Group Code	COURSE	
CE	**CIVIL ENGINEERING**	
MAXIMUM MARKS	**TOTAL DURATION**	**MAXIMUM TIME FOR ANSWERING**
180	200 Minutes	180 Minutes

MENTION YOUR DIPLOMA CET NUMBER	BOOKLET VERSION CODE	SERIAL NUMBER
	A1	

207745

DOs:

1. This question booklet is issued to you by the invigilator after the 2nd bell i.e., after 9.50 am.

2. Check whether the DCET Number has been entered and shaded in the respective circles on the OMR answer sheet.

3. The version code and 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 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 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 or start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. In case of usage of signs and symbols in the questions, the regular textbook connotation should be considered unless stated otherwise.

2. This question booklet contains 180 (items) questions and each question will have one statement and four different options / responses & out of which you have to choose one correct answer.

3. After the 3rd Bell is rung at 10.00 am, remove the paper seal on the right hand side 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.

4. 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 METHOD								
Ⓐ	●	Ⓒ	Ⓓ	⊗	Ⓑ	Ⓒ	Ⓓ	Ⓐ	Ⓑ	Ⓒ	⊘	Ⓐ	●	●	Ⓓ
Ⓐ	●	Ⓒ	Ⓓ	◉	Ⓑ	Ⓒ	Ⓓ	Ⓐ	●	Ⓒ	Ⓓ				

5. Please note that even a minute unintended ink dot on the OMR answer sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.

6. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.

7. **Last bell will ring at 1.00 pm, stop marking on the OMR answer sheet.**

8. Hand over the **OMR answer sheet** to the room invigilator as it is.

9. After separating the top sheet (Office copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self-evaluation.

PART - A

APPLIED SCIENCE

1. Which of the following is the supplementary unit of SI System?

   (A) Candela
   (B) Kelvin
   (C) Radian
   (D) Mole

2. The main scále of Slide Calipers is divided into millimeter, the length of Vernier is 19 mm and is divided into 20 equal parts. The least count is

   (A) 0.01 cm
   (B) 0.001 cm
   (C) 0.05 cm
   (D) 0.005 cm

3. Which one of the following is not a vector quantity?

   (A) Velocity
   (B) Acceleration
   (C) Speed
   (D) Force

4. The magnitude of resultant of two forces $\vec{P}$ and $\vec{Q}$ acting in the same line and in opposite direction is

   (A) $P + Q$
   (B) $P - Q$
   (C) $\dfrac{P}{Q}$
   (D) $\dfrac{Q}{P}$

5. Two forces 3N and 5N are acting at a point making an angle of 60°. The magnitude of the resultant is

   (A) 15 N
   (B) 2 N
   (C) 7 N
   (D) 8 N

6. Torque produces

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

Space For Rough Work

7. Which one of the following is not related to couple?

    (A) Kicking of football

    (B) Opening and closing of tap

    (C) Rotation of steering wheel

    (D) Pedalling of bicycle

8. Within elastic limit, stress is

    (A) independent of strain

    (B) zero

    (C) directly proportional to strain

    (D) inversely proportional to strain

9. The length of a wire increases by 1% on suspending a load of 2 N from it. The tensile strain in the wire is

    (A) 0.01

    (B) 0.5

    (C) 2

    (D) 1

10. Pressure at any point inside a liquid

    (A) remains zero

    (B) increases with depth

    (C) decreases with depth

    (D) independent of depth

11. The pressure at the bottom of a swimming pool 20m wide and the water 2m deep (given density of water 1000 Kg/m³ and g = 10 m/s²) is

    (A) 2×10^3 Pa

    (B) 40×10^3 Pa

    (C) 10×10^3 Pa

    (D) 20×10^3 Pa

12. In the case of liquids, as the temperature increases, the surface tension generally

    (A) remains constant

    (B) decreases

    (C) increases

    (D) zero

Space For Rough Work

13. The property of a liquid to oppose the relative motion between different layers is called

    (A) density   (B) elasticity

    (C) viscosity   (D) capillarity

14. An expression for coefficient of viscosity is (if F = viscous force; A = Area, V = difference in Velocity, x = distance between two layers)

    (A) $\eta = -\dfrac{FA}{xV}$ (B) $\eta = -\dfrac{FV}{Ax}$

    (C) $\eta = -\dfrac{Fx}{AV}$ (D) $\eta = -\dfrac{FxA}{V}$

15. The expression that represents Charle's law is

    (A) PV = constant   (B) VT = constant

    (C) $\dfrac{P}{V}$ = constant   (D) $\dfrac{V}{T}$ = constant

16. The pressure of a gas at 27°C is one atmospheric pressure. Keeping the volume constant, if the temperature is raised to 60°C, then its pressure will be

