

21 — PRODUCTION AND INDUSTRIAL ENGINEERING

(Answer ALL questions)

56. In rectangular element subjected to like principal tensile stresses P_1 and P_2 in two mutually perpendicular directions x and y , the maximum shear stress would occur along the
1. plane normal to x -axis
 2. plane normal
 3. plane at 45° to y -direction
 4. planes at 45° and 135° to the y -direction
57. In gears, interference takes place when
1. The tip of a tooth of a mating gear digs into the portion between base and root circles.
 2. gears do not move smoothly in the absence of lubrication
 3. pitch of the gear is not same
 4. gear teeth are undercut
58. A governor is said to be isochronous when the equilibrium speed for all radii of rotation the balls within the working range
1. is not constant
 2. is constant
 3. varies uniformly
 4. has uniform acceleration
59. Which of the following is a positive locking device?
1. Castled nut
 2. Locking by pin
 3. Locking by threaded pin
 4. split nut
60. In a belt drive, if the pulley diameter is doubled keeping the tension and belt width constant, then it will be necessary to
1. increase the key length
 2. increase the key width
 3. decrease the key width
 4. decrease the key length
61. Accuracy of shell moulding is of the order of
1. 0.001 m/m
 2. 0.003 to 0.005 m/m
 3. 0.01 m/m
 4. 0.1 m/m
62. The addition of coal dust to the green moulding sand is to improve
1. permeability
 2. surface finish
 3. mouldability
 4. green strength
63. The ratio between the pattern shrinkage allowance of steel and cast iron is about
1. 1:1
 2. 2:1
 3. 1:2
 4. 1:1.5
64. Pipes subjected to very high pressure of the order 11120 kgf/cm² are made by
1. pressed casting
 2. semi-centrifugal casting
 3. slush casting
 4. extrusion process
65. The recrystallization temperature of steel is
1. 710° C
 2. 723° C
 3. 250° C
 4. 800° C
66. The spring back in steel is of the order of
1. 0 to 0.5°
 2. 0.5 to 5°
 3. 5 to 10°
 4. 10° to 13.5°

67. For extrusion, the temperature of copper alloys in the die should be
1. 1100 to 1250°C
 2. 650 to 900°C
 3. 425 to 480°C
 4. 1350 to 425°C
68. Large size bolt heads are made by
1. swaging
 2. roll forging
 3. tumbling
 4. upset forging
69. In cold welding the pressure range varies from
1. 300 kg/cm² to 500 kg/cm²
 2. 1300 kg/cm² to 500 kg/cm²
 3. 200 kg/cm² to 300 kg/cm²
 4. 100 kg/cm² to 1000 kg/m²
70. Oxygen to acetylene ratio in case of oxidizing flame is
1. 1 : 2
 2. 1.5 : 1
 3. 2 : 1
 4. 4 : 1
71. In resistance welding, the heat generated is given by,
1. $H = \frac{I^2 \times R}{T}$
 2. $H = \frac{I^2 \times T}{R}$
 3. $H = I^2 \cdot R \cdot T$
 4. $H = \frac{R \times T}{I^2}$
72. The pressure applied in case of ultrasonic welding is of the order of
1. 2 to 3 kg/cm²
 2. 10 to 20 kg/cm²
 3. 20 to 40 kg/cm²
 4. 40 to 100 kg/cm²
73. Forge welding is best suited for
1. stainless steel
 2. high carbon steel
 3. cast iron
 4. wrought iron
74. Value of n for high speed steel in the Taylor's equation $VT^n = C$ is
1. 0.4 to 0.55
 2. 0.70 to 1.5
 3. 0.3 to 0.4
 4. 0.1 to 0.15
75. The angle between lathe centre is
1. 15°
 2. 30°
 3. 45°
 4. 60°
76. Average thickness of the cut is one travel of the circular saw is
1. 1.5 mm
 2. 3.0 mm
 3. 6.25 mm
 4. 8.0 mm
77. Sintered and tungsten carbides can be machined by
1. brazing
 2. grinding
 3. diamond tools
 4. Electro-machining process
78. If tool life relationship for HSS tool is $VT^{1/8} = C_1$, and for tungsten carbide is $VT^{0.2} = C_2$,
1. 1.08
 2. 1.58
 3. 2.08
 4. 2.58
79. When a cut is made partway across the metal, the operation is called
1. trimming
 2. lancing
 3. slotting
 4. notching
80. A device, which holds, locate a work piece, guides and controls one or more cutting tools is called
1. jig
 2. fixture
 3. templates
 4. lathe

