2021
BASICS OF ENGINEERING
(Degree Standard)

Duration : Three Hours]   [Total Marks : 300

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. You will be supplied with this question booklet 15 minutes prior to the commencement of the examination.

2. This question booklet contains **200** questions. Before answering the questions, you are requested to check whether all the questions are printed serially and ensure that there are no blank pages in the question booklet. **If any defect is noticed in the question booklet, it shall be reported to the invigilator within the first 10 minutes and get it replaced with a complete question booklet. If the defect is reported after the commencement of the examination, it will not be replaced.**

3. Answer all the questions. All the questions carry equal marks.

4. You must write your register number in the space provided on the top right side of this page. Do not write anything else on the question booklet.

5. An answer sheet will be supplied to you separately by the room invigilator to shade the answers. Instructions regarding filling of answers etc., which are to be followed mandatorily, are provided in the answer sheet and in the memorandum of admission (Hall Ticket).

6. You shall write and shade your question booklet number in the space provided on page one of the answer sheet with **BLACK INK BALL POINT PEN.** If you do not shade correctly or fail to shade the question booklet number, your answer sheet will be invalidated.

7. Each question comprises of five responses (answers) : i.e. (A), (B), (C), (D) and (E). You have to select ONLY ONE correct answer from (A) or (B) or (C) or (D) and shade the same in your answer sheet. If you feel that there are more than one correct answer, shade the one which you consider the best. **If you do not know the answer, you have to mandatorily shade (E).** In any case, choose ONLY ONE answer for each question. If you shade more than one answer for a question, it will be treated as a wrong answer even if one of the given answers happens to be correct.

8. You should not remove or tear off any sheet from this question booklet. You are not allowed to take this question booklet and the answer sheet out of the examination room during the time of the examination. After the examination, you must hand over your answer sheet to the invigilator. You are allowed to take the question booklet with you only after the examination is over.

9. **You should not make any marking in the question booklet except in the sheets before the last page of the question booklet, which can be used for rough work. This should be strictly adhered to.**

10. Failure to comply with any of the above instructions will render you liable for such action as the Commission may decide at their discretion.

1. Let $f(z)$ be an analytic function in and on the simple closed curve c except at a point $z = a$, then $\int_c \dfrac{f(z)}{z-a}\,dz =$

   (A)   0   (B) $2\pi i$

   (C) $2\pi i\, f(a)$ ✓   (D) $f(a)$

   (E)   Answer not known

2. If $f(\varepsilon) = \oint_c \dfrac{4z^2 + z + 5}{z - \varepsilon}\,dz$ where c is the ellipse $(x/2)^2 + (y/3)^2 = 1$ then the value of $f(3.5)$ is

   (A) $\dfrac{\pi}{2}$ (B) $-\dfrac{\pi}{2}$

   (C)   0 ✓   (D) $2\pi i$

   (E)   Answer not known

3. The values of a and b are, if $f(z) = (x^2 - 2xy + ay^2) + i(bx^2 - y^2 + 2xy)$ is analytic

   (A)   0 and -1 (B)   1 and 0

   (C) -1 and -1 (D) -1 and 1 ✓

   (E)   Answer not known

4. The fixed points of the transformation $w = \dfrac{z-1}{z+1}$ are

   (A) ± 1 (B) $\pm i$ ✓

   (C)   1 and i (D) -1 and $-i$

   (E)   Answer not known

5. If $\bar{r}$ is the position vector of the point $P(x, y, z)$, then ∇r^n is

   (A) $nr^2\bar{r}$ (B) $nr^{n-2}\bar{r}$ ✓

   (C) nr^{n-1} (D) $n r^{n-1}\bar{r}$

   (E)   Answer not known

6. The singular solution of $y = px + ap^{-1}$, where $p = \dfrac{dy}{dx}$, is

   (A) $y^2 = 4ax$ ✓   (B) $x^2 = 4ay$

   (C) $y^2 = -4ax$ (D) $x^2 = -4ay$

   (E)   Answer not known

7. The Wronskian value of the functions $y_1 = x^3$ & $y_2 = x^2$ is

   (A) $-x^4$ ✓   (B) x^4

   (C) x (D) $-x$

   (E)   Answer not known

8. If $\lambda_1, \lambda_2, \ldots, \lambda_n$ are the eigen values of a $n \times n$ matrix A, then A^m has the eigen values (m being a +ve integer)

   (A) $\lambda_1^m, \lambda_2^m, \ldots, \lambda_n^m$ ✓   (B) $\lambda_1^{-m}, \lambda_2^{-m}, \ldots, \lambda_n^{-m}$

   (C) $m^{\lambda_1}, m^{\lambda_2}, \ldots, m^{\lambda_n}$ (D) $m^{-\lambda_1}, m^{-\lambda_2}, \ldots, m^{-\lambda_n}$

   (E)   Answer not known

9. If $A = \begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$, then the eigen values of A^{-1} are

   (A) $3, 2, 5$ (B) $3, 0, 0$

   (C) $\frac{1}{3}, \frac{1}{2}, \frac{1}{5}$ ✓   (D) $\frac{1}{3}, 1, \frac{1}{4}$
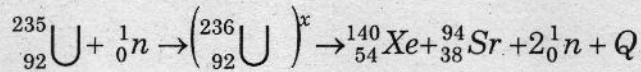
   (E)   Answer not known

10. An eigen vector to the matrix $M = \begin{bmatrix} -3 & 1 & -2 & -4 \\ 12 & 0 & 4 & 9 \\ 6 & 5 & -3 & -4 \\ 3 & -4 & 5 & 9 \end{bmatrix}$ is

   (A) $(+1, 2, -1, 2)^T$ (B) $(-1, -2, +1, 2)^T$

   (C) $(-1, 2, -1, 2)^T$ ✓   (D) $(-1, -2, 1, 2)^T$

   (E)   Answer not known

11. Fission chain reaction in a nuclear reactor can be controlled by introducing

   (A) Iron rods
   (B) Graphite rods
   (C) Platinum rods
   (D) Cadmium rods ✓
   (E) Answer not known

12. The following nuclear reaction represents;

   $$^{235}_{92}U + ^{1}_{0}n \rightarrow \left(^{236}_{92}U\right)^{x} \rightarrow ^{140}_{54}Xe + ^{94}_{38}Sr + 2^{1}_{0}n + Q$$

   (A) Fission ✓
   (B) Fusion
   (C) α - decay
   (D) β - decay
   (E) Answer not known

13. Einstein photoelectric equation is given by [γ = frequency of the incident light, h= Planck's constant]

   (A) Kinetic energy = $h\gamma$ + Binding energy
   (B) Kinetic energy = $h\gamma$ - Binding energy ✓
   (C) Kinetic energy = Binding energy - $h\gamma$
   (D) Kinetic energy = $-[h\gamma$ + Binding energy]
   (E) Answer not known

14. Optical fibre communication is based on the Phenomenon of

   (A) Refraction
   (B) Total internal reflection ✓
   (C) Polarisation
   (D) Diffraction
   (E) Answer not known

15. Population inversion means

   (A) The number of atoms in the higher energy state is smaller than the number of atoms in lower energy state
   (B) The number of atoms in the higher energy state is more than the number of atoms in lower energy state ✓
   (C) The number of atoms in the higher energy state is equal to the number of atoms in lower energy state
   (D) There will no atoms in the higher energy state
   (E) Answer not known

