1. Which of the following is a Hidden loss in TPM?

(A) Minor stoppages
(B) Equipment failures
(C) Reduced speed
(D) Setup of machines
(E) Answer not known

2. Which of the following is not a goal of TPM?

(A) Zero unplanned equipment downtime
(B) Zero equipment caused defects
(C) Zero loss of equipment speed
(D) Zero loss of man hours
(E) Answer not known

3. In TPM, OEE means

(A) Overall Equipment Efficiency
(B) Overall Energy Efficiency
(C) Overall Engineering Effectiveness
(D) Overall Equipment Effectiveness
(E) Answer not known

4. Which one of the following control chart is used for variables?

(A) P-chart
(B) C-chart
(C) R-chart
(D) np-chart
(E) Answer not known

5. The three time estimates that are used in PERT are

(A) Optimistic time, most likely time, pessimistic time
(B) Optimistic time, normal time, crash time
(C) Most likely time, crash time, normal time
(D) Optimistic time, crash time, pessimistic time
(E) Answer not known

6. Prescribing of when and where each operation necessary to manufacture a product is to be performed is called

(A) Process planning
(B) Scheduling
(C) Routing
(D) Controlling
(E) Answer not known

7. Routing is essential in the following type of industry

(A) Assembly industry
(B) Chemical industry
(C) Job order industry
(D) Man production industry
(E) Answer not known

8. In std. time calculation the allowance that should not exceed 5% is

(A) Variable allowance
(B) Fixed allowance
(C) Interference allowance
(D) Contingency allowance
(E) Answer not known

9. Which one of the following is <u>not</u> a part of Time Study?

(A) Contingency Allowance
(B) Dimensional Allowance
(C) Fatigue Allowance
(D) Personal Allowance
(E) Answer not known

10. Work measurement is used to measure

(A) Method
(B) Cost
(C) Time
(D) Dimension
(E) Answer not known

11. The relaxation allowance given for a worker in time study is about

(A) 1 – 4%
(B) 4 – 7%
(C) 7 – 10%
(D) 10 – 12%
(E) Answer not known

12. In the scale of rating factor, the standard rating of average worker is

(A) 25%
(B) 50%
(C) 75%
(D) 100%
(E) Answer not known

13. Match the following on time study allowances :

Category		Element
(a) Personal	1.	Tiredness due to continuous work
(b) Fatigue	2.	Extra time to finish work
(c) Interference	3.	Going rest room
(d) Contingency	4.	Operates more than one machine

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

(E) Answer not known

14. An operation process chart used in method gives details about

(A) The sequence of operations in the process
(B) The activities performed by the worker
(C) The movement of materials between departments
(D) The activities performed by man and machine
(E) Answer not known

15. Which of the following is not examined in method study?

(A) Purpose
(B) Cost
(C) Place
(D) Sequence
(E) Answer not known

16. The flow of material between functional areas of a plant is recorded on

(A) Flow chart
(B) Relationship chart
(C) Travel chart
(D) Process chart
(E) Answer not known

17. Which one of the following is the prevention measure of accident?

(A) Dumping more equipments
(B) Restricted paths of movement
(C) Keeping open the covers of machines
(D) Providing automatic quick stoppage devices
(E) Answer not known

18. The layout in which breakdown of one machines leads to stoppage of production line is

(A) Product layout
(B) Process layout
(C) Fixed position layout
(D) Functional layout
(E) Answer not known

19. The principle of plant layout that avoids back tracking of materials is

(A) Principle of minimum distance
(B) Principle of flow
(C) Principle of maximum handling
(D) Principle of maximum flexibility
(E) Answer not known

20. Match the following :

Safety devices		Area of use
(a)	Goggles	1. Mines
(b)	Helmets	2. Forging factory
(c)	Gloves	3. Machine shop
(d)	Respirators	4. Flour mill

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

(E) Answer not known

21. Which one of the following is the environmental factor causing accidents?

(A) Defective equipment
(B) Wrong maintenance
(C) Poor ventilation
(D) Poor material handling
(E) Answer not known

22. The sequence of processes in a simple vapour compression refrigeration system

(A) Expansion – Compression – Condensation – Evaporation
(B) Expansion – Compression – Evaporation – Condensation
(C) Compression – Condensation – Expansion – Evaporation
(D) Compression – Condensation – Evaporation – Expansion
(E) Answer not known

23. During a refrigeration cycle heat is rejected by the refrigerant in

(A) Condenser
(B) Compressor
(C) Evaporator
(D) Expansion value
(E) Answer not known

24. A psychrometer is an instrument which measures ———————— of air.

(A) Dry bulb temperature
(B) Wet bulb temperature
(C) Both dry and wet bulb temperatures
(D) Saturation temperature
(E) Answer not known

25. In a vapour compression refrigeration system, for which of the following process throttle valve is used

(A) Compression
(B) Condensation
(C) Expansion
(D) Evaporation
(E) Answer not known

26. Humidity ratio is also called

(A) Relative humidity
(B) Absolute humidity
(C) Specific humidity
(D) Normal humidity
(E) Answer not known

27. The purpose of a moderator in a nuclear power plant is to

(A) Reduce the radioactive pollution
(B) Reduce the temperature
(C) Control the reaction
(D) Reduce the speed of fast moving neutrons
(E) Answer not known

28. In a nuclear reactor, the most commonly used moderator is

(A) Steel
(B) Graphite
(C) Aluminium
(D) Bricks
(E) Answer not known

29. Tarapur is the place in India where the first following power plant is located

(A) Steam power plant
(B) Hydro-electric power plant
(C) Diesel-Electric power plant
(D) Nuclear power plant
(E) Answer not known

