D-C E T – 2018

A

	COURSE	VERSION CODE	QUESTION BOOKLET SERIAL NUMBER
EN	ENVIRONMENTAL	A	201857

MAXIMUM MARKS	TOTAL DURATION	TIME
180	200 Minutes	10.00 a.m. to 1.00 p.m.

MAXIMUM TIME FOR ANSWERING	MENTION YOUR DIPLOMA CET NUMBER				
180 Minutes					

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 a.m.**
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.

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 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.

SEAL

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 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
① ● ③ ④	⊗ ② ③ ④ ① ② ③ ✓ ① ● ● ④ ⓪ ② ③ ④ ① ◉ ③ ④

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 (Dept. 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.**

[P.T.O.

DO NOT WRITE HERE

PART – A

It consists of **1 – 40** questions.

1. If $A = \begin{bmatrix} 3 & 0 \\ -2 & 1 \end{bmatrix}$, then $2A - 3A^T =$

(1) $\begin{bmatrix} -3 & -6 \\ -4 & 1 \end{bmatrix}$ (2) $\begin{bmatrix} -3 & 6 \\ -2 & 1 \end{bmatrix}$

(3) $\begin{bmatrix} -3 & 6 \\ -4 & -1 \end{bmatrix}$ (4) $\begin{bmatrix} -3 & 6 \\ 4 & -1 \end{bmatrix}$

2. If $\begin{bmatrix} 3 & 4 & x \end{bmatrix} \begin{bmatrix} -1 \\ 2 \\ 5 \end{bmatrix} = [2x + 8]$ then the value of x =

(1) 1 (2) –1

(3) $-\frac{1}{2}$ (4) $\frac{1}{2}$

3. If $\begin{vmatrix} 3 & m-1 \\ m+1 & 2 \end{vmatrix} = 3$, then the value of m =

(1) ±1 (2) $\pm\sqrt{2}$

(3) ±3 (4) ±2

4. In solving simultaneous linear equations x – y = 4, 2y + 3z = –2 and 3x + y + 2z = 1 using Cramer's rule, the value of determinant of co-efficients of x, y and z is

(1) 6 (2) 12

(3) –8 (4) –16

SPACE FOR ROUGH WORK

5. If $A = \begin{bmatrix} -2 & 5 \\ 2 & -3 \end{bmatrix}$, then inverse of A =

(1) $\frac{1}{4}\begin{bmatrix} 2 & -5 \\ -2 & 3 \end{bmatrix}$ (2) $\frac{1}{4}\begin{bmatrix} -3 & -5 \\ -2 & -2 \end{bmatrix}$

(3) $\frac{1}{4}\begin{bmatrix} -2 & 2 \\ 5 & -3 \end{bmatrix}$ (4) $\frac{1}{4}\begin{bmatrix} 3 & 5 \\ 2 & 2 \end{bmatrix}$

6. The characteristic roots of the matrix $\begin{bmatrix} 4 & -2 \\ -3 & -1 \end{bmatrix}$ are

(1) 2 and –5 (2) –2 and 5

(3) –2 and –5 (4) 2 and 5

7. If $\vec{a} = 2\hat{i} - 3\hat{j} + 5\hat{k}$
$\vec{b} = 3\hat{i} - 2\hat{j} - 5\hat{k}$ and
$\vec{c} = \hat{i} + 4\hat{k}$

then the scalar product of $\vec{a} + \vec{b}$ and $\vec{b} - \vec{c}$ is

(1) –9 (2) 9

(3) 20 (4) –20

8. If A, B and C are three consecutive vertices of a parallelogram with position vectors $3\hat{i} - 2\hat{j} + \hat{k}, 2\hat{i} + \hat{j} - \hat{k}$ and $\hat{i} - \hat{j} + \hat{k}$, then area of the parallelogram is