16. As temperature increases, the thermal conductivity of water will

    (A) Decrease   (B) Increase ✓

    (C) No change   (D) Either decrease or increase

    (E) Answer not known

17. When water is heated from $0°C$ to $10°C$, its volume.

    (A) Increases   (B) Decreases

    (C) First increases and then decreases   (D) First decreases and then increases ✓

    (E) Answer not known

18. Which one of the following material in the form of a bar is used to produce ultrasonic waves in magnetostriction oscillator

    (A) Diamagnetic   (B) Paramagnetic

    (C) Ferromagnetic ✓   (D) Anti-Ferro

    (E) Answer not known

19. Frequency of ultrasonic waves is _____

    (A) < 20 Hz   (B) 20 – 20,000 Hz

    (C) > 20,000 Hz ✓   (D) 5000 - 10,000 Hz

    (E) Answer not known

20. The intensity of sound produced by thunder is $0.1 wm^{-2}$. The intensity level in decibel is

    (A) 110 dB ✓   (B) 220 dB

    (C) 55 dB   (D) 330 dB

    (E) Answer not known

21. Reduction potentials of A, B, C and D are 0.8V, 0.79V, 0.34V and -2.37V respectively which element displaces all the other three elements?

    (A) B   (B) A
    (C) D   (✓) C
    (E) Answer not known

22. The basic difference between brass and bronze is

    (A) Brass is an alloy of copper and tin while Bronze is an alloy of copper and zinc
    (✓) Brass is an alloy of copper and zinc while Bronze is an alloy of copper and tin
    (C) Brass is an alloy of copper and chromium while Bronze is an alloy of copper and cobalt
    (D) Brass is an alloy of copper and cobalt while Bronze is an alloy of copper and chromium
    (E) Answer not known

23. Explosives containing nitroglycerine as the principal ingredient are called

    (A) TNT   (B) RDX
    (✓) Dynamites   (D) Detonators
    (E) Answer not known

24. The explosives among the following which possess positive oxygen balance are :

    I. NH_4NO_3 (Ammonium Nitrate)

    II. $C_7H_5N_3O_6$ (TNT),

    III. $C_3H_6N_6O_6$ (RDX)

    IV. $C_5H_8N_4O_{12}$ (PETN)

    (A) I, II and III only   (B) II and III only
    (✓) I and IV only   (D) I, III and IV only
    (E) Answer not known

25. Raw rubber valcanized with 32% of sulphur is called

   (A) Crepe rubber   (B) Gutta Percha

   ✓(C) Ebonite   (D) Butyl rubber

   (E) Answer not known

26. Phenol and formaldehyde condense to form

   (A) Dacron   ✓(B) Bakelite

   (C) Polystyrene   (D) Butyl rubber

   (E) Answer not known

27. Which among the following polymers would have the highest density?

   (A) Isotactic Polypropylene

   ✓(B) Syndiotactic Polypropylene

   (C) Atactic Polypropylene

   (D) Polypropylene, Cross linked by 1% butadiene

   (E) Answer not known

28. Potable water treatment does not involve

   (A) Disinfection   ✓(B) Demineralisation

   (C) Coagulation   (D) Sedimentation

   (E) Answer not known

29. The % of isooctane that should be present in a gasoline fuel (petrol) of octane number 92 is,

   (A) 92 Percent   (B) 100 Percent

   (C) 8 Percent   ✓(D) Can be any percent, even zero

   (E) Answer not known

30. Select the lettered pair that best expresses and relationship simliar to that expressed in the original pair.

IMPECCABLE – FLAW

(A) Inimitable – Choice   (B) Irrevocable – Strong

(C) Immodest – Gentle   ✓(D) Infalliable – Mistake

(E) Answer not known

31. Nickel alloy

✓(A) Alloy containing nickel   (B) Alloy made of nickel

(C) Alloy coated with nickel   (D) Alloy without nickel

(E) Answer not known

32. Fill in the blank by choosing the correct word

She had little patience for the ————— who could surround her husband.

✓(A) Sycophants   (B) Sky Scrapers

(C) Saccharine   (D) Obsequious

(E) Answer not known

33. Choose the correct meaning of the idiom.

'at the drop of a hat'

(A) Slowly   ✓(B) Instantly

(C) Far off   (D) Close by

(E) Answer not known

34. Choose the pair that completes the meaning of the sentence most appropriately.

The Indian School of Business ————— students to draft business plans although it is not part of their —————.

(A) Makes, Course   (B) Prepares, Objective

(C) Suggests, Plans   ✓(D) Encourages, Curriculum

(E) Answer not known

35. Select the correct questionare :

————————— there 28 days in February?

(A) Isn't   (B) Aren't ✓

(C) Wasn't   (D) Weren't

(E) Answer not known

36. Choose the correct conditional sentence.

(A) ✓ If I were a prince, I would live in a palace

(B) If I were a prince, I will live in a palace

(C) If I were a prince, I shall live in a palace

(D) If I were a prince, I must live in a palace

(E) Answer not known

37. The wife stood ————————— him all the time.

(A) ✓ Beside   (B) Besides

(C) Near   (D) Through

(E) Answer not known

38. Choose the correct indirect sentence.

The student said to the professor "I was waiting for you"

(A) ✓ The student told the professor that she had been waiting for him

(B) The student told the professor that she has been waiting for him

(C) The student told the professor that she were waiting for him

(D) The student said the professor that she have been waiting for him

(E) Answer not known

39. Rearrange the following sentences into a coherent passage:

1. Corrections are carried out using correction fluid

2. The ink is applied on the roller and is rotated to make more copies

3. The stencil is set in its position and the letters are typed on it

4. The correct words are replaced

(A) 2, 3, 1, 4

(B) ✓ 3, 1, 4, 2

(C) 1, 4, 3, 2

(D) 4, 2, 1, 3

(E) Answer not known

40. In a browser to select one hyperlink after another, press.

   (A) Ctrl + K   (B) Ctrl + D

   (C) Tab ✓   (D) Ctrl + H

   (E) Answer not known

41. Functions in MS-Excel begin with ———————— symbol.

   (A) ((B) = ✓

   (C) +   (D) :

   (E) Answer not known

42. The layer which transmits raw bits over a communication channel is ——————

   (A) Application

   (B) Session

   (C) Data link

   (D) Physical ✓

   (E) Answer not known

43. Which layer does the operation of encryption and compression of data.

   (A) Transport layer

   (B) Application layer

   (C) Session layer

   (D) Presentation layer ✓

   (E) Answer not known

44. The utility program used to bring the object code into memory for execution is
    (A) Linker   (B) Fetcher
    (C) Loader ✓   (D) Assembler
    (E) Answer not known

45. Which mode of I/O data transfer will enhance the speed of data transfer?
    (A) Programmed I/O   (B) Interrupt initiated I/O
    (C) Direct memory access ✓   (D) Polling
    (E) Answer not known

46. The register used as a working area in CPU is
    (A) Program counter   (B) Instruction register
    (C) Instruction decoder   (D) Accumulator ✓
    (E) Answer not known

