DIPLOMA - COMMON ENTRANCE TEST-2019

EN	**COURSE**	**DAY : SUNDAY DATE : 21-07-2019**
	ENVIRONMENTAL	**TIME : 10.00 a.m. to 1.00 p.m.**

MAXIMUM MARKS	**TOTAL DURATION**	**MAXIMUM TIME FOR ANSWERING**
180	**200 MINUTES**	**180 MINUTES**

MENTION YOUR DIPLOMA CET NUMBER	**QUESTION BOOKLET DETAILS**	
	VERSION CODE	**SERIAL NUMBER**
	A	**220081**

Dos :

1. Candidate must verify that the DCET number and Name printed on the OMR Answer Sheet is tallying with the DCET number and Name printed on the Admission Ticket. Discrepancy if any, report to invigilator.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 9.50 am**.
3. The Version Code of this Question Booklet should be entered on the OMR Answer Sheet and the respective circle should also be shaded completely.
4. The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DONTs :

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. The **3rd Bell rings at 10.00 am, till then;**
    *   Do not remove the seal present on the right hand side of this question booklet.
    *   Do not look inside this question booklet.
    *   Do not start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains **180** (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the **3rd Bell is rung at 10.00 am**, remove the paper seal of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent **180** minutes :
    *   Read each question (item) carefully.
    *   Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
    *   Completely **darken / shade** the relevant circle with a blue or **black ink ballpoint pen against the question number on the OMR answer sheet.**

ಸರಿಯಾದ ಕ್ರಮ **CORRECT METHOD**	ತಪ್ಪು ಕ್ರಮಗಳು **WRONG METHODS**
(A) ● (C) (D)	(✗) (B) (C) (D) (A) (B) (C) (✓) (A) ● ● (D)
	(◑) (B) (C) (D) (A) (◉) (C) (D)

4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
5. After the **last bell is rung at 1.00 pm**, stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
6. Hand over the **OMR answer sheet** to the room invigilator as it is.
7. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year**.

EN-A

PART – A

APPLIED SCIENCE

1. One of the basic unit in SI is

   (A) Newton   (B) Joule

   (C) Kilometer   (D) Ampere

2. The pitch of screw is $\frac{1}{2}$ mm. The number of divisions on head scale of screw gauge is 50. The least count of screw gauge is

   (A) 0.1 mm   (B) 0.5 mm

   (C) 0.01 mm   (D) 0.05 mm

3. Which one of the following is a vector quantity ?

   (A) Speed   (B) Density

   (C) Velocity   (D) Mass

4. The magnitude of resultant of two forces $\vec{P}$ & $\vec{Q}$ acting perpendicular to each other is

   (A) $\sqrt{P^2 + Q^2}$ (B) $\sqrt{P^2 - Q^2}$

   (C) $P^2 - Q^2$ (D) $P^2 + Q^2$

5. A force of 50 N acts at a point making an angle of 30° with the horizontal. The vertical component is

   (A) 50 N   (B) 25 N

   (C) 150 N   (D) 1.6 N

Space For Rough Work

6. A couple produces

   (A) pure linear motion   (B) pure rotational motion

   (C) both linear and rotational motion (D) neither linear nor rotational motion

7. The resultant of two like parallel forces acts in the direction of

   (A) same as that of two forces   (B) opposite to two forces

   (C) perpendicular to two forces   (D) direction cannot be specified

8. The reciprocal of bulk modulus of elasticity is called

   (A) Compressibility   (B) Rigidity

   (C) Modulus of elasticity   (D) Viscosity

9. A steel wire has a cross sectional area of 0.05 m^2. If the maximum stress of steel wire is 1000 N/m^2. The force is

   (A) $20 \times 10^3 \text{ N}$ (B) 50 N

   (C) 200 N   (D) 20 N

10. The pressure at a point on surface of a liquid is

    (A) minimum   (B) maximum

    (C) zero   (D) infinity

11. The pressure exerted by sea water of density 1025 kg/m^3 on a fish at a depth of 10 m $(g = 10 \text{ m/s}^2)$ is

    (A) 1025 kPa   (B) 10.25 kPa

    (C) 1.025 kPa   (D) 102.5 kPa

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12. A drop of rain assumes spherical shape due to

(A) Density   (B) Viscosity

(C) Surface tension   (D) Humidity

13. The phenomenon of rise or fall of liquid in a capillary tube is

(A) Viscosity   (B) Capillarity

(C) Density   (D) Elasticity

14. The S.I. unit of coefficient of viscosity is

(A) Ns/m^2 (B) Nm^2/s

(C) m^2s/N (D) Ns/m

15. The expression that represents Boyle's law is

(A) PV = constant   (B) PT = constant

(C) VT = constant   (D) PVT = constant

16. The volume of gas at 30 °C is 2 litres. To what temperature the gas must be heated for its volume to become 4 litres at constant pressure.

