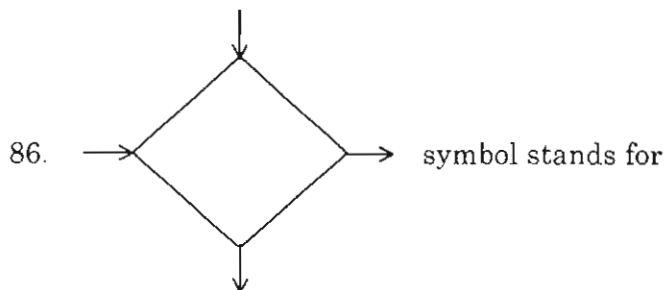
67. The deflection of a closely coiled helical spring of diameter ' D ' subjected to an axial load of ' W ' is
- (A) $\frac{64 WR^3 n}{Cd^4}$ (B) $\frac{64 WR^2 n}{Cd^4}$
 (C) $\frac{64 WRn}{Cd^4}$ (D) $\frac{64 WRn^2}{Cd^4}$
68. For Diesel engines, the method of governing employed is
- (A) Quality governing (B) Quantity governing
 (C) Hit and miss governing (D) None of the above
69. For power spent to be minimum in Rotary compressors, the compression should be,
- (A) Isothermal (B) Reversible adiabatic
 (C) Polytropic (D) None of the above
70. Forced circulation boiler is
- (A) Lamont boiler (B) Loeffler boiler
 (C) Benson boiler (D) All the above
71. In an impulse turbine, steam expands
- (A) fully in nozzle (B) fully in blades
 (C) partly in nozzle and partly in blades (D) none of these
72. For maximum power of spark ignition engine, the fuel-air mixture ratio should be
- (A) chemically correct (B) rich
 (C) lean (D) may be lean or rich
73. Mechanical efficiency of reciprocating air compressor is expressed as
 [P_b = brake power, P_i = indicated power, P_f = fuel power]
- (A) P_b/P_i (B) P_i/P_b
 (C) P_f/P_b (D) P_f/P_i
74. Surging is the phenomenon of
- (A) air stream blocking the passage (B) motion of air at sonic velocity
 (C) unsteady, periodic and reversed flow (D) production of no air pressure

75. Super heating is a refrigeration cycle
- (A) Increases COP (B) Decreases COP
(C) COP remains same (D) Unpredictable
76. The process in a hot water spray washer maintained at a temperature of 40°C, through which unsaturated air at 10°C dry bulb temperature and 50% relative humidity passes, is
- (A) sensible heating (B) humidification
(C) heating and humidification (D) heating and dehumidification
77. The value of reheat factor normally varies from
- (A) 1.2 to 1.6 (B) 1.02 to 1.06
(C) 0.9 to 0.95 (D) 0.5 to 0.6
78. Sampling inspection classified as
- (A) sampling by attributes
(B) sampling by non-attributes
(C) sampling by attachments
(D) sampling by average
79. Maximum efficiency of Parson's reaction turbine is equal to
- (A) $\frac{\cos^2 \alpha}{1 + 2 \cos^2 \alpha}$ (B) $\frac{1 + \cos^2 \alpha}{2 \cos^2 \alpha}$
(C) $\frac{2 \cos^2 \alpha}{1 + \cos^2 \alpha}$ (D) $\frac{1 + 2 \cos^2 \alpha}{\cos^2 \alpha}$
80. Ten grams of moisture per kg of dry air is removed from atmospheric air during air conditioning and the temperature becomes 30°C. If the atmospheric conditions are 40°C DBT and 60% RH, the RH of air after refrigeration would be
- (A) 60% (B) 50%
(C) 40% (D) 69%
81. For the same overall pressure ratio, the leakage of air past the piston for multistage compression as compared to single stage compression, is
- (A) more (B) less
(C) constant (D) may be more or less