47. A magnetic disk's tracks are divided into smaller parts called
    (A) Clusters   (B) Sectors ✓
    (C) Bytes   (D) Slices
    (E) Answer not known

48. The governing equation for the trajectory of a projectile is
    where α is the angle of projection
    u is the velocity of projection

    (A) ✓ $$y = x\tan\alpha - \frac{gx^2}{2u^2\cos^2\alpha}$$

    (B) $$y = x\tan\alpha - \frac{gx^2}{2u^2\tan^2\alpha}$$

    (C) $$y = x\tan\alpha + \frac{gx^2}{2u^2\cos^2\alpha}$$

    (D) $$y = x^2\tan\alpha - \frac{gx^2}{2u^2\cos^2\alpha}$$

    (E) Answer not known

49. The moment of inertia of a right angled triangle of base "b" and height "h", about XX axis passing through its base is
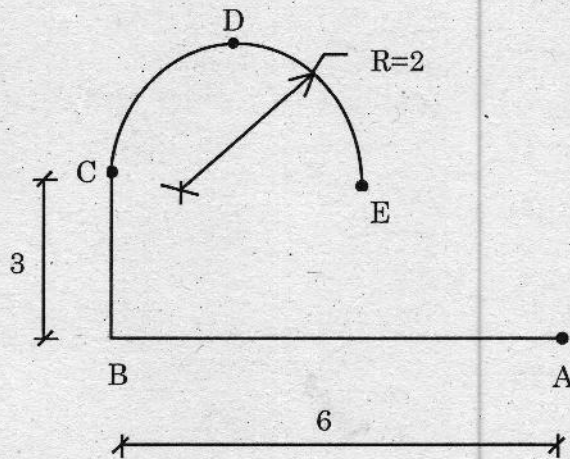
(A) $\dfrac{bh^3}{36}$ ✓

(B) $\dfrac{bh^3}{12}$

(C) $\dfrac{hb^3}{36}$

(D) $\dfrac{hb^3}{12}$

(E) Answer not known

50. Locate the centroid of the thin wire bent as shown, from the element BC

(A) 2 ✓

(B) 2.5

(C) 3.5

(D) 4

(E) Answer not known

51. A block of 200 N weight must be held against a vertical wall by applying a force 'P' normal to the contact surface. If the co-efficient of friction between the surfaces is 0.3 determine minimum force required

(A) 666.67 N ✓

(B) 665.67 N

(C) 666 kN

(D) 660.67 kN

(E) Answer not known

52. Assertion (A) : In dealing with the equilibrium of constrained bodies under the action of concurrent force in one plane we cannot determine definitely the magnitude of more than two reactive forces and the problem is said to be statically in determinate

Reason (R) : The resolution of a given source into more than two coplanar concurrent components is an indeterminate problem.

(A) A and R are true and R is the correct explanation

(B) A and R are true and R is not the correct explanation

(C) A is true and R is false

(D) A is false and R is true

(E) Answer not known

53. A 500 N vertical force is applied to the end of a lever which is attached to a shaft at O as shown. Find the smallest force applied at A which will create the same moment about O as the 500 N force.
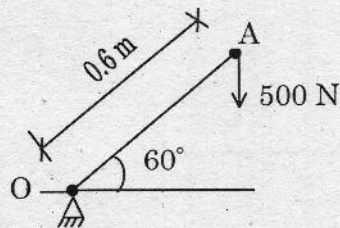

(A) 125 N

(B) 250 N

(C) 300 N

(D) 700 N

(E) Answer not known

54. A spherical ball of weight 150N is suspended from the ceiling with the help of a string as shown. Find the tension in the string if a horizontal force $F = 150$ kN is applied. Determine the angle made by the tension with F.
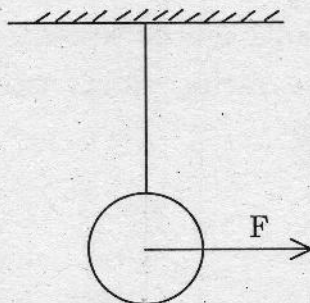
(A) 150 N, 45°

(B) 150 N, 60°

(C) 150 $\sqrt{2}$ N, 45°

(D) 150 $\sqrt{2}$ N, 135°

(E) Answer not known

55. Select the circuit which will produce the given output Q for the input signals X_1 and X_2 given in the figure

(A)

(B) ✓

(C)

(D)
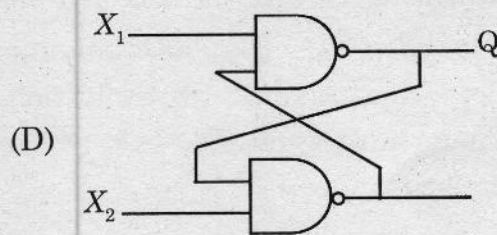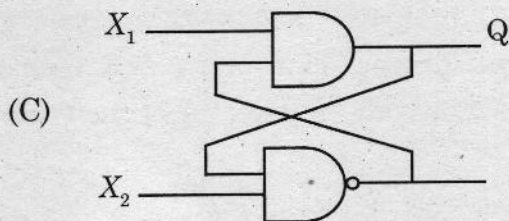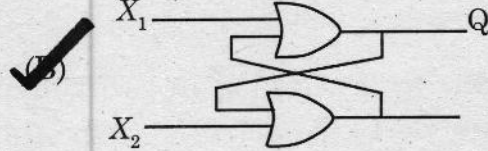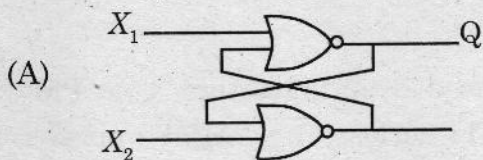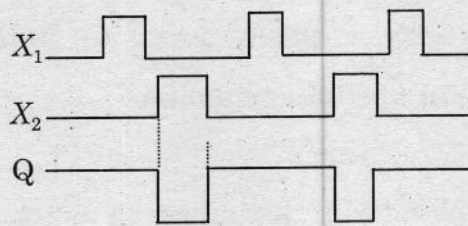
(E) Answer not known

56. The solutions to the quadratic equation $x^2 - 11x + 22 = 0$ are $x = 3$ and $x = 6$. What is the base of the numbers?

