COMBINED TECHNICAL SERVICES EXAMINATION
(NON-INTERVIEW POSTS)

COMPUTER BASED TEST

DATE OF EXAM: 18.08.2026 - FN

PAPER-II: INDUSTRIAL SAFETY AND HEALTH (DEGREE STD.)

(CODE NO.515)

1. The robots having human-like intelligence, self-learning and conclusion-drawing capabilities by past experiences was introduced in _____.

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

2. Match it correctly about wrist configuration.

(a)	Motion in a plane perpendicular to the end of the arm	1.	Pitch
(b)	Motion in a vertical plane passing through the arm	2.	Yaw
(c)	Motion in a horizontal plane passing through the arm	3.	Roll

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

(E) Answer not known

3. Which of the following are the elements of worker involvement in the lean production structure?

1. The 5s system
2. Visual management
3. Continuous improvement
4. Quality circles

(A) 1, 2 and 3
(B) 1, 2, 3 and 4
(C) 1, 3 and 4
(D) 2, 3 and 4
(E) Answer not known

4. Work sampling study was conducted with level of confidence 95% and accuracy ± 5%. Calculate the number of observation to obtain the desired results, a trial study was conducted consisting of 1000 random observations, 250 observations showed that the machine was idle

(A) 2400 observations
(B) 4800 observations
(C) 7200 observations
(D) 9600 observations
(E) Answer not known

5. Which of the following method is not used in decision making of evaluation of alternatives?

(A) Quantitative factors
(B) Marginal analysis
(C) Cost effective analysis
(D) Differentiation strategy
(E) Answer not known

6. Which of the following statements are correct?

Pelton wheel turbine is a

(i) Impulse turbine

(ii) No problem of cavitation

(iii) Low head turbine

(iv) Flow is tangential

(A) (i) and (ii) are correct

(B) (i), (ii) and (iii) are correct

(C) (i), (ii) and (iv) are correct

(D) (ii), (iii) and (iv) are correct

(E) Answer not known

7. A centrifugal pump delivers 12 litres of water per second running at 1200 rpm. What will be the discharge of the pump if the pump runs at 1500 rpm?

(A) 15 litres/s

(B) 9.6 litres/s

(C) 30 litres/s

(D) 24 litres/s

(E) Answer not known

8. Which of the following is incorrectly paired?

(i)	Maximum hydraulic efficiency of Pelton wheel turbine	–	$\frac{1 - \cos \phi}{2}$
(ii)	Kaplan turbine	–	Axial flow reaction turbine
(iii)	Muschel curves	–	Constant speed curves
(iv)	Jet ratio	–	$\frac{\text{diameter of jet (d)}}{\text{diameter of pitch (D) of pelton wheel}}$

(A) (i) only
(B) (i) and (ii) only
(C) (i), (ii) and (iv) only
(D) (i), (iii) and (iv) only
(E) Answer not known

9. Match the following :

(a) Work saved by fitting air vessel in a single acting reciprocating pump	1. High heads can be achieved
(b) Work saved by fitting air vessel in a double acting reciprocating pump	2. High discharge can be achieved
(c) Centrifugal pump connected in series	3. 39.2%
(d) Centrifugal pump connected in parallel	4. 84.8%

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

(E) Answer not known

10. Theoretical discharge of a reciprocating pump is 0.0105 m^3/s and the actual discharge of the pump is 0.01 m^3/s. The percentage of slip of the pump is _____.

(A) 4.5%
(B) – 4.5%
(C) 0.5%
(D) – 0.5%
(E) Answer not known

11. The prism is compressed freely subjected to a pressure p on the top (say z-direction), the stresses in the metal prism is represented by

(A) $\sigma_x = 0,\ \sigma_y = 0,\ \sigma_z = p$

(B) $\sigma_x = 0,\ \sigma_y = 0,\ \sigma_z = -p$

(C) $\sigma_x = -p,\ \sigma_y = -p,\ \sigma_z = p$

(D) $\sigma_x = p,\ \sigma_y = p,\ \sigma_z = -p$

(E) Answer not known

12. The entire area under the stress-strain curve from origin to rupture represent _____.

(A) Resilience

(B) Toughness

(C) Modulus of Resilience

(D) Modulus of Toughness

(E) Answer not known

13. Which of the following are true?

(1) The rate of change of shear force with respect to distance is rate of loading

(2) The rate of change of Bending moment with respect to distance is shear force

(A) Only (1)

(B) Only (2)

(C) Both (1) and (2)

(D) Neither (1) nor (2)

(E) Answer not known

14. Which of the following statements are incorrect regarding self locking?

(1) Self-locking of screw is possible when the coefficient of friction is low

(2) Self-locking property of screw is lost when the lead is small

(3) Self-locking property of screw is lost when the number of starts increases

(4) Multiple threaded screw is better than single threaded screws from self-locking conditions

(A) (1), (2) and (3) only
(B) (1), (2) and (4) only
(C) (2), (3) and (4) only
(D) (1), (3) and (4) only
(E) Answer not known

15. Which of the following are true about herringbone gear and double helical gear, two gears are used with

(1) Same module

(2) Same number of teeth

(3) Same pitch circle diameter

(4) Same hand of helix teeth

(5) There is a groove between two helical gears in case of herringbone gears

(A) (1), (2), (3) and (4)
(B) (1), (2), (3) and (5)
(C) (1), (2), (4) and (5)
(D) (1), (2) and (3) only
(E) Answer not known

16. In a spring loaded. Hartnell governor, what is the effect of increasing the spring stiffness have on the governors performance

(A) It makes the governor more susceptible to wear stear

(B) It increases the governors operating speed range

(C) It decreases the governors sensitivity

(D) It reduces the governors stability

(E) Answer not known

17. Choose the correct statement regarding FLYWHEEL.

(A) It increases the fluctuation of speed of the prime mover

(B) It reduces the fluctuation of speed during a cycle for constant output load

(C) No influence on mean speed for prime mover

(D) No influence over cyclic speed fluctuation

(E) Answer not known

18. For static balancing of a shaft _____.

(A) the net dynamic force acting on the shaft is equal to zero

(B) the net couple due to the dynamic forces acting on the shaft is equal to zero

(C) both (A) and (B)

(D) neither (A) nor (B)

(E) Answer not known

19. The partial balancing means _____.

(A) balancing partially the revolving masses

(B) balancing partially the reciprocating masses

(C) balancing of engines

(D) both (A) and (B)

(E) Answer not known

20. The frictional torque transmitted by a disc (or) plate clutch is same as that of

(i) Flat collar bearing

(ii) Flat pivot bearing

(iii) Conical pivot bearing

(iv) Trapezoidal pivot bearing

(A) (i) and (ii) only

(B) (i) only

(C) (i) and (iii) only

(D) (i) and (iv) only

(E) Answer not known

21. A gauge fitted to a steam condenser indicates 700 mm Hg when the barometer records 760 mm Hg. Calculate the nearest absolute pressure in the condenser in kPa.

(A) 6 kPa

(B) 7 kPa

(C) 8 kPa

(D) 9 kPa

(E) Answer not known

22. The inner surface of a plane brick wall is at 60°C and the outer surface is at 35°C. Calculate the rate of heat transfer per m^2 of surface area of the wall, which is 220 mm thick. The thermal conductivity of the brick is 0.51 w/m°C.