30. Locomotive boiler is a

(A) Single tube, horizontal, internally fired and stationary boiler
(B) Single tube, vertical, externally fired and stationary boiler
(C) Multi tublar, horizontal, internally fired and mobile boiler
(D) Multi tublar, horizontal, externally fired and stationary boiler
(E) Answer not known

31. The device used to heat the inlet feed water by waste flue gases is called

(A) Super heater
(B) Economiser
(C) Air pre heater
(D) Feed pump
(E) Answer not known

32. The main function of an air pump is to maintain ———————— in the condenser.

(A) A vacuum
(B) Temperature
(C) Pressure
(D) Flow rate
(E) Answer not known

33. The major loss that occur in a boiler is due to

(A) Moisture in fuel
(B) Dry flue gases
(C) Unburnt carbon
(D) Steam formation
(E) Answer not known

34. Vapour is a

(A) Pure substance
(B) Mixed phase of liquid and gas
(C) Gas saturated with liquid
(D) Phase of a substance above its critical point
(E) Answer not known

35. Intercooling is provided between

(A) Two stages of turbine
(B) Two stages of compressor
(C) Two stages of engine
(D) Compressor and combustor
(E) Answer not known

36. During compression process in air compressor, which of the following remains constant

(A) Pressure
(B) Temperature
(C) Mass
(D) Volume
(E) Answer not known

37. Work done on the air is minimum when the compression is

(A) Adiabatic
(B) Isentropic
(C) Iso thermal
(D) Polytropic
(E) Answer not known

38. Which of the following compressor always used as multistage?

(A) Centrifugal compressor
(B) Axial flow compressor
(C) Reciprocating compressor
(D) Roots blower
(E) Answer not known

39. The diesel cycle normally operates with a compression ratio in the range

(A) 1 to 5
(B) 6 to 10
(C) 11 to 15
(D) 16 to 20
(E) Answer not known

40. Compression ignition engine works on

(A) Carnot cycle
(B) Otto cycle
(C) Diesel cycle
(D) Rankine cycle
(E) Answer not known

41. Which of the following has the highest efficiency for the given temperature limits?

(A) Otto cycle
(B) Diesel cycle
(C) Carnot cycle
(D) Dual cycle
(E) Answer not known

42. Compression ratio of an otto cycle is given by the ratio

(A) $\frac{\text{Pressure before compression}}{\text{Pressure after compression}}$

(B) $\frac{\text{Pressure after compression}}{\text{Pressure before compression}}$

(C) $\frac{\text{Volume before compression}}{\text{Volume after compression}}$

(D) $\frac{\text{Volume after compression}}{\text{Volume before compression}}$

(E) Answer not known

43. Consider the following statements

(i) Indicated power = Brake power + Frictional power

(ii) Mechanical efficiency = $\frac{\text{Brake power}}{\text{Indicated power}}$

(iii) Air standard efficiency = $\frac{\text{Frictional power}}{\text{Indicated power}}$

(A) Statements (i), (ii) and (iii) are correct

(B) Statements (i), (ii) and (iii) are wrong

(C) Statements (i) and (ii) are correct, (iii) is wrong.

(D) Statements (i) is wrong, (ii) and (iii) are correct.

(E) Answer not known

44. The function of a Carburettor is to supply

(A) Air and diesel

(B) Air and petrol

(C) Air only

(D) Petrol only

(E) Answer not known

45. Match the following

	Scientists		Field
(a)	Bohr	1.	Electro magnetic induction
(b)	Ohm	2.	Complicated circuits
(c)	Kirchoff	3.	Atomic model
(d)	Faraday	4.	Simple circuits

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

(E) Answer not known

46. Match the following

(a)	Transformer	1.	Converting step up/down AC to DC
(b)	Rectifier	2.	Removing ripples in D.C.
(c)	Filter	3.	Stepping up/down A.C.
(d)	Stabilizer	4.	Keeping D.C. constant

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

(E) Answer not known

47. As per the Kirchoff's current law, the algebraic sum of currents meeting at a point in an electric circuit is

(A) 1
(B) 0
(C) 2
(D) 0.5
(E) Answer not known

48. A logic gate in an electronic circuit which

(A) Alternates between 0 and 1 values
(B) Works on binary algebra
(C) Allows electron flow only in one direction
(D) Makes logic decisions
(E) Answer not known

49. Calculate the current of a electric bulb of 100 W, 200 V type

(A) 0.5 A
(B) 20000 A
(C) 2 A
(D) 300 A
(E) Answer not known

50. The magnetic flux per unit area taken perpendicular to the direction of the magnetic flux is known as

(A) Magnetic flux density
(B) Magnetic flux
(C) Reluctance
(D) Magneto motive force
(E) Answer not known

51. Which of following materials is not used for transmission and distribution of electrical power

(A) Steel
(B) Aluminium
(C) Tungsten
(D) Copper
(E) Answer not known

52. Match the following :

Terminology	Unit
(a) Magnetic flux	1. Weber
(b) Magnetic flux density	2. AT/wb
(c) Magneto motive force	3. Weber (wb)/sqm
(d) Reluctance	4. Ampere Terms (AT)

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

(E) Answer not known

53. The part which rotates and connected to the mechanical load through shaft is called

(A) Starter
(B) Stator
(C) Terminal
(D) Rotor
(E) Answer not known

54. 'The direction of induced emf is opposite to the cause producing it' is

(A) Faraday's second law

(B) Faraday's first law

(C) Lenz's law

(D) Kirchoff's voltage law

(E) Answer not known

55. In a flat belt drive, the belt can be subjected to a maximum tension (T) and centrifugal tension (T_c). The condition for transmission of maximum power is given by