    (A) 1.11 atmospheric pressure   (B) 1.5 atmospheric pressure

    (C) 2.2 atmospheric pressure   (D) 2 atmospheric pressure

17. Hot water at 80°C will exchange heat with surroundings maintained at 25°C till the temperature of water becomes

    (A) 80°C   (B) 50°C

    (C) 55°C   (D) 25°C

18. Radiator in automobiles works on the principle of

    (A) Conduction   (B) Convection

    (C) Radiation   (D) Evaporation

Space For Rough Work

19. In the expression $C_p - C_v = R$, notation R represents

(A) Resultant force

(B) Planck's constant

(C) Universal gas constant

(D) Resonance

20. Physical quantity that represents the energy of the mechanical wave is

(A) Wave length

(B) Frequency

(C) Amplitude

(D) Wave period

21. Which one of the following is not an example of simple harmonic motion?

(A) Swinging of cradle

(B) Oscillations of simple pendulum

(C) Vibrations of tuning fork

(D) Motion of hands of clock

22. In the equation for velocity of sound in air, which of the following options does not hold good according to Laplace?

(A) Poor conductivity of air

(B) Rapid pressure changes

(C) Maintaining constant temperature

(D) Rise and fall of temperature

23. Distance between two consecutive nodes in a stationary wave is equal to

(A) Wavelength of individual wave

(B) Difference of wavelengths of two waves

(C) Sum of wavelengths of two waves

(D) Half of wavelength of individual wave

24. When the tension on the sonometer wire is increased by 15 N, its frequency is doubled. The original tension is

(A) Zero

(B) 5 N

(C) 10 N

(D) 15 N

Space For Rough Work

25. Two identical waves superpose on one another, then the beat frequency is

   (A) Zero   (B) One

   (C) Ten   (D) Infinity

26. Damage to the suspension bridge by marching military troops is due to

   (A) Reverberation   (B) Resonance

   (C) Beats   (D) Noise

27. A tuning fork produces waves in a medium. The parameter that changes with temperature of the medium is

   (A) Wavelength   (B) Frequency

   (C) Amplitude   (D) Period

28. The electromagnetic radiation used to detect the artificial gems from the original gems is

   (A) Microwave   (B) Radio wave

   (C) Ultraviolet ray (UV ray)   (D) X-ray

29. During excitation of an atom from ground state to excited state, the number of photons absorbed by the single atom is