(A) hexadecimal (16)

(B) decimal (10)

(C) ✓ octal (8)

(D) hexa (6)

(E) Answer not known

57. The minimum number of flip-flops required for a decade counter is ————

(A) 1

(B) 2

(C) 3

(D) ✓ 4

(E) Answer not known

58. The magnetising current in an induction motor is larger than in a transformer of the same KVA rating because of

    (A) the large air gap between the rotor and the stator of the induction motor

    (B) the moving parts in the induction motor

    (C) induction in the transformer

    (D) the presence of the rotor in the induction motor

    (E) Answer not known

59. The dc current flowing in a circuit is measured by 2 ammeters. One PMMC and another electrodynamometer type connected in series. The PMMC meter contains 100 turns in the coil, the flux density in the air gap is 0.2 wb/m^2 and the area of the coil is 80 mm^2. The electrodynamometer ammeter has a change in mutual inductance with respect to deflection of 0.5 mH/degree. The spring constants of both the meters are equal. The value of current, at which the deflections of the two meters are same is

    (A) 1.8 A   (B) 1.6 A

    (C) 3.2 A   (D) 0.8 A

    (E) Answer not known

60. The type of damping used in moving Iron type of instruments is

    (A) Eddy current damping   (B) Electro magnetic damping

    (C) Air friction damping   (D) Fluid friction damping

    (E) Answer not known

61. Which one of the ammeter has uniform scale?

    (A) Permanent magnet moving coil Ammeter

    (B) Dynamometer type Ammeter

    (C) Repulsion type Moving Iron Ammeter

    (D) Attraction type Moving Iron Ammeter

    (E) Answer not known

62. Grapevine communication is

   (A) Downward communication   (B) Upward communication

   ✔(C) Informal communication   (D) Horizontal communication

   (E) Answer not known

63. Theory X and Theory Y were developed by

   (A) Edgar. H. Schein   ✔(B) Douglas Mc Gregor

   (C) George Elton Mayo   (D) Henry L.Gantt

   (E) Answer not known

64. A selection of course of action from among alternatives is called

   (A) Directing   ✔(B) Decision Making

   (C) Forecasting   (D) Organising

   (E) Answer not known

65. The hierarchy of Needs theory was put forth by

   (A) Frederick Herzberg   ✔(B) Abraham Maslow

   (C) Douglas T. Hall   (D) Douglas McGregar

   (E) Answer not known

66. Which one of the following is not a key result area for business organization.

   (A) Productivity   (B) Market standing

   (C) Profitability   ✔(D) Organisational structure

   (E) Answer not known

67. Carbon nano tubes are made up of
   (A) graphite sheet ✓
   (B) glass sheet
   (C) honey
   (D) plastic
   (E) Answer not known

68. ——————— is not an example of a title of a middle manager.
   (A) First line ✓   (B) District Manager
   (C) Dean   (D) Division Manager
   (E) Answer not known

69. An organizer is one who
   (A) makes plans   (B) assembles resources ✓
   (C) executes plans   (D) controls activities
   (E) Answer not known

70. Rearrange the steps in MBO process in a sight order
   1. Developing action plans
   2. Setting up a subordinate goals
   3. Matching goals and reasons
   4. Setting overall organisational goods
   (A) 2 4 1 3   (B) 4 2 3 1 ✓
   (C) 1 3 2 4   (D) 1 4 3 2
   (E) Answer not known

71. ——————— is a comprehensive managerial system that integrates many key managerial activities in a systematic manner and is consciously directed toward the effective and efficient achievement of organisational and individual objectives
   (A) Management by Exceptions
   (B) Management by Objectives ✓
   (C) Performance Appraisal
   (D) Controlling
   (E) Answer not known

72. Management is

(A) An art (B) A science

(C) Both Art and Science (D) None of the above ✓

(E) Answer not known

73. Match the following :

(a) Staff executives 1. Advisory function
(b) Directing 2. Manpower development
(c) Line executives 3. Guiding function
(d) Staffing 4. Managerial function

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

(E) Answer not known

74. "Management is a multipurpose organ that manages, the business and manages managers and manages workers and work". The above definition is given by

(A) Peter Drucker ✓ (B) John Mee

(C) American Management Association (D) Terry

(E) Answer not known

75. Match the following ISO standards with Title :

Standards Title
(a) ISO 9000 : 2005 1. Quality Management System : Requirements
(b) ISO 9001 : 2008 2. QMS : Fundamentals
(c) ISO 9004 : 2009 3. QMS : Performance Improvement
(d) ISO 14000 4. Environmental Management System

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

(E) Answer not known

76. Arrange the six sigma roles in hierarchical order of authority from lowest to highest
    1. Black belt
    2. Green belt
    3. Leader
    4. Master Black belt
    (A) 2 – 1 – 4 – 3 ✓   (B) 2 – 1 – 3 – 4
    (C) 3 – 2 – 1 – 4   (D) 3 – 1 – 2 – 4
    (E) Answer not known

77. If you know yourself and your enemy, you need not fear the results of hundred battles. This is a saying which focus on the concept of
    (A) Quality function deployment   (B) Quality deployment
    (C) Benchmarking ✓   (D) Quality control circles
    (E) Answer not known

78. The organisation chosen as a role model is called
    (A) Benchmarking partner ✓   (B) Benchmarking standard
    (C) Benchmarking champion   (D) Benchmarking agent
    (E) Answer not known

79. Which charts have no statistical base?
    (A) Flow charts ✓   (B) Run charts
    (C) C-chart   (D) Control charts
    (E) Answer not known

80. P – D – C – A stands for
    (A) Plan – Do – Check – Act ✓   (B) Plan – Do – Correct – Act
    (C) Proceed – Do – Check – Act   (D) Proceed – Do – Correct – Act
    (E) Answer not known

81. Who taught quality control courses as part of the national defence effort during the II world war?

(A) Ronald Fisher   (B) Shewhart

(C) ✓ W. Edwards Denming   (D) Juran

(E) Answer not known

82. "Kaizeno – The key to Japan's competitive success" is the book written by

(A) Kaoru Ishikawa   (B) Genichi Taguchi

(C) Shigeo Shingo   (D) ✓ Masaaki Imai

(E) Answer not known

83. Juran's trilogy does not include the following as a part of continuous improvement.

(A) Quality planning   (B) ✓ Quality training

(C) Quality control   (D) Quality Improvement

(E) Answer not known

84. Identify the dimension of Quality Considered more important in the context of software.

(A) Efficiency   (B) Maintainability

(C) Reliability   (D) ✓ Portability

(E) Answer not known

85. Which of the following is not part of Quality Assurance (QA)?

(A) Quality of Design   (B) Quality of conformance

(C) Quality of performance   (D) ✓ Quality of Policy

(E) Answer not known

86. Aerobic method of composting practised in India is called

(A) Bangalore method
(B) Nagpur method
(C) Delhi method
(D) Indore method
(E) Answer not known

87. Exposure of human body to radiation of 'x' rems may cause severe changes in blood cells and haemorrhage, where 'x' is more than

(A) 50
(B) 100
(C) 200
(D) 300
(E) Answer not known

88. Which one of the following is an electromagnetic radiation that travels at the speed of light?

(A) Alpha Ray
(B) Beta Ray
(C) Gamma Ray
(D) U.V Ray
(E) Answer not known

89. Which of the following compound causes pungent smell during decomposition of sewage?

(A) CO_2
(B) H_2SO_4
(C) HCL
(D) H_2S
(E) Answer not known

90. The efficiency of a sedimentation tank does not depend upon

(A) Detention time
(B) Depth of the tank
(C) Surface overflow
(D) Horizontal velocity of water
(E) Answer not known

91. For a colony of 10,000 persons having sewage flow rate of 200 l / capita / day, BOD of applied sewage of 300 mg /l and organic loading of 300 kg / day/ hectare, the area of an oxidation pond required for treating the sewage of colony is

(A) 0.2 hectares
(B) 1 hectares
(C) 2 hectares
(D) 6 hectares
(E) Answer not known

92. Longer exposure to NO_2 even in small concentrations may cause disease pertaining to

   (A) Lever   (B) Lung

   (C) Kidneys   (D) Heart

   (E) Answer not known

93. Subsidence inversion can be related to a:

   (A) Cyclone   (B) Anticyclone

   (C) Radiation   (D) Tornado

   (E) Answer not known

94. The permissible RSPM (annual average) ambient air quality for industrial areas in India is:

   (A) 60 μg/m^3 (B) 120 μg/m^3

   (C) 140 μg/m^3 (D) 360 μg/m^3

   (E) Answer not known

95. Photo chemical oxidants are produced because of

   (A) NO_2

   (B) NO_2 + hydrocarbons

   (C) NO_2 + hydrocarbons + oxygen

   (D) NO_2 + hydrocarbons + oxygen + light

   (E) Answer not known

96. The Air (prevention and control of pollution) Act was introduced during

   (A) 1980   (B) 1981

   (C) 1982   (D) 1983

   (E) Answer not known

97. In some applications, a force of very large magnitude acts over short intervals of time, Which one of the following functions can be used as a model for such a force?