(A) 57.95
(B) 222.82
(C) 10.78
(D) 2.805
(E) Answer not known

23. The barometric pressure = 1.03 bar. The saturation pressure at the given dry bulb temperature = 0.06 bar. The actual pressure at the same dry bulb temperature = 0.03 bar. Relative humidity of air at this condition is

(A) 33.33%
(B) 50%
(C) 48.5%
(D) 75%
(E) Answer not known

24. In an absorption type refrigeration system, heating in generator, refrigeration in evaporator and cooling by normal water in condenser, takes place at 95°C, – 5°C and 30°C. The maximum COP of the system is

(A) 2.3525
(B) 1.3525
(C) 4.3525
(D) 0.3525
(E) Answer not known

25. A room has options to get heated with either heat pump based vapour compression refrigeration system or electrical resistance based room heaters. For the same heat supply, which of the following statement is correct?

(i) Both electrical heater and heat pump system consumes same amount of energy

(ii) Electrical heater consumes less energy

(iii) Heat pump consumes less energy

(iv) Both the systems cannot be compared

(A) (i) (B) (ii)

(C) (iii) (D) (iv)

(E) Answer not known

26. Match the following with respect to a typical vapour compressor refrigeration system :

(a)	Compressor	1.	Reversible adiabatic process
(b)	Condenser	2.	Isenthalpic process
(c)	Throttling	3.	Isobaric process
(d)	Evaporator	4.	Isobaric process

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

(E) Answer not known

27. Gudgeon pin forms a link between

(A) Piston and big end of connecting rod

(B) Piston and small end of connecting rod

(C) Connecting rod and crank

(D) Big and small end of connecting rod

(E) Answer not known

28. 5 kg of O_2 is heated in a reversible non-flow constant volume process from temperature of 60°C until the pressure is doubled. The change in enthalpy in the above process is _____, if C_p is assumed as 0.913 kJ/kgK.

(A) 393 kJ

(B) 1087 kJ

(C) 1520 kJ

(D) 2263 kJ

(E) Answer not known

29. Internal energy of an ideal gas is a function of

(A) Temperature and volume

(B) Pressure and volume

(C) Pressure and temperature

(D) Temperature alone

(E) Answer not known

30. Choose the right among the following with respect to the similarities between heat and work.

Both heat and work are

(i) Transient phenomenon
(ii) Boundary phenomenon
(iii) Path function
(iv) In-exact differentials

(A) (i) only
(B) (i) and (ii) only
(C) (i), (ii) and (iii) only
(D) (i), (ii), (iii) and (iv)
(E) Answer not known

31. Which of the following statement is true about the charging time of super capacitors?

(A) Super capacitors charge very slowly compared to batteries
(B) Super capacitors charge in a fraction of the time compared to batteries
(C) Super capacitors charge at the same rate as batteries
(D) Super capacitors do not need charging
(E) Answer not known

32. The commonly used battery in Electric Vehicles (EVs) is

(A) Zinc carbon battery
(B) Nickel Cadmium battery
(C) Lead acid battery
(D) Lithium ion battery
(E) Answer not known

33. In a fuel cell, the anode is responsible for

(A) Oxidation of the fuel
(B) Transporting electrons
(C) Reduction of the fuel
(D) Producing heat
(E) Answer not known

34. Which of the following is a key component of the electric vehicle's thermal management systems?

(A) Air conditioning compressor
(B) Battery Coolant loop
(C) Exhaust gas recirculation
(D) Fuel injector
(E) Answer not known

35. Which smart grid feature helps to prevent widespread outages during emergencies?

(A) Demand Response
(B) Smart meters
(C) Self-healing grid technology
(D) Distributed energy sources
(E) Answer not known

36. Which type of turbine is typically used in high-head hydro power plants?

(A) Pelton turbine
(B) Francis turbine
(C) Kaplan turbine
(D) Bulb turbine
(E) Answer not known

37. The primary purpose of an electrostatic precipitator in a power plant is to _____.

(A) Remove ash particles from the exhaust
(B) Reduce fuel consumption
(C) Generate electricity
(D) Increase combustion efficiency
(E) Answer not known

38. The primary fuel used in nuclear power plant is

(A) U^{235}
(B) U^{233}
(C) U^{239}
(D) U^{238}
(E) Answer not known

39. Which of the following types of wind turbines is most commonly used in commercial wind farms?

(A) Horizontal – Axis Wind Turbine (HAWT)
(B) Vertical – Axis Wind Turbine (VAWT)
(C) Savonius Wind Turbine
(D) Darrieus Wind Turbine
(E) Answer not known

40. A controller in commercial type of wind turbines are provided with data from _____.

(A) Yaw drive
(B) Wind Vane
(C) Rotor
(D) Anemometer
(E) Answer not known

41. When large volumes of dilute slurry must be thickened, which equipment given below is used?

(A) Rotary drum filter
(B) Mechanical agitated thickness
(C) Horizontal belt filter
(D) Continuous conveyor centrifuges
(E) Answer not known

42. Which one is not belong to ultra fine grinders?

(A) Colloid mill
(B) Fluid energy mill
(C) Attrition mill
(D) Agitated mill
(E) Answer not known

43. The separation of solids from a suspension in a liquid by gravity settling is called:

(A) Filtration
(B) Separation
(C) Sedimentation
(D) None of the above
(E) Answer not known

44. The continuity equation $\frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z} = 0$ is valid for

(A) Ideal fluid only
(B) Steady flow and compressible fluid
(C) Unsteady flow and compressible fluid
(D) Steady flow and Incompressible fluid
(E) Answer not known

45. _____ flow means the flow of incompressible flow without the presence of shear.

(A) Potential
(B) Streamline
(C) Creep
(D) Boundary layer
(E) Answer not known

46. In the stokes law range, the terminal velocity of a solid spherical particle falling through a stationary fluid mass _____ the fluid viscosity.

(A) Directly proportional to
(B) Inversely proportional to
(C) Inversely proportional to square root of
(D) Independent of
(E) Answer not known

47. The fluids for which the ratio of the shear stress to the shear rate is constant, are called as:

(A) Non-Newtonian fluids
(B) Newton's law of viscosity
(C) Newtonian fluids
(D) Kinetic viscosity
(E) Answer not known

48. A log – log plot of f v/s $16/N_{RR}$ results in a straight line with a slope equal to _____.

(A) One
(B) Plus 16
(C) Minus 16
(D) Minus one
(E) Answer not known

49. Which equation is helpful in replacing unmeasurable quantities in thermodynamic equations by measurable quantities?

(A) Clapeyron equation
(B) Gibbs – Duhem equation
(C) Maxwell's equations
(D) Joule – Thompson equation
(E) Answer not known

50. Which of the following is not a common Refrigerant?

(A) Freon – 12
(B) Ethylene
(C) Ammonia
(D) Carbon di oxide
(E) Answer not known

51. From the following list, Identify the properties which are equal in both vapour and liquid phases at Equilibrium.

P : Density

Q : Temperature

R : Chemical potential

S : Enthalpy

(A) P and Q only
(B) Q and R only
(C) R and S only
(D) P and S only
(E) Answer not known

52. The compressibility factors (Z) of a gas is

(A) Fugacity in given state/fugacity in standard state
(B) Actual volume/volume of gas if it were ideal
(C) The change in volume with temperature at constant pressure
(D) The difference between actual volume and ideal gas volume
(E) Answer not known

53. A plot having $\log P_v$ (vapour pressure) on y axis and $1/T$ on x axis. Where T is temperature is called as

(A) Humidity chart

(B) During chart

(C) Cox chart

(D) Enthalpy concentration chart

(E) Answer not known

54. The ratio of molar heat capacity at constant pressure to molar heat capacity at constant volume, for an ideal gas, (γ) is equal to

