DIPLOMA - COMMON ENTRANCE TEST-2016

EN	COURSE	DAY : SUNDAY
	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 - 1	135512

DOs :

1. Check whether the Diploma CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the invigilator after the 2nd **Bell i.e., after 09.50 a.m.**
3. The Serial Number of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts :

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 a.m., till then;**
   - Do not remove the paper seal / polythene bag 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 a.m.,** remove the paper seal / polythene bag 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 BALL POINT PEN against the question number on the OMR answer sheet.**

Correct Method of shading the circle on the OMR answer sheet is as shown below :

Ⓐ ● Ⓒ Ⓓ

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 p.m.,** 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-A1

PART – A

APPLIED SCIENCE

1. An example of basic S.I. unit is

   (A) Newton   (B) Joule

   (C) Ampere   (D) Watt

2. The prefix used for 10^{+2} is

   (A) hecta   (B) centi

   (C) pico   (D) peta

3. An example of dimensionless physical quantity is

   (A) surface tension   (B) strain

   (C) impulse   (D) period

4. The velocity of a freely falling body gradually _____ as it falls.

   (A) decreases   (B) increases

   (C) remains same   (D) increases and then decreases

5. A main scale is divided into half mm and having a vernier containing 20 divisions has a least count of _____ cm.

   (A) 2.5×10^{-2} (B) 0.5×10^{-2}

   (C) 0.025×10^{-2} (D) 0.25×10^{-2}

6. For a particular mass of the moving body, its friction is minimum when it is

   (A) sliding   (B) static

   (C) rolling   (D) dragged

Space For Rough Work

7. All equations of motion hold good under the condition of

   (A) constant velocity
   (B) constant acceleration
   (C) variable velocity
   (D) variable acceleration

8. A force of 1.5×10^{-2} N acts for 3 seconds on a body of mass 0.05 kg moving with velocity 4 m/s. The final velocity of the body is

   (A) 4.9 m/s
   (B) 18 m/s
   (C) 9 m/s
   (D) 7.5 m/s

9. To check the equilibrium of five coplanar concurrent forces, we use law of

   (A) Parallelogram of forces
   (B) Triangle of forces
   (C) Lami's theorem
   (D) Polygon of forces

10. The S.I. unit of momentum is

    (A) kg m
    (B) $kg\ m^{-1}s^{-1}$
    (C) $kg\ m\ s^{-2}$
    (D) $kg\ m\ s^{-1}$

11. When three forces acting at a point are in equilibrium, the angle opposite to biggest force is always _____ angle.

    (A) biggest
    (B) smallest
    (C) equal to other
    (D) obtuse

12. Towing of a boat by two forces is an illustration of

    (A) Law of parallelogram of forces.
    (B) Lami's theorem.
    (C) Law of triangle of forces.
    (D) Law of polygon of forces.

Space For Rough Work

13. Two forces 3N and 5N acts on a body simultaneously making an angle 60° between them. The resultant force on the body is