(A) 300 °C   (B) 273 °C

(C) 333 °C   (D) 606 °C

17. Working of pressure cooker is based on the principle of

(A) Boyle's law   (B) Charle's law

(C) Laplace's law   (D) Gay-Lussac's law

Space For Rough Work

18. Land and sea breeze is an example of

    (A) Conduction   (B) Convection

    (C) Condensation   (D) Radiation

19. The measure of average kinetic energy of all the particles in a gas is

    (A) Heat   (B) Mechanical energy

    (C) Chemical energy   (D) Temperature

20. When a wave travels through the medium, the particles of the medium are

    (A) displaced in the direction of wave

    (B) displaced opposite to the direction of wave

    (C) mean position remains same

    (D) starts rotating

21. Two waves with very little difference in their frequencies overlap on one another to produce

    (A) Stationary waves   (B) Progressive waves

    (C) Beats   (D) Transverse waves

22. The acceleration of the particle executing simple harmonic motion is directly proportional to its

    (A) displacement from its mean position

    (B) period of motion

    (C) frequency of vibration

    (D) amplitude of wave

Space For Rough Work

23. In the expression for velocity of sound in air, $V = \sqrt{\dfrac{\gamma P}{\rho}}$, notation γ is equal to

(A) $C_P + C_V$

(B) $C_P - C_V$

(C) $C_P \times C_V$

(D) $\dfrac{C_P}{C_V}$

24. Velocity of sound in outer space is

(A) 3×10^8 m/s

(B) 330 m/s

(C) zero

(D) 360 m/s

25. A string of length 1 m and mass 0.04 kilogram vibrates with fundamental frequency of 100 Hz then the tension in the string is

(A) 4000 N

(B) 1600 N

(C) 400 N

(D) 1000 N

26. Nodes and antinodes are characteristics of

(A) Stationary waves

(B) Longitudinal waves

(C) Transverse waves

(D) Beats

27. Natural frequency of a string does not vary with

(A) thickness

(B) applied force

(C) tension

(D) length

28. The electromagnetic radiation used in Forensic Department to study the finger print is

(A) Ultraviolet Ray (UV Ray)

(B) Radio wave

(C) Micro wave

(D) X-ray

Space For Rough Work

29. The type of light used to study Holography is

    (A) Visible light   (B) Laser light

    (C) Sodium light   (D) Mercury light

30. Which technology is used to develop Sun Screen lotion and cosmetics ?

    (A) Geo-technology   (B) Nano-technology

    (C) Electro-technology   (D) Micro-technology

31. The process of separating the information signal from the carrier wave at the receiver is known as

    (A) Amplification   (B) Modulation

    (C) Attenuation   (D) Demodulation

32. Optical fibre is used in

    (A) Pressure sensors   (B) Drilling

    (C) Holography   (D) Welding

33. The mass of copper deposited on the cathode of a copper voltmeter by a current of 2 amperes in 30 minutes is

(Given ece of copper $(Z) = 0.0003$ gm / coulomb)

    (A) 3.2 gm   (B) 4.3 gm

    (C) 1.08 gm   (D) 2.5 gm

34. The process of coating zinc over iron or steel is known as

    (A) Galvanizing   (B) Tinning

    (C) Alloying   (D) Non-Metallic coating

Space For Rough Work

35. SOFC is a type of

    (A) Primary cell   (B) Secondary cell

    (C) Fuel cell   (D) Solar cell

36. Magnalium is an alloy made by the combination of aluminium and

    (A) Phosphorous   (B) Zinc

    (C) Tin   (D) Magnesium

37. Zinc-carbon battery is an example for

    (A) Secondary Battery   (B) Fuel cell

    (C) Primary Battery   (D) Solar cell

38. Which of the following is not a polymer ?

    (A) Teflon   (B) Nylon

    (C) Bakelite   (D) Glass

39. Ceramic is which type of material ?

    (A) Composite material   (B) Alloy

    (C) Polymer   (D) Bio-material

40. The pH value of distilled water is

    (A) 13   (B) 7

    (C) 2   (D) 11

Space For Rough Work

PART – B

ENGINEERING MATHEMATICS

41. If $A = \begin{bmatrix} -3 & 4 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 \\ -2 & 1 \end{bmatrix}$, then $B^T \cdot A^T$ is

(A) $\begin{bmatrix} 3 & 8 \\ -4 & 0 \end{bmatrix}$

(B) $\begin{bmatrix} -5 & -2 \\ -2 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} 5 & 2 \\ -2 & -4 \end{bmatrix}$