82. The most common input devices are
 (A) keyboard (B) track balls
 (C) scanners (D) all the above
83. A plotter is a special type _____ device.
 (A) input (B) output
 (C) storage (D) none of these
84. The firing order in case of four cylinder in-line engines is usually
 (A) 1 - 2 - 4 - 3 (B) 1 - 3 - 4 - 2
 (C) 1 - 4 - 3 - 2 (D) Either (B) or (C)
85. Match manufacturing process and surface roughness values and select the correct answer using the codes given below the list

Manufacturing process		Surface roughness (microns)	
(a) Turning		1. 0.012 to 0.016	
(b) Surface grinding		2. 0.32 to 25	
(c) Lapping		3. 0.4 to 6.4	
(d) Boring		4. 0.063 to 5	

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



- (A) processing (B) execution
 (C) decision making (D) none of the above
87. Flow chart can be used for
 (A) help the program (B) develop the program
 (C) roadmap of a program (D) none of the above
88. LAN abbreviation is _____
 (A) Local Area Network (B) Land Area Network
 (C) Large Area Network (D) None of the above

89. The communication devices are _____.
- (A) modem (B) wireless router
(C) switch (D) all of the above
90. The system software is stored in _____.
- (A) RAM (B) HDD
(C) ROM (D) None of these
91. The liquid used in an inverted differential manometer should be of
- (A) low density (B) high density
(C) low surface tension (D) high surface tension
92. The hydraulic efficiency of a reaction turbine is the ratio of
- (A) power produced by the turbine to the energy supplied to the turbine
(B) actual work available at the turbine to the energy imparted to the wheel
(C) workdone on the wheel to the head of water
(D) none of the above
93. An opening in a vessel through which water flows is
- (A) mouthpiece (B) venturimeter
(C) orifice (D) throat
94. The tube which is used to connect the turbine and the tail race is
- (A) mano-tube (B) pitot tube
(C) draft tube (D) surge tube
95. The most common storage medium
- (A) Magnetic disk (B) RAM
(C) Both (A) and (B) (D) None of the above
96. In an pelton wheel, the pressure of water both at entering and leaving the vanes is
- (A) high (B) low
(C) atmospheric (D) all above

97. Mixing coal dust with moulding sand results in

- (A) Blackening of the mould (B) Strong Mould
(C) Good air venting (D) Cohesive structure of mould

98. Match the following :

Defects	Sources of Defects
(a) Hot tears	1. Moisture in sand and hydrogen in melt
(b) Misruns & Cold shuts	2. Metallurgical
(c) Fusion & rat tails	3. Pouring Metal
(d) Blow holes & Pin hole porosity	4. Moulding Material

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

99. Which drill is good for soft material like Brass?

- (A) Low Helix drill (B) High Helix drill
(C) Straight flute drill (D) Gun drill

100. Managerial objectives should be

- (A) Getting Information from other source (B) Clearly defined and communicated
(C) Less productivity plan (D) None of the above

101. Inventory carrying cost means

- (A) Interest on Capital Investment
(B) Cost involving deterioration and obsolescence
(C) Cost of Insurance
(D) All the above

102. Objective of Inventory Control

- (A) Control the Labours (B) Purchasing material at an economical price
(C) Control the machines (D) Control the Industrial Disputes

103. Break even point means

- (A) Making no profit (B) Making no loss
(C) Making no profit no loss (D) None of the above

104. Decision Making of a Manager

- (A) Leak of knowledge of a manager
- (B) An outstanding quality of a successful manager
- (C) Poor performance of a manager
- (D) None of the above

105. Function of a Manager enumerated by

- (A) Forecasting and Planning
- (B) Co-ordination
- (C) Control
- (D) All the above

106. Point method involves

- (A) Skill-experience
- (B) Effort – Mental & Physical
- (C) Working Conditions
- (D) All the above

107. Limitation for Ranking method

- (A) The method is not very accurate
- (B) The method is very accurate
- (C) It is useful for large organisation
- (D) None of the above

108. Job evaluation clarifies

- (A) It prevents supply of raw material
- (B) It deals with marketing
- (C) The responsibility and authority connected with each job
- (D) None of the above