(A) 8 N

(B) 4 N

(C) 7 N

(D) 49 N

14. Dimensional formula for stress is

(A) $[LM^{-1}T^{-2}]$

(B) $[L^{-1}MT^{-2}]$

(C) $[L^{-1}M^{-1}T]$

(D) $[L^2M^{-1}T^{-2}]$

15. The pull in the bicycle chain is an example of

(A) tensile stress

(B) volume stress

(C) shear stress

(D) shear strain

16. Viscosity of water at 20 °C in centipoise is

(A) 1.792

(B) 0.650

(C) 1.005

(D) 0.470

17. Dimensional formula of surface tension is

(A) $[LMT^{-2}]$

(B) $[L^2MT^{-2}]$

(C) $[LM^{-1}T^{-2}]$

(D) $[L^0MT^{-2}]$

18. A steel needle can be floated on the surface of water because of the

(A) density of steel is greater than water

(B) density of steel is less than water

(C) surface tension

(D) viscosity

Space For Rough Work

19. Thrust on the bottom of the container having a base area of 10 m² filled with water to a height of 6 m is

(A) 60×10^2 N (B) 58.8×10^4 N

(C) 60.8 N (D) 600 N

20. Keeping the temperature constant, if the pressure of the gas is doubled its volume

(A) remains constant (B) doubles

(C) reduces to one fourth (D) reduces to half

21. Heat transfer in the absence of the medium is

(A) conduction (B) convection

(C) radiation (D) absorption

22. Zero of absolute scale of temperature is at

(A) 0 °C (B) 100 °C

(C) 273 °C (D) – 273 °C

23. Ripples on water surface is an example of

(A) electromagnetic waves (B) transverse waves

(C) waves travelling in space (D) longitudinal waves

24. The time interval between two consecutive waxing and waning of sound waves is

(A) beat period (B) wave period

(C) beat frequency (D) wave frequency

Space For Rough Work

25. S.I. unit of intensity of sound is

   (A) watt per square meter   (B) watt per meter

   (C) watt square meter   (D) watt meter

26. The study of characteristics of buildings with reference to sound is

   (A) resonance   (B) interference

   (C) echo   (D) acoustics

27. The distance travelled by the disturbance in the medium for one complete oscillation is

   (A) wave velocity   (B) wavelength

   (C) wave frequency   (D) wave amplitude

28. Momentum of a photon is given by

   (A) $P = \dfrac{\lambda}{h}$ (B) $P = \dfrac{h}{\lambda}$

   (C) $P = \lambda h$ (D) $P = \lambda^2 h$

29. The velocity of sound in case of liquids is given by

   (A) $\sqrt{\dfrac{d}{k}}$ (B) $\sqrt{kd}$

   (C) $\sqrt{\dfrac{k}{d}}$ (D) $\sqrt{\dfrac{d^2}{k}}$

30. A tuning fork vibrating in air is an example of

   (A) damped free vibrations   (B) resonant vibrations

   (C) undamped free vibrations   (D) forced vibrations

Space For Rough Work

A-1

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EN

31. Raman lines are

    (A) unpolarised
    (B) polarised
    (C) diffracted
    (D) reflected

32. A crystal which has two optic axes is

    (A) calcite
    (B) quartz
    (C) mica
    (D) glass

33. Electron microscope is used to

    (A) study virus and bacteria
    (B) view three dimensional images
    (C) automatic switching on and off of street-lights
    (D) electronic industry for soldering

34. Which of the following statements is correct in case of γ-rays ?

    (A) Penetrating power is less than β-rays.
    (B) Penetrating power is less than α-rays.
    (C) Penetrating power is very high.
    (D) γ particles are nothing but electrons.

35. For destructive interference of light the path difference should always be

    (A) $(2n + 1) \dfrac{\lambda}{2}$
    (B) $\dfrac{n\lambda}{2}$
    (C) $(2n + 1) \dfrac{\lambda}{3}$
    (D) $n\lambda$

Space For Rough Work

36. The resultant intensity of interference of two monochromatic waves having same amplitude and constant phase difference equal to ϕ is

(A) $2a \cos\left(\dfrac{\phi}{2}\right)$

(B) $4a^2\cos^2\left(\dfrac{\phi}{2}\right)$

(C) $4a^2\cos\left(\dfrac{\phi}{2}\right)$

(D) $4a \cos^2\left(\dfrac{\phi}{2}\right)$

37. For two objects to be just resolved, the principle maximum should be on

(A) first maximum

(B) second maximum

(C) first minimum

(D) second minimum

38. Resolving power of microscope is given by

(A) $\dfrac{\lambda}{2n \sin\theta}$

(B) $\dfrac{n}{2\lambda \sin\theta}$

(C) $\dfrac{2\lambda \sin\theta}{n}$

(D) $\dfrac{2n \sin\theta}{\lambda}$

39. In case of acids, the concentration of H^+ ions is

(A) more than 10^{-7} g ions/litre.

(B) less than 10^{-7} g ions/litre.

(C) equal to 10^{-7} g ions/litre.

(D) between 10^{-7} g ions/litre and 10^{-14} g ions/litre.

40. Corrosion of metal can be prevented by keeping it in

(A) acidic medium

(B) basic medium

(C) neutral medium

(D) moisture

PART – B
APPLIED MATHEMATICS

41. The value of the determinant $A = \begin{vmatrix} 1 & 1 & 1 \\ 3 & 3 & 3 \\ 4 & 5 & 6 \end{vmatrix}$ is

   (A) 1

   (B) 3

   (C) – 2

   (D) 0

42. The value 'x' by Cramer's rule in $3x + 2y = 4$ and $x - 2y = 8$ is

   (A) 12

   (B) 3

   (C) – 13

   (D) 15

43. If $A = \begin{bmatrix} 2 & -3 \\ 1 & 5 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 \\ 4 & -3 \end{bmatrix}$, then A + 2B is