(D) $\begin{bmatrix} 5 & 2 \\ 2 & 4 \end{bmatrix}$

42. The value of the $\begin{vmatrix} \tan\theta & 0 & -1 \\ 1 & 0 & \tan\theta \\ 2 & -1 & 3 \end{vmatrix}$ is

(A) $-\sec^2\theta$

(B) $\csc^2\theta$

(C) 1

(D) $\sec^2\theta$

43. The values of x and y in the simultaneous equations $2x - 3y = 13$ and $3x + 4y = -6$ are

(A) $x = -3, y = 2$

(B) $x = -2, y = -3$

(C) $x = 2, y = -3$

(D) $x = 2, y = 3$

44. If $\begin{vmatrix} 3 & -2 & 4 \\ 4 & 0 & x \\ 2 & -5 & 4 \end{vmatrix} = -4$, then the value of x is

(A) 4

(B) -4

(C) $\dfrac{44}{19}$

(D) $-\dfrac{44}{19}$

Space For Rough Work

45. The characteristics roots of the matrix $\begin{bmatrix} 2 & 0 \\ 0 & -3 \end{bmatrix}$ are

(A) $\lambda = 2$ and $\lambda = 3$

(B) $\lambda = -2$ and $\lambda = -3$

(C) $\lambda = 2$ and $\lambda = -3$

(D) $\lambda = -2$ and $\lambda = 3$

46. The adjoint of the matrix $\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$ is

(A) $\begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & 3 \\ -2 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$

(D) $\begin{bmatrix} 4 & -3 \\ 2 & 1 \end{bmatrix}$

47. If A = (1, 2, –3) and B = (2, 0, –1) then $\overrightarrow{AB}$ is

(A) $i - 2j + 2k$

(B) $-i + 2j - 2k$

(C) $3i + 2j - 4k$

(D) $i + 2j - 2k$

48. The work done by the force $\overrightarrow{F} = 2i + 6j - 8k$, whose displacement is $\overrightarrow{S} = -2i + 3j - k$ is

(A) 26 units

(B) –22 units

(C) 22 units

(D) 30 units

49. The vector product of $\overrightarrow{a} = 4i - j + k$ and $\overrightarrow{b} = 3i - 2k$ is

(A) $2i - 11j + 3k$

(B) $2i + 11j + 3k$

(C) $2i + 5j + 3k$

(D) $2i + 11j - 3k$

50. When a fair coin is tossed two times, the event A "getting exactly one tail" is given by

(A) {HT, TH}

(B) {TT}

(C) {TH}

(D) {TT, HT}

Space For Rough Work

51. If $\tan \theta = \frac{5}{12}$ and $\pi < \theta < \frac{3\pi}{2}$, then the value of $\sin \theta - \cos \theta$ is