(A) $T = T_c$ (B) $T = \sqrt{T_c}$

(C) $T = \sqrt{3}\, T_c$ (D) $T = 3\, T_c$

(E) Answer not known

56. The position of axes of the shafts of bevel gears,

(A) Parallel and non intersecting

(B) Non-Parallel and intersecting

(C) Non-Parallel and Non- intersecting

(D) Parallel and intersecting

(E) Answer not known

57. If 'T_1' and 'T_2' are the Tensions on tight side and slack side of an open belt drive and 'v' is the velocity of belt then, the power transmitted (P) by belt is given by

(A) $(T_1 + T_2)\, V$
(B) $(T_1 - T_2)\, V$
(C) $\frac{T_1}{T_2} \cdot V$
(D) $(T_1 + T_2)\, V^2$
(E) Answer not known

58. The size of the gear is usually specified by

(A) Pitch circle diameter
(B) Circular pitch
(C) Diametral pitch
(D) Pressure angle
(E) Answer not known

59. Spur gears are used to connect

(A) two parallel and coplanar shafts
(B) two non parallel, but coplanar shafts
(C) two shafts which are right angle to each other
(D) two non parallel and non coplanar shafts
(E) Answer not known

60. In Gear, the module is the reciprocal of

(A) Diametral Pitch
(B) Circular Pitch
(C) Module – 1
(D) Pitch circle
(E) Answer not known

61. The bending moment at the free end of a cantilever beam carrying any type of load is

(A) Minimum
(B) Zero
(C) Maximum
(D) equal to the load
(E) Answer not known

62. The bending equation is written as

(A) $\frac{I}{M} = \frac{\sigma}{y} = \frac{E}{R}$
(B) $\frac{M}{I} = \frac{\sigma^2}{y} = \frac{E^2}{R^2}$
(C) $\frac{M}{I} = \frac{\sigma}{y} = \frac{E}{R}$
(D) $\frac{M^2}{I} = \frac{\sigma^2}{y} = \frac{E^2}{R}$
(E) Answer not known

63. Find the moment of inertia of a rectangular section 30 mm wide and 40 mm deep about *XX* axis

(A) $320 \times 10^3 \text{mm}^4$
(B) $4 \times 10^3 \text{mm}^4$
(C) $90 \times 10^3 \text{mm}^4$
(D) $160 \times 10^3 \text{ mm}^4$
(E) Answer not known

64. A thin cylinder with internal diameter 30 mm, thickness 1.5 mm has a gas with an internal pressure of 6 N/mm^2. Find its longitudinal stress.

(A) 1.3 N/mm^2
(B) 1.5 N/mm^2
(C) 6 N/mm^2
(D) 30 N/mm^2
(E) Answer not known

65. Torque transmitted by a solid shaft of diameter (D), when subjected to a shear stress (τ) is equal to

(A) $\frac{\pi}{16} \cdot \tau \cdot D^2$

(B) $\frac{\pi}{16} \cdot \tau \cdot D^3$

(C) $\frac{\pi}{32} \cdot \tau \cdot D^3$

(D) $\frac{\pi}{32} \cdot \tau \cdot D^2$

(E) Answer not known

66. A closed coiled helical spring of round steel wire 5 mm in diameter having 12 complete coils of 50 mm mean diameter is subjected to an axial load of 100 N. Find the deflection of the spring. C = 80 GPa .

(A) 24 m

(B) 24 mm

(C) 24 cm

(D) 0.24 mm

(E) Answer not known

67. Two springs with stiffness k_1 and k_2 are connected in Parallel. What will be the stiffness of composite spring.

(A) $k = k_1 \cdot k_2$

(B) $k = k_1 + k_2$

(C) $k = \frac{k_1 k_2}{k_1 + k_2}$

(D) $k = k_1$ or k_2, which is maximum

(E) Answer not known

68. If a close-coiled helical spring is subjected to load W and the deflection produced is δ, then stiffness of the spring is given by

(A) W/δ (B) δ/W

(C) $W-\delta$ (D) $W^2-\delta$

(E) Answer not known

69. In the assembly of pulley, key and shaft

(A) key is made strongest link

(B) key is made weaker link

(C) all the three are designed for the same strength

(D) pulley is made weaker

(E) Answer not known

70. In springs, the Wahl's correction factor is _____ (where s = Spring Index).

(A) $k=\frac{4s-1}{4s-2}+\frac{0.615}{s}$ (B) $k=\frac{4s-1}{4s-3}+\frac{0.835}{s}$

(C) $k=\frac{4s-1}{4s-4}+\frac{0.615}{s}$ (D) $k=\frac{4s-1}{4s-4}+\frac{0.835}{s}$

(E) Answer not known

71. The Hook's law states that,

(A) When a material is loaded, within its elastic limit, the stress is directly proportional to the strain

(B) When a material is loaded, within its elastic limit the stress is inversely proportional to the strain

(C) Within its plastic limit, the stress is directly proportional to the strain

(D) Within its plastic limit the stress is inversely proportional to the strain

(E) Answer not known

72. The moment of inertia about a principal axis is called

(A) Mass moment of inertia

(B) Area moment of inertia

(C) Second moment of inertia

(D) Principal moment of inertia

(E) Answer not known

73. The property of a material by virtue of which a body returns to its original shape after removal of the load is known as