   (A) $\begin{bmatrix} 4 & 1 \\ 9 & -1 \end{bmatrix}$

   (B) $\begin{bmatrix} 4 & 1 \\ 9 & 1 \end{bmatrix}$

   (C) $\begin{bmatrix} 3 & -1 \\ 5 & 2 \end{bmatrix}$

   (D) $\begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix}$

44. If $A = \begin{bmatrix} 2 & 3 & 4 \\ -2 & x & -4 \\ -5 & 6 & 7 \end{bmatrix}$ is singular, then the value of x is

   (A) –3

   (B) 3

   (C) $\frac{1}{3}$

   (D) $\frac{-1}{3}$

Space For Rough Work

45. The characteristic roots of the matrix $A = \begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$ is

(A) 5, 2

(B) −5, −2

(C) 5, −2

(D) −5, 2

46. If $^nC_{16} = {^nC_3}$, then the value of n is

(A) −19

(B) 19

(C) 13

(D) −13

47. The last term in the expansion of $\left(3x^2 + \dfrac{1}{2x^2}\right)^4$ is

(A) $\dfrac{1}{8x^8}$

(B) $\dfrac{1}{16x^8}$

(C) $81 x^8$

(D) $12 x^8$

48. The unit vector of $\vec{a} = 2i - 3j + 4k$ is

(A) $\dfrac{2i-3j+4k}{\sqrt{29}}$

(B) $\dfrac{2i-3j+4k}{\sqrt{11}}$

(C) $\dfrac{2i-3j+4k}{\sqrt{3}}$

(D) $\dfrac{\sqrt{29}}{2i-3j+4k}$

49. If $\vec{a} = i - 4j + 3k$ and $\vec{b} = -2i + j + 6k$, then the projection of $\vec{a}$ on $\vec{b}$ is

(A) $\dfrac{24}{\sqrt{41}}$

(B) $\dfrac{12}{\sqrt{26}}$

(C) $\dfrac{-12}{\sqrt{41}}$

(D) $\dfrac{12}{\sqrt{41}}$

Space For Rough Work

50. The area of triangle whose two sides are $\bar{a} = 3i + 4j + k$ and $\bar{b} = 5i + 6j + 2k$ is

(A) 3 sq. units

(B) $\dfrac{1}{2}$ sq. units

(C) $\dfrac{3}{2}$ sq. units

(D) $\dfrac{9}{2}$ sq. units

51. The simplification of $\dfrac{1}{1+\sin\theta} + \dfrac{1}{1-\sin\theta}$ is

(A) $2\cos^2\theta$

(B) $2\sec^2\theta$

(C) $\tan^2\theta$

(D) $2\,\mathrm{cosec}^2\theta$

52. The value of $\tan^2 30° + \sin^2 45° + \cos^2 90° + \cos^2 60°$ is

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

(B) $\dfrac{13}{12}$

(C) $\dfrac{13}{24}$

(D) $\dfrac{25}{12}$

53. The simplification of $\dfrac{\sin(180°-A)\cos(360°-A)}{\tan(90°+A)\sin(-A)}$ is

(A) $\sin A$

(B) $\mathrm{cosec}\,A$

(C) $-\sin A$

(D) $-\,\mathrm{cosec}\,A$

54. If $\cos A = \dfrac{-3}{5}$ where $90° < A < 180°$, then the value of cot A is

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

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

(C) $\dfrac{-3}{4}$

(D) $\dfrac{-4}{3}$

Space For Rough Work

55. The value of cos 105° is

(A) $\dfrac{\sqrt{3}-1}{2\sqrt{2}}$

(B) $\dfrac{\sqrt{3}+1}{2\sqrt{2}}$

(C) $\dfrac{2\sqrt{2}}{1-\sqrt{3}}$

(D) $\dfrac{1-\sqrt{3}}{2\sqrt{2}}$

56. If $\tan \dfrac{A}{2} = \dfrac{1-\cos A}{\sin A}$, then the value of $\tan 22\dfrac{1}{2}^{\circ}$ is

(A) $\sqrt{2}+1$

(B) $1-\sqrt{2}$

(C) $\sqrt{2}-1$

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

57. The value of $\cos 5x \cdot \cos 3x$ is

(A) $\cos 8x + \cos 2x$

(B) $\dfrac{1}{2}(\cos 8x + \cos 2x)$

(C) $\dfrac{1}{2}(\sin 8x + \sin 2x)$

(D) $\dfrac{1}{2}(\cos 8x - \cos 2x)$

58. The simplified value of $\tan^{-1}\left(\dfrac{1}{2}\right) + \tan^{-1}\left(\dfrac{1}{3}\right)$ is

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

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

(C) 1

(D) $\tan^{-1}\left(\dfrac{1}{7}\right)$

59. Distance of a point P(− 2, 5) from the origin is

(A) $\sqrt{29}$

(B) $\sqrt{21}$

(C) $\sqrt{3}$

(D) 29

60. The co-ordinates of the point which divides the line joining the points A (8, 3) and B(−5, 6) in the ratio of 2 : 3 externally is