(A) 1

(B) 1.4

(C) 0.4

(D) 0

(E) Answer not known

55. The value of gas constant R in J/mol.K is

(A) 1.987

(B) 62.36

(C) 8.314

(D) 0.08314

(E) Answer not known

56. Throttling process for most real gases results in

(A) rise in temperature of gas

(B) no change in pressure and temperature of gas

(C) decrease in temperature and decrease in pressure

(D) decrease in temperature and increase in pressure

(E) Answer not known

57. Glass-reinforced plastic is _____.

(A) Elastomer
(B) Composite material
(C) Epoxy Resin
(D) Polymeric material
(E) Answer not known

58. Tung oil used as _____.

(A) Frying of foods
(B) Wood finishing product
(C) Lubricants
(D) Medical applications
(E) Answer not known

59. Match the following :

(a)	Antileprotic drug	1.	Metronidazole
(b)	Analgesics	2.	Procaine hydrochloride
(c)	Anesthetics	3.	Clofazimine
(d)	Antimalarials	4.	Ibuprofen
(e)	Gastrointestinal drugs	5.	Chloroquine

	(a)	(b)	(c)	(d)	(e)
(A)	3	4	2	5	1
(B)	5	1	4	2	3
(C)	4	2	1	3	5
(D)	2	3	5	4	1

(E) Answer not known

60. Liquid green soap is manufactured using _____.

(A) Sodium hydroxide with fatty acid

(B) Potassium hydroxide with fatty acid

(C) Potassium hydroxide with vegetable oil

(D) Sodium hydroxide with vegetable oil

(E) Answer not known

61. In v/f control of 3-phase induction motor, if voltage is increased by 10%, in order to keep air gap flux constant, what is the % increment or decrement of frequency?

(A) Frequency is decreased by 10%

(B) Frequency is decreased by 20%

(C) Frequency is increased by 10%

(D) Frequency is increased by 20%

(E) Answer not known

62. Which among the following statements are correctly paired?

(i) Plugging – reverse voltage braking

(ii) Regenerative braking – energy generated is supplied to source

(iii) Dynamic braking – mechanical braking

(A) (i) and (ii)

(B) (ii) and (iii)

(C) (i) and (iii)

(D) (i), (ii) and (iii)

(E) Answer not known

63. While configuring the current source inverter, the following statements are false?

(i) No feed back diodes are required.

(ii) A phase controlled rectifier is used on line side to provide voltage control.

(iii) DC link contains only inductance.

(iv) Regeneration is not possible by changing the polarity of voltages.

(A) (i) and (ii) only
(B) (ii) and (iii) only
(C) (i) only
(D) (iv) only
(E) Answer not known

64. A single phase semi converter is operated from 120 V, 50 Hz ac supply. The load resistance is 10 Ω. If the average output voltage is 50% of the maximum possible average output voltage, determine the firing angle.

(A) 47 V
(B) 54 V
(C) 64 V
(D) 27 V
(E) Answer not known

65. In a three-phase full converter bridge, the effect of source inductance L_s is

(A) To increase the average dc output voltage
(B) To reduce the average dc output voltage
(C) To increase the overlap angle
(D) To reduce the overlap angle
(E) Answer not known

66. In SCR commutation circuit, the satisfactory turn-off is obtained when

(A) Circuit turn - off time < device turn-off time

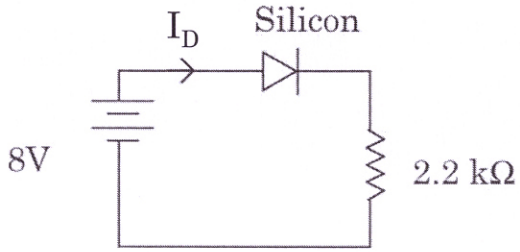
(B) Circuit turn - off time > device turn-off time

(C) Circuit time constant > device turn-off time

(D) Circuit time constant < device turn-off time

(E) Answer not known

67. For the semi conductor device configuration the value of I_D, current through the diode is



(A) 0.7 mA

(B) 1.12 mA

(C) 2.42 mA

(D) 3.32 mA

(E) Answer not known

68. Proportional hydraulic system is converted into proportional derivative control by a dashpot spring series combination by fixing the dashpot outer body

(A) that are connected to input link

(B) that are connected to feedback link

(C) that are connected to spool value

(D) that are connected to spring

(E) Answer not known

69. The setting time of a critically damped system with transfer function $\frac{C(s)}{R(s)} = \frac{9(1+T_D s)}{s^2 + (9T_D + 1.8s) + 9}$

(A) 1.02 sec
(B) 1.12 sec
(C) 1.24 sec
(D) 1.34 sec
(E) Answer not known

70. Given system $G(s) = \frac{k}{[s^3(1+sT)]}$ is operated in a closed loop with unit feedback. The order and type of the closed-loop system are

(A) 2 and 3
(B) 3 and 4
(C) 4 and 0
(D) 3 and 0
(E) Answer not known

71. The wrongly paired Torque – Voltage analogy is

(i) Moment of inertia – Inductance
(ii) Angular displacement – Charge
(iii) Viscous friction coefficient – Reciprocal of capacitance
(iv) Torsional spring stiffness – Resistance

(A) (i) and (ii)
(B) (ii) and (iii)
(C) (iii) and (iv)
(D) (i) and (iv)
(E) Answer not known

72. Match correctly the amplifier with their corresponding operation :

(a)	Isolation amplifier	1.	Amplify micro-level signals using special switching stabilizer
(b)	Chopper stabilized Amplifier	2.	Amplify differential signal using high common mode voltage
(c)	Electrometer Amplifier	3.	Amplify signals from settling time with 2 μ s down to 100 ns
(d)	Fast-settling op-amplifier	4.	Amplify extremely small signal currents into high-level voltage

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

(E) Answer not known

73. Which of the following statements are incorrect about Data Acquisition System (DAS)?

(i) It must monitor the complete plane operation to maintain on-line optimum and safe operations

(ii) It must be able to process summarise and store data for diagnosis of operation and record purpose

(iii) It must be rigid and less capable of being expanded for further requirements

(iv) It must be reliable and not have a down time greater than 1%.

(A) (i), (ii) and (iii) only
(B) (ii), (iii) and (iv) only
(C) (iii) and (iv) only
(D) (i) and (ii) only
(E) Answer not known

74. Find the successive approximation A/D output for a 4 bit converter to a 8.217 V input, if the reference is 5V.

(A) 0110
(B) 0111
(C) 1001
(D) 1010
(E) Answer not known

75. A low pass filter has an input S/N of 20. The input voltage is 3 mV. Calculate the noise voltage

(A) 0.67 mV
(B) 6.70 mV
(C) 7.60 mV
(D) 0.067 mV
(E) Answer not known

76. Match correctly the flow rate meter with their operating principles :

(a)	Vortex flowmeter	1.	Unsteady flow of gases in terms of mass
(b)	Ultrasonic flowmeter	2.	Pulse frequency is proportional to flow rate
(c)	Thermal flowmeters	3.	No of times the container is filled and emptied
(d)	Quantity flowmeters	4.	Variation in parameters of ultrasonic oscillation

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

(E) Answer not known

77. Assertion [A] : Temperature scales are based upon some recognized fixed points. At least two fixed points are required which are constant in temperature and can be easily reproduced such as

(i) The lower fixed point or steam point

(ii) The upper fixed point or ice point.

Reason [R] : Ice point is the temperature of ice, prepared from distilled water, when melting under a pressure of 760 mm of mercury. Steam point is the temperature of steam from pure distilled water boiling under a pressure of 760 mm of mercury.