109. In case of break even analysis, a change in product mix is likely to influence

- (A) Profits
- (B) Break even point
- (C) Contribution
- (D) All of the above

110. ABC analysis which class of items are generally large

- (A) A.
- (B) B
- (C) C
- (D) None of the above

111. Administration overhead is
- (A) Salary of Employees and Labour employed in the workshop
 - (B) The expenses of providing a general management and clerical services
 - (C) All the above
 - (D) None of the above
112. Sinking Fund factor for 'n' years and r = rate of interest is equal to
- (A) $\frac{r}{(1+r)^n - 1}$
 - (B) $\frac{(1+r)^n - 1}{r}$
 - (C) $\frac{(1+r)^n}{r-1}$
 - (D) $\frac{r-1}{(1+r)^n}$
113. Object of Job evaluation is
- (A) Adds to job satisfaction
 - (B) Minimises labour turn over
 - (C) Describes and evaluate new jobs
 - (D) All the above
114. To detect the idle times being enforced on machines and workers by this method
- (A) Multiple activity chart
 - (B) Safety prevention
 - (C) Canteen maintenance
 - (D) Fire Study
115. Automatic Material Handling is very difficult in
- (A) Process Layout
 - (B) Product Layout
 - (C) All the above
 - (D) None of the above
116. Control chart applied for
- (A) Identification of stores
 - (B) Final assemblies
 - (C) Visual things
 - (D) None of the above
117. Purpose of control chart is
- (A) To control the layout
 - (B) A control chart indicates whether the process is in control or out of control
 - (C) To maintain the entire discipline of the worker in the shop
 - (D) None of the above
118. SQC use the technique
- (A) Sampling inspection
 - (B) Complete inspection
 - (C) Training
 - (D) Placing

119. The different material handling equipment is

- (A) Overhead travelling crane
- (B) Lathe
- (C) Milling machine
- (D) CNC machine

120. String diagram means

- (A) A continuous coloured thread traces the path taken up by the materials or workers while performing a particular operation
- (B) Select the work worth studying and define the objectives to be achieved
- (C) What should be done, who should be done, where it should be done
- (D) None of the above

121. Basic concept of good organisation

- (A) To keep less morale
- (B) Transmits Instruction down
- (C) A reasonably clear division of authority
- (D) None of the above

122. Plant break down creates

- (A) Need for over-time
- (B) Bonus
- (C) Incentive
- (D) None of the above

123. The basic tool in work study is

- (A) Process chart
- (B) Planning chart
- (C) Bar chart
- (D) Stop watch

124. Which of the following is unavoidable delay?

- (A) Waiting for raw material
- (B) Non-availability of inspection gang
- (C) Non-availability of power
- (D) Tool breakage

125. Stop Watch Time Study equipment, a stop watch may be of the following type

- (A) Fly back
- (B) Play back
- (C) Non play back
- (D) Split play back

126. Maintenance department keep records

- (A) of union activities
- (B) of cost
- (C) of political changes
- (D) none of the above

127. Motion economy principles, rules concerning human body is indicated as follows :

- (A) During working time the worker is allowed to take rest
- (B) Except for the rest period, the two hands should not be idle at one time
- (C) All the above
- (D) None of the above

128. The chart used to review the overall sequence of an operation by focusing either the movement of operator or materials is called

- (A) SIMO chart
- (B) NEMA chart
- (C) Flow Process chart
- (D) Gantt chart

129. Analytical approach to evaluate of preventive maintenance

- (A) $\frac{\text{Inspection Scheduled}}{\text{Inspection incomplete}} \times 100$
- (B) $\frac{\text{Inspection complete}}{\text{Scheduled time}} \times 100$
- (C) $\frac{\text{Inspection incomplete}}{\text{Inspection scheduled}} \times 100$
- (D) None of the above