   (A) 2   (B) 1

   (C) 3   (D) 0

30. In Nano-technology, the manipulation of atom is done in the range of

   (A) 1 nano meter – 100 nano meter   (B) 1 micro meter – 100 micro meter

   (C) 1 pico meter – 100 pico meter   (D) 1 millimeter – 100 millimeter

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Space For Rough Work

31. Live telecast of a programme can be viewed by

(A) Manual communication

(B) X-ray communication

(C) Landline communication

(D) Satellite communication

32. Optical Fibre is used in

(A) Endoscopy

(B) Biometric Machine

(C) Simple Microscope

(D) Simple Telescope

33. Acetic acid is an example for

(A) Strong Electrolyte

(B) Neutral Solution

(C) Weak Electrolyte

(D) Non-Electrolyte

34. The process of coating tin over iron and steel is known as

(A) Alloying

(B) Galvanizing

(C) Tinning

(D) Refining

35. The batteries which are recharged and reused are called

(A) Primary Battery

(B) Secondary Battery

(C) Fuel Cell

(D) Alkaline Battery

Space For Rough Work

36. PAFC is a type of

(A) Primary Cell

(B) Secondary Cell

(C) Solar Cell

(D) Fuel Cell

37. The easily fusible material which is formed when Flux reacts with gangue is

(A) Slag

(B) Alloy

(C) Polymer

(D) Mineral

38. Which of the below given polymers is obtained by condensation polymerization?

(A) Poly ethene

(B) Nylon

(C) PVC

(D) Poly propane

39. Which of the following is not a composite material?

(A) Fibreglass

(B) Concrete

(C) Ceramic

(D) Bronze

40. The pH value of Lemon juice is about

(A) 2.4

(B) 8.2

(C) 10.2

(D) 14

___

Space For Rough Work

ENGINEERING MATHEMATICS

41. The value of $\begin{vmatrix} \cos 50° & \sin 10° \\ \sin 50° & \cos 10° \end{vmatrix}$ is

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

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

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

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

42. The values of x & y from the simultaneous equations $3x + 4y = 7$ and $7x - y = 6$ are.

   (A) $x = 1, y = 1$

   (B) $x = -1, y = -1$

   (C) $x = 1, y = -1$

   (D) $x = -1, y = 1$

43. If $\begin{vmatrix} x & 3 \\ 3 & x \end{vmatrix} = 0$ then the value of x is

   (A) ± 1

   (B) ± 3

   (C) ± 9

   (D) $\pm \sqrt{6}$

44. If $A = \begin{bmatrix} -1 & 3 \\ 4 & -5 \end{bmatrix}$, then $2A^T$ is

   (A) $\begin{bmatrix} -2 & 6 \\ 8 & -10 \end{bmatrix}$

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

   (C) $\begin{bmatrix} -2 & 8 \\ 6 & 8 \end{bmatrix}$

   (D) $\begin{bmatrix} -2 & 8 \\ 6 & -10 \end{bmatrix}$

Space For Rough Work

45. If A is a given square Matrix then

(A) $\text{adj } A = \dfrac{A^{-1}}{|A|}$

(B) $\text{adj } A = \dfrac{|A|}{|A^{-1}|}$

(C) $\text{adj } A = |A| \cdot A^{-1}$

(D) $AA^{-1} = \text{adj } A \cdot |A|$

46. The characteristic Equation of the Matrix $A = \begin{bmatrix} -5 & 6 \\ -2 & 1 \end{bmatrix}$ is

(A) $\lambda^2 - 6\lambda + 12 = 0$

(B) $\lambda^2 - 4\lambda + 17 = 0$

(C) $\lambda^2 + 4\lambda + 7 = 0$

(D) $\lambda^2 - 4\lambda + 7 = 0$

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

(A) $\hat{a} = \dfrac{3i + 4j - 2k}{\sqrt{26}}$

(B) $\hat{a} = \dfrac{3i + 4j - 2k}{\sqrt{29}}$

(C) $\hat{a} = i + j - 2k$

(D) $\hat{a} = \dfrac{3i + 4j - 2K}{\sqrt{21}}$

48. If $\vec{a} = i + \lambda j$ and $\vec{b} = 2j + 3k$ and $\vec{a} \cdot \vec{b} = 0$ then 'λ' is Equal to

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

(B) $\dfrac{2}{3}$

(C) $\dfrac{3}{2}$

(D) 0

49. Area of the triangle whose adjacent sides are $\vec{a} = 2i - j + 2k$ and $\vec{b} = 3i - j$ is

(A) $\sqrt{41}$ sq.units

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

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

(D) $\dfrac{\sqrt{65}}{2}$ sq.units

Space For Rough Work

50. The number of possible outcomes in the sample space when two dice of different colours are rolled is

(A) 36

(B) 6

(C) 9

(D) 12

51. Sin θ is positive and tan θ is negative when θ is in

(A) I quadrant

(B) II quadrant

(C) III quadrant

(D) IV quadrant

52. The value of

$$\frac{\tan(\pi - \alpha)}{\tan(-\alpha)} + \frac{\cos(\pi/2 - \alpha)}{\sin(2\pi - \alpha)} + \frac{\csc\left(\frac{3\pi}{2} + \alpha\right)}{\sec(\pi + \alpha)} \text{ is}$$