(A) [A] is true but [R] is false

(B) Both [A] & [R] are true, and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] & [R] are true, but [R] is not the correct explanation of [A]

(E) Answer not known

78. Swamping resistance is connected in series with

(A) Shunt coil to reduce temperature error in shunted ammeters

(B) Ammeters to reduce errors on friction

(C) Meter and have high resistance temperature coefficient to reduce temperature errors

(D) Meter and have low resistance temperature coefficient to reduce temperature errors

(E) Answer not known

79. The Nominal ratio of a current transformer is

(A) Primary winding current / secondary winding current

(B) No. of primary winding turns / No. of secondary winding turns

(C) Rated primary winding current / Rated secondary winding current

(D) Number of secondary winding turns / No. of primary winding turns

(E) Answer not known

80. In a dynamometer 3-phase power factor meter, the planes of two moving coils are at

(A) 0°

(B) 60°

(C) 90°

(D) 120°

(E) Answer not known

81. Choose the right answers :

1. In nonwoven filter media, filtration efficiency is influenced by fiber diameter.

2. In nonwoven filter media, pressure drop is influenced by pore size

3. In nonwoven filter media, filtration efficiency is influenced by tortuosity

4. In nonwoven filter media, pressure drop influenced by fiber length

(A) 1 and 4 are correct

(B) 2 and 4 are correct

(C) 3 and 4 are correct

(D) 1, 2, 3 are correct

(E) Answer not known

82. Assertion [A] : Needle punched spun laid PET fabrics coated with bitumen gives excellent results in roofing application.

Reason [R] : Needle punched PET fabrics coated with bitumen have good puncture and tear resistance.

(A) [A] is true but [R] is false

(B) Both [A] and [R] are true, and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]

(E) Answer not known

83. Which one of the following non wovens have a silk like feels and its for skin contact application?

(A) Spun bonded polyester

(B) Melt blown polyester

(C) Spun bonded polyamides

(D) Spun bonded needle punched PLA

(E) Answer not known

84. The light weight and high uniformity air laid non woven webs produced by _____

(A) Laroche system

(B) DoA system

(C) K12 high loft system

(D) Spinnban hybrid system

(E) Answer not known

85. What type of needle is most commonly used in weft knitting machines?

(A) Beard needle
(B) Compound needle
(C) Latch needle
(D) Crown needle
(E) Answer not known

86. Match the knitting term with its definition :

(a)	Knitting loop	1.	A row of loops inserted widthwise
(b)	Face loop	2.	Basic unit of knitting
(c)	Course	3.	Vertical columns of loops
(d)	Wale	4.	It shows only the legs at stitch point

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

(E) Answer not known

87. What is the shogging movement of the guide bar in warp knitting machine?

(A) Vertical movement parallel to the needle bar
(B) Lateral movement parallel to the needle bar
(C) Angular movement of the rocking shaft
(D) Horizontal movement of the needle hook
(E) Answer not known

88. In peg plan design, the vertical column indicates _____.

(A) Warp yarn
(B) Weft yarn
(C) Heald shaft
(D) Woven design
(E) Answer not known

89. In choosing move number for satin/sateen construction, which of the statement is not correct?

(A) The move number should not be equal to the design repeat
(B) It should be same as repeat size
(C) It should not be a factor of the repeat size
(D) It should not be a multiple of the factor
(E) Answer not known

90. 40's reed (stock port) and 1 end per dent for plain weave means, there will be _____.

(A) 10 dents per inch
(B) 20 dents per inch
(C) 1 dent per inch
(D) 40 dents per inch
(E) Answer not known

91. Sateen twill designs are constructed with _____.

(A) Greater number of PPI than EPI
(B) Both PPI & EPI equal
(C) Greater number of EPI than PPI
(D) Warp face structures
(E) Answer not known

92. Ball warping is mainly used for _____.

(A) Cotton fabric
(B) Denim fabric
(C) Sateen fabric
(D) Bandage fabric
(E) Answer not known

93. In weaving preparatory process, the flangeless packages permit the yarn unwinding at _____.

(A) Low speed
(B) Very low speed
(C) High speed
(D) Very high speed
(E) Answer not known

94. Assertion [A] : The cradle can be adjusted to deliver packages of conicity varying between 0° to 5°.57'

Reason [R] : Keep yarn length variation are diameter variation in a package within a tolerance range.

(A) [A] is true but [R] is false
(B) Both [A] & [R] are true and [R] is the correct explanation of [A]
(C) [A] is false, [R] is true
(D) Both [A] & [R] are true, but [R] is not the correct explanation of [A]
(E) Answer not known

95. DREF-III friction spinning machine are able to produce count upto _____.

(A) 12 Ne
(B) 18 Ne
(C) 22 Ne
(D) 24 Ne
(E) Answer not known

96. If two roving each with a CV of 8% are fed into a spinning zone and if the spinning unit adds a CV of 18%. What will be CV of the output yarn?

(A) 18.88%
(B) 24.82%
(C) 20.80%
(D) 26.32%
(E) Answer not known

97. Which among the following factor is not affecting spinning yarn tension in ring spinning system?

(A) Spindle speed
(B) Traveller weight
(C) Draft
(D) Ring diameter
(E) Answer not known

98. In organic fibers are produced in _____.

(A) Micro crystalline
(B) Micro crowing
(C) Micro formatting
(D) Micro sining
(E) Answer not known

99. How many amino acids group are present in Wool Keratin Polymer?

(A) 16
(B) 18
(C) 20
(D) 56
(E) Answer not known

100. The gum in silk cocoon is nearly _____ of its total weight.

(A) 13%
(B) 23%
(C) 40%
(D) 45%
(E) Answer not known

101. A little play between Nut and screw at random may lead to back lash. Thus result in a difference / variation of the final machined diameter of every job. This type of variation has been categorized as _____.

(A) Assignable causes
(B) Chance causes
(C) Both (A) & (B)
(D) Bright causes
(E) Answer not known

102. Choose the right matches of control charts :

1. $\overline{X}$ chart – Variable chart
2. P chart – Attribute chart
3. C chart – Variable chart
4. σ chart – Attribute chart

(A) 1 and 2 are correct
(B) 1 and 3 are correct
(C) 1 and 4 are correct
(D) 2 and 4 are correct
(E) Answer not known

103. The reliability of components lies in the range of _____.

(A) $-\alpha$ to $+\alpha$
(B) -1 to 0
(C) 0 to 1
(D) 1 to 1000
(E) Answer not known

104. The dispersion (spread) of the process data has been estimated using

(A) Mean
(B) Median
(C) Range
(D) Mode
(E) Answer not known

105. The resolution of a monitor is determined by

(A) Number of pixels in both the horizontal and the vertical directions

(B) Number of pixels in the horizontal directions

(C) Number of pixels in the vertical directions

(D) Number of pixels in the diagonals / corners only

(E) Answer not known

106. Forecast sales quantity of MAIDA powder in 2024 = 24 Kgs. Actual sales quantity of MAIDA powder in 2024 = 22 Kgs. What is the forecast sales in 2025 = ?

(Use smoothing constant as 0.1)

(A) 24.8 kgs

(B) 23.8 kgs

(C) 21.8 kgs

(D) 25.8 kgs

(E) Answer not known

107. A volume of air (2000 cc) will pass for 1000 seconds. Under a pressure of 10 gm/cm^2 through a specimen having a cross sectional area of 20.268 cm^2 and 5.08 cm deep (height of the sand specimen). Identify the permeability number

(A) 2 (B) 3

(C) 8 (D) 5

(E) Answer not known

108. A hole and shaft have a basic size of 25 mm and are to have a clearance fit with maximum clearance of 0.02 mm and a minimum clearance of 0.01 mm. The hole tolerance is to be 1.5 times of the shaft tolerance. Identify the lower limit of shaft following Hole Basis System.