    (A)   Unit step function   ✓(B)   Dirac delta function

    (C)   Constant function   (D)   Exponential function

    (E)   Answer not known

98. The Laplace transform of the function $\cos^2 6t$ is

    (A) $\dfrac{1}{s} + \dfrac{s}{s^2 + 12^2}$ ✓(B) $\dfrac{1}{2}\left[\dfrac{1}{s} + \dfrac{s}{s^2 + 144}\right]$

    (C) $\dfrac{1}{2}\left[\dfrac{1}{s} + \dfrac{12}{s^2 + 144}\right]$ (D) $\dfrac{1}{2}\left[\dfrac{1}{s} + \dfrac{s}{s^2 + 12}\right]$

    (E)   Answer not known

99. The inverse Laplace transform of $\dfrac{e^{-\pi s}}{s^2 + 4}$

    (A) $\dfrac{1}{2}\sin 2(t+1).u(t+1)$ (B) $\dfrac{1}{2}\sin 2(t-1).u(t-1)$

    (C) $\dfrac{1}{2}\sin 2(t+\pi).u(t+\pi)$ ✓(D) $\dfrac{1}{2}\sin 2(t-\pi).u(t-\pi)$

    (E)   Answer not known

100. The residue of $f(z) = z \cos\dfrac{1}{z}$ at $z = 0$ is

    (A)   0   (B)   1

    ✓(C) $-\frac{1}{2}$ (D) $\frac{1}{2}$

    (E)   Answer not known

101. The Laurent's series expansion of $f(z) = z^2 . e^{1/z}$ about $z = 0$ is

    (A) $1 + z + z^2 + \dfrac{1}{\lfloor 2} + \dfrac{1}{\lfloor 3}\dfrac{1}{z} + \dfrac{1}{\lfloor 4}\dfrac{1}{z^2} + \ldots \infty$ (B) $z + \dfrac{1}{z} + \dfrac{1}{\lfloor 3}\dfrac{1}{z^2} + \dfrac{1}{\lfloor 4}\dfrac{1}{z^3} + \ldots \infty$

    ✓(C) $z + z^2 + \dfrac{1}{2} + \dfrac{1}{\lfloor 3 z} + \dfrac{1}{\lfloor 4 z^2} + \ldots \infty$ (D) $1 + z + \dfrac{1}{z^2} + \dfrac{1}{z^3} + \dfrac{1}{z^4} + \dfrac{1}{z^5} + \ldots \infty$

    (E)   Answer not known

102. If $\vec{F}$ is a vector point function finite and differentiable in a region R bounded by a closed surface S then

(A) $\int_c \vec{F}.\vec{dr} = \iint_s (\nabla \times \vec{F}).\hat{n}ds$

(B) $\iint_s \vec{F}.\hat{n}ds = \iiint_v (\nabla \times \vec{F})dv$

(C) $\iint_s \vec{F}.\hat{n}ds = \iiint_v \nabla.\vec{F}dv$ ✓

(D) $\int_c \vec{F}.\vec{dr} = \iint_s \vec{F}..\hat{n}ds$

(E) Answer not known

103. Is the vector $\vec{v} = (x + 3y)\vec{i} + (y - 2z)\vec{j} + (x + az)\vec{k}$ is solenoidal, then the value of 'a' is

(A) 2

(B) 3

(C) −2 ✓

(D) −3

(E) Answer not known

104. The value of $\int e^x \cos x\, dx$ is

(A) $\frac{1}{2}[e^x \sin x + e^x \cos x] + c$ ✓

(B) $\frac{1}{2}[e^x \sin x - e^x \cos x] + c$

(C) $-\frac{1}{2}[e^x \sin x + e^x \cos x] + c$

(D) $-\frac{1}{2}[e^x \sin x - e^x \cos x] + c$

(E) Answer not known

105. The stationary points of the functions $f(x,y) = x^2 + y^2 + 6x + 12$ is

(A) $(3,0)$

(B) $(-3,0)$ ✓

(C) $(-6,2)$

(D) $(6,0)$

(E) Answer not known

106. The function $\varphi(x,y) = \begin{cases} \dfrac{x^3 + y^3}{x - y} & , x \neq y \\ 0 & , x = y \end{cases}$ is

(A) Continuous and differentiable at origin

(B) Continuous but not differentiable at origin

(C) Differentiable but not continuous at origin

(D) Not Continuous and not differentiable at origin ✓

(E) Answer not known

107. Dielectric materials under the influence of electric field exhibit a property called

(A) Magnetization
(B) Superconductivity
(✓C) Polarization
(D) Thermal Expansion
(E) Answer not known

108. The Susceptibility of a diamagnetic material

(A) Varies directly with temperature
(B) Varies as $\dfrac{1}{(T - \theta)}$
(C) Varies as $\dfrac{1}{T}$
(✓D) Is independent of temperature
(E) Answer not known

109. The magnetic field does not penetrate into the body of the superconductor, this property is known as

(✓A) Meissner effect
(B) Photo electric effect
(C) BCS theory
(D) Mechanical effect
(E) Answer not known

110. In Crystals dislocations are

(✓A) Line defects
(B) Planar defects
(C) Chemical defects
(D) Point defects
(E) Answer not known

111. The number of lattice points in a primitive cell are

(✓A) 1
(B) $\dfrac{1}{2}$
(C) 2
(D) $\dfrac{3}{2}$
(E) Answer not known

112. A He-Nw layer emits light at a wave length of 632.8nm and has an output power of 2.3 mw. The no of photons emitted per minute, Given $h = 6.625 \times 10^{-34}$ SI units.