(A) (− 34, −3)

(B) (34, 3)

(C) $\left(\dfrac{14}{5}, \dfrac{21}{5}\right)$

(D) (34, −3)

Space For Rough Work

61. The area of triangle with the vertices $(5, 3)$, $(4, 6)$ and $(5, 8)$ is

(A) $\dfrac{15}{2}$ sq. units

(B) 15 sq. units

(C) $\dfrac{5}{2}$ sq. units

(D) $\dfrac{45}{2}$ sq. units

62. The slope of the line making an angle $150°$ with the x-axis is

(A) $\dfrac{-1}{\sqrt{3}}$

(B) $\dfrac{1}{\sqrt{3}}$

(C) $\sqrt{3}$

(D) $-\sqrt{3}$

63. The two point form of a straight line is

(A) $y - y_1 = m(x - x_1)$

(B) $\dfrac{y - y_1}{x - x_1} = \dfrac{y_2 - y_1}{x_2 - x_1}$

(C) $\dfrac{y}{x} = \dfrac{y_2 - y_1}{x_2 - x_1}$

(D) $\dfrac{y - y_2}{x - x_2} = \dfrac{y_2 - y_1}{x_2 - x_1}$

64. The equation of straight line perpendicular to $2x + 5y - 8 = 0$ and passing through $(-1, 2)$ is

(A) $2x + 5y + 9 = 0$

(B) $5x - 2y + 1 = 0$

(C) $5x - 2y + 9 = 0$

(D) $5x + 2y - 9 = 0$

65. The value of $\displaystyle\lim_{x \to 3} \dfrac{2x^2 - 7x + 3}{2x - 6}$ is

(A) 3

(B) $\dfrac{2}{5}$

(C) $\dfrac{5}{2}$

(D) 5

Space For Rough Work

66. The value of $\lim\limits_{x \to 0} \dfrac{\sqrt{1 - \cos x}}{x}$ is

(A) $\dfrac{1}{\sqrt{2}}$

(B) $\sqrt{2}$

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

(D) 1

67. If $y = e^x(\cos x - \sin x)$, then $\dfrac{dy}{dx}$ is

(A) $2e^x \cos x$

(B) $-2e^x \cos x$

(C) $2e^x \sin x$

(D) $-2e^x \sin x$

68. If $x + y = \log x + \log y$, then $\dfrac{dy}{dx}$ at $x = -1$ and $y = 2$ is

(A) $-\dfrac{1}{4}$

(B) -4

(C) 4

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

69. If $x = a\cos^2\theta$ and $y = b\sin^2\theta$, then $\dfrac{dy}{dx}$ is

(A) $\dfrac{-b}{a}$

(B) $\dfrac{b}{a}$

(C) $\dfrac{a}{b}$

(D) $\dfrac{-a}{b}$

70. The second derivative of $y = \log\left(\dfrac{1}{x}\right)$ is

(A) x

(B) 1

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

(D) $\dfrac{-1}{x^2}$

Space For Rough Work

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71. The equation of normal to the curve $y = (2x + 1)^2$ at $(-2, 0)$ is