(A) $\frac{17}{13}$

(B) $\frac{7}{13}$

(C) $-\frac{17}{13}$

(D) $-\frac{7}{13}$

52. The value of $\tan 225° \times \cot 405°$ is

(A) 1

(B) −1

(C) 2

(D) $\frac{1}{2}$

53. The value of $\sin 50° \cos 20° - \cos 50° \cdot \sin 20°$ is

(A) $\sin 70°$

(B) $\frac{\sqrt{3}}{2}$

(C) $\frac{1}{2}$

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

54. If $\cos A = \frac{15}{17}$ and $\sin B = \frac{3}{5}$, then the value of $\cos (A + B)$ is

(A) $\frac{84}{85}$

(B) $-\frac{36}{85}$

(C) $-\frac{84}{85}$

(D) $\frac{36}{85}$

55. The value of $\sqrt{\frac{1 + \sin 2A}{1 - \sin 2A}}$ is

(A) $\cot\left(\frac{\pi}{4} + A\right)$

(B) $\cot\left(\frac{\pi}{4} - A\right)$

(C) $\tan\left(\frac{\pi}{4} - A\right)$

(D) $\cot\left(\frac{\pi}{2} - A\right)$

Space For Rough Work

56. The value of $\cos 40° + \sin 10°$ is

    (A) $\sin 20°$ (B) $-\cos 20°$

    (C) $\cos 20°$ (D) $-\sin 20°$

57. The value of $i + i^2 + i^3 + i^4$ is

    (A)   i   (B) $-i$

    (C)   1   (D)   0

58. $\displaystyle\lim_{x \to 0} \frac{x}{\sqrt{1+x} - 1}$ is equal to

    (A)   0   (B)   1

    (C)   2   (D) ∞

59. $\displaystyle\lim_{x \to \infty} \frac{3x^3 + 4x + 7}{(6 + x^2)(x - 1)} =$

    (A)   3   (B) -3

    (C) $\dfrac{1}{2}$ (D) $\dfrac{1}{6}$

60. $\displaystyle\lim_{x \to 0} \frac{3x + \sin 4x}{2 \sin 3x - 5x} =$

    (A) $\dfrac{4}{3}$ (B)   7

    (C) $\dfrac{3}{5}$ (D) $\dfrac{7}{11}$

Space For Rough Work

61. The slope and y-intercept of the line $6x - 4y + 3 = 0$ are respectively

(A) $\frac{3}{2}$ and $\frac{3}{4}$

(B) $\frac{2}{3}$ and $\frac{4}{3}$

(C) $\frac{-3}{2}$ and $\frac{4}{3}$

(D) $\frac{3}{2}$ and $\frac{2}{3}$

62. The equation of the line joining the points $(1, 3)$ and $(2, -4)$ is

(A) $7x - y - 10 = 0$

(B) $7x + y - 10 = 0$

(C) $x + 7y + 10 = 0$

(D) $x - 7y - 10 = 0$

63. If $y = e^{-2x} + 4a^x$, then $\frac{dy}{dx} =$

(A) $\frac{e^{-2x}}{2} + \frac{4a^x}{\log a}$

(B) $e^{-2x} + 4x\, a^{x-1}$

(C) $-2e^{-2x} + 4a^x \log a$

(D) $2e^{-2x} - 4a^x \log a$

64. If $y = \log(\log 3x)$ then $\frac{dy}{dx} =$

(A) $\frac{1}{x \log 3x}$

(B) $\frac{3}{x \log 3x}$

(C) $2 \log 3x$

(D) $\frac{1}{\log x}$

65. If $xy = x + y^2$, then $\frac{dy}{dx} =$

(A) $\frac{x - 2y}{1 - y}$

(B) $\frac{1 - y}{x - 2y}$

(C) $\frac{2y - x}{y - 1}$

(D) $\frac{1 + y}{x + 2y}$

Space For Rough Work

66. If $x = \tan^{-1} t$ and $y = 3t + t^3$ then $\dfrac{dy}{dx} =$

(A) 3

(B) $3(1 + t^2)^2$

(C) $\dfrac{3}{(1 + t^2)^2}$

(D) $\dfrac{1}{3(1 + t^2)^2}$

67. If $y = (x)^{\frac{1}{x}}$, then $\dfrac{dy}{dx} =$

(A) $y\left[\dfrac{1 + \log x}{x^2}\right]$

(B) $\dfrac{1 + \log x}{x^2 y}$

(C) $\dfrac{1 - \log x}{x^2 y}$

(D) $\dfrac{y[1 - \log x]}{x^2}$

68. Which of the following equations satisfy for the function $y = e^{\tan^{-1} x}$ with usual notations ?

(A) $(1 + x^2)y_2 + (2x - 1)y_1 = 0$

(B) $(1 + x^2)y_2 + 2xy_1 = 0$

(C) $(1 - x^2)y_2 - xy_1 - y = 0$

(D) $xy_2 - 2y_1 - xy = 0$

69. The equation of a normal to the curve $y = 4x^3 + 3x^2 + 4$ at the point $(-1, 3)$ is

(A) $6x + y - 19 = 0$

(B) $x + 6y - 17 = 0$

(C) $x - 6y + 17 = 0$

(D) $6x - y + 19 = 0$

70. The rate of change of surface area of a sphere is $12 \text{ cm}^2/\text{s}$. The rate at which the radius is changing when the radius of the sphere is 2 cm is equal to

(A) $\dfrac{\pi}{4}$ cm/s

(B) $\dfrac{3\pi}{4}$ cm/s

(C) 3π cm/s

(D) $\dfrac{3}{4\pi}$ cm/s

Space For Rough Work

71. $\int \left(1 + x - \dfrac{1}{x} + e^x\right) dx$

(A) $1 - \dfrac{1}{x^2} + e^x + c$

(B) $1 + \dfrac{x^2}{2} - \dfrac{1}{x^2} + e^x + c$

(C) $x + \dfrac{x^2}{2} - \log x + e^x + c$

(D) $x + 1 - \dfrac{1}{x^3} - e^x + c$

72. $\int e^{\tan x} \cdot \sec^2 x \, dx =$

(A) $e^{\tan x} + c$

(B) $e^{\sec^2 x} + c$

(C) $e^{\tan^2 x} + c$

(D) $e^{\sec x} + c$

73. $\int \cot^2 x \, dx =$

(A) $-\csc x + c$

(B) $-\cot x - x + c$

(C) $-\cot x + x + c$

(D) $\cot x + x + c$

74. $\int x \sin x \, dx =$

(A) $x \sin x - \cos x + c$

(B) $x \cos x - \sin x + c$

(C) $x \sin x + \cos x + c$

(D) $-x \cos x + \sin x + c$

75. $\int \sqrt[3]{x^2} \, dx =$

(A) $\dfrac{5}{2} x^{\frac{5}{2}} + c$

(B) $\dfrac{3}{5} x^{\frac{5}{3}} + c$

(C) $\dfrac{5 x^{\frac{2}{5}}}{2} + c$

(D) $\dfrac{x^2}{2} + c$

Space For Rough Work

76. $\displaystyle\int_{0}^{\pi/2} \cos^2 x \, dx =$

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

(B) $\dfrac{\pi}{6}$

(C) $\dfrac{\pi}{3}$

(D) $\dfrac{\pi}{4}$

77. The volume of a solid generated when the curve $y = \sqrt{x^2 + 4}$ is rotated about x-axis between the ordinates $x = -1$ and $x = 1$ is