(1) $3\sqrt{5}$ sq. units (2) $5\sqrt{3}$ sq. units

(3) $2\sqrt{5}$ sq. units (4) $5\sqrt{2}$ sq. units

9. Work done by the force 2i – 3j + 5k in moving a particle from (–3, 1, 2) to (1, –1, 1) is

(1) 3 (2) 9

(3) 6 (4) 15

SPACE FOR ROUGH WORK

10. The probability of drawing a non-diamond card from a well shuffled deck of 52 cards is

(1) $\frac{3}{4}$ (2) $\frac{1}{2}$

(3) $\frac{1}{4}$ (4) $\frac{12}{13}$

11. If $\tan\theta = \frac{2}{3}$ and $\pi < \theta < \frac{3\pi}{2}$, then $\sin\theta + \cos\theta =$

(1) $\frac{5}{\sqrt{13}}$

(2) $\frac{-1}{\sqrt{13}}$

(3) $\frac{1}{\sqrt{13}}$

(4) $\frac{-5}{\sqrt{13}}$

12. If $\tan A + \tan B + \tan A \tan B = 1$, then $A + B =$

(1) 180° (2) 90°

(3) 45° (4) 360°

13. $\sqrt{\frac{1-\cos 40^\circ}{1+\cos 40^\circ}} =$

(1) tan 20° (2) cot 40°

(3) tan 10° (4) tan 40°

14. If $\tan A = \frac{1}{2}$ and $\tan B = \frac{2}{3}$ then $\tan(A - B)$ is

(1) –1 (2) 1

(3) $\frac{-1}{8}$ (4) $\frac{1}{8}$

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15. The numerical value of $\sin 10° \sin 50° \sin 70°$ =

(1) $\frac{\sqrt{3}}{8}$ (2) $\frac{1}{8}$

(3) $\frac{3}{16}$ (4) $\frac{1}{16}$

16. $\frac{\sin 12° + \cos 12°}{\sin 12° - \cos 12°}$ =

(1) cot 33° (2) –tan 33°

(3) –tan 57° (4) tan 57°

17. The polar form of the complex number $\sqrt{3} - i$ is

(1) $2\left[\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right]$ (2) $2\left[\cos\frac{\pi}{6} - i\sin\frac{\pi}{6}\right]$

(3) $2\left[\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right]$ (4) $2\left[\cos\frac{\pi}{3} - i\sin\frac{\pi}{3}\right]$

18. The value of $\lim_{x\to\infty} x\left[\sqrt{x^2+1} - x\right]$ is

(1) 1 (2) 2

(3) $\frac{1}{2}$ (4) 0

19. The value of $\underset{x\to 3}{Lt} \frac{x\sqrt{x} - 3\sqrt{3}}{\sin(x-3)}$ is

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

(3) $\frac{2}{3\sqrt{3}}$ (4) $\frac{1}{3\sqrt{3}}$

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20. The value of $\lim_{x \to 0} \frac{1-\sqrt{\cos x}}{x^2}$ is

(1) 1 (2) $\frac{1}{4}$

(3) 2 (4) $-\frac{1}{2}$

21. The equation of line passing through the point (1, –3) and having slope $\frac{1}{2}$ is

(1) $x - 2y - 7 = 0$ (2) $2x - y + 7 = 0$

(3) $x - 2y - 4 = 0$ (4) $x - y + 4 = 0$

22. The equation of line passing through the point (–2, 3) and parallel to the line $5x + 3y + 5 = 0$ is,

(1) $5x + 3y - 19 = 0$ (2) $5x + 3y + 1 = 0$

(3) $5x + 3y + 19 = 0$ (4) $3x - 5y + 1 = 0$

23. If $y = e^x \log x$ then $\frac{dy}{dx}$ is

(1) $e^x\left[\frac{1}{x} + \log x\right]$ (2) $e^x\left[\frac{1}{x} - \log x\right]$

(3) $e^x \cdot \frac{1}{x}$ (4) $e^x + \frac{1}{x}$

24. If $y = \log(\tan x + \sec x)$, then $\frac{dy}{dx}$ is,

(1) $-\sec x$

(2) $\sec x$

(3) $\frac{\sec x}{\tan x + \sec x}$

(4) $\log(\sec^2 x + \tan x \sec x)$

SPACE FOR ROUGH WORK

25. If $\frac{x^2}{2}+\frac{y^2}{2}=1$ then $\frac{dy}{dx}$ is

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

(3) $\frac{-x}{y}$ (4) $\frac{1-x}{y}$

26. If $x=\frac{1}{t}$; $y=3t^3$ then $\frac{dy}{dx}$ is,

(1) $-6t^4$ (2) $-9t^4$

(3) -6 (4) -9

27. If $y=(\sin x)^{\log x}$ then $\frac{dy}{dx}$ is

(1) $(\sin x)^{\log x}\left[\log x\cos x+\frac{\log \sin x}{x}\right]$ (2) $(\sin x)^{\log x}\left[\frac{\log x}{\sin x}+\frac{\log \sin x}{x}\right]$

(3) $(\sin x)^{\log x}[-\log x \cot x+\log \sin x]$ (4) $(\sin x)^{\log x}\left[\log x \cot x+\frac{\log \sin x}{x}\right]$