(A) ✓ 4.4×10^{17} Photons/minute
(B) 1.7×10^{4} Photons/minute
(C) 1.4×10^{17} Photons/minute
(D) 5.5×10^{15} Photons/minute
(E) Answer not known

113. Two sources of waves are called coherent if

(A) Both have the same amplitude and vibration
(B) Both produce waves of the same wave length
(C) Both produce waves having the same velocity
(D) ✓ Both produce waves of the same wave length having a constant phase difference
(E) Answer not known

114. The colours exhibited by a soap bubble is due to

(A) Reflection of light
(B) Refraction of light
(C) ✓ Interference of light
(D) Diffraction of light
(E) Answer not known

115. The slopes of isothermal and adiabatic curves are related as

(A) Isothermal curve slope = Adiabatic curve slope
(B) ✓ Adiabatic curve slope = $\gamma \times$ Isothermal curve slope
(C) Isothermal curve = $\gamma \times$ Adiabatic curve slope
(D) Adiabatic curve slope = $\dfrac{1}{2} \times$ Isothermal curve slope
(E) Answer not known

116. The first law of thermodynamics is a special case of

(A) Law of conservation of momentum
(B) ✓ Law of conservation of energy
(C) Law of heat exchange
(D) Charle's law
(E) Answer not known

117. If T is the reverberation time of an auditorium of volume V then

(A) $T \propto \dfrac{1}{V}$

(B) $T \propto \dfrac{1}{V^2}$

(C) $T \propto V^2$

(D) $T \propto V$ ✓

(E) Answer not known

118. The reciprocal of bulk modulus is called

(A) Modulus of elasticity

(B) Hooke's law

(C) Compressibility ✓

(D) Poisson ratio

(E) Answer not known

119. The bulk modulus is a proportionality constant that relates the pressure acting on an object

(A) The shear

(B) The fractional change in volume ✓

(C) The fractional change in length

(D) Young's modulus

(E) Answer not known

120. 1 horse power is equal to

(A) 736 W

(B) 716 W

(C) 726 W

(D) 746 W ✓

(E) Answer not known

121. The law of inertia is related to

(A) Newton's first law of motion ✓

(B) Newton's second law of motion

(C) Newton's third law of motion

(D) Law of conservation of momentum

(E) Answer not known

122. Which of the following chemical formula represents tobermorite gel formed during hardening of cement?

(A) ✓ $3CaO \cdot 2SiO_2 \cdot 3H_2O$ (B) $3CaO \cdot Al_2O_3 \cdot 6H_2O$

(C) $3CaO \cdot Fe_2O_3 \cdot H_2O$ (D) $3CaO \cdot Al_2O_3 \cdot CaSO_4 \cdot 7H_2O$

(E) Answer not known

123. Identify the metal pairs which are suitable for hot dipping.

(A) Cr and Pb   (B) Pb and Sn

(C) ✓ Sn and Zn   (D) Cr and Zn

(E) Answer not known

124. The atomic weight of Al is 27 and its density is 2.70 g/cc. Similarly the molecular weight of $Al_2O_3 = 102$ and its density is 3.70 g/cc. The pilling bedworth ratio of Al_2O_3 is

(A) 2.74   (B) 0.63

(C) ✓ 1.37   (D) 0.79

(E) Answer not known

125. A natural abrasives which has hardness 10 in Moh's scale is

(A) Corundum   (B) Topaz

(C) ✓ Diamond   (D) Gypsum

(E) Answer not known

126. Arrange the following abrasives in increasing order of hardness:

Norbide, Carborundum, Corundum, Garnet

(A) ✓ Garnet < Norbide < Corundum < Carborundum

(B) Carborundum < Corundum < Norbide < Garnet

(C) Corundum < Norbide < Garnet < Carborundum

(D) Garnet < Norbide < Carborundum < Corundum

(E) Answer not known

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[Turn over

127. The electrolyte in the hydrogen – oxygen fuel cell consists of

(A) 25% KOH   (B) 25% NaOH

(C) 85% KOH   (D) 85% NaOH

(E) Answer not known

128. The theoretical cell voltage that can be obtained from a $H_2 - O_2$ fuel cell is

(A) 0.80 V   (B) 0.90 V

(C) 1.0 V   (D) 1.23 V

(E) Answer not known

129. Choose the best option:

——————— is a record of declaration of one's objectives, interest and skills.

(A) Resume   (B) Letter

(C) Interview   (D) Case study

(E) Answer not known

130. Rearrange the sentences :

Milton said that

1. Those persons
2. Would be condemned
3. Who do not obey
4. God's commands

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

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

(E) Answer not known

131. Choose the sentence that is closest in meaning to the statement

I don't think that my team is likely to win

(A) My team always wins

(B) My team likes to win

(C) I didn't know my team was so successful

(D) My team will probably lose

(E) Answer not known

132. Choose the correct suffix to form a meaningful word to the following word

Way

(A) – let   (B) – some

(C) – en   (✓) – ward

(E) Answer not known

133. Choose the best synonym of the underlined word.

Fashion is <u>volatile</u> and has its impact in every walk of life in the globalized world of hybridity.

(A) Constant   (✓) Changeable

(C) Converge   (D) Complex

(E) Answer not known

134. Choose the word which is opposite in meaning to the underlined word

Safety is the <u>drastic</u> need of the residents of sea side villages.

(A) Severe   (✓) Moderate

(C) Mandatory   (D) Basic

(E) Answer not known

135. Choose the correct connective and fill in the blanks.

Plastics tend to be resistant to inorganic acids —————— can be dissolved by solvents like carbon tetra chloride.

(✓) but   (B) yet

(C) while   (D) whereas

(E) Answer not known

136. Spot the error:

No sooner/had he heard/the news, then/he wept.

    A   B   C   D

(A) No Sooner   (B) Had he heard

(✓) The news then   (D) He wept

(E) Answer not known

[Turn over

137. —————— liquid sample assumes the shape of its container.
    (A) The   (B) A
    (C) An   (D) By
    (E) Answer not known

138. Choose the correct passive voice of the given sentence :
    He showed me how to do the work.
    (A) He is showed by me how to do the work
    (B) The work was showed by him to me
    (C) I was showed how to do the work
    (D) He was showed how to do the work by me
    (E) Answer not known

139. Fill in the blank with suitable verb:
    Next week by now, I —————— my holidays.
    (A) Will enjoy   (B) Will be enjoying
    (C) Would enjoy   (D) Would have been enjoying
    (E) Answer not known

140. Complete the following, using the past perfect continuous/Frame a past perfect continuous question from the words given in brackets.
    (You/have/a party?) ——————.
    (A) Had you been in a party?   (B) Had you been having a party?
    (C) Have you been having a party? (D) Have you been in a party?
    (E) Answer not known

141. Which of the following is not considered under Business to Business e-commerce?
    (A) Direct selling and support to business
    (B) Industry portals
    (C) Information sites about an industry
    (D) Buying a product through Web Site
    (E) Answer not known

142. Data Communication Network within a building or campus

    (A) WAN   ✓ (B) LAN

    (C) MAN   (D) CAN

    (E) Answer not known

143. Piggybacking communication are mostly

    ✓ (A) Full – duplex

    (B) Half – duplex

    (C) Simplex

    (D) Multi – directional

    (E) Answer not known

144. A variable is an

    (A) Constant   ✓ (B) Identifier

    (C) Identity   (D) Operator

    (E) Answer not known

145. —————— stores many data values under the same variable name.