(A) $\dfrac{23\pi}{3}$ cubic units

(B) $\dfrac{26\pi}{3}$ cubic units

(C) $\dfrac{16\pi}{3}$ cubic units

(D) 0

78. The order and degree of the differential equation $\dfrac{dy}{dx} = \sqrt{1 + \dfrac{d^2y}{dx^2}}$ respectively are

(A) 1 and 1

(B) 1 and 2

(C) 2 and 1

(D) 2 and 2

79. The differential equation formed from the equation $y = ae^x + be^{-x}$ by eliminating arbitrary constants is

(A) $\dfrac{d^2y}{dx^2} - y = 0$

(B) $\dfrac{d^2y}{dx^2} + y = 0$

(C) $\dfrac{dy}{dx} + y = 0$

(D) $\dfrac{dy}{dx} - y = 0$

80. Solution of the differential equation $\dfrac{dy}{dx} = \dfrac{1 + y^2}{1 + x^2}$ is

(A) $\tan^{-1} y + \tan^{-1} x = k$

(B) $\tan^{-1} y - \tan^{-1} x = k$

(C) $\sin^{-1} y + \sin^{-1} x = k$

(D) $\sin^{-1} y - \sin^{-1} x = k$

Space For Rough Work

PART – C

ENVIRONMENTAL ENGINEERING

81. The rocks which are formed due to cooling of magma at a considerable depth from earth's surface are called

(A) Plutonic rocks   (B) Hypabassal rocks

(C) Volcanic rocks   (D) Igneous rocks

82. Plywood has the advantage of

(A) greater tensile strength in longer direction.

(B) greater tensile strength in shorter direction.

(C) same tensile strength in all directions.

(D) lesser tensile strength in longer direction.

83. The constituent of cement which is responsible for all the undesirable properties of cement is

(A) Di-calcium silicate   (B) Tri-calcium silicate

(C) Tri-calcium aluminate   (D) Tetra calcium alumino ferrite

84. Which of the following is the purest form of iron ?

(A) Cast Iron   (B) Wrought Iron

(C) Mild Steel   (D) High carbon steel

85. The stretcher bond in brick masonry can be used only when the thickness of wall is

(A) 90 mm   (B) 180 mm

(C) 190 mm   (D) 280 mm

Space For Rough Work

86. The initial setting time for ordinary portland cement as per IS specifications should not be less than

(A)   10 minutes   (B)   30 minutes

(C)   60 minutes   (D)   600 minutes

87. The vehicle used in case of enamel paints is usually

(A)   Linseed oil   (B)   Water

(C)   Varnish   (D)   Ethyl alcohol

88. A first class brick immersed in water for 24 hours, should not absorb water (by weight) more than

(A)   10%   (B)   15%

(C)   20%   (D)   25%

89. The slump recommended for mass concrete is about

(A)   25 mm to 50 mm   (B)   50 mm to 100 mm

(C)   100 mm to 125 mm   (D)   125 mm to 150 mm

90. A mortar joint in masonry which is normal to the face of wall is known as

(A)   Bed Joint   (B)   Wall Joint

(C)   Cross Joint   (D)   Bonded Joint

91. The 9 cm × 9 cm side of a brick as seen in the wall face, is generally known as

(A)   Stretcher   (B)   Face

(C)   Front   (D)   Header

92. The foundation in which a cantilever beam is provided to join two footings is known as

(A)   Strip footing   (B)   Strap footing

(C)   Combined footing   (D)   Raft footing

Space For Rough Work

93. The triangular portion between any two adjacent arches and the tangent to their crowns, is

(A) Haunch   (B) Spandrel

(C) Soffit   (D) Rise

94. The inclined support at the ends of treads and rises of a stair, is known as

(A) Baluster   (B) Header

(C) String   (D) Beam

95. A wall constructed to resist the pressure of an earth filling is called

(A) Retaining wall   (B) Breast wall

(C) Buttress   (D) Parapet wall

96. A wooden block hinged on post outside a door is known

(A) Cleat   (B) Stop

(C) Horn   (D) Crown

97. Los Angeles machine is used to test the aggregate for

(A) Crushing strength   (B) Impact value

(C) Abrasion Resistance   (D) Water Absorption

98. The process of mixing, transporting, placing and compacting concrete using ordinary portland cement should not take more than

(A) 30 minutes   (B) 40 minutes

(C) 60 minutes   (D) 90 minutes

99. The strength of concrete after one year as compared to 28 days strength is about

(A) 10 to 15% more   (B) 15 to 20% more

(C) 20 to 25% more   (D) 25 to 50% more

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100. Water cement ratio is

(A) volume of water to that of cement   (B) weight of water to that of cement

(C) weight of concrete to that of water   (D) Both (A) and (B)