28. If $y=e^{5x}+e^{-5x}$ then $\frac{d^2y}{dx^2}$ at $x=0$ is,

(1) 25 (2) -25

(3) 50 (4) -50

29. The rate of change of volume of a sphere with respect to radius, when its radius 3 cm is

(1) 3π (2) 6π

(3) 18π (4) 36π

30. The equation of normal to the curve $y=x^2$ at (2, 2) is

(1) $x-4y-10=0$ (2) $x-4y+10=0$

(3) $x+4y-10=0$ (4) $x+4y+10=0$

SPACE FOR ROUGH WORK

31. The value of $\int e^{5\log x}\,dx$ is

(1) $5x^4 + C$ (2) $\frac{x^6}{6} + C$

(3) $6x^6 + C$ (4) $\frac{x^5}{5} + C$

32. The value of $\int\frac{\cos x - \sin x}{\cos x}dx$ is

(1) $x - \cos x + C$ (2) $x + \cos x + C$

(3) $x + \log \sec x + C$ (4) $x - \log \sec x + C$

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

(1) $2\sin x + \frac{(\sin x)^4}{4} + C$ (2) $\frac{\sin^4 x}{4} + C$

(3) $2\cos x + \frac{(\cos x)^4}{4} + C$ (4) $\frac{\cos^4 x}{4} + C$

34. The value of $\int\frac{x+5}{x^2+10x-5}dx$ is,

(1) $\log (x^2 + 10x - 5)^2 + C$ (2) $\frac{1}{2}\log (x^2 + 10x - 5) + C$

(3) $\frac{1}{2}\log (x + 5) + C$ (4) $\log (x + 5)^2 + C$

35. The value of $\int 4x \log 5x\,dx$ is,

(1) $\frac{x^2 \log 5x}{2} - \frac{x^2}{4} + C$ (2) $\frac{x \log 5x}{5} + \frac{x^2}{2} + C$

(3) $5x \log 5x + 1 + C$ (4) $2x^2 \log 5x - x^2 + C$

SPACE FOR ROUGH WORK

36. $\int_0^{\pi/4} \frac{\sec^2 x}{1+\tan x}\,dx =$

(1) $-\log 2$ (2) $\log 2$

(3) $\log 3$ (4) $\log 4$

37. The volume of a solid generated by revolving the curve $y = \tan x$ about x-axis between the lines $x = 0$ and $x = \frac{\pi}{4}$ is,

(1) $\pi + \frac{\pi^2}{4}$ cu. units (2) $1 + \frac{\pi}{4}$ cu. units

(3) $1 - \frac{\pi}{4}$ cu. units (4) $\pi - \frac{\pi^2}{4}$ cu. units

38. Order and degree of differential equation $\frac{d^2y}{dx^2} = \sqrt{1 - \frac{dy}{dx}}$ are

(1) 2 and 2 respectively (2) 2 and 1 respectively

(3) 1 and 2 respectively (4) 1 and 1 respectively

39. The differential equation obtained by eliminating the arbitrary constants from the equation $y^2 = a \sin x + b \cos x$ is

(1) $2y\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^2 - y^2 = 0$ (2) $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + y^2 = 0$

(3) $2y\frac{d^2y}{dx^2} - 2\left(\frac{dy}{dx}\right)^2 + y^2 = 0$ (4) $2y\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^2 + y^2 = 0$

40. The solution of differential equation $x\frac{dy}{dx} + y = x - 1$ is

(1) $xy = x - \frac{x^2}{2} + C$ (2) $xy = \frac{x^2}{2} - x + C$

(3) $xy + \frac{x^2}{2} + x = C$ (4) $xy - \frac{x^2}{2} - x = C$

SPACE FOR ROUGH WORK

PART – B

It consists of **41 – 80** questions.

41. The value of 20 peta Hertz is

(1) 20×10^9 Hz (2) 20×10^{12} Hz

(3) 20×10^{15} Hz (4) 20×10^{18} Hz

42. The total reading for Screw Gauge is found by

(1) TR = PSR + (HSR × LC) ± ZE

(2) TR = PSR + (HSR × LC) ± ZC

(3) TR = (PSR + HSR) × LC ± ZE

(4) TR = (PSR + HSR) × LC ± ZC

43. The least count of a slide calipers is 0.01 cm. In a setting the zero of the Vernier Scale lies between 3.2 cm and 3.3 cm and 5^{th} division of the Vernier co-incides with the main scale division. The total reading is