(A) 25.01 mm
(B) 24.986 mm
(C) 25.016 mm
(D) 24.536 mm
(E) Answer not known

109. Chaplets are used for

(A) Chilling the Casting
(B) Supporting the core
(C) Controlling the Shrinkage
(D) Directional Solidification
(E) Answer not known

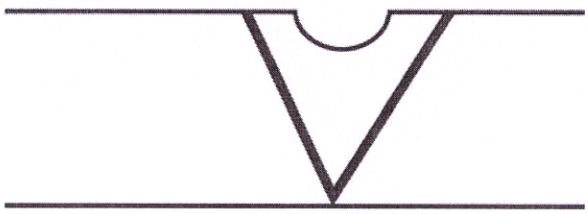
110. ———— is used for shaping metal sheets into cylindrical objects.

(A) Tongs
(B) Bar folder
(C) Ratchet stake
(D) Bevel edge stake
(E) Answer not known

111. Among the given options, in which type of welding defect, a long and continuous separation line can be visualised between base metal & HAZ.

(A) Incomplete fusion
(B) Lamellar tearing
(C) Hot cracking
(D) Undercut
(E) Answer not known

112. Identify the following type of defect that occur in welded pieces / joints.



(A) Undercut
(B) Under pass
(C) Under fill
(D) Overlap
(E) Answer not known

113. Motion control of tools in a NC system involves the use of

1. Point to Point
2. Curvature
3. Straight - cut
4. Contouring
5. Edge finisher

(A) 1, 2 and 5
(B) 1, 3 and 4
(C) 1, 4 and 5
(D) 1, 2 and 3
(E) Answer not known

114. In temperature measurement the liquid in glass thermometers work based on the expansion expression ————————.

(A) $V = V_0/(1+\gamma T)$
(B) $V = V_0(1+\gamma T)$
(C) $V = V_0(1-\gamma T)$
(D) $V = V_0/(1-\gamma T)$
(E) Answer not known

115. Match the correct answer.

(a) Eutetic Reaction — 1. $\text{Liquid} + \text{Solid}_1 \underset{\text{Heating}}{\overset{\text{Cooling}}{\rightleftharpoons}} \text{New Solid}_2$

(b) Peritectic Reaction — 2. $\text{Liquid} \underset{\text{Heating}}{\overset{\text{Cooling}}{\rightleftharpoons}} \text{Solid}_1 + \text{Solid}_2$

(c) Eutectoid Reaction — 3. $\text{Solid}_1 + \text{Solid}_2 \underset{\text{Heating}}{\overset{\text{Cooling}}{\rightleftharpoons}} \text{New Solid}_3$

(d) Peritectoid Reaction — 4. $\text{Solid}_1 \underset{\text{Heating}}{\overset{\text{Cooling}}{\rightleftharpoons}} \text{Solid}_2 + \text{Solid}_3$

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

(E) Answer not known

116. Choose the right matches

1.	Fine grains	–	High Strength
2.	Isothermal quenching	–	Martempering
3.	Stepped quenching	–	Austempering
4.	Tempering	–	Increase toughness

(A) (1) and (2) only
(B) (1) and (3) only
(C) (1) and (4) only
(D) (2) and (4) only
(E) Answer not known

117 Which of the following is a surface defect?

1. Twin Boundaries
2. Grain Boundaries
3. Edge dislocation
4. Schottky Imperfection

(A) (1) and (4) only
(B) (2) and (4) only
(C) (1) and (2) only
(D) (2) and (3) only
(E) Answer not known

118. Condensation polymerization of phenol and formaldehyde in an acid (or) alkaline medium produces

(A) Polyester
(B) Polyethylene
(C) PVC
(D) Bakelite
(E) Answer not known

119. Carburizing increases the carbon content of the steel by process of

1. Absorption
2. Diffusion
3. Separation

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

120. Which of the following statements are incorrect?

1. Grain size of the metal has greater effect on the mode of fracture
2. Mode of fracture is greatly affect by temperature
3. Metals with FCC structures are more suspectable to ductile-brittle transition than BCC structure
4. Griffth's theory is applicable only for brittle materials

(A) (1) only
(B) (2) only
(C) (3) only
(D) (4) only
(E) Answer not known

121. The internal rate of return is the discount rate for which the NPV (Net Present Value) of an investment or project is

(A) Positive
(B) Zero
(C) Negative
(D) Less than 1
(E) Answer not known

122. A building intended to be used for commercial purpose will be required to follow energy conservation building code under Energy Conservation Act, 2001 provided its

(A) connected load is 120 kW and above

(B) contract demand is 100 kVA and above

(C) connected load is 100 kW and above or contract demand is 120 kVA and above

(D) connected load is 500 kW and contract demand is 600 kVA

(E) Answer not known

123. A new small cogeneration plant installation is expected to reduce a company's annual energy bill by Rs. 4,86,000. If the capital cost of the new boiler installation is Rs. 22,22,000 and the annual maintenance and operating costs are Rs. 42,000. The expected payback period for the project is

(A) 10 years

(B) 5 years

(C) 3 years

(D) 7 years

(E) Answer not known

124. Maloperation of differential protection of transformers due to magnetizing inrush current is prevented by

(A) Setting the current of the relay higher than the maximum value of inrush current

(B) Keeping the time setting long enough for the inrush current to fall to a value below the primary operating current of the relay

(C) Bypassing the inrush current from the operating coil of the relay

(D) Filtering the second harmonic content of the inrush current flowing through the operating coil and passing through the restraining coil

(E) Answer not known

125. Consider the following statements.

A differential relay is used for a 3-phase transformer protection to avoid mal operation due to

1. Saturation of current transformer
2. Mismatching of the current ratio for current transformer
3. Difference in connections on both sides of power transformer.
4. Current setting multipliers.

(A) 1 and 4 are correct

(B) 1 and 2 are correct

(C) 1, 2 and 3 are correct

(D) 2, 3 and 4 are correct

(E) Answer not known

126. A synchronous machine, connected to an infinite bus, is working at a certain load angle. A sudden increment in load angle causes synchronizing power to flow from

1. Infinite bus to motor
2. Motor to infinite bus
3. Infinite bus to generator
4. Generator to infinite bus

From these, the correct answer is

(A) 1 and 4
(B) 2 and 4
(C) 2 and 3
(D) 1 and 3
(E) Answer not known

127. Which of the following are the types of BLDC motor?

(A) Unipolar, Bipolar
(B) Unipolar, PWM
(C) Bipolar, PWM
(D) Synchronous, Induction
(E) Answer not known

128. Consider the following statements about the operation of a three-phase Induction motor running at full load :

If one of the supply line fuse blows off, the motor will

1. stall
2. continue to run with increased slip
3. continue to run with normal supply current
4. continue to run with excessive supply current

(A) 1 alone is correct
(B) 3 alone is correct
(C) 2 and 3 are correct
(D) 2 and 4 are correct
(E) Answer not known

129. Which of the following statements are true about compensating winding in DC Generator?

1. To reduce the eddy current
2. To neutralise the magnetizing action of the armature current
3. To increase the armature speed
4. To provide the path for circulation of cooling air

(A) 1 and 3 are correct
(B) 2 and 4 are correct
(C) 2 only
(D) 3 only
(E) Answer not known

130. Match the following.

(a)	Shunt motor	1.	Traction drives
(b)	Series motor	2.	Drilling and milling machines
(c)	Cumulative compound motor	3.	Experimental and Research work
(d)	Differential compound motor	4.	Mine hoists

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

(E) Answer not known

131. Open circuit and short circuit test conducted on a 10 kVA, 2000 V/200 V, 50 Hz. Single phase transformer gave the following readings.