(A) Ductility

(B) Plasticity

(C) Elasticity

(D) Resilience

(E) Answer not known

74. Which of the following forms the basis of rigid bodies and strength of materials?

(A) Centroid

(B) Centre of gravity

(C) Moment of Inertia

(D) Mass moment of Inertia

(E) Answer not known

75. Stress induced in a square rod with dimensions 25×25 mm is 4 N/mm^2. What is the load applied on it?

(A) 100 N
(B) 250 N
(C) 2500 N
(D) 25000 N
(E) Answer not known

76. Poisson's ratio for aluminium is

(A) 0.13
(B) 0.23
(C) 0.33
(D) 0.43
(E) Answer not known

77. Rotating part of a centrifugal pump is called as

(A) Casing
(B) Delivery pipe
(C) Impeller
(D) Suction pipe
(E) Answer not known

78. The difference between the theoretical discharge and actual discharge in a pump is called

(A) Slip of the pump
(B) Priming of the pump
(C) Evacuation of the pump
(D) Co-efficient of discharge of the pump
(E) Answer not known

79. The phenomenon of formation of vapour bubbles of a flowing liquid is called as

(A) Priming
(B) Cavitation
(C) Capilarity
(D) Viscosity
(E) Answer not known

80. Air vessel is used in the case of

(A) A centrifugal pump
(B) A reciprocating pump
(C) An air lift pump
(D) A jet pump
(E) Answer not known

81. The negative slip in possible in case of reciprocating pumps having

(A) Long suction and long delivery pipe
(B) Short suction and short delivery pipe
(C) Long suction pipe and short delivery pipe
(D) Short suction pipe and long delivery pipe
(E) Answer not known

82. Consider the following statements. Which of the following statements are false?

(1) If a centrifugal pump consisting two or more impellers, the pump is multi stage.

(2) To produce a high head, the impellers are connected in parallel.

(3) Specific speed, $N_S = \frac{N\sqrt{Q}}{H_m^{Y4}}$

(A) (1) and (2) (B) (2) only

(C) (2) and (3) (D) (1) and (3)

(E) Answer not known

83. If the head on the turbine is more than 300 m, the type of turbine used should be

(A) Kaplan turbine (B) Francis turbine

(C) Pelton wheel (D) Propeller

(E) Answer not known

84. Francis turbine is

(A) An impulse turbine

(B) A radial flow impulse turbine

(C) An axial flow turbine

(D) A radial flow reaction turbine

(E) Answer not known

85. Penstock refers to a

(A) Pipe connecting dam (water storage place) and turbine inlet
(B) Pipe connecting turbine outlet to tail race
(C) Bucket in a pelton wheel
(D) Runner in a francis turbine
(E) Answer not known

86. Draft tube connected at the exit of the turbine has

(A) Constant area of cross section
(B) Gradually increasing area of cross section from turbine exit to tail race
(C) Gradually decreasing area of cross section from turbine exit to tail race
(D) Sudden decrease in cross section area
(E) Answer not known

87. The draft tube in a reaction water turbine

(A) Prevents air from entering
(B) Increases the viscosity
(C) Eliminates eddies in the down stream
(D) Converts kinetic energy in to pressure energy
(E) Answer not known

88. Which of the following method may not be used to avoid cavitation?

(A) The cavitation effect can be reduced by polishing the surface

(B) It is possible to reduce the cavitation effect by selecting materials

(C) The cavitation free runner may be designed

(D) Runner/turbine may be kept above water

(E) Answer not known

89. Maximum efficiency of pelton wheel is given by

(where ϕ = vane angle at outlet)

(A) $\eta_{max} = \frac{(1 - \cos\phi)}{2}$

(B) $\eta_{max} = \frac{(1 + \cos\phi)}{2}$

(C) $\eta_{max} = \frac{(1 - \sin\phi)}{2}$

(D) $\eta_{max} = \frac{(1 + \sin\phi)}{2}$

(E) Answer not known

90. Which of the following statement is true in case of Kaplan turbine?

(A) It is axial flow turbine water flows parallel to the axis of the turbine shaft

(B) It is mixed flow turbine water flows parallel to the axis of the shaft

(C) It is axial flow turbine water flows perpendicular to the axis of the shaft

(D) It is mixed flow turbine water flows perpendicular to the axis of the turbine shaft

(E) Answer not known

91. The specific speed of the turbine is given by the relation

(A) $N_S = \frac{N\sqrt{P}}{(H)^{3/2}}$ (B) $N_S = \frac{N\sqrt{P}}{(H)^{1/2}}$

(C) $N_S = \frac{N\sqrt{P}}{(H)^{2/3}}$ (D) $N_S = \frac{N\sqrt{P}}{(H)^{5/4}}$

(E) Answer not known

92. Which one of the following statement is false?

(A) The atmospheric pressure head is 760 mm of mercury

(B) Vacuum pressure is defined as the pressure above atmospheric pressure

(C) Diaphragm pressure gauge is a type of mechanical gauge

(D) Piezometer used to measure gauge pressure

(E) Answer not known

93. Pitot tube is used for measuring the

(A) Pressure at a point (B) Density at a point

(C) Velocity of flow at a point (D) Discharge in a pipe

(E) Answer not known

94. When a certain pressure is applied at any point in a fluid at rest, the pressure is equally transmitted in all directions and to every other point in the fluid?