(1) 3.35 cm (2) 3.35 mm

(3) 3.25 cm (4) 3.25 mm

44. The rectangular component of a vector R are

(1) $R_X = R\cos\theta$, $R_Y = R\sin\theta$

(2) $R_X = R\sin\theta$, $R_Y = R\cos\theta$

(3) $R_X = \cos\theta$; $R_Y = \sin\theta$

(4) $R_X = -\cos\theta$; $R_Y = -\sin\theta$

45. A body of weight 5 kg is suspended by means of a light string. It is pulled horizontally until the string makes an angle of 30° with the vertical. Then the horizontal force applied is

(1) $\frac{1}{\sqrt{3}}$ kg wt (2) 5 kg wt

(3) $5\sqrt{3}$ kg wt (4) $\frac{5}{\sqrt{3}}$ kg wt

SPACE FOR ROUGH WORK

46. Among these which is the vector quantity ?

(1) Work (2) Energy

(3) Surface tension (4) Power

47. The resultant of two like parallel forces P and Q acting at a point is

(1) P + Q away from P

(2) P + Q away from Q

(3) P ~ Q in between P and Q

(4) P + Q in between P and Q

48. Shock absorbers in automobiles is an example for

(1) Tensile stress (2) Compressive stress

(3) Shear stress (4) Breaking stress

49. The elasticity of steel compared to rubber is

(1) More (2) Less

(3) Equal (4) Less than or equal

50. The stress-strain graph for an elastic body within elastic limit is

(1) Linear (2) Curved

(3) Parabola (4) Hyperbola

51. The maximum stress of steel wire is 500 N/mm^2, if the area of cross section of wire is 0.05 m^2 then the force is

(1) 25 N (2) 25 KN

(3) 25 MN (4) 250 N

52. In case of concave meniscus, the angle of contact is

(1) Acute (2) Right angle

(3) Linear (4) Obtuse

SPACE FOR ROUGH WORK

53. The surface tension of a liquid varies as
    (1) Directly with temperature, inversely with density
    (2) Directly with both temperature and density
    (3) Inversely with both temperature and density
    (4) Inversely with temperature and directly with density

54. The thrust on the bottom of a container having base area 0.5 m^2 filled with water to a height of 6 cm is
    (1) 147 N (2) 294 N
    (3) 147 dynes (4) 294 dynes

55. The fastest mode of transfer of heat is
    (1) Conduction (2) Convection
    (3) Radiation (4) Transmission

56. Pressure is directly proportional to absolute temperature at constant volume is a statement of
    (1) Charle's law (2) Boyle's law
    (3) Gay-Lussac's law (4) Boltzmann's law

57. Boyle's law is applicable for
    (1) Isothermal process (2) Isobaric process
    (3) Isochoric process (4) Isotonic process

58. At absolute zero temperature, the pressure and volume of a given mass of gas is
    (1) 1 (2) 273
    (3) −273 (4) 0

59. In cold countries, the windows are provided with double doors because
    (1) Air between two windows behaves as a perfect insulator
    (2) Air between two windows behaves as a perfect conductor
    (3) To strengthen the windows
    (4) Security purpose

SPACE FOR ROUGH WORK

60. The sound waves and light waves can be differentiated by

(1) Interference (2) Diffraction

(3) Reflection (4) Polarization

61. The velocity of sound in gas is independent of

(1) Temperature (2) Pressure

(3) Humidity (4) Density

62. The superposition of two waves of same frequency moving in opposite direction is

(1) Progressive wave (2) Transverse waves

(3) Sound wave (4) Stationary wave

63. For every degree raise of temperature, the velocity of sound waves in gas is increased by

(1) 6 m/s (2) 60 m/s

(3) 0.6 s/m (4) 0.6 m/s

64. The angle between the particle vibration and wave propagation in a transverse wave is

(1) 0° (2) 45°

(3) 90° (4) 180°

65. The original tension in the string if the frequency of a sonometer wire is doubled, when the tension is increased by 12 kg wt is

(1) 2 kg wt (2) 4 kg wt

(3) 8 kg wt (4) 12 kg wt

66. At resonance, the body vibrates with

(1) Small amplitude (2) Large amplitude

(3) Zero amplitude (4) Same amplitude

SPACE FOR ROUGH WORK

67. Beats occurs in mining due to the presence of
(1) Ore (2) Water
(3) Contaminated air (4) Fossils

68. The statement which is correct in these is
(1) X-rays have longer wavelength than microwaves
(2) Gamma rays have shorter wavelength than microwaves
(3) UV-rays have shorter wavelength than violet rays
(4) Red rays have longer wavelength than infrared rays