(A) -1

(B) 2

(C) -2

(D) 1

53. The value of sin (105°) is

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

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

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

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

54. The value of $\dfrac{1 - \cos A + \sin A}{1 + \cos A + \sin A}$ is

(A) $\tan A$

(B) $\tan\left(A/2\right)$

(C) $\cot\left(A/2\right)$

(D) $\cot A$

55. If sin A = $\dfrac{1}{3}$, then the value of sin 3A is

(A) $\dfrac{-3}{27}$

(B) 1

(C) $\dfrac{-4}{27}$

(D) $\dfrac{23}{27}$

Space For Rough Work

56. The value of 2 cos 3A. sin 2A is

(A) sin 5A + sin A

(B) cos 5A + cos A

(C) sin 5A − sin A

(D) cos 5A − cos A

57. The polar form of $1 + i$ is

(A) $\sqrt{2}\left[\cos \dfrac{\pi}{4} + i \sin \dfrac{\pi}{4}\right]$

(B) $\sqrt{2}\left[\cos \dfrac{\pi}{4} - i \sin \dfrac{\pi}{4}\right]$

(C) $\sqrt{2}\left[\sin \dfrac{\pi}{4} + i \cos \dfrac{\pi}{4}\right]$

(D) $\sqrt{2}\left[-\cos \dfrac{\pi}{4} - i \sin \dfrac{\pi}{4}\right]$

58. $\displaystyle \lim_{x \to -3} \dfrac{x^2 - 5x + 6}{x^2 - 3x} =$

(A) $\dfrac{-5}{3}$

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

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

(D) $\dfrac{5}{3}$

59. $\displaystyle \lim_{x \to a} \dfrac{\sqrt{x^3} - \sqrt{a^3}}{x - a} =$

(A) $\dfrac{3}{2}\sqrt{a}$

(B) $\dfrac{3}{2\sqrt{a}}$

(C) $\sqrt{a}$

(D) $\dfrac{1}{\sqrt{a}}$

60. $\displaystyle \lim_{\theta \to 0} \dfrac{\cos 3\theta - \cos \theta}{\theta \sin 2\theta} =$

(A) $\tan 2\theta$

(B) 2

(C) −2

(D) 1

Space For Rough Work

61. Equation of the straight line passing through the point $(1, 3)$ and having slope -2 is

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

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

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

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

62. Equation of the straight line passing through the origin and perpendicular to the line $5x - 4y - 1 = 0$ is

(A) $5x - 4y = 0$

(B) $4x + 5y = 0$

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

(D) $4x + 5y + 1 = 0$

63. If $y = \dfrac{x^2 - 5}{x^2 + 3}$, then $\dfrac{dy}{dx} =$

(A) $\dfrac{4x^3 - 4x}{(x^2 + 3)^2}$

(B) $\dfrac{16x}{(x^2 + 3)^2}$

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

(D) $\dfrac{-16x}{(x^2 + 3)^2}$

64. If $y = \sin^{-1}(\cos x)$, then $\dfrac{dy}{dx} =$

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

(B) $\dfrac{-\sin x}{\sqrt{1 - x^2}}$

(C) 1

(D) -1

65. If $y = \sqrt{y \log x}$, then $\dfrac{dy}{dx} =$

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

(B) $\dfrac{1}{x}$

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

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

Space For Rough Work

66. If $x = a \cos^2\theta$ and $y = b \sin^3\theta$, then $\dfrac{dy}{dx} =$

(A) $-\dfrac{3b}{2a} \sin\theta$

(B) $-\dfrac{3b}{2a}$

(C) $\dfrac{2a}{b} \cos\theta$

(D) $\dfrac{-2a}{3b \sin\theta}$

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

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

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

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

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

68. If $y = \sin^2 x$, then $\dfrac{d^2y}{dx^2} =$

(A) $2\cos 2x$

(B) $2\sin 2x$

(C) $2\sin x \cos x$

(D) $2x \sin x$

69. The Equation of tangent to the curve $y = \sin x$ at the point $(\pi, 0)$ is

(A) $x + y + 1 = 0$

(B) $x - y - 1 = 0$

(C) $x + y - \pi = 0$.

(D) $x - y + \pi = 0$.

70. The rate of change of radius of the sphere is 9cm/s. Then the rate of change of volume of the sphere when the radius is 2 cm is equal to

(A) 144π cm^3/s

(B) 9π cm^3/s

(C) 56π cm^3/s

(D) 64π cm^3/s

Space For Rough Work

71. $\int \dfrac{1}{1 + \cos x} \, dx =$

   (A) $\tan x + \sec x + c$ (B) $\tan x - \sec x + c$

   (C) $-\cot x + \operatorname{cosec} x + c$ (D) $\cot x - \operatorname{cosec} x + c$

72. $\int \left(\sqrt{x} + \cot x \right) dx =$

   (A) $\dfrac{2}{3} x^{3/2} + \log \sin x + c$ (B) $\dfrac{3}{2} x^{2/3} + \log \sec x + c$

   (C) $\dfrac{2}{3} x^{3/2} - \log \sin x + c$ (D) $\dfrac{3}{2} x^{2/3} - \log \sec x + c$