(A) Archimidis law (B) Buoyancy law

(C) Fluid's law (D) Pascal's law

(E) Answer not known

95. Select the formula used to find the velocity of fluid.

(g – acceleration due to gravity, H – Head)

(A) $V = \sqrt{\frac{2g}{H}}$ (B) $V = \sqrt{\frac{2H}{g}}$

(C) $V = \sqrt{2gH^2}$ (D) $V = \sqrt{2gH}$

(E) Answer not known

96. The relationship between coefficient of discharge (C_d), coefficient of velocity (C_v) and coefficient of contraction (C_c) is

(A) $C_d = C_c \times C_v$ (B) $C_v = C_d \times C_c$

(C) $C_d = \frac{C_v}{C_c}$ (D) $C_d = C_v - C_c$

(E) Answer not known

97. The Kaplan turbine has the following major items in the hydraulic circuit

(1) Draft tube

(2) Runner

(3) Guide vanes

(4) Penstock

(5) Scroll case

The correct sequence of items in the direction of flow.

(A) (4), (2), (3), (1), (5)

(B) (1), (2), (3), (5), (4)

(C) (1), (3), (2), (4), (5)

(D) (4), (5), (3), (2), (1)

(E) Answer not known

98. In a manometer, S_h is the specific gravity of heavier liquid, S_o is the specific gravity of liquid flowing through the pipe, x-Difference of the heavier liquid coloumn in U tube, then 'h' is given by

(A) $h = x\left[\frac{S_o}{S_h} - 1\right]$

(B) $h = x\left[\frac{S_h + S_o}{S_o}\right]$

(C) $h = x\left[\frac{S_h}{S_o} - 1\right]$

(D) $h = x\left[\frac{S_h}{S_o} + 1\right]$

(E) Answer not known

99. A flat-faced follower having perfectly flate plane is known as

(A) Flat follower
(B) Roller follower
(C) Mushroom follower
(D) Knife edged follower
(E) Answer not known

100. Rocker arms are made of

(A) Grey cast iron
(B) Nodullar graphite iron
(C) Pearlitic malleable iron
(D) White cast iron
(E) Answer not known

101. The type of follower generally used where the space is limited is called as

(A) Knife edge follower
(B) Roller follower
(C) Mushroom follower
(D) Spherical faced follower
(E) Answer not known

102. In constructing the cam profile, the principle of kinematic inversion is used i.e., the cam is imagined to be stationary and the follower is allowed to rotate in the ———— direction to the cam rotation.

(A) Same
(B) Opposite
(C) Offset
(D) Remains stationary
(E) Answer not known

103. Size of a part specified in the drawing as a matter of convenience is known as

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

104. The algebraic difference between actual size and basic size is

(A) Actual deviation
(B) Upper deviation
(C) Lower deviation
(D) Mean deviation
(E) Answer not known

105. The type of fit in which the tolerance zone of the hole is entirely above the tolerance zone of the shaft is known as

(A) Clearance fit
(B) Interference fit
(C) Transition fit
(D) Shrink fit
(E) Answer not known

106. The system expressing the size as $50.5^{\pm 0.00}_{0.20}$ is known as

(A) Universal dimension system
(B) Limiting dimension system
(C) Unilateral system
(D) Bilateral system
(E) Answer not known

107. In the turning manufacturing process, what level of IT grade of tolerance can be produced?

(A) 5 to 11
(B) 6 to 12
(C) 7 to 13
(D) 8 to 14
(E) Answer not known

108. The dimensions of the mating parts, according to hole basis system, are given as follows

Upper limit of the hole = 25.02 mm

Upper limit of the shaft = 24.97 mm

Lower limit of the shaft = 24.95 mm

Lower limit of the hole = 25 mm

Find the allowance.

(A) 0.03 mm
(B) 0.02 mm
(C) 0.05 mm
(D) 0.07 mm
(E) Answer not known

109. Ball bearings are designated by

(A) Size of ball
(B) Number of ball
(C) Bore size
(D) Roller size
(E) Answer not known

110. The clearance ratio of bearing is defined by

Where

C = Diameteral Clearance

D = Diameter of Journal

(A) C + D
(B) C – D
(C) C/D
(D) D/C
(E) Answer not known

111. In sliding contact bearing, it load acts perpendicular to the axis of shaft, it is called

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

112. In a thrust bearing, the load acts

(A) Parallel to the axis of rotation
(B) Along the axis of rotation
(C) Perpendicular to the axis of rotation
(D) In all directions
(E) Answer not known

113. The rated life of a bearing varies

(A) Directly
(B) Inversely as square of load
(C) Inversely as cube of load
(D) Inversely as fourth power of load
(E) Answer not known

114. Babbit metal is

(A) Tin-88%, Antimony 8%, Copper 4%
(B) Copper 93.7%, Tin 6%, Phosphorus 0.3%
(C) Copper 96%, Silicon 3%, Manganese 1%
(D) Copper 88%, Zinc 2%
(E) Answer not known

115. The property of a material to resist fracture due to high impact loads is known as

(A) Stiffness
(B) Ductility
(C) Toughness
(D) Fatigue
(E) Answer not known

116. The essential mechanical property for spring materials which is measured by the amount of energy absorbed per unit volume within elastic limit is known as

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

117. Which metal is bright and shining white metal and can be rolled into thin sheets. Also it is ductile and malleable?

(A) Gun metal
(B) Lead
(C) Tin
(D) Aluminium
(E) Answer not known

118. While designing heat transfer applications, generally copper is preferred, because it's thermal conductivity is

(A) 253.5 w/m°C
(B) 293.5 w/m°C
(C) 353.5 w/m°C
(D) 393.5 w/m°C
(E) Answer not known