69. LASER is used in
(1) LIDAR (2) RADAR
(3) SONAR (4) GPS

70. Nano means
(1) One hundredth of meter
(2) One thousandth of meter
(3) One millionth of meter
(4) One billionth of meter

71. Microphone is a
(1) Transducer (2) Receiver
(3) Channel (4) Transmitter

72. The principle behind optical fibre is
(1) Total internal refraction (2) Total internal reflection
(3) Reflection (4) Refraction

73. Faraday's I law of electrolysis is represented mathematically as
(1) $M = ZQ$ (2) $Z = MQ$
(3) $Q = MZ$ (4) $M = \frac{Z}{Q}$

SPACE FOR ROUGH WORK

74. A galvanic cell setup between two dissimilar metals in contact is called
(1) Concentration cell (2) Composition cell
(3) Stress cell (4) Secondary cell

75. In which of these cells the reaction can be reversed ?
(1) Primary cell (2) Secondary cell
(3) Solar cell (4) Photo cell

76. The statement which is true for fuel cell is
(1) They make more pollution
(2) They produce noise
(3) They liberate more heat
(4) They are heavy in weight

77. Alloy of steel is a mixture of
(1) Chromium, iron and nickel
(2) Chromium, iron and zinc
(3) Chromium, iron and aluminium
(4) Chromium, iron and tin

78. The materials with weak intermolecular forces of attraction between polymer chains are
(1) Elastomers (2) Fibres
(3) Thermoplastic (4) Thermosetting polymers

79. The type of composite material to which reinforced concrete belongs is
(1) Laminate (2) Particulate
(3) Short fibre (4) Long fibre

80. pH value of a solution is given by
(1) $-\log_{10}[H^+]$ (2) $-\log_e[OH^-]$
(3) $-\log_e[H^+]$ (4) $\log_{10}[H^+]$

SPACE FOR ROUGH WORK

PART – C

It consists of **81 – 180** questions.

81. Marble is an example of

(1) aqueous rock (2) metamorphic rock

(3) sedimentary rock (4) igneous rock

82. The percentage of silica in a good brick clay should vary from

(1) 20 to 30% (2) 30 to 40%

(3) 40 to 50% (4) 50 to 60%

83. A first class brick should have a minimum crushing strength of

(1) 70 kg/cm^2 (2) 105 kg/cm^2

(3) 125 kg/cm^2 (4) 140 kg/cm^2

84. The central part of a tree is called

(1) Heart wood (2) Pith

(3) Sap wood (4) Cambium layer

85. The soundness of cement is tested by

(1) Vicat's apparatus (2) Le-chatelier apparatus

(3) Standard briquette test (4) Compression testing machine

86. The essential ingredient of paint is

(1) alcohol (2) drier (3) pigment (4) oil

87. The base material for distemper is

(1) Chalk (2) Lime (3) Clay (4) Lime putty

SPACE FOR ROUGH WORK

88. Brass is an alloy of

(1) Copper and Tin
(2) Copper and Steel
(3) Copper and Zinc
(4) Copper and Lead

89. For a rectangular foundation of width b, the eccentricity of the load should not be greater than

(1) b/3 (2) b/4 (3) b/5 (4) b/6

90. The most commonly used material for damp proofing is

(1) Bitumen
(2) Paraffin Wax
(3) Cement Solution
(4) Cement Concrete

91. The vertical members which support the door frame are called

(1) reveals (2) styles (3) posts (4) jambs

92. The surface of the abutment on which the arch rests, is known as

(1) span
(2) key stone
(3) skew back
(4) crown

93. The pitch of stair should never exceed

(1) 20° (2) 25° (3) 30° (4) 40°

94. Cork flooring is provided in

(1) residential buildings
(2) offices
(3) godowns
(4) theatres

95. The couple roofs are used

(1) for spans up to 3.5 m
(2) for spans up to 5 m
(3) for spans up to 10 m
(4) for spans up to 12 m