OC Test : 200 V, 1.1 A, 81 W

SC Test : 30 V, 5 A, 100 W

At what fraction of full load will the transformer operates at maximum efficiency

(A) 0.9

(B) 0.8

(C) 0.6

(D) 0.7

(E) Answer not known

132. The Lorentz's Equation of Force (F) is :

Where F_e – Electric Force

F_m – Magnetic Force

(A) $F_e F_m$

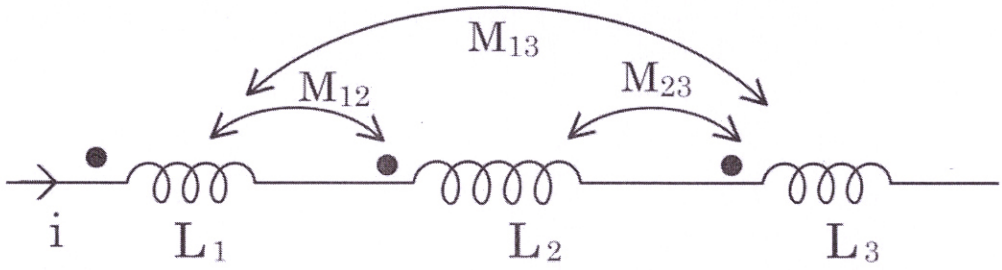
(B) F_e / F_m

(C) $F_e + F_m$

(D) $F_e - F_m$

(E) Answer not known

133. Find the total inductance of the coupled coils. Where $L_1 = 1$ H; $L_2 = 2$ H; $L_3 = 5$ H; $M_{12} = 0.5$ H, $M_{13} = 1$ H; $M_{23} = 1$ H



(A) 13 H

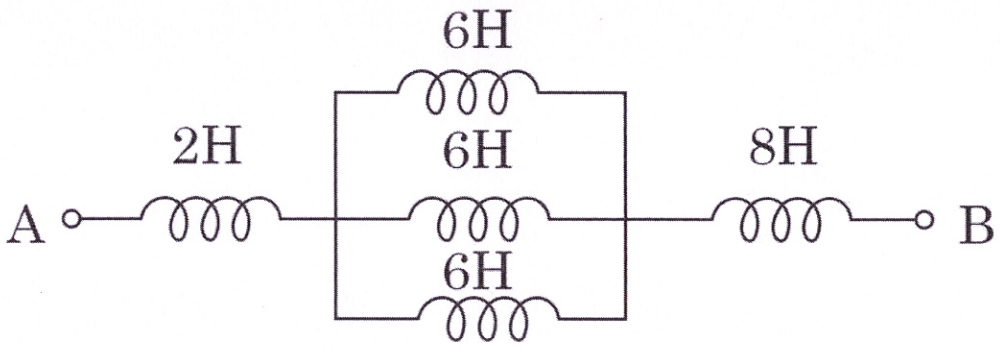
(B) 8 H

(C) 10.5 H

(D) 12.5 H

(E) Answer not known

134. What is the equivalent inductance of the given circuit between the terminal A and B?



(A) 13 H
(B) 26 H
(C) 12 H
(D) 28 H
(E) Answer not known

135. The magnetic flux through a 50 turns coil increases at the rate of 0.05 wb/s. What value of induced emf between the ends of the coil?

(A) 25 V
(B) 10 V
(C) 2.5 V
(D) 5 V
(E) Answer not known

136. Which of the following condition is NOT a true derivative of Ampere's Circuit Law?

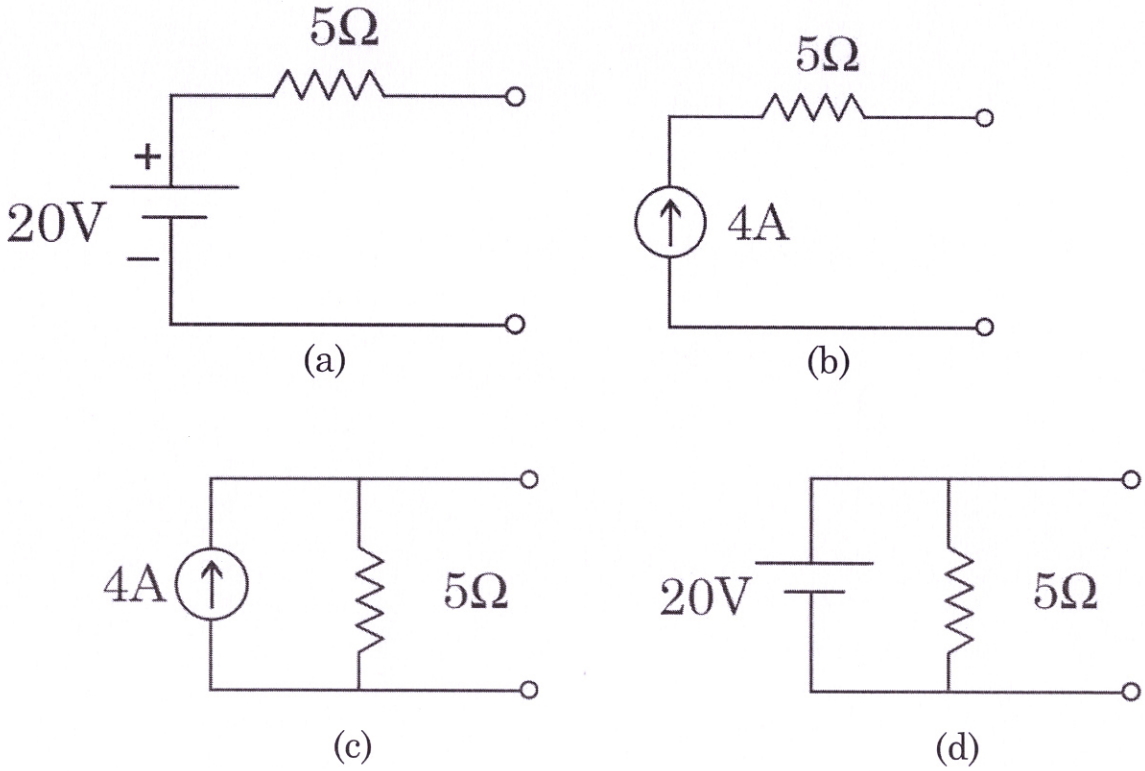
1. $\nabla \times J = H$
2. $\nabla \times H = J$
3. $I_{enc} = \overset{0}{\int_{s}} J \cdot dS$
4. $I_{ex} = \oint_{L} H \cdot dl$

(A) 1 only
(B) 4 only
(C) 2 and 3 only
(D) 1 and 4 only
(E) Answer not known

137. Which year experimental Coulomb's Law is formulated?

(A) 1875
(B) 1755
(C) 1785
(D) 1575
(E) Answer not known

138. Which pair of circuits are equivalent?



(A) (c) and (d)
(B) (b) and (d)
(C) (a) and (b)
(D) (a) and (c)
(E) Answer not known