130. Increase in temperature of intake air in I.C. Engines will

- (A) Increase the efficiency
- (B) Decrease the efficiency
- (C) Increase (or) decrease the efficiency
- (D) Not affect the efficiency

131. A two stage air compressor operating for condition of maximum efficiency receives air at 1 bar and compresses it to 4 bar in the first stage. The over all compression ratio is

- (A) 8
- (B) 12
- (C) 16
- (D) 20

132. Ideal process in a rotary compressor is

- (A) Isothermal
- (B) Polytropic
- (C) Adiabatic
- (D) None of these

133. Skeleton patterns are generally used for

- (A) small castings
- (B) non ferrous castings
- (C) large castings
- (D) hollow castings

134. What is the basic structure of ferrite?
 (A) FCC (B) BCC
 (C) FCC and BCC (D) None of the above
135. Which process improves mechanical properties of materials?
 (A) Hot working (B) Cold working
 (C) Forming (D) Swaging
136. Selection of grinding wheel depends on
 I. Type of abrasive
 II. Grit size
 III. Grade
 (A) I (B) II
 (C) III (D) I & II & III
137. Casting is the process of producing the parts by
 (A) removing the excess material by single point cutting tool
 (B) forming the metal
 (C) pouring metal into the mould cavity allowing it to solidify
 (D) none of the above
138. Drill diameter is measured over the
 (A) main body (B) plain shank portion
 (C) margins at the drill point (D) lips
139. Where the maximum temperature can be obtained in carburising frame?
 (A) White intermediate feather cone (B) Bluish outer cone
 (C) Sharp inner cone (D) None of the above
140. Determine the amount of setover required to turn a taper on the entire length of a workpiece having diameter of the large end 30 mm and diameter of the small end 20 mm.
 (A) 5 mm (B) 1.5 mm
 (C) 6 mm (D) 10 mm
141. Which of the following is not a boiler accessory?
 (A) Pressure gauge (B) Injector
 (C) Air pre heater (D) Super heater

142. Which one of the following processes results in the best accuracy of the hole made?

- (A) Drilling
- (B) Reaming
- (C) Countersinking
- (D) Boring

143. Basic raw materials of plastic is

- (A) Husk
- (B) Petroleum
- (C) Animal waste
- (D) None of these

144. What is the purpose of quenching?

- (A) To increase temperature
- (B) To get rapid cooling
- (C) To reduce hardness
- (D) To form cementite

145. Organising means

- (A) divide the work into component activities
- (B) planning for sales activities
- (C) planning for market survey
- (D) none of the above

146. Semiconductor is formed by _____ bonds.

- (A) Covalent
- (B) Electrovalent
- (C) Co-ordinate
- (D) None of the above

147. In PNP transistor the current carriers are

- (A) holes
- (B) electrons
- (C) acceptor ions
- (D) donor ions

148. A MOSFET has _____ terminals.

- (A) two
- (B) five
- (C) four
- (D) three

149. The unit of Luminous Intensity is
(A) Candela (B) Ampere
(C) Degree Kelvin (D) None of these
150. When cells are arranged in parallel
(A) the current capacity decreases (B) the current capacity increases
(C) the e.m.f. increases (D) the e.m.f. decreases
151. The SI unit of resistance is
(A) V/A (B) A/V
(C) Constant (D) None of these
152. The end of the magnet pointing north is called
(A) South pole (B) North pole
(C) North-South direction (D) None of the above
153. A triac is a _____ switch.
(A) unidirectional (B) bidirectional
(C) mechanical (D) none of the above
154. A zener diode has _____ breakdown voltage.
(A) undefined (B) sharp
(C) zero (D) none of the above
155. An IC has _____ size.
(A) very large (B) large
(C) extremely small (D) none of the above
156. When magnet is heated?
(A) It gains magnetism (B) It loose magnetism
(C) It neither loses nor gains magnetism (D) None of the above