101. An ideal vertical curve to join two gradients, is

(A) circular   (B) parabolic

(C) elliptical   (D) hyperbolic

102. If the angular measurements of a traverse are more precise than its linear measurements, balancing of the traverse, is done by

(A) Bowditch's rule   (B) Empirical rule

(C) Transit rule   (D) Traverse rule

103. The angle between two plane mirrors of optical square is

(A) 20°   (B) 30°

(C) 60°   (D) 45°

104. For a curve of radius 100 m and normal chord 10 m, the Rankine's deflection angle is

(A) 0° 35'.95   (B) 1° 25'.53

(C) 1° 35'.95   (D) 2° 51'.53

105. True meridian of different places

(A) converge from the south pole to the north pole.

(B) converge from the north pole to the south pole.

(C) converge from the equator to the poles.

(D) run parallel to each other.

106. The diaphragm of a stadia theodolite is fitted with two additional

(A) Horizontal Hairs   (B) Vertical Hairs

(C) Horizontal and two Vertical Hairs   (D) Vertical and two Horizontal Hairs

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A   20   EN

107. The reduced bearing of a line is N 87° W. Its whole circle bearing is

(A) 87°   (B) 273°

(C) 93°   (D) 3°

108. Surveys which are carried out to depict mountains, rivers, water bodies, wooded areas and other cultural details, are known as

(A) Cadastral surveys   (B) City surveys

(C) Topographical surveys   (D) Plane surveys

109. The method of finding out the difference in elevation between two points for eliminating the effect of curvature and refraction, is

(A) Reciprocal levelling   (B) Precise levelling

(C) Differential levelling   (D) Fly levelling

110. Ranging in chain survey means

(A) looking at an isolated point not on the line.

(B) establishing an intermediate point on the line.

(C) determining the distance between end points.

(D) determining the offset distance.

111. The longest chain line passing through the centre of the area is called

(A) Base line   (B) Tie line

(C) Check line   (D) Main line

112. A staff reading taken as a benchmark or change point is called

(A) Fore sight   (B) Back sight

(C) Intermediate sight   (D) Reduced level

113. A series of closed contour lines on the map with lower to higher values inside them represents a

(A) Steep slope   (B) Hill

(C) Depression   (D) Ridge

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114. A passive sensor uses _____ as a source of energy.

(A) Satellite   (B) Earth

(C) Moon   (D) Sun

115. When the water level on the downstream side of a weir is above the top surface of a weir, the weir is known as

(A) Narrow – crested weir   (B) Broad crested weir

(C) Ogee weir   (D) Submerged weir

116. According to Bernoulli's equation

(A) $Z + \dfrac{p}{w} + \dfrac{v^2}{2g} = \text{constant}$ (B) $Z + \dfrac{p}{w} - \dfrac{v^2}{2g} = \text{constant}$

(C) $Z - \dfrac{p}{w} + \dfrac{v^2}{2g} = \text{constant}$ (D) $Z - \dfrac{p}{w} - \dfrac{v^2}{2g} = \text{constant}$

117. The velocity at which the flow changes from laminar flow to turbulent flow is called

(A) Critical velocity   (B) Velocity of approach

(C) Sub-sonic velocity   (D) Super-sonic velocity

118. The discharge through a convergent mouthpiece is _____ the discharge through an internal mouthpiece of the same diameter and head of water.

(A) equal to   (B) one-half

(C) three-fourth   (D) double

119. The pressure measured with the help of a pressure gauge is called

(A) Atmospheric pressure   (B) Gauge pressure

(C) Absolute pressure   (D) Mean pressure

120. The unit of dynamic viscosity in S.I. units is

(A) $N - m/sec^2$ (B) $N - sec/m^2$

(C) Poise   (D) Stoke

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121. An earth formation which, although porous and capable of absorbing water does not provide an appreciable supply to wells is known as

(A) Aquifer   (B) Aquiclude

(C) Aquifuge   (D) Aquitard

122. In pressure supply mains, water hammer pressure is reduced by providing

(A) Sluice valves   (B) Air valves

(C) Pressure relief valves   (D) Scour valves

123. To control the growth of algae in reservoirs, the compound which is used, is

(A) Bleaching powder   (B) Copper sulphate

(C) Lime solution   (D) Alum solution

124. As per IS : 1172 – 1963, water required per head per day for average domestic purposes, is

(A) 50 litres   (B) 65 litres

(C) 85 litres   (D) 135 litres

125. Permanent hardness of water can be removed by

(A) adding alum   (B) adding lime

(C) adding chlorine   (D) zeolite process

126. In a rapid sand filter, air binding is caused due to excessive

(A) negative pressure   (B) pressure

(C) turbidity   (D) sand balls

127. The efficiency of sedimentation tank does not depend upon

(A) Depth of the tank   (B) Length of tank

(C) Detention period   (D) Velocity of water

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128. The intake opening is generally covered by a screen to prevent entry of debris etc. and its level is kept at

(A)   the level of water of the source.   (B)   the bottom of water of the source.