(A) $x - 16y + 2 = 0$

(B) $x - 12y + 2 = 0$

(C) $x + 16y + 2 = 0$

(D) $x + 12y + 2 = 0$

72. The maximum value of the function $y = 2x^3 + 3x^2 - 36x$ is

(A) -44

(B) -30

(C) 81

(D) -81

73. The value of $\int \sin 3x \cos 2x \, dx$ is

(A) $\dfrac{-1}{2}\left[\dfrac{\cos 5x}{5} + \cos x\right] + C$

(B) $\dfrac{1}{2}\left[\dfrac{-\cos 5x}{5} + \cos x\right] + C$

(C) $\dfrac{1}{2}\left[\dfrac{\cos 5x}{5} + \cos x\right] + C$

(D) $\dfrac{-1}{2}[\cos 5x + \cos x] + C$

74. The value of $\int x^2 \sin(2x^3) \, dx$ is

(A) $\dfrac{-\cos(2x^3)}{6} + C$

(B) $\dfrac{-\cos(2x^3)}{3} + C$

(C) $12x^3 \cos (2x^3) + C$

(D) $\dfrac{\cos(2x^3)}{6} + C$

75. $\int \log x \, dx$ is

(A) $\dfrac{1}{x} + C$

(B) $\dfrac{1}{x} - x + C$

(C) $x \log x + x + C$

(D) $x \log x - x + C$

Space For Rough Work

76. The value of $\int\limits_{0}^{\pi/2}\sqrt{1+\sin 2x}\ dx$ is

(A) 0   (B) 1

(C) 2   (D) -2

77. $\int\limits_{0}^{1}\dfrac{x}{1+x^4}$ is

(A) $\dfrac{\pi}{4}$ (B) $\dfrac{\pi}{8}$

(C) $\dfrac{-\pi}{8}$ (D) $\dfrac{-\pi}{4}$

78. The area formed by the curve $y = (2x + 1)^3$ between the ordinates $x = -1$ and $x = 1$ is

(A) $\dfrac{41}{4}$ sq. units   (B) 2 sq. units

(C) 20 sq. units   (D) 10 sq. units

79. The order and degree of differential equation $\left[1+\left(\dfrac{dy}{dx}\right)^4\right]^{2/3} = \dfrac{d^2y}{dx^2}$ is

(A) order 2 and degree 3   (B) order 2 and degree 1

(C) order 1 and degree 2   (D) order 1 and degree 4

80. The solution of differential equation $\sec^2x \tan y\ dx + \sec^2y \tan x\ dy = 0$ is

(A) $\tan^2x + \tan^2y = C$ (B) $\tan x + \tan y = C$

(C) $\tan x\ \tan y = C$ (D) $x + y + \log(\sec x \sec y) = C$

Space For Rough Work

PART-C

ENVIRONMENTAL ENGINEERING

81. Basalt is an example of _____ .

    (A) Igneous rock   (B) Sedimentary rock

    (C) Metamorphic rock   (D) None of the above

82. Good brick earth contains _____ % of Alumina.

    (A) 0 – 10%   (B) 10 – 20%

    (C) 20 – 30%   (D) 30 – 40%

83. The depression made on the brick is known as _____

    (A) Fish   (B) Crab

    (C) Frog   (D) None of the above

84. _____ ingredient imparts strength to cement.

    (A) Alumina   (B) Silica

    (C) Lime   (D) Magnesia

85. Cement becomes totally useless if it absorbs more than _____ % of moisture.

    (A) 5%   (B) 4%

    (C) 3%   (D) 1%

86. If water required for 1 bag of cement is 30 litres then the water cement ratio is equal to

    _____ .

    (A) 0.5   (B) 0.6

    (C) 0.65   (D) 0.7

Space For Rough Work

87. If the slump value of concrete lies between 10 mm to 30 mm, then the nature of concrete mix is _____
   (A) Stiff and extra stiff mix
   (B) Poorly mobile mix
   (C) Mobile mix
   (D) Cast mix

88. The process of keeping concrete surface wet is known as _____.
   (A) Consolidation
   (B) Curing
   (C) Mixing
   (D) Compaction

89. Error due to temperature in chain surveying will be _____.
   (A) Cumulative +
   (B) Cumulative –
   (C) Compensating + or –
   (D) Cumulative + or –

90. The book in which the chain or tape measurements are entered is _____.
   (A) Measurement book
   (B) R.L. Book
   (C) Field book
   (D) All of the above

91. In _____ system of angular measurement, it is expressed in degrees, minutes and seconds (0° 1' 1").
   (A) Hour system
   (B) Sexagesimal system
   (C) Centesimal system
   (D) M.K.S. system

92. In _____ compass needle acts as the index.
   (A) Surveyor's compass
   (B) Prismatic compass
   (C) Clinometer
   (D) Transit compass

93. Direct levelling is achieved by _____.
   (A) Trignometric leveling
   (B) Barometric levelling
   (C) Spirit levelling
   (D) Fly levelling

Space For Rough Work

94. In a dumpy level upper plate is known as _____.

    (A) Trivet   (B) Tribrach
    (C) Tripod   (D) Trivet stage

95. Negative readings are recorded in _____ levelling.

    (A) Fly   (B) Inverted
    (C) Differential   (D) Profile

96. Contour maps can be used to _____.

    (a) calculation of reservoir capacity

    (b) measurement of drainage areas

    (c) determination of intervisibility between two points

    (d) drawing of 2D plans of area

    (A) (a) and (d) only   (B) (a), (b) and (c) only
    (C) (b) and (d) only   (D) All (a), (b), (c) and (d)

97. Specific volume is the reciprocal of _____.

    (A) Specific gravity   (B) Viscosity
    (C) Mass density   (D) Surface tension

98. If the pressure intensity at a point in a fluid (water) is 9810 N/m^2, then the corresponding height of fluid is given by _____

    (A) 0   (B) 1 m
    (C) 2 m   (D) 3 m

99. The point at which the resultant pressure on an immersed surface acts, is known as _____.

    (A) centre of gravity   (B) centre of depth
    (C) centre of pressure   (D) centre of immersed surface

Space For Rough Work

100. _____ mouthpiece is having maximum co-efficient of discharge.