157. The ability of material to be flattened into thin sheets without cracks, by pressing, rolling, hammering etc is
- (A) elasticity (B) plasticity
(C) malleability (D) ductility
158. The material which permits easy removal of material with a satisfactory finish at lowest cost is
- (A) machineability (B) brittleness
(C) ductility (D) hardness
159. The centre of gravity of a cube of side ' l ' is _____ from every face.
- (A) $l/4$ (B) $l/3$
(C) $l/5$ (D) $l/2$
160. In thin cylindrical shell the circumferential stress is also known as
- (A) Hoop stress (B) Longitudinal stress
(C) Simple stress (D) Varying stress
161. The bending moment at the free end of a cantilever beam carrying any type of load is
- (A) zero (B) minimum
(C) maximum (D) equal to the load
162. The beam which extends in the form of a cantilever beyond its support is
- (A) simply supported beam (B) overhanging beam
(C) continuous beam (D) cantilever beam
163. When a cantilever is loaded at its free end max. compressive stress shall develop at
- (A) bottom fibre (B) top fibre
(C) neutral axis (D) centre of gravity

164. When a section is subjected to two equal and opposite pushes and the body tends to shorten its length, the stress induced is called
- (A) Compressive stress (B) Tensile stress
(C) Constant stress (D) Load stress
165. The centre of gravity of a right circular cone of diameter ' d ' and height ' h ' lies at a distance of _____ from the base measured along the vertical radius.
- (A) $h/2$ (B) $h/3$
(C) $h/4$ (D) $h/6$
166. The moment of inertia of a circular section about xx (or) yy axis if the diameter is ' d '
- (A) $\pi/32 d^6$ (B) $\pi/64 d^5$
(C) $\pi/64 d^4$ (D) $\pi/32 d^3$
167. Moment of inertia of a hollow circular section when ' D ' is the outer diameter and ' d ' is the inner diameter about xx axis is
- (A) $I_{xx} = \pi (D^4 - d^2)$ (B) $I_{xx} = \frac{\pi}{64} (D^4 - d^4)$
(C) $I_{xx} = \frac{\pi d^2}{4}$ (D) $I_{xx} = \frac{\pi r^2}{4}$
168. Moment of inertia of a triangular section having base ' b ' and height ' h ' is
- (A) $\frac{bh^3}{36}$ (B) $\frac{bh^2}{36}$
(C) $\frac{hb^3}{24}$ (D) $\frac{hb^3}{12}$
169. If a cantilever beam is subjected to a point load at its free end, then the shear force under the point load is
- (A) zero (B) less than the load
(C) equal to the load (D) more than the load
170. In the theory of simple bending the bending stress in the beam section varies
- (A) linearly (B) parabolically
(C) elliptically (D) none of them

171. Steam turbines are classified according to
(A) direction of flows (B) principle of action
(C) number of cylinders (D) all the above
172. For the best utilization of fuel, the air supply in the engine cylinder should be
(A) about 10% surplus (B) about 25% surplus
(C) about 10% deficient (D) about 20% deficient
173. Theoretically correct mixture of air and petrol is approximately
(A) 8:1 (B) 10:1
(C) 15:1 (D) 20:1
174. In a centrifugal air compressor, the pressure developed depends on
(A) Impeller tip velocity (B) Inlet temperature
(C) Compression index (D) All the above
175. The pressure on the two sides of the moving blades of a reaction steam turbine is
(A) Same
(B) Higher at inlet
(C) Lower at inlet
(D) May be higher (or) lower depending upon the quality of entry steam
176. Which of the following is considered to be superior quality of coal for power plants?
(A) Bituminous coal (B) Peat
(C) Coke (D) Lignite
177. Actual compression curve is
(A) same as isothermal (B) same as adiabatic
(C) better than isothermal and adiabatic (D) inbetween isothermal and adiabatic
178. Frost on cooling coils
(A) Increases heat transfer
(B) Improves COP of the system
(C) Reduces power consumption
(D) Acts as an insulation, increasing power consumption