(C)   about 2.5 m above the bottom.   (D)   about 1.5 m above the bottom.

129. When gravity and pumping systems of water distribution are adopted, the type of distribution reservoir is

(A)   Elevated tank   (B)   Ground level reservoir

(C)   Intz tank   (D)   Stand pipe

130. The best process of disinfection of public water supply is

(A)   Boiling   (B)   Chlorination

(C)   Adding lime   (D)   Adding ozone

131. Aeration of water is done to remove

(A)   Odour   (B)   Colour

(C)   Bacteria   (D)   Turbidity

132. The maximum permissible nitrites in public water supplies is

(A)   Nil   (B)   0.5 ppm

(C)   1.0 ppm   (D)   1.5 ppm

133. In pumping stations, the type of joint generally used is

(A)   Socket and Spigot joint   (B)   Flanged joint

(C)   Expansion joint   (D)   Dresser coupling joint

134. Raw water treated with only chlorine is known as

(A)   Plain Chlorination   (B)   Pre-Chlorination

(C)   Post-Chlorination   (D)   De-Chlorination

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135. The maximum pressure which the pipe can withstand without any leakage during hydrostatic pressure test, is called

(A) Working pressure   (B) Design pressure

(C) Test pressure   (D) Hydrostatic pressure

136. The solubility of atmospheric oxygen in fresh water @ 0 °C under 1 atm of pressure is

(A) 14.6 mg/*l*   (B) 7.3 mg/*l*

(C) 7.0 mg/*l*   (D) 14.0 mg/*l*

137. The dispersion of solid in a liquid medium is commonly known as

(A) Emulsion   (B) Smoke

(C) Foam   (D) Sol

138. In hydrolytic reactions, hydrolases break the chemical bonds by addition of

(A) Hydrogen   (B) Hydrochloric acid

(C) Water   (D) Hydrogen Peroxide

139. In colorimetry, solutions of the coloured compound must have properties that conform to

(A) Beer's law   (B) Lambert's law

(C) Langmuir law   (D) Both (A) and (B)

140. In adsorption process, the material being concentrated is the

(A) Absorbent   (B) Adsorbent

(C) Absorbate   (D) Adsorbate

141. The sewer which transports the sewage to the point of treatment, is called

(A) House sewer   (B) Main sewer

(C) Outfall sewer   (D) Lateral sewer

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142. The minimum and the maximum diameter of sewers, generally adopted in the designs, may be

(A)   15 cm and 100 cm
(B)   15 cm and 300 cm
(C)   25 cm and 450 cm
(D)   60 cm and 300 cm

143. The rational formula, for evaluating peak drainage discharge, can be safely applied to catchments, up to :

(A)   25 hectares
(B)   500 hectares
(C)   2000 hectares
(D)   up to any limit

144. An egg-shaped sewer, when compared to a circular sewer, is :

(A)   economical
(B)   more stable
(C)   easier to construct
(D)   provide better self cleansing velocity at low discharges

145. Sheeting and bracing of excavation trench for laying sewers, will be more a necessity, in :

(A)   Clayey soil
(B)   Silty soil
(C)   Sandy soil
(D)   Quick sands

146. Gases, which are generally evolved during aerobic decomposition of sewage are :

(A) $CO_2 + NH_3 + H_2S$
(B) $CO_2 + NH_3 + H_2S + CH_4$
(C) $CO_2 + NH_3 + SO_2$
(D) $CO_2 + NH_3 + SO_2 + CH_4$

147. BOD_5 represents 5 days biochemical oxygen demand at a temperature of

(A)   0 °C
(B)   20 °C
(C)   30 °C
(D)   35 °C

148. The phenomenon by virtue of which a soil is clogged with sewage matter, is called

(A)   Sewage farming
(B)   Sewage bulking
(C)   Sewage sickness
(D)   Sewage irrigation

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149. The detention period adopted for grit chambers is of the order of :

   (A) 1 minute   (B) 5 minutes

   (C) 2 – 4 hours   (D) 12 hours

150. Lower F/M value in a conventional activated sludge plant will mean

   (A) lower BOD removal   (B) higher BOD removal

   (C) constant BOD removal   (D) no effect on BOD removal

151. The gas coming out from a sludge digestion tank is :

   (A) methane only

   (B) carbon dioxide only

   (C) 70% methane and 30% carbon dioxide

   (D) 30% methane and 70% carbon dioxide

152. The minimum horizontal distance for locating a privy pit, from a well or a hand pump, is

   (A) 10 m   (B) 30 m

   (C) 100 m   (D) 500 m

153. In house plumbing system, the leakage of different pipes is tested by

   (A) smoke test   (B) air test

   (C) water test   (D) All of these

154. In a shallow waste stabilization pond, the waste water is treated by

   (A) aerobic bacteria only

   (B) algae only

   (C) dual action of aerobic bacteria and algae

   (D) anaerobic bacteria

155. The term sludge age is associated with

   (A) Sedimentation   (B) Aeration

   (C) Sludge drying   (D) Sludge digestion

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156. The organic substances present in industrial waste will deplete the _____ content of the receiving water body.