    (A) External
           (B) Convergent-divergent

    (C) Internal
             (D) Re-entrant

101. The co-efficient of velocity is determined experimentally by using the relation _____.

    (A) $C_v = \sqrt{\dfrac{y^2}{4\,xH}}$
        (B) $C_v = \sqrt{\dfrac{x^2}{4\,yH}}$

    (C) $C_v = \sqrt{\dfrac{4\,xH}{y^2}}$
        (D) $C_v = \sqrt{\dfrac{4\,yH}{x^2}}$

102. Notch is a device used for measuring _____.

    (A) rate of flow through pipes

    (B) rate of flow through a small channel or tank

    (C) velocity through pipes

    (D) velocity through a small channel

103. Francis formula for a rectangular weir for two end contractions is given by _____.

    (A) $1.84 (L - 0.2 H)^{5/2}$
        (B) $1.84 (L - 0.2 H)^{3/2}$

    (C) $1.84 (L - 0.2 H)^{2/3}$
        (D) $1.84 (L - 0.2 H)^{2/5}$

104. The discharge through a trapezoidal channel is maximum when

    (A) Half of top width = one of sloping side

    (B) Top width = Half of sloping side

    (C) Top width = Wetted perimeter

    (D) Top width = $1.5 \times$ sloping side

105. The depth of flow at which specific energy is minimum is called _____.

    (A) Normal depth
        (B) Critical depth

    (C) Alternate depth
        (D) None of the above

Space For Rough Work

106. A nozzle placed at the end of a water pipe line discharges water at a _____.

    (A)   low pressure   (B)   high pressure

    (C)   low velocity   (D)   high velocity

107. Bases tends to increase the _____ ion concentration in solution.

    (A)   Hydrogen   (B)   Hydroxide

    (C)   Both (A) and (B)   (D)   None of the above

108. In the demineralization of brackish water, _____ principle is used.

    (A)   Osmosis   (B)   Dialysis

    (C)   Both (A) and (B)   (D)   None of the above

109. The common anions found in water can be determined by _____.

    (A)   Gas chromatography   (B)   Liquid chromatography

    (C)   Ion chromatography   (D)   None of the above

110. Colour caused by suspended matter is referred as _____.

    (A)   Apparent colour   (B)   True colour

    (C)   Suspended colour   (D)   None of the above

111. The equivalent weight of $CaCO_3$ is _____.

    (A)   25   (B)   50

    (C)   75   (D)   100

112. When the degree of Hardness is 75 to 150 mg/l, it is known as _____.

    (A)   Soft water   (B)   Moderately hard water

    (C)   Hard water   (D)   Very hard water

113. The chlorine demand vary with the amount of _____.

    (A)   Chlorine applied   (B)   pH

    (C)   Contact time   (D)   All of the above

Space For Rough Work

14. The nature of B.O.D. reaction is _____ reaction.

    (A) Second order
    (B) First order
    (C) Zero order
    (D) None of the above

15. _____ problem is caused from the reduction of sulphates to Hydrogen sulphide under anaerobic conditions.

    (A) Odour
    (B) Sewer corrosion
    (C) Explosion
    (D) Both (A) and (B)

116. Nitrites are oxidized to nitrates by _____ bacteria.

    (A) Nitrosomonas
    (B) Nitrobacter
    (C) De-nitryfying
    (D) All of the above

117. A flow mass curve is a plot of _____ vs. _____.

    (A) Discharge vs. time
    (B) Accumulated flow vs. time
    (C) Discharge vs. accumulated flow
    (D) None of the above

118. A tube well may fail due to _____.

    (A) Corrosion
    (B) Incrustation
    (C) Reduced ground water table
    (D) Both (A) and (B)

119. The design period for a water supply project is generally taken as _____.

    (A) 10 years
    (B) 20-30 years
    (C) 50 years
    (D) 50-100 years

120. Priming of a centrifugal pump is necessary

    (A) If it is located above the reservoir level.
    (B) If it is located below the reservoir level.
    (C) If it is located at the reservoir level.
    (D) If delivery head is high.