    (A) List   (B) Table

    ✓ (C) Array   (D) Tree

    (E) Answer not known

146. Shell is a component of

    (A) DOS

    ✓ (B) UNIX

    (C) System software

    (D) Application software

    (E) Answer not known

147. 'A' throws an apple vertically upwards from the ground to 'B' standing near the window of a room 30m above. The apple was caught by 'B' 2 sec later by her outstretched hand. The final velocity of the apple just before it was caught is

(A) 5.19 m/sec

(B) 22.31 m/sec

(C) 8.27 m/sec

(D) 20.34 m/sec

(E) Answer not known

148. A particle moves along a straight line so that its displacement in metre from a fixed point is expressed as $s = t^3 + 3t^2 + 4t + 5$. The velocity of the body at 4 seconds is

(A) 76 m/s

(B) 66 m/s

(C) 60 m/s

(D) 4 m/s

(E) Answer not known

149. A body is rotating with an angular velocity of 5 radians/s. After 4 seconds the angular velocity of the body reaches 13 radians/s. The angular acceleration of the body is

(A) 8 rad/s^2

(B) 4 rad/s^2

(C) 2 rad/s^2

(D) 1 rad/s^2

(E) Answer not known

150. The centre of gravity of a hemisphere of radius 8 cm from its base measured along vertical radius is

(A) 32/3 cm

(B) 12 cm

(C) 3 cm

(D) 32/7 cm

(E) Answer not known

151. A ladder of length 4 m, weighing 200 N is placed against a vertical wall as shown. The coefficient of friction between the wall and the ladder is 0.2 and that between the floor and the ladder is 0.3. In addition to self weight, the ladder has to support a man weighting 600 N at a distance of 3m from A. What is the frictional force developed at B?
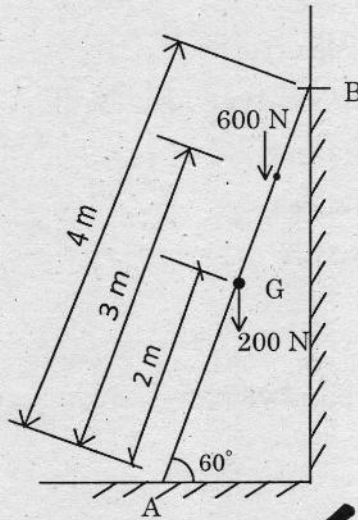
(A) 50 N   (B) 57 N
(C) 53 N   (D) 62 N
(E) Answer not known

152. Limiting friction is the maximum value of static friction that occurs when

(A) the body is at rest
(B) the motion is impending
(C) the body is moving at constant speed
(D) the motion is periodic
(E) Answer not known

153. If 'T_2' is the tension in the slack side of the belt, 'μ' is the coefficient of friction between the belt and pulley, 'θ' is the angle of contact between the belt and pulley, Tension 'T_1' in the tight side of the belt is expressed as

(A) $T_1 = T_2 e^{\mu\theta}$ (B) $T_1 = \dfrac{T_2}{e^{\mu\theta}}$

(C) $T_1 = \dfrac{e^{\mu\theta}}{T_2}$ (D) $T_1 = T_2 e^{-\mu\theta}$
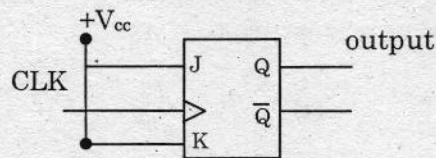
(E) Answer not known

154. The area under the acceleration-time plot represents.
   (A) change in acceleration
   (B) change in displacement
   (C) change in velocity ✓
   (D) change in time
   (E) Answer not known

155. In a pulse transmission system, the error rate
   (A) is independent of noise at S/N ratio above 20 db.
   (B) increases as S/N ratio increases
   (C) decreases as S/N ratio decreases
   (D) decreases as S/N ratio increases ✓
   (E) Answer not known

156. In a radio receiver, reducing the bandwidth will reduce the response as
   (i) Lower AF
   (ii) Higher AF
   (iii) Both
   (iv) Mixer
   (A) (i) only correct
   (B) (ii) only correct ✓
   (C) (i) and (ii) are correct
   (D) (iv) only correct
   (E) Answer not known

157. Modulation is used to —————
   (A) reduce bandwidth
   (B) reduce power
   (C) separate different transmission ✓
   (D) increase power
   (E) Answer not known

158. For the following circuit, the input clock frequency is 10 KHz, then the output frequency at Q is

   (A) 5 KHz ✓
   (B) 10 KHz
   (C) 20 KHz
   (D) 2.5 KHz
   (E) Answer not known

159. Which of the following statements are valid

(1) When a pn junction is heavily doped, its breakdown voltage will increase

(2) The avalenche breakdown and zener breakdown are the same mechanisms by which a pn junction breaks

(3) Zener diode can be used for meter projection and for wave shaping

(4) Zener diode can be used for meter protection but cannot be used for wave shaping

(A) (1) only

(B) (1), (3) and (4) only

(C) (3) only ✓

(D) (1), (2) and (3) only

(E) Answer not known

160. The ripple factor of a full wave rectifier is

(A) 1.21

(B) 1.707

(C) 0.48 ✓

(D) 1.414

(E) Answer not known

161. The barrier voltage at a pn junction for germanium is about

(A) 3.5 V

(B) 3 V

(C) Zero

(D) 0.3 V ✓

(E) Answer not known

162. The KVA rating of an ordinary two winding transformer increases considerably when connected as an auto transformer because

(A) Secondary voltage is increased

(B) Secondary current is increased

(C) Energy is transferred both inductively and conductively ✓

(D) Transformation ratio is increased

(E) Answer not known

163. Rotational losses in a dc machine consist of

(A) Magnetic and copper losses

(B) Magnetic and mechanical losses ✓

(C) Mechanical and copper losses

(D) Copper losses only

(E) Answer not known

164. The power dissipated in 6 Ω resistor of the given circuit will be
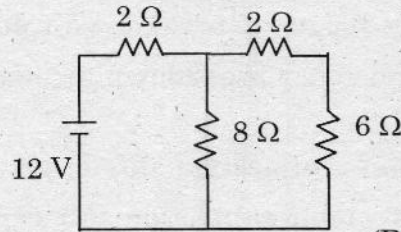
(A) 6 W   (B) 12 W

(C) 24 W   (D) 28 W

(E) Answer not known

165. The ratio of maximum value to r.m.s value of an alternating quantity is called

(A) Form factor   (B) Mean value

(C) Effective value   (D) Crest factor

(E) Answer not known

166. In a 3-phase balanced system the phasor sum of 3-phase voltages , V_a, V_b and V_c are

(A) Zero   (B) $1.5 \, V_{L-L}$

(C) $\sqrt{3} \, V_{L-L}$ (D) $\dfrac{1}{\sqrt{2}} V_{L-L}$

(E) Answer not known

167. When the instantaneous applied voltage across a capacitor is zero, the instantaneous current through the capacitor will be

(A) zero   (B) minimum

(C) no current flow   (D) maximum

(E) Answer not known

168. What is the weakest form of control?

(A) Pre control   (B) Simultaneous control

(C) Post control   (D) Duel control

(E) Answer not known

169. Arrange in the order of selection process
    1. Physical examination
    2. Reference checking
    3. Selection tests
    4. Employment interview
    ✓ (A) 3 – 4 – 2 – 1   (B) 4 – 3 – 2 – 1
    (C) 3 – 4 – 1 – 2   (D) 4 – 2 – 3 – 1
    (E) Answer not known

170. ———————— training is provided by special instructors, away from the shop floor.
    (A) Induction   (B) Apprenticeship
    (C) Refresher   ✓ (D) Vestibule
    (E) Answer not known

171. The kind of interview in which, the standard questions to be put to a candidate are framed in advance is called
    ✓ (A) Patterned interview   (B) Direct interview
    (C) Stress interview   (D) Panel interview
    (E) Answer not known

172. ———————— is a statement of minimum acceptable qualities required in a job incumbent for the effective performance of the job.
    ✓ (A) Job specification   (B) Job analysis
    (C) Job description   (D) Man power planning
    (E) Answer not known

173. If a general manager asks sales manager to recruit executives on his behalf, it is an instance of
    (A) Centralisation of authority   (B) Decentralisation of authority
    (C) Delegating responsibility   ✓ (D) Delegating authority
    (E) Answer not known

174. SMART is an acronym for ——————— in planning.

    (A) ✓ Specific, Measurable, Achievable, Realistic and Time-related

    (B) Simple, Mission, Achieve, Reply and Time

    (C) Solution, Method, Action, Reply and Time

    (D) System, Method, Activities, Report and Time

    (E) Answer not known

175. ——————— provides the basis for control.