119. Ability of material to withstand load is called

(A) Hardness
(B) Toughness
(C) Strength
(D) Stiffness
(E) Answer not known

120. Which one of the following material is used for manufacture the ball bearings?

(A) High carbon chromium steel
(B) High carbon silicon steel
(C) Cast iron Grade 25
(D) Copper Alloys
(E) Answer not known

121. Choose the correct statement

(A) Nitriding is a process of producing hard surface
(B) Nitriding is carried out to prevent corrosion
(C) Nitriding improves surface finish
(D) Nitriding refines grain size
(E) Answer not known

122. Steel can be hardened quickly by

(A) Carburising
(B) Cyaniding
(C) Induction hardening
(D) Nitriding
(E) Answer not known

123. In full annealing, the hyper-eutectoid steel in heated from 30°C to 50°C above the upper critical temperature and then cooled

(A) in still air

(B) slow in the furnace

(C) suddenly in a suitable cooling medium

(D) by water

(E) Answer not known

124. Cutting force required to shear, in press is

(A) Shear length of perimeter × shear strength of material × material thickness

(B) (Shear length of perimeter × shear strength of material) / material thickness

(C) $\frac{1}{\text{material thickness}} \times \frac{1}{\text{shear length of perimeter}} \times \text{shear strength of material}$

(D) $\frac{\text{shear length of perimeter}}{(\text{material thickness} \times \text{shear strength of material})}$

(E) Answer not known

125. Which one of the following heat treatment process is used for castings?

(A) Carburising

(B) Normalising

(C) Annealing

(D) Tempering

(E) Answer not known

126. Trepanning is performed for

(A) Finishing a drilled hole

(B) Producing a large hole without drilling

(C) Truing a hole for alignment

(D) Enlarging a drilled hole

(E) Answer not known

127. In shapers, the cutting and return speeds are constant throughout the stroke when ———— mechanism is used.

(A) Crank and slotted link

(B) Whitworth quick return

(C) Hydraulic shaper

(D) Open and cross belt

(E) Answer not known

128. An operation of embossing a diamond shaped pattern on the surface of a workpiece is known as

(A) Counter-boring

(B) Grooving

(C) Knurling

(D) Facing

(E) Answer not known

129. The rake angle provided in broaching tool usually ranges between.

(A) 30° – 35°

(B) 0° – 20°

(C) 25° – 30°

(D) 28° – 32°

(E) Answer not known

130. Orthogonal cutting system is also known as

(A) One-dimensional cutting system

(B) Two-dimensional cutting system

(C) Three-dimensional cutting system

(D) Four-dimensional cutting system

(E) Answer not known

131. In a Lathe, swing diameter over bed is

(A) the largest diameter of work that will revolve over the lathe saddle

(B) the largest diameter of work that will revolve without touching the bed

(C) the maximum diameter of bar stock

(D) the minimum diameter of bar stock

(E) Answer not known

132. Silica is

(A) Neutral refractories

(B) Basic refractories

(C) Acid refractories

(D) Not a refractories

(E) Answer not known

133. Calendering is

(A) a cross linking process in elostomers

(B) a forming process by which rubber compound are spread upon fabric

(C) the application of a thin sheet of rubber to a sheet of fabric

(D) removing of flush by wire

(E) Answer not known

134. The melting point of tantalum is

(A) 3410°C
(B) 3000°C
(C) 327°C
(D) 350°C
(E) Answer not known

135. In powder metallurgy, the sintering process results in

(A) Increase Electrical Conductivity
(B) Increase Density
(C) Decrease Ductility
(D) Both (A) and (B)
(E) Answer not known

136. Which of the following statements are true related to powder metallurgy.

(1) There is no loss of material

(2) The components produced possess poor impact strength and elongation

(3) Highly skilled labour is not required

(A) (1) only
(B) (1) and (2)
(C) (2) and (3)
(D) (1) (2) and (3)
(E) Answer not known

137. In order to deliver molten metal from pouring basin to gate

(A) a riser is used
(B) a sprue is used
(C) a core is used
(D) a gagger is used
(E) Answer not known

138. The carburizing flame is one which there is an excess of

(A) Oxygen
(B) Acetylene
(C) Hydrogen
(D) Nitrogen
(E) Answer not known

139. A taper provided on the pattern for its easy and clean withdrawal from the mould is known as

(A) Machining allowances
(B) Draft allowances
(C) Shrinkage allowance
(D) Distorsion allowance
(E) Answer not known

140. Forging dies are constructed from

(A) Medium grade carbon
(B) High grade carbon
(C) Steel
(D) Aluminium
(E) Answer not known

141. The contraction allowance for the material zinc in castings process is

(A) 7 to 10.5 mm/metre
(B) 24 mm/metre
(C) 18 mm/metre
(D) 16 mm/metre
(E) Answer not known

142. The option BCC available in email used

(A) Visible to all other receipents
(B) Visible to Administrator
(C) Not visible to all other receipents
(D) Not visible to Administrator
(E) Answer not known

143. Which option is Not available in MS excel?

(A) Copy
(B) Spell check
(C) Font format
(D) Paste
(E) Answer not known

144. Information such as page numbers, word count, language and zoom are displayed in

(A) Status bar
(B) Scroll bar
(C) Tool bar
(D) Menu bar
(E) Answer not known

145. In MS excel, in order to know the printable portion, ———— view is used.

(A) Page layout view
(B) Page break preview
(C) Full screen view
(D) Custom view
(E) Answer not known

146. ———— can help you make sense of a work sheet's contents.