139. Superposition principle states that at a time ———————— act(s).

(i) All the given sources

(ii) Only voltage source

(iii) Only current source

(iv) Only one source

(A) (iv) only

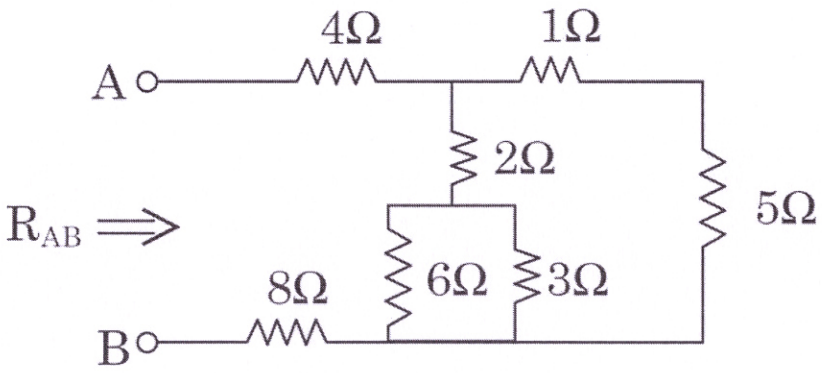
(B) (i) only

(C) (i) and (iv) only

(D) (ii) and (iii) only

(E) Answer not known

140. Find the total resistance (R_{AB}) of the given circuit :



(A) 18 Ω

(B) 14.4 Ω

(C) 12.4 Ω

(D) 16.4 Ω

(E) Answer not known

141. Which of the following describe a dart in garment construction?

(i) It is a wedge-shaped cut out in a pattern

(ii) It controls the fit of the garment

(iii) It adds decorative pleats to the garment

(A) (i) only

(B) (i) and (ii) only

(C) (iii) only

(D) (i) and (iii) only

(E) Answer not known

142. Match the cutting method with its characteristic or drawback.

(a) Computer controlled knife	1. Limited to single or two plies
(b) Laser	2. High velocity jet of high temperature ionised gas
(c) Plasma	3. Creating vacuum within the fabric lay
(d) Water jet	4. Wet edges and inconsistent cutting quality

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

(E) Answer not known

143. Which of the following is the most important factor affecting thermal comfort

(A) Relative humidity
(B) Air movement
(C) Radiation
(D) Air temperature
(E) Answer not known

144. Which of the following stitch has appearance of lockstitch on the top but has a double chain effect on the underside?

(A) Class 401
(B) Class 301
(C) Class 201
(D) Class 101
(E) Answer not known

145. Which of the following garment types requires 'no pressing'?

(A) Nightgowns
(B) Trousers
(C) Jackets
(D) Bras
(E) Answer not known

146. The reason for maintaining the concentration of NaOH between 18% and 25% during mercerisation of cotton fabric is

(A) To attack the amorphous region
(B) To attack the crystalline region
(C) To remove the convolutions
(D) To protect the crystalline region
(E) Answer not known

147. Identify the type of yarn having lower twist per inch (TPI).

(A) Hosiery yarn
(B) Warp yarn
(C) Weft yarn
(D) Fancy yarn
(E) Answer not known

148. Drape coefficient of cardboard is

(A) 1
(B) 0.5
(C) 0.25
(D) 0.15
(E) Answer not known

149. Which one of the following measures the periodic variation in yarn by analysing the frequencies at which faculties occur electronically

(A) Spectrogram
(B) VL curve
(C) Classimat
(D) Flow diagram
(E) Answer not known

150. The fibre parameter that cannot be obtained from Baer Sorter diagram

(A) Mean length
(B) Effective length
(C) Span length
(D) Modal length
(E) Answer not known

151. The staple yarn spinning machine performance is determined by

(A) Limit of irregularity
(B) Index of irregularity
(C) Actual irregularity
(D) Ratio of limit irregularity to actual irregularity
(E) Answer not known

152. The scouring effluent have a (BOD) Biological Chemical Demand level within the range

(A) 8000-14000 mgO_2/l

(B) 20000-25000 mgO_2/l

(C) 26000-28000 mgO_2/l

(D) 29000-32000 mgO_2/l

(E) Answer not known

153. The objectives of calendaring process on textile material is

(i) To impart a smooth silky touch to the fabric

(ii) To reduce the air permeability by closing the threads

(iii) To increase the opacity of fabric

(A) (i) and (ii) only

(B) (ii) and (iii) only

(C) (i) and (iii) only

(D) (i), (ii) and (iii)

(E) Answer not known

154. Identify the Limiting Oxygen Index (LOI) value of cotton and wool fibre.

(A) 18 and 25

(B) 28 and 31

(C) 29 and 34

(D) 31 and 38

(E) Answer not known

155. Which one of the following enzymes is most suitable for bio polishing of cotton material?

(A) Cellulase
(B) Amylases
(C) Proteases
(D) Catalases
(E) Answer not known

156. Match the following : Enzymes for textile processes

(a)	Pectinase	1.	removal of fats and waxes
(b)	Proteases	2.	desizing of starches
(c)	Lipases	3.	scouring of animal fibres
(d)	Amylase	4.	scouring of vegetable (or) bast fibres

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

(E) Answer not known

157. Identify the instruments used for determination of rubbing fastness.

(A) Crock meter
(B) Launder-o-meter
(C) Perspirometer
(D) Bursting tester
(E) Answer not known

158. Match the following : Ionic nature of dyes

(a)	Reactive dye	1.	Non ionic
(b)	Basic dye	2.	Anionic
(c)	Disperse dye	3.	Anionic
(d)	Acid dye	4.	Cationic

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

(E) Answer not known

159. Match the following :

(a)	Reactive dye	1.	In soluble in water
(b)	Direct dye	2.	Solid-solid solution mechanism
(c)	VAT dye	3.	Hydrogen bond
(d)	Disperse dye	4.	Covalent bond

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

(E) Answer not known

160. The transfer printing technique is most suitable for

(A) Polyester
(B) Cotton
(C) Flax
(D) Jute
(E) Answer not known

161. Which diagram is used to express the cooling process of air?

(A) Psychrometric chart
(B) Mollier diagram
(C) P-V diagram
(D) String diagram
(E) Answer not known

162. Identify the statement that shows the financial status of the company.

(A) Income Statement
(B) Balance sheet
(C) Break even analysis
(D) Profit and loss statement
(E) Answer not known

163. Which of the following analysis is concerned with finding the point at which revenues and costs agree exactly?

(A) Reducing balance
(B) Sinking Fund
(C) Annuity
(D) Break even
(E) Answer not known

164. Assertion [A]: When a belt continuously runs over the pulleys, a centrifugal force is generated, which increase the tension on both tight and slack sides of the belt.

Reason [R]: The tension caused by the centrifugal force is known as centrifugal tension.

(A) [A] is true but [R] is false
(B) Both [A] and [R] are true; and [R] is the correct explanation of [A]
(C) [A] is false, [R] is true
(D) Both [A] and [R] are true; but [R] is not correct explanation of [A]
(E) Answer not known

165. In gears, the height by which a tooth projects beyond the pitch line is _____

(A) Back lash
(B) Addendum
(C) Dedendum
(D) Pitch cylinder
(E) Answer not known

166. Identify the correct answer among type.
The new principles of TQM are

(i) Meet the customer's requirements on time

(ii) Strive to do error – free work

(iii) Manage by prevention and not by correction

(iv) Measure the cost of quality

(A) (i) and (ii) only
(B) (i), (ii) and (iii) only
(C) (i), (iii) and (iv) only
(D) (i), (ii), (iii) and (iv)
(E) Answer not known

167. What does a higher SEER (Seasonal Energy Efficiency Ratio) rating indicate in humidification plant?

(A) Less heat removed from the air
(B) More energy consumed by the air conditioner
(C) Higher energy efficiency
(D) Lower cooling power
(E) Answer not known

168. Engineers shall disclose all known and potential _____ that could influence their judgment.

(A) Statement
(B) Workplace
(C) Professional report
(D) Conflicts of interest
(E) Answer not known

169. Choose the wrong one.
Need for protection of IPR is

(A) It prevents others using it
(B) Prevent plagiarism
(C) No prevention for using it for financial gain
(D) Provide strategy to generate steady income
(E) Answer not known