Space For Rough Work

121. The valve which allows uni-directional flow of water is called _____.

(A) Sluice valve

(B) Gate valve

(C) Reflux valve

(D) Washout valve

122. The pipe joint commonly used in pumping station is _____

(A) Flexible joint

(B) Expansion joint

(C) Flanged joint

(D) Socket & Spigot joint

123. The peak flow factor in water demand in relation to average daily demand is _____

(A) 1.8

(B) 1.5

(C) 2.0

(D) 2.7

124. Zeolite is a _____.

(A) A naturally occurring salt

(B) Hydrated silica

(C) De-hydrated calcium silicate

(D) Hydrated Alumino-silicate

125. Slow sand filters can remove bacteria as much as _____

(A) 70-80%

(B) 80-90%

(C) 90-95%

(D) 96-97%

126. The following is an algicide :

(A) Alum

(B) Bleaching powder

(C) Copper sulphate

(D) Lime

127. Coagulation with alum increases _____.

(A) acidity and hardness of water

(B) sulphates in water

(C) carbonates and bicarbonates of water

(D) None of the above

Space For Rough Work

128. In the design of sedimentation tank, the essential factor to be considered is _____.

(A) Surface loading

(B) Depth of tank

(C) Turbidity

(D) Concentration of suspended solids

129. _____ is used in Prashanthi technique of defluoridation.

(A) Activated carbon

(B) Activated lime

(C) Activated silica

(D) Activated alumina

130. _____ system is also known as interlaced system.

(A) Dead end

(B) Grid iron

(C) Ring

(D) Radial

131. The basic purpose of surge tank is

(A) To remove impurities from water.

(B) To supply more water when needed.

(C) To increase velocity of flow in pipe.

(D) To provide safety against water hammer.

132. When rainy season is confined to a few months, like India, the preferred sewerage system would be _____

(A) Combined system

(B) Separate system

(C) Partially separate system

(D) All the above

133. 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

134. The most suitable section of a sewer in a combined sewerage system is _____.

(A) Rectangular

(B) Circular

(C) Egg-shaped

(D) Parabolic

Space For Rough Work

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

_____.

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

136. A manhole is generally classified as deep manhole if its depth is more than _____.

(A) 0.9 m
(B) 1.2 m
(C) 1.5 m
(D) 2.0 m

137. The specific gravity of sewage is _____.

(A) 0
(B) slightly less than 1
(C) equal to 1
(D) slightly greater than 1

138. Well oxidized sewage will contain nitrogen, largely in the form of _____.

(A) Nitrites
(B) Nitrates
(C) Free Ammonia
(D) All of the above

139. The solubility of oxygen in sewage, when compared to its solubility in distilled water is

_____.

(A) 80%
(B) 90%
(C) 99%
(D) 99.9%

140. Algae dies out, though fish life may survive, in a river zone, known as _____.

(A) Zone of degradation
(B) Zone of active decomposition
(C) Zone of recovery
(D) None of the above

141. Sewage treatment units are generally designed for _____.

(A) Maximum flow only
(B) Minimum flow only
(C) Average flow only
(D) Both (A) and (B)

Space For Rough Work

142. The settling velocity of a spherical body in still water is given by _____.

    (A)   Lacey's formula

    (B)   Darcy's law

    (C)   Hazen's William's formula

    (D)   Stoke's Law

143. The sewage treatment units which work on aerobic decomposition of organic matter are _____.

    (A)   Trickling filters   (B)   Imhoff tanks

    (C)   Sludge digestion tanks   (D)   None of these

144. The term sludge age is associated with _____

    (A)   Sedimentation   (B)   Aeration

    (C)   Sludge drying   (D)   None of these

145. The most economical and hygienic rural privy is _____

    (A)   An aqua privy   (B)   A pit privy

    (C)   A cess pool   (D)   A soak pit

146. A pipe installed in house drainage for ventilation purposes is called _____

    (A)   Soil pipe   (B)   Anti-siphonage pipe

    (C)   Vent pipe   (D)   None of these

147. _____ test is conducted for testing drains and pipes.

    (A)   Air test   (B)   Water test

    (C)   Smoke test   (D)   All of the above

148. A major portion of the organic load is also removed from the mains stream by _____

    (A)   Absorption   (B)   Adsorption

    (C)   Sorption   (D)   Settling

Space For Rough Work

149. _____ and _____ are the main source of entrophication.
   - (A) Nitrogen and Phosphorus
   - (B) Phosphorus & Sulphur
   - (C) Nitrogen & Sulphur
   - (D) Floating matter & suspended matter

150. _____ can cause damage to the flora and fauna of receiving streams due to the toxicity.
   - (A) Cyanide
   - (B) Sulphide
   - (C) Carbide
   - (D) Acetone

151. _____ process can remove 94% of colour from pulp and paper mill waste.
   - (A) Activated carbon
   - (B) Acidic activated carbon
   - (C) Massive line treatment
   - (D) Chemical treatment