(A) Oxygen (B) Nitrogen

(C) Hydrogen (D) BOD

157. The spent liquor produced by the process of digestion in pulp making of pulp and paper mill is known as

(A) Green liquor (B) Brown liquor

(C) Black liquor (D) White liquor

158. In distilleries, the raw material used in industrial alcohol manufacture is

(A) Bagasses (B) Molasses

(C) Grains (D) Malted Barley

159. The discharge of waste from dairy is often

(A) continuous (B) intermittent

(C) constant (D) very less

160. In sugar manufacturing process, the sugarcane juice is coagulated by the addition of

(A) Alum (B) Lime

(C) Copperas (D) Chlorine

161. Which of the following is not an anthropogenic cause of air pollution ?

(A) Burning of fossil fuels (B) Burning of firewood

(C) Agricultural activities (D) Burning of forests due to lightening

162. The poisonous gas responsible for causing the catastrophic Bhopal gas tragedy in 1984 in India was :

(A) Sulphur dioxide (B) Methyl isocyanate

(C) Carbon monoxide & methane (D) Laughing gas

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163. The particles in cigarette smoke are usually smaller than :

(A) 1 micron

(B) 10 micron

(C) 25 micron

(D) 100 micron

164. The Respiratory Suspended Particulate Matter (RSPM) concentration includes all particles in an air mass of size upto

(A) 10 μ

(B) 25 μ

(C) 50 μ

(D) 100 μ

165. Carbon monoxide is hazardous to health, because :

(A) it causes loss of sense of smell.

(B) it is carcinogenic in nature.

(C) it reduces oxygen carrying capacity of blood.

(D) it may cause conjunctivitis.

166. The device, which can be used to control gaseous as well as particulate pollutants in the industrial emissions, is known as

(A) Cyclone separator

(B) Spray tower

(C) Dynamic precipitator

(D) Fabric filters

167. During temperature inversion in atmosphere, air pollutants tend to

(A) accumulate above inversion layer

(B) accumulate below inversion layer

(C) disperse laterally

(D) disperse vertically

168. The most favourable plume to control air pollution is

(A) Coning

(B) Looping

(C) Fumigation

(D) Lofting

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169. Depletion of ozone layer in the atmosphere causes _____ in human beings.

(A) Asthama

(B) Loss of memory

(C) Skin Cancer

(D) Lung disorders

170. The air pollutant which causes severe damage to plants, even at much lower concentrations than what may be harmful to human health, is

(A) Fluorine

(B) Ozone

(C) PAN

(D) Lead

171. _____ is an epidemic among animals.

(A) Sporadic

(B) Endemic

(C) Epizootic

(D) Pendemic

172. The causative organism for typhoid fever is

(A) Salmonella bacteria

(B) Protozoa

(C) Botulinum bacteria

(D) Staphylococci bacteria

173. The word quaranta means _____ no. of days that suspected vessel were held in observation.

(A) 40

(B) 30

(C) 60

(D) 50

174. Death by heart or respiratory paralysis occure in most of the cases in _____ food poisoning.

(A) Staphylococcus intoxication

(B) Botulinus intoxication

(C) Salmonellosis infection

(D) All of these

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175. _____ privy is a water tight tank constructed underground with seat over top.

(A) Pit privy
(B) Bore hole privy
(C) Removable receptable privy
(D) Concrete vault privy

176. Insect or rodent vehicles are also called as

(A) Carriers
(B) Channel of infection
(C) Vectors
(D) Infectious agents

177. A minimum site area of _____ is required for elementary schools.

(A) 5 acres plus 1 acre for each 100 pupils.
(B) 6 acres plus 1 acre for each 100 pupils.
(C) 10 acres plus 1 acre for each 100 pupils.
(D) 2 acres plus 1 acre for each 100 pupils.

178. The disease caused due to inhalation of dust particles containing silica is

(A) Asbestosis
(B) Byssinosis
(C) Silicosis
(D) Tuberculosis

179. Deep marine divers and cassion workers who work under high air pressure are exposed to _____ disease.

(A) white finger
(B) bends
(C) strokes
(D) cataracts

180. The process or operation of industry have potential threat to health and safety of worker is called

(A) Risk
(B) Accident
(C) Occupational hazard
(D) Disaster

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