179. Benson steam boiler has
- (A) one drum (B) two drums
 (C) no drum (D) one water drum and one steam drum
180. To cool and dehumidify a stream of moist air, it must be passed over the coil at a temperature
- (A) which lies between the dry bulb and wet bulb temperature of the incoming stream
 (B) which lies between the wet bulb and dew point temperature of the incoming stream
 (C) which is lower than the dew point temperature of the incoming stream
 (D) of adiabatic saturation of incoming stream
181. Refrigeration cycle operates between 5°C and 40°C
- (A) COP carnot > COP simple saturated cycle
 (B) COP carnot < COP simple saturated cycle
 (C) COP carnot = COP simple saturated cycle
 (D) Cannot predict unless refrigerant used is known
182. The air standard efficiency of Otto cycle is
 [r = compression ratio, γ = Isentropic index of compression]
- (A) $\eta = 1 - \frac{1}{r^{\left(\frac{\gamma-1}{\gamma}\right)}}$ (B) $\eta = 1 - \frac{1}{r^{\gamma-1}}$
 (C) $\eta = 1 - r^{\left(\frac{\gamma-1}{\gamma}\right)}$ (D) $\eta = 1 - \frac{1}{r^{\gamma+1}}$
183. The air standard Otto cycle comprises
- (A) two constant volume processes and two constant entropy processes
 (B) two constant pressure and two constant entropy processes
 (C) two constant pressure and two constant volume processes
 (D) none of the above
184. Cornish boiler is a
- (A) fire tube boiler (B) water tube boiler
 (C) high pressure boiler (D) locomotive boiler
185. Heat is rejected by the refrigerant, during vapour compression refrigeration cycle in
- (A) condenser (B) evaporator
 (C) throttle valve (D) compressor

186. The number of buckets on the periphery of a pelton wheel is given by

(A) $\frac{D}{2d} + 5$

(B) $\frac{D}{2d} + 10$

(C) $\frac{D}{2d} + 15$

(D) $\frac{D}{2d} + 20$

187. A pipe fitted outside of an orifice is known as

(A) orifice

(B) orificemeter

(C) venturimeter

(D) external mouthpiece

188. The venturimeter is working under the principle of

(A) Newton law

(B) Bernoulli's equation

(C) Routh's law

(D) Orient law

189. The loss of head due to sudden enlargement in a pipe is equal to

(A) $\frac{v_1 - v_2}{2g}$

(B) $\frac{(v_1 - v_2)^2}{2g}$

(C) $\frac{v_1^2 - v_2^2}{2g}$

(D) $\frac{v_1^2 + v_2^2}{2g}$

190. Where accuracy is the prime consideration the manometer used is

(A) inverted differential manometer

(B) Bourdons manometer

(C) H-tube manometer

(D) Pressure gauge

191. Reciprocating pump is suitable for

(A) less discharge

(B) more discharge

(C) higher heads

(D) both (A) and (C)

192. A Kaplan turbine is a

(A) axial flow reaction turbine

(B) radial flow reaction turbine

(C) mixed flow turbine

(D) impulse turbine

193. If a convergent mouthpiece is replaced by a convergent-divergent mouthpiece, the discharge will

(A) decrease

(B) increase

(C) remain the same

(D) depend upon the head of water

194. The computer system consists of _____
- (A) processor (B) memory
(C) storage (D) all of the above
195. Computer can be classified according to
- (A) Size of the computer (B) Cost of the computer
(C) Processing speed (D) None of the above
196. Which of the following is an output device?
- (A) Software (B) Hardware
(C) Printer (D) None of the above
197. _____ printer create an image directly on the paper by spraying ink through tiny nozzles.
- (A) Laser (B) Ink Jet
(C) Band (D) All of the above
198. _____ type of computers are used for processing complex scientific applications.
- (A) Micro computer (B) Main frame computer
(C) Super computer (D) None of these
199. The brain of the computer is _____.
- (A) ALU (B) CU
(C) Processor (D) ROM
200. When the computer is powered on the first step performed is _____.
- (A) POST (B) ROM
(C) Hard disk (D) None of the above

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