170. Identify the correct matches related to Humidity on workers and working environment.

(i) Low Humidity — Respiratory infections & asthmatic symptoms
(ii) High Humidity — Growth of fungi/mold
(iii) Dry air — Rough and flaky skin

(A) (i) and (ii) only
(B) (i) and (iii) only
(C) (ii) and (iii) only
(D) (i), (ii) and (iii)
(E) Answer not known

171. Which theory had a strong male bias?

(A) Kohlberg theory
(B) Gilligan's theory
(C) Heinz theory
(D) Wien theory
(E) Answer not known

172. Pick the odd one.
The basic step in techniques of job safety analysis is

(A) select the job
(B) break the job down into steps
(C) identity the hazards
(D) avoid eliminating the hazards
(E) Answer not known

173. Identify the chemical Asphyxiants from the options given

(A) Benzene
(B) Argon
(C) Ammonia
(D) Carbon monoxide
(E) Answer not known

174. Match the Building codes and their aspects :

(a) National Building Code Part 3	1. Fire & Life safety
(b) National Building Code Part 4	2. Building materials
(c) National Building Code Part 5	3. Development control rules and general building requirements
(d) National Building Code Part 6	4. Structural design

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

(E) Answer not known

175. _____ is the internationally recognized assessment specification for occupational health and safety management system.

(A) OHSAS-17001-2009
(B) OHSAS-18001-2007
(C) OHSAS-16001-2010
(D) OHSAS-15001-2010
(E) Answer not known

176. Darcy's law state that $Q \propto$ _____.

where,

ΔH – Head Loss

A – Area of cross section.

(A) $Q \propto \Delta H/L \cdot A$
(B) $Q \propto L/\Delta H$
(C) $Q \propto 1/kAi$
(D) $Q \propto kAi$
(E) Answer not known

177. Important chemical characteristics of sewage water are _____.

(A) pH value, COD, BOD
(B) Smell, odour
(C) Colour
(D) Temperature
(E) Answer not known

178. Effect of air pollution on plants are

(A) lameness, poisoning
(B) chlorosis, necrosis
(C) acid rain, ozone
(D) appetite, death
(E) Answer not known

179. _____ the major categories of offensive odours.

(A) Amines, Ammonia
(B) CO, CO_2
(C) SO, SO_2
(D) NO, NO_2
(E) Answer not known

180. Which of the following is not a Total Quality Management tool?

(A) Flow chart
(B) Control chart
(C) Ishikawa diagram
(D) String diagram
(E) Answer not known

181. A wet solid weighs 50 kg and contains 10 kg moisture. Express the moisture concentration on dry basis.

(A) 15%
(B) 20%
(C) 25%
(D) 30%
(E) Answer not known

182. The height of the packed column (Where N is the number of theoretical plates) is estimated by _____.

(A) $Z = HTU \times N$
(B) $Z = NTU \times N$
(C) $Z = HETP \times N$
(D) $Z = HETP \times NTU$
(E) Answer not known

183. Reduction of Iron ore to Iron and Steel is an example of

(A) Homogenous non catalytic reaction
(B) Heterogeneous non catalytic reaction
(C) Homogenous catalytic reaction
(D) Heterogeneous catalytic reaction
(E) Answer not known

184. The dimensionless group in the man transfer that is equivalent to Prandtl number in heat transfer is _____.

(A) Nusselt number
(B) Sherwood number
(C) Schmidt number
(D) Stanton number
(E) Answer not known

185. A furnace has a 20 cm thick wall with thermal conductivity 0.8 W/mK. For same heat loss from furnace, what will be thickness of the wall if the thermal conductivity of material is 0.16 W/mK?

(A) 4 cm
(B) 6.3 cm
(C) 10 cm
(D) 40 cm
(E) Answer not known

186. LMTD for a heat exchanger is given by

(A) $\dfrac{\Delta T_1 - \Delta T_2}{\ln(\Delta T_2 / \Delta T_1)}$

(B) $\dfrac{\Delta T_1 - \Delta T_2}{\ln\left(\dfrac{\Delta T_1}{\Delta T_2}\right)}$

(C) $\ln \dfrac{\Delta T_2 - \Delta T_1}{(\Delta T_1 / \Delta T_2)}$

(D) $\ln \dfrac{\Delta T_2 - \Delta T_1}{(\Delta T_2 / \Delta T_1)}$

(E) Answer not known

187. Automobile radiator is heat exchanger of

(A) Parallel flow type
(B) Counter flow type
(C) Cross flow type
(D) Recuperator type
(E) Answer not known

188. The process by which heat energy is transmitted through collisions between neighboring molecules is known as

(A) Conduction
(B) Convection
(C) Radiation
(D) Temperature Gradient
(E) Answer not known

189. The Routh test for determining the stability of a control system is limited to the system which have _____.

(A) Linear equation
(B) Least square method
(C) Taylor's series expansion
(D) Polynomial characteristic equation
(E) Answer not known

190. Break-even point is the point where _____.

(A) Fixed cost & variable cost intersect
(B) Variable cost & total cost intersect
(C) Fixed cost & total cost intersect
(D) Sales revenue and total cost line intersect
(E) Answer not known

191. The overshoot of the underdamped second order system for step forcing function is _____.

(A) $e^{-\pi\xi\sqrt{1-\xi^2}}$
(B) $e^{-\pi\xi}$
(C) $e^{\sqrt{1-\xi^2}}$
(D) $e^{\pi\xi}$
(E) Answer not known

192. Whenever the output of the process control system is not compared with input, then it is known as _____.

(A) Feedback control system
(B) Negative feedback control system
(C) Open loop control system
(D) Regulator control system
(E) Answer not known

193. The eigen values of $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ matrix are

(A) 4, 1
(B) 6, 1
(C) 2, 1
(D) 3, 1
(E) Answer not known

194. The technique of refining the initial estimate of y_i for the differential eqn. $\frac{dy}{dx} = f(x, y)$ by means of more accurate formula is known as

(A) Euler method
(B) Range Kutta method
(C) Predictor-corrector method
(D) Taylor series method
(E) Answer not known

195. Simpson $1/3^{rd}$ rule is obtained from Newton cote quadrature formula by substituting the value of n with

(A) 0
(B) 1
(C) 2
(D) 3
(E) Answer not known

196. The criteria for convergence of roots using iterative methods to solve system of linear equation is

(A) Diagonally dominant coefficient matrix

(B) Eigen values of coefficient matrix greater than one

(C) Diagonally non dominant coefficient matrix

(D) Eigen values of coefficient matrix is equal to zero

(E) Answer not known

197. The expression for Arrhenius's law relating rate constant K and temperature T is

(A) $K = K_0 e^{E/RT}$

(B) $K = K_0 e^{T/R}$

(C) $K = K_0 e^{-E/RT}$

(D) $K = K_0 e^{-ER/T}$

(E) Answer not known

198. The advantage of fluidized contacting over fixed bed reactor in industries is

(A) Very poor temperature control

(B) Requires more catalyst than fixed bed process

(C) Regeneration of catalyst and effective use of catalyst

(D) Formation of hot spots in reactor

(E) Answer not known

199. The Residence time distribution of a reactor is represented by normalizing the Exit age distribution curve (E) $\int_0^\infty Edt$, such that area under the curve is

(A) Infinity
(B) Zero
(C) 1
(D) Less than unity
(E) Answer not known

200. The first order rate constant k is related to conversion X_A of the reactant by the expression

(A) $(1-X_n)=kt$
(B) $\ln(1-X_A)=kt$
(C) $-\ln(1-X_A)=kt$
(D) $\frac{X_A}{1-X_A}=kt$
(E) Answer not known