SPACE FOR ROUGH WORK

96. The pointing is provided for

(1) Preventing the dampness (2) Magnifies the appearance

(3) Both (1) and (2) (4) None of the above

97. With the moisture content of 5 to 10% by weight, the bulking of sand is increased by

(1) 20% (2) 30% (3) 40% (4) 50%

98. The ratio of different ingredients (cement, sand and aggregate) in concrete mix of grade M 20 is

(1) 1 : 1 : 2 (2) 1 : 1.5 : 3 (3) 1 : 2 : 4 (4) 1 : 3 : 6

99. If the water cement ratio is 0.4, then the quantity of water required for one bag of cement is

(1) 15 litres (2) 20 litres (3) 25 litres (4) 30 litres

100. The object of curing is to

(1) Prevent the loss of water by evaporation

(2) Reduce the shrinkage of concrete

(3) Preserve the properties of concrete

(4) All of these

101. A line joining some fixed points on the main survey lines, is called a

(1) check line (2) tie line

(3) base line (4) none of these

102. In a whole circle bearing system, S 25° 15′ E corresponds to

(1) 115° 15′ (2) 154° 45′ (3) 205° 15′ (4) 334° 45′

SPACE FOR ROUGH WORK

103. The method of levelling in which the heights of mountains are found by observing the temperature at which water boils is known as

(1) barometric levelling (2) reciprocal levelling

(3) longitudinal levelling (4) hypometry

104. The contour interval depends upon the

(1) nature of the ground (2) scale of map

(3) purpose and extent of survey (4) all of the above

105. In a theodolite, a straight line tangential to the longitudinal curve of the level tube at its centre, is known as

(1) tube centre (2) horizontal axis

(3) bubble line (4) line of sight

106. When the curve is to be set out over a rough ground, the method used is

(1) Rankine's method (2) Theodolite method

(3) Tacheometric method (4) Either 2 or 3

107. The measured distance parallel to the meridian is called

(1) departure (2) latitude

(3) dip (4) declination

108. In precision theodolite traverse for roads and railways, the angular error of closure should not exceed,

(1) $15''\sqrt{N}$ (2) $30''\sqrt{N}$ (3) $45''\sqrt{N}$ (4) $1'\sqrt{N}$

where N = Number of angles.

SPACE FOR ROUGH WORK

109. Ceylon ghat tracer is a instrument for setting out

(1) vertical angle (2) gradient

(3) horizontal angle (4) contour

110. Active remote sensing uses _____ as the source of EM energy.

(1) Sun (2) Own source

(3) Moon (4) None of the above

111. The mass per unit volume of a liquid at standard temperature and pressure is called

(1) Specific weight (2) Mass density

(3) Specific gravity (4) None of the above

112. The flow in which the velocity, pressure, density at a point do not change with time is called

(1) steady flow (2) uniform flow

(3) unsteady flow (4) non-uniform flow

113. Bernoulli's theorem deals with the law of conservation of

(1) mass (2) energy

(3) momentum (4) none of the above

114. The theoretical velocity of jet at vena-contracta is

(1) $2gH$ (2) $2g\sqrt{H}$ (3) $\sqrt{2gH}$ (4) $H\sqrt{2g}$

where H = head of water at vena-contracta.

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115. A cippoletti weir is one

(1) whose crest is broad

(2) weir having round crest

(3) whose body is submerged

(4) trapezoidal whose sides has slope of 1 horizontal to 4 vertical

116. Friction loss when water flows through pipe is

(1) $\frac{flv^2}{2gd}$ (2) $\frac{f^2lv^2}{2gd}$ (3) $\frac{fl^2v^2}{2gd}$ (4) $\frac{fl^2v}{2gd}$

117. For most economical rectangular channel, hydraulic mean depth must be equal to

(1) two times the depth of flow (2) two times the width of flow

(3) half the depth of flow (4) none of the above

118. Chezy's formula for finding velocity of flow is given by

(1) $V = m\sqrt{Ci}$ (2) $V = mC\sqrt{i}$ (3) $V = \sqrt{Cmi}$ (4) $V = C\sqrt{mi}$

119. The water hammer occurs in a pipe line due to

(1) excessive leakage in pipe (2) gradual closing of valve

(3) sudden closing of valve (4) high pressure of fluid

120. Piezometer is used to measure

(1) Atmospheric pressure

(2) Difference in pressure between two points

(3) Low pressure

(4) High pressure

SPACE FOR ROUGH WORK

121. The standard recording rain gauge adopted in India, is of the type

(1) Weighing Bucket (2) Tipping Bucket

(3) Natural Siphon (4) Symon's

122. The total water requirement of a city is generally assessed on the basis of

(1) maximum hourly demand

(2) maximum daily demand + fire demand

(3) average daily demand + fire demand

(4) greater of (1) and (2)

123. The most widely used type of a tubewell in India is

(1) A cavity well (2) A strainer well

(3) A dug well (4) A slotted well

124. Simple submerged intakes may be suitable to

(1) large water supply projects on rivers

(2) small water supply projects on streams

(3) small water supply projects on lakes

(4) both (2) and (3)