(A) Cell pointers
(B) Labels
(C) Cell references
(D) Values
(E) Answer not known

147. In MS-Word, a paragraph mark can be created on pressing the ———— key.

(A) ESC
(B) Enter
(C) Ctrl
(D) End
(E) Answer not known

148. What is the smallest unit of worksheet in Excel?

(A) Row
(B) Column
(C) Cell
(D) Range
(E) Answer not known

149. Rectangle Shaped Symbol in a flowchart indicates

(A) Process
(B) Input
(C) Decision
(D) Stop
(E) Answer not known

150. Every Web page has a unique address, called a

(A) Hyperlink
(B) Uniform resource location
(C) HTTP
(D) Map
(E) Answer not known

151. Web TV is an example of

(A) Super computer
(B) Mini computer
(C) Network computer
(D) Laptop
(E) Answer not known

152. The operation of a digital computer is based on ———— principle.

(A) Counting
(B) Measuring
(C) Electronic
(D) Logical
(E) Answer not known

153. The computer memory that is not erasable is

(A) ROM
(B) RAM
(C) EPROM
(D) EEPROM
(E) Answer not known

154. In a computer, BIOS stands for

(A) Built In Operating System
(B) Basic Input Output System
(C) Basic Input Output Software
(D) Built In Operating Software
(E) Answer not known

155. The device with more capacity is

(A) Flopply diskette
(B) DVD
(C) CD-ROM
(D) RW-CD
(E) Answer not known

156. Convert 625 into Binary Number

(A) 1001110001
(B) 0110001110
(C) 1010011101
(D) 1001001001
(E) Answer not known

157. The speed of super computers is specified by

(A) GHz
(B) GIPS
(C) GFLOPS
(D) N/sec
(E) Answer not known

158. IBM 1401 is a

(A) First Generation Computer
(B) Second Generation Computer
(C) Third Generation Computer
(D) Fourth Generation Computer
(E) Answer not known

159. CD-ROM and Pendrives are the examples of

(A) Input unit
(B) Output unit
(C) Primary memory devices
(D) Secondary memory devices
(E) Answer not known

160. The preparatory functions used to select the machining planes XY, XZ and YZ are

(A) G17, G18 and G19
(B) G01, G02 and G03
(C) G17, G19 and G18
(D) G01, G03 and G02
(E) Answer not known

161. A sheet which contains the details of the sequence of the operations, the machine tools used, the tools used with their numbers speeds, feeds, etc. is known as

(A) Process Planning sheet
(B) Tool cards
(C) Setup sheet
(D) Programming sheet
(E) Answer not known

162. In CNC turning, in the thread cutting block of part program the word F1.5 means

(A) Feed rate in mm/min
(B) Feed rate in mm/rev
(C) Pitch of the thread
(D) Force required
(E) Answer not known

163. In Fanuc system, G 04 indicates

(A) Drilling cycle
(B) Turning cycle
(C) Dwell
(D) Program stop
(E) Answer not known

164. Coolant on is executed in a CNC machine using FANUC system by

(A) G 08
(B) M 08
(C) G 03
(D) M 03
(E) Answer not known

165. In CNC programming, repetitive machining operations can be used as

(A) Turning cycles
(B) Canned cycles
(C) Threading cycles
(D) Peck drilling cycles
(E) Answer not known

166. In CNC machines, usually the axis along the spindle axis or parallel to the spindle axis is designated as (for single spindle machines)

(A) X - axis
(B) Y - axis
(C) Z - axis
(D) A - axis
(E) Answer not known

167. Which one is the manufacturing attribute in parts classification and coding system?

(A) Material type
(B) Tolerances
(C) Part function
(D) Operation sequence
(E) Answer not known

168. In IGES, the optional section used to indicate the form in which the data is specified is known as

(A) Flag section
(B) Start section
(C) Global section
(D) Data Entry section
(E) Answer not known

169. Milling operation in CNC system is an example for

(A) Point to point motion control
(B) Paraxial motion control
(C) Contouring motion control
(D) Continuous path motion control
(E) Answer not known

170. The miscellaneous codes M 03, M 04 and M 05 of a part program are used to control ———— in the CNC machine tool.

(A) Spindle
(B) Coolant
(C) Tool
(D) Clamps
(E) Answer not known

171. In the 'MICLASS' coding system used in GT, the universal codes has ———————— digits.

(A) 5
(B) 8
(C) 10
(D) 12
(E) Answer not known

172. What is PHIGS stands for?

(A) Programmer's Hierarchical Interactive Graphics Standard
(B) Performance Hyper Interactive Graphics Standard
(C) Programmable Hierarchical Interactive Graphics System
(D) Programmer's Hyper Interactive Graphics System
(E) Answer not known

173. In surface modelling, B-spline, Bezier surface, NURBS are belonging to

(A) Planer surfaces
(B) Single curved surfaces
(C) Double curved surfaces
(D) Free-form surfaces
(E) Answer not known

174. The 2D device dependent coordinate system whose origin is usually located at the lower left corner of the graphics display is called as

(A) Screen coordinate system
(B) Model coordinate system
(C) Working coordinate system
(D) Image coordinate system
(E) Answer not known

175. A neutral file created by a translator preprocessor is read by its own post processor to create a native file of the translated model. This kind of test is called as

(A) Reflection test
(B) Transmission test
(C) Loop back test
(D) Universal ranking test
(E) Answer not known

176. Which modelling technique is used in tracing NC tool paths for continuous path machining?

(A) Wire frame modelling
(B) Surface modelling
(C) Solid modelling
(D) Hybrid modelling
(E) Answer not known