81. When holes are required to be machined in several faces in small work piece, the jig used is
1. box jig
 2. of welded construction
 3. from the channel section
 4. none of these
82. Regular dowels employed for all new dies are made oversize to provide a secure press fit to the extent.
1. 0.00508 mm
 2. 0.5 mm
 3. 0.1 mm
 4. 0.2 mm
83. Total throw of a cam is about
1. 140°
 2. 180°
 3. 90°
 4. 110°
84. Millimeter scale in a micrometer is marked on
1. barrel
 2. thimble
 3. spindle
 4. anvil
85. Fiducial indicators contain
1. calibrated scale
 2. single index mark
 3. micrometer screw movement
 4. optical head
86. In the graphical representation of LP, if constraints do not form a closed polygon then the solution is
1. unbounded for maximisation problems
 2. optimum for maximisation problems
 3. infeasible for maximisation problems
 4. infeasible for minimisation problems
87. In simplex method, value of slack variable in the final (optimal) table indicates
1. shortage in resource
 2. cost of resource
 3. optimal solution
 4. un-utilised resource
88. In an unbalanced transportation problem
1. number of sources is greater than number of supplies
 2. number of sources is less than number of supplies
 3. the number of basic cells is insufficient
 4. demand is not equal to supply
89. The critical path refers to the path
1. of minimum duration
 2. of maximum duration
 3. with no dummy activities
 4. made up of dummy activities
90. In the maximal flow problem the capacity of the cut is given by the
1. sum of flows into the cut from sink
 2. maximal flow possible
 3. sum of flows into the cut from source
 4. sum of all the flows in the network
91. In inventory costing, the carrying cost is based on
1. maximum inventory
 2. average inventory
 3. buffer size
 4. demand
92. A game is said to be fair if the value of game is
1. zero
 2. maximum
 3. minimum
 4. negative
93. An ambulance crossing the traffic signal when red light in is on, is the case of
1. FIFO
 2. LIFO
 3. preemptive priority
 4. non preemptive priority

94. Given last period's forecast of 65, and last period's demand of 62, what is the simple exponential smoothing forecast with a smoothing constant value of 0.4 for the next period?
1. 63.8
 2. 65
 3. 62
 4. 63.2
95. Which of the following is NOT a time-series model?
1. linear regression
 2. naïve approach
 3. exponential smoothing
 4. moving averages
96. Which one is not a disadvantage of a level approach compared to a chase approach in Aggregate Production Planning?
1. greater inventory costs
 2. increased overtime and idle time
 3. varying resource utilization
 4. varying workforce levels
97. A measure of the reserve capacity a process has to handle in unexpected increases in demand is the:
1. Capacity utilization rate
 2. Capacity cushion
 3. Capacity bottleneck
 4. Capacity constraint limit
98. A facility with a design capacity of 1,000 units, an actual average of 800 units, and effective capacity of 850 units has a utilization of
1. 85%
 2. 80%
 3. 125%
 4. 94%
99. _____ is a method of reducing manufacturing lead time. The order is split into two or more lots and run on two or more machines simultaneously.
1. Operation overlapping
 2. Operation splitting
 3. Infinite loading
 4. Backward scheduling
100. _____ is the amount of time the job is waiting at a work center before an operation begins.
1. Queue time
 2. Setup time
 3. Run time
 4. Wait time
101. Function Point based software cost estimation techniques require problem decomposition based on
1. information domain values
 2. project schedule
 3. software functions
 4. process activities
102. Adding indirect production expenditure to the direct cost of production can be known as:
1. full costing
 2. activity based costing
 3. contribution costing
 4. marginal costing
103. A cost which is connected with production but does not vary directly with the level of output may be known as:
1. selling and distribution expense
 2. variable cost
 3. factory indirect expense
 4. direct cost
104. Failure time data of electronic components usually observe
1. Exponential distribution
 2. Normal distribution
 3. Log-normal distribution
 4. Weibull distribution
105. Risk Priority Number is associated with
1. Maintenance Risk Management
 2. Failure Based Maintenance
 3. Physical Asset Management
 4. Failure Modes and Effect Analysis

106. A reliability block diagram of a composite system would reveal that
1. System configuration is very compact and precise
 2. System is neither in perfect series nor in parallel configuration
 3. Exact system reliability value can not be determined
 4. Maintenance cost of such system would be high due to complex configuration
107. One of the following is not a Goodness of fit test
1. Accelerated test
 2. Chi-square test
 3. Kolmogorov-Smirnov test
 4. Bartlett's test
108. Tero Technology is the term related to
1. Spare parts management
 2. Maintainability engineering
 3. Maintenance management
 4. Fault diagnosis and management
109. An unusual number of consecutive points falling on one side of the mean on the control chart is an indication that
1. Process is poorly maintained
 2. Process is under control
 3. Process is not capable
 4. Process average has suddenly shifted
110. Design of experiments can be used for
1. Reliability improvement
 2. Process parameter optimization
 3. Cost reduction
 4. Availability demonstration
111. The ideal goals of Total Productive Maintenance are
1. Zero failures, Zero defects and Zero accidents
 2. Zero accidents, Zero risk, and Zero faults
 3. Zero faults, Zero downtime and Zero accidents
 4. Zero paper work, Zero failures and Zero defect
112. A systematic process which identifies all of the functions and functional failures of assets is
1. Total Productive Maintenance
 2. Reliability Centered Maintenance
 3. Event Tree Analysis
 4. Corrective Maintenance
113. Predictive maintenance program should include monitoring and diagnostic technique such as
1. Maintenance Prevention
 2. Five Zero Concept
 3. Signature analysis
 4. RCM
114. The operating characteristic curves for acceptance sampling plans show the relationship between
1. Percent defective and batch time
 2. Rational subgroups and Percent defective
 3. Number of defectives and Attribute quality characteristics
 4. Probability of acceptance and Percent defective
115. When universe dispersion as well as universe average is shifting, it is obvious that lack of process control will be indicated in
1. Both Range control chart and average control chart
 2. Only the average chart
 3. Only the Range chart
 4. Both average chart and Sampling chart