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

(1) working pressure (2) test pressure

(3) design pressure (4) hydrostatic pressure

SPACE FOR ROUGH WORK

126. The valve, which is provided in the water distribution pipes at street corners and pipe junctions to control the flow in the distribution system, is

(1) an air valve (2) a sluice valve

(3) a scour valve (4) a reflux valve

127. The specific conductivity of water helps in knowing the extent of

(1) organic matter (2) inorganic matter

(3) dissolved salts (4) suspended salts

128. Temporary hardness in water is caused by

(1) Carbonates and Bicarbonates of Calcium and Magnesium

(2) Bicarbonates of Sodium and Potassium

(3) Carbonates of Calcium and Magnesium

(4) Dissolved Carbon Dioxide

129. The settling velocity of inorganic particles of less than 0.1 mm dia. varies with the dia. (d), in proportion to

(1) d^3 (2) d^2 (3) d (4) $\frac{d}{2}$

130. The amount of coagulant needed in water treatment increases with the

(1) increase in temperature of water (2) increase in turbidity of water

(3) decrease in turbidity of water (4) both (1) and (2)

131. Chlorine demand of water is equal to

(1) applied chlorine (2) residual chlorine

(3) (1) + (2) above (4) (1) – (2) above

SPACE FOR ROUGH WORK

132. The main disadvantage of lime-soda process of water softening is that

(1) it is unsuitable for turbid and acidic water

(2) zero-hardness effluent, cannot be obtained

(3) excessive hard waters cannot be softened by it

(4) huge amount of precipitate is formed, posing disposal problem

133. The approximate value of Avogadro's Number is

(1) 6.02×10^{23} (2) 6.02×10^{-23} (3) 6.02×10^{32} (4) 6.02×10^{-32}

134. The gain of electrons by an atom or ion is known as

(1) Reduction (2) Oxidation

(3) Ionization (4) Electronation

135. The compounds derived from plant and animal origin are known as

(1) Inorganic compounds

(2) Organic compounds

(3) Plant compounds

(4) Plant and animal compounds

136. Reverse osmosis can remove _____ ions from solution.

(1) dissolved (2) suspended

(3) both (1) and (2) (4) charged

137. The determination of chloride involving the formation of precipitate is _____ analysis.

(1) colorimetric (2) gravimetric

(3) volumetric (4) chromatographic

SPACE FOR ROUGH WORK

138. The unit of electrical conductivity is

(1) ohms/cm (2) mhos/cm

(3) siemens (4) both (2) and (3)

139. The solubility of atmospheric oxygen is fresh water @ 35°C is

(1) 7 mg/l (2) 4 mg/l (3) 10 mg/l (4) 14 mg/l

140. The dispersion of gas particles in a liquid medium is commonly known as

(1) Sol (2) Emulsion (3) Foams (4) Fogs

141. Dry waste of a community is called

(1) sullage (2) refuse (3) sludge (4) garbage

142. Colour of fresh sewage is

(1) grey (2) blue (3) green (4) dark green

143. Liquid wastes originated from residential and industrial buildings collectively are called as

(1) domestic sewage (2) sanitary sewage

(3) combined sewage (4) none of the above

144. Combined sewage system collectively carries

(1) domestic and industrial sewage (2) storm and domestic sewage

(3) storm and sanitary sewage (4) storm and industrial sewage

145. Most suitable section of a sewer in a combined sewage system is

(1) circular sections (2) rectangular sections

(3) u-shaped sections (4) parabolic sections

SPACE FOR ROUGH WORK

146. Minimum and maximum diameter of sewers generally adopted in designs may be

(1) 15 cm and 100 cm
(2) 25 cm and 450 cm
(3) 60 cm and 300 cm
(4) 15 cm and 300 cm

147. Manholes are generally located at

(1) all the change in direction of sewers
(2) all the junctions of different sewers
(3) all the change in gradient of sewers
(4) all of the above

148. Detention period adopted for grit chambers is

(1) 2 to 4 hours
(2) 5 minutes
(3) 1 minute
(4) 12 hours

149. Septic tanks should be cleaned for every

(1) 2 to 6 months
(2) 1 to 3 months
(3) 6 to 12 months
(4) 4 to 12 months

150. Biological treatment of sewage can be accomplished in

(1) screens
(2) trickling filters
(3) sedimentation tanks
(4) all of the above

151. Treatment of sewage by aerobic bacteria can be attained in

(1) oxidation pond
(2) settling tank
(3) trickling filter
(4) all the above

152. Chlorination done beyond the break point is called

(1) post-chlorination
(2) hypochlorination
(3) pre-chlorination
(4) super chlorination