152. Bating the hides in tannery helps in removing the _____ products from it.
   - (A) Protein degradation
   - (B) Fat degradation
   - (C) Dirt & Soil
   - (D) pH

153. The colour of the coagulated juice in sugar industry is bleached out during _____.
   - (A) Acidification
   - (B) Sulphitation
   - (C) Crystallization
   - (D) Evaporation

154. _____ is processed which uses largest volume of water in industries.
   - (A) Cooling
   - (B) Manufacturing
   - (C) Cleaning
   - (D) Recovery

155. Stabilization of _____ and _____ are the main objectives of equalization.
   - (A) pH and BOD
   - (B) Solids and BOD
   - (C) pH and temperature
   - (D) Both (A) and (B)

Space For Rough Work

156. Air is sometimes injected in the equalization basin to provide _____.

(A) better mixing

(B) Chemical oxidation

(C) Agitation

(D) All of the above

157. Sludge conditioning improves _____ of the digested sludge.

(A) Drainability

(B) Filterability

(C) Settleability

(D) Floatability

158. _____ are versatile bio molecules that store, transmit and translate genetic information.

(A) Carbohydrates

(B) Proteins

(C) Lipids

(D) Nucleic acids

159. _____ is a protein part in blood that plays an important role in clotting of blood.

(A) Haemoglobin

(B) Serum globin

(C) Fibrinogen

(D) Globulin

160. _____ soluble only in solvents like benzene, ether, chloroform etc,

(A) Protein

(B) Lipids

(C) Enzymes

(D) Carbohydrates

161. Effect of enzyme concentration on rate of enzyme activity shows _____ order reaction.

(A) Zero

(B) First

(C) Second

(D) None of the above

162. _____ is necessary for metabolism of fats and carbohydrates.

(A) Biotin

(B) Vitamin B6

(C) Vitamin B5

(D) None of the above

Space For Rough Work

163. Nucleus carries information on to daughter cells during _____.

(A) cell division   (B) mitosis

(C) meiosis   (D) fission

164. _____ is a mixture of nutrients used for growth and multiplication of microbes.

(A) Broth   (B) Culture media

(C) Substrate   (D) All of the above

165. _____ bacteria grows in mutual beneficial association with other living organisms.

(A) Parasitic   (B) Saprophytic

(C) Symbiotic   (D) Heterotrophic

166. In prokaryotes, chromosomes have naked DNA _____ protein.

(A) with   (B) without

(C) complex   (D) none of the above

167. Algae are rich in carbohydrates & _____.

(A) fats   (B) proteins

(C) lipids   (D) enzymes

168. Light dispersion of minute water droplets suspended in the atmosphere ranging from 40 to 400 microns in size is known as _____.

(A) Aerosol   (B) Rain

(C) Snow   (D) Mist

169. The dust particulates causes respiratory diseases called _____.

(A) Pneumoconiosis   (B) Discolouration

(C) Peeling   (D) Poisoning

Space For Rough Work

170. The impact of green house effect include

(A) Rising of sea level

(B) Changes in precipitation pattern

(C) Increase in desert formation

(D) All of the above

171. Instrument used for measurement of sound pressure level is called _____.

(A) Noise dosimeter

(B) Sound level meter

(C) Frequency analyser

(D) None of the above

172. Ozone depletion causes _____.

(A) Damage in immune system

(B) Restricted growth of crop

(C) Destruction of aquatic life

(D) All of the above

173. _____ will not show the inter dependence between the various activities in the project.

(A) Bar chart

(B) Network analysis

(C) Milestone chart

(D) PERT

174. Information required to prepare job layout are _____

(A) Boundaries of construction site

(B) Floor plans, elevations, sections, terrace plan

(C) Service plan

(D) All the above

175. Each zone in the state PWD organization headed by the _____

(A) Superintendent Engineer

(B) Executive Engineer

(C) Chief Engineer

(D) Junior Engineer

Space For Rough Work

176. Security deposit is usually _____ of the total cost of the work.

(A) 8%

(B) 9%

(C) 10%

(D) 11%

177. The necessity of the tender is

(A) to know the final cost of the project.

(B) to calculate the profit.

(C) to estimate the early completion of the project.

(D) to award contract.

178. In the Lumsum contract

(A) contractor executes only foundation

(B) owner has to supply material

(C) contractor has to complete the project only for the fixed amount

(D) none of the above

179. EIA of each project is important to know _____.

(A) Profit

(B) Risk on Environment

(C) Cost control

(D) Quality control

180. Organisation should have

(A) Common goal

(B) Good co-ordination between different departments

(C) Clear objectives

(D) All the above

Space For Rough Work

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