    (A) ✓ Planning   (B) Co-ordination

    (C) Directing   (D) Organisation

    (E) Answer not known

176. Henry Fayol laid down

    (A) 10 principles   (B) 12 principles

    (C) ✓ 14 principles   (D) 15 principles

    (E) Answer not known

177. ——————— has suggested the factors for evaluating alternative course of action.

    (A) ✓ Peter Drucker   (B) F. W. Taylor

    (C) Henry Fayol   (D) George Terry

    (E) Answer not known

178. Peter Drucker emphasized that "three ways to determine the kind of structure needed in a specific enterprise"! They are

    (A) ✓ Activities Analysis, Decision Analysis and Relation Analysis

    (B) Relation Analysis, Job Analysis and Person Analysis

    (C) Decision Analysis, Job Analysis and Evaluation Analysis

    (D) Job Analysis, Evaluation Analysis and Relation Analysis

    (E) Answer not known

179. Fundamental rethinking and radical redesign of business processes is known as

(A) Business Process Reengineering ✓ (B) Quality Function Deployment

(C) Reverse Engineering (D) Total Productive Maintenance

(E) Answer not known

180. When a measuring instrument is calibrated, the objective is to reduce:

(A) Accuracy (B) Bias ✓

(C) Repeatability (D) Reproducibility

(E) Answer not known

181. Zero accident, zero defect, zero breakdown and zero losses are the major objectives of

(A) KAIZEN (B) TPM ✓

(C) QFD (D) BPR

(E) Answer not known

182. 'Voice of Customer (VOC)' is an quality development process used in

(A) Design of six sigma ✓ (B) Poka-Yoke

(C) DMAIC (D) Lean Management

(E) Answer not known

183. Approximately what area is covered under the normal distribution curve between ± 3 standard deviations?

(A) 95.40% (B) 88.00%

(C) 99.73% ✓ (D) 68.00%

(E) Answer not known

184. Which one of the following is correctly matching the six-sigma state?

(A) Measure – Define – Analyse – Improve – Control

(B) Improve – Measure – Define – Analyse – Control

(C) Define – Measure – Analyse – Improve – Control ✓

(D) Measure – Analyse – Control – Define – Improve

(E) Answer not known

185. Which of the following is incorrectly paired?

   (A)   SEIRI – SORTING   (B)   SEITON – DEVELOP

   (C)   SEISO – SHINE   (D)   SEIKETSU – STANDARDISE

   (E)   Answer not known

186. Which one of the following is not a characteristic feature of quality circle?

   (A)   The membership consists of departmental work leaders and line operators

   (B)   Membership is compulsory

   (C)   Compensation for out of working hours from full time to nothing

   (D)   Each activity should have its own group of employees or workers

   (E)   Answer not known

187. The four primary continuous process improvement strategies are

   (A)   rework, refinement, redefine, renovation

   (B)   repair, refinement, renovation, reinvention

   (C)   repair, reengineer, redefine, renovation

   (D)   rectify, refinement, redefine, reinvention

   (E)   Answer not known

188. Costs that are incurred to ensure that bad quality does not occur in manufactured goods are

   (A)   Appraisal costs   (B)   Failure costs

   (C)   Hidden costs   (D)   Prevention costs

   (E)   Answer not known

189. Who stated that 80% of the problem are found in 20% of the work?

   (A)   Philip Crosby   (B)   Joseph Juran

   (C)   Pareto   (D)   Edward Deming

   (E)   Answer not known

190. What are the core principles of the TQM in a company wide effort?

 (A) Customer and process orientation only

 (B) Continuous improvement only

 (C) Process orientation and continuous improvement only

 (D) Continuous improvement process and customer orientation ✓

 (E) Answer not known

191. " Poor Quality loses" are

 1. Process non-conformities

 2. Scrap

 3. Slow down

 4. Coffee and lunch breaks

 (A) 1 and 2 only ✓   (B) 1 and 3 only

 (C) 3 and 4 only   (D) 1 and 4 only

 (E) Answer not known

192. Noise is called as

 (A) loud noise   (B) constant sound

 (C) unwanted sound ✓   (D) sound of high frequency

 (E) Answer not known

193. The intensity (I) and power (W) of sound wave are related by the equation.

 (A) $I = W/\alpha$ ✓   (B) $I = W * \alpha$

 (C) $I = W + \alpha$ (D) $I = W - \alpha$

 (E) Answer not known

194. Noise is measured in units of

 (A) hertz   (B) decibel ✓

 (C) doboson   (D) bacqueral

 (E) Answer not known

195. The phenomenon by virtue of which a soil is clogged with sewage matter, is?

 (A) Sewage farming   (B) Sewage sickness ✓

 (C) Sewage bulking   (D) Sewage loading

 (E) Answer not known

196. If a 2% solution of sewage sample is incubated for 5 days at 20°C, and the dissolved oxygen depletion is 10 mg/l, then the BOD of the sewage would be

(A) 50 mg/l
(B) 200 mg/l
(C) 500 mg/l ✓
(D) 5000 mg/l
(E) Answer not known

197. Arrange these green house gases according to relative contribution for global warming

1. CH_4
2. N_2O
3. CO_2
4. O_3
5. CFC

(A) 2 > 3 > 5 > 1 > 4
(B) 3 > 1 > 5 > 4 > 2 ✓
(C) 4 > 2 > 5 > 3 > 1
(D) 3 > 2 > 4 > 5 > 1
(E) Answer not known

198. The Chloro Fluoro Carbons (CFCs) are released into the environment by humans, as they are largely used

(A) in refrigeration and air conditioning
(B) as cleaning solvent in factories
(C) in aerosol sprays
(D) all of the above ✓
(E) Answer not known

199. Which of the following gases are the main contributors to acid rain?

(A) Carbon dioxide and carbon monoxide
(B) Sulphur dioxide and carbon dioxide
(C) Suplhur dioxide and nitrogen dioxide ✓
(D) Sulphur, dioxide and nitrous oxide
(E) Answer not known

200. Which of the following organ systems affected by air pollutants?

I. Respiratory system
II. Nervous system
III. Circulatory system

(A) III alone
(B) I and III ✓
(C) II and III
(D) I alone
(E) Answer not known

SPACE FOR ROUGH WORK

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