SPACE FOR ROUGH WORK

153. Sludge treatment is done to

(1) stabilize the organic matter

(2) destroy the pathogenic bacteria

(3) reduce the water content

(4) all of the above

154. The process by which the flowing water gets cleaned by itself is known as

(1) oxidation (2) self purification

(3) reduction (4) photosynthesis

155. Traps are provided to

(1) stop flow of sewage

(2) seperate flow of liquid and solids

(3) avoid back flow of sewage

(4) prevent escape of foul gases inside and outside the house

156. Strength of waste may be reduced by

(1) Equipment modification (2) Segregation of wastes

(3) By-product recovery (4) All of the above

157. In chrome-tanning process, the tanning is carried out by the addition of

(1) chromium chloride (2) chromium sulphate

(3) chromium nitrate (4) chromium sulphide

158. A pipe installed in the house drainage for ventation purpose is called

(1) vent pipe (2) soil pipe

(3) anti-siphonage pipe (4) none of the above

SPACE FOR ROUGH WORK

159. In Kraft process, the green liquor is converted to white liquor by addition of

(1) oxygen (2) alum

(3) lime (4) chlorine

160. Air is sometimes injected in the equalization basin to provide

(1) better mixing (2) chemical oxidation

(3) agitation (4) all of the above

161. Which of the following is not a major constituent of a photochemical smog ?

(1) PAN (2) CO (3) HC (4) O_3

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

(1) Fluorine (2) Ozone

(3) PAN (4) None of them

163. Which of the following devices is suitable for the removal of gaseous pollutants ?

(1) Cyclone seperator (2) Electrostatic precipitator

(3) Fabric filter (4) Wet scrubber

164. The locations of air quality monitoring stations depends on

(1) Stack height (2) Wind speed

(3) Wind direction (4) Rainfall

165. The most economical and hygenic rural privy is

(1) An aqua privy (2) A pit privy

(3) A cess pool (4) A soak pit

SPACE FOR ROUGH WORK

166. Killing (or) collapse of tissue (or) death of cells is

(1) Necrosis (2) Chlorosis

(3) Abscission (4) Epinasty

167. During inversion

(1) Temperature increases with altitude

(2) Temperature decreases with altitude

(3) Temperature remains constant

(4) None of the above

168. Highest percentage of air consists of

(1) Oxygen (2) Carbon dioxide

(3) Nitrogen (4) Argon

169. Which of the following is a liquid form of aerosol ?

(1) Fume (2) Dust (3) Mist (4) Smoke

170. The minimum size of smoke particle is

(1) 0.2 μm (2) 1 μm (3) 0.8 μm (4) 0.5 μm

171. An infection which is constantly maintained in a population at a baseline level in a geographic area without external inputs is known as

(1) Epidemic disease (2) Endemic disease

(3) Epizootic disease (4) Enteric disease

172. The symptoms of hookworm infection is

(1) abdominal pain (2) diarrhea

(3) weight loss (4) all the above

173. Influenza (commonly known as "flu") is a acute respiratory infection caused by a

(1) Bacteria (2) Virus (3) Fungi (4) Protozoan

SPACE FOR ROUGH WORK

174. _____ is caused by a spore-forming bacteria and most commonly occurs in wild and domestic herbivore mammals.

(1) Anthrax (2) Rabies

(3) Brucellosis (4) Herpes

175. Which type of prevention is most common in preventing communicable diseases ?

(1) Primary prevention (2) Secondary prevention

(3) Tertiary prevention (4) Primordial prevention

176. Food poisoning is caused by

(1) E-coli (2) Salmonella

(3) Compylobacter (4) All the above

177. Traps are placed at

(1) under the water closet

(2) at the junction of the house drain and the street sewer

(3) where the surface water enters the sewer

(4) all the above

178. The depth of Bore-Hole privy is

(1) 2 to 4 m (2) 4 to 8 m (3) 2 to 6 m (4) 4 to 6 m

179. The chance or probability that a person will be harmed or experience an adverse health effect if exposed to a hazard is known as

(1) Risk (2) Hazard (3) Accident (4) Disaster

180. The peak or maximum concentration of an airborne to which most workers could be safely exposed is known as

(1) Threshold value

(2) Threshold limit value

(3) Maximal allowable concentration

(4) Average allowable concentration

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SEAL