177. In CNC programming, repetitive operations are written as

(A) Blocks
(B) Subroutines
(C) Programs
(D) Canned cycles
(E) Answer not known

178. The representation of a complete object by a number of lines with their coordinates and their connectivity relationships is known as

(A) 2D modelling
(B) Wire frame modelling
(C) Surface modelling
(D) Solid modelling
(E) Answer not known

179. Boolean operators are used in ———————— representation of solid modeling.

(A) Cellular decomposition
(B) Boundary representation
(C) Constructive solid geometry
(D) Hybrid scheme
(E) Answer not known

180. Match the principles and actions of TQM.

(a)	The approach	–	1.	Company wide
(b)	The scope	–	2.	Cost of quality
(c)	The standard	–	3.	Management led
(d)	The control	–	4.	Right first time

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

(E) Answer not known

181. Which one is not a TQM dimensions?

(A) Human
(B) Cultural
(C) Economic
(D) Technological
(E) Answer not known

182. In Economic Order Quantity policy the maximum level of stock is calculated by

(A) EOQ – Safety stock
(B) Safety stock + EOQ
(C) Safety stock ÷ EOQ
(D) Safety stock × EOQ
(E) Answer not known

183. EOQ = $\sqrt{X}$

X =

If A = Annual demand

S = Set up cost per order

R = Inventory carry cost/unit/year

(A) $\frac{2AS}{R}$
(B) $2AS \times R$
(C) $2AS + R$
(D) $2AS - R$
(E) Answer not known

184. Identify the correct formula to find total ordering cost, when A is Annual requirement. Q is quantity per order, S is ordering cost/unit.

(A) Total ordering cost = $S + \frac{A}{Q}$
(B) Total ordering cost = $S - \frac{A}{Q}$
(C) Total ordering cost = $S \times \frac{A}{Q}$
(D) Total ordering cost = $S \times \frac{Q}{A}$
(E) Answer not known

185. Find out the depreciation per year by 'straight line method' when the original value of a machine is Rs. 20,000 and expected life is 10 years. The scrap value is Rs. 2,000.

(A) Rs. 1,200/year
(B) Rs. 1,500/year
(C) Rs. 1,800/year
(D) Rs. 2,000/year
(E) Answer not known

186. The selling price of a product is a summation of 'profit' and

(A) Prime cost
(B) Factory cost
(C) Total cost
(D) Production cost
(E) Answer not known

187. The reduction in asset value over the life span will be minimum by ———— method while calculating depreciation.

(A) Straight line method
(B) Cross line method
(C) Sinking fund method
(D) Percentage on diminishing value method
(E) Answer not known

188. The summation of 'prime cost' and 'factory overhead' is termed as

(A) Production cost
(B) Factory cost
(C) Total cost
(D) Sales cost
(E) Answer not known

189. The production cost and sales overhead incurred by a company is Rs. 10,000. Find selling price of the product when the profit is 20% of total cost.

(A) Rs. 5,000
(B) Rs. 10,000
(C) Rs. 12,000
(D) Rs. 8,000
(E) Answer not known

190. In Break even analysis, the change in variable cost to change in volume of production is

(A) proportional
(B) inversely proportional
(C) not dependent
(D) not relevant
(E) Answer not known

191. 'Sales overhead' incurred in a company is the difference between total cost and

(A) Prime cost
(B) Factory cost
(C) Production cost
(D) Sales cost
(E) Answer not known

192. Choose the correct formula to calculate depreciation 'D' by straight line method, when V is original value of asset, S - scrap value after the life N - Life of the asset in years.

(A) $D = \frac{N}{V - S}$
(B) $D = \frac{N}{V + S}$
(C) $D = \frac{V - S}{N}$
(D) $D = \frac{V + S}{N}$
(E) Answer not known

193. As per the principle of 'stability of tenure of personnel' higher labour turn over indicates ———————— management.

(A) Bad
(B) Good
(C) Efficient
(D) Effective
(E) Answer not known

194. According to McGregor's 'Y' theory a man was ———————— at work.

(A) Good and optimistic
(B) Pessimistic
(C) Lazy
(D) Not interested
(E) Answer not known

195. Work study is concerned with

(A) Improving present method and finding standard time
(B) Motivation of workers
(C) Improving production capability
(D) Improving production planning and control
(E) Answer not known

196. Arrange the order of contributions to Industrial Engineering and Management as per the year in ascending order.

(I) Fredrick Taylor
(II) Henry and Gantt
(III) James Watt
(IV) Adam Smith

(A) (I), (II), (III), (IV)
(B) (IV), (III), (I), (II)
(C) (II), (IV), (III), (I)
(D) (III), (I), (II), (IV)
(E) Answer not known

197. The fourth need of people is referred as ———————— according to Maslow's hierarchical theory.

(A) Physiological needs
(B) Security needs
(C) Belongingness needs
(D) Esteem needs
(E) Answer not known

198. Match the following :

	Need		Groups
(a)	Desire	1.	Safety
(b)	Kindness	2.	Physiological
(c)	Food	3.	Social needs
(d)	Security	4.	Self actualization

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

(E) Answer not known

199. In Ranking method of job evaluation system, jobs are ranked in terms of their importance.

(A) from highest to lowest
(B) from lowest to highest
(C) in ascending order of price
(D) in descending order of price
(E) Answer not known

200. Arrange the order of job evaluation processes given below :

(I) Job classification

(II) Wage determination

(III) Job description

(IV) Job analysis

(A) (I), (II), (III), (IV)
(B) (III), (IV), (II), (I)
(C) (IV), (III), (I), (II)
(D) (II), (I), (IV), (III)
(E) Answer not known