73. $\int \dfrac{e^{\log x}}{x} \, dx =$

   (A) $e^x + c$ (B) $\log (e^x) + c$

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

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

   (A) $x \log x + x + c$ (B) $x \log x - x + c$

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

75. $\int \dfrac{x}{\sqrt{1 + x^2}} \, dx =$

   (A) $\sqrt{1 + x^2} + c$ (B) $\sqrt{1 - x^2} + c$

   (C) $\dfrac{1}{\sqrt{1 + x^2}} + c$ (D) $\dfrac{1}{\sqrt{1 - x^2}} + c$

Space For Rough Work

76. $\int\limits_{-2}^{1} (x + 1)(x - 1)\, dx =$

   (A) 0

   (B) 1

   (C) − 1

   (D) − 2

77. The area bounded by the curve $y = \sin^2 x$, the x–axis and the ordinates $x = 0$ and $x = \pi/2$ is

   (A) $\dfrac{\pi}{4}$ sq. units

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

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

   (D) $\dfrac{\pi}{6}$ sq. units

78. The order and degree of a differential equation $4\left(\dfrac{dy}{dx}\right)^3 + 8\, xy + \left(\dfrac{d^2 y}{dx^2}\right)^2 - 7 = 0$ respectively are

   (A) 1 and 3

   (B) 2 and 2

   (C) 2 and 3

   (D) 2 and 1

79. The differential equation formed from the equation $y^2 = 4ax$ by eliminating arbitrary constant is

   (A) $2x\dfrac{dy}{dx} - y = 0$

   (B) $2x\dfrac{dy}{dx} + y = 0$

   (C) $y.\dfrac{dy}{dx} - 2x = 0$

   (D) $y\dfrac{dy}{dx} + 2x = 0$

80. For the differential equation $\dfrac{dy}{dx} + (\tan x).\, y = \cos x$, the integrating factor is

   (A) log x

   (B) cot x

   (C) cosec x

   (D) sec x

Space For Rough Work

PART – C

CIVIL ENGINEERING

81. The minimum specific gravity of a good building granite stone is

    (A) 1.6
    (B) 2.6
    (C) 3.0
    (D) 3.2

82. Formation of whitish deposits on the bricks due to the presence of salts in brick earth is

    (A) Warping
    (B) Efflorescence
    (C) Disintegration
    (D) None of the above

83. The unsoundness in cement is due to the presence of

    (A) Excess of Silica
    (B) Excess of Lime
    (C) Excess of Alumina
    (D) Excess of Gypsum

84. The peculiar curved swellings found on the body of a tree is known as

    (A) knots
    (B) rind galls
    (C) shakes
    (D) upsets

85. Standard quality structural steel weighs.

    (A) 7.6 g/cm^3
    (B) 7.7 g/cm^3
    (C) 7.8 g/cm^3
    (D) 7.9 g/cm^3

86. Extenders are used in paints for

    (A) Colouring
    (B) Glossy face
    (C) Smooth surface
    (D) Easy spreading

87. For well conditioned triangle, angle should not be less than

    (A) 60°
    (B) 25°
    (C) 45°
    (D) 30°

Space For Rough Work

88. If the magnetic meridian is to the right of true meridian, the declination is said to be

(A) Western

(B) Eastern

(C) Northern

(D) Southern

89. Zero is engraved on _____ of the graduated circle of Prismatic compass

(A) East end

(B) West end

(C) North end

(D) South end

90. Contour lines of different elevation crossing at one point in case of

(A) Ridge

(B) Valley

(C) Vertical cliff

(D) Saddle

91. In a closed traverse ABCDEA the sum of interior angles is equal to

(A) $4 \times 90°$

(B) $5 \times 90°$

(C) $6 \times 90°$

(D) $6 \times 180°$

92. Area of Level Section is calculated by using with usual notation.

(A) $A = (b + nh)h$

(B) $A = (b + nh^2) h$

(C) $A = (b + n) h$

(D) $A = (b + h) h$

93. Passive remote sensing uses _____ as the source of Electromagnetic energy.

(A) Sun

(B) Own source

(C) Moon

(D) None

94. When the length of the chord is less than the Peg interval is called

(A) Short chord

(B) Sub-chord

(C) Long chord

(D) Normal chord

95. The backsight on a B M of RL 100.000 M is 2.560 M. If the FS taken on a point is 1.430 M then the RL of the point is

(A) 101.130 M

(B) 102.650 M

(C) 101.345 M

(D) 101.340 M

Space For Rough Work

96. A Planimeter is an instrument which measures the _____ of plan of any shape very accurately.

(A) Area
(B) Volume
(C) Diameter
(D) Curvature.

97. If Two forces of same magnitude 'P' act at a point at right angle, then resultant of these two forces is

(A) P
(B) 2P
(C) $P\sqrt{2}$
(D) $2\sqrt{P}$

98. Moment of Inertia of solid circular section about an axis perpendicular to the cross section.

(A) $\dfrac{\pi d^3}{16}$
(B) $\dfrac{\pi d^3}{32}$
(C) $\dfrac{\pi d^4}{32}$
(D) $\dfrac{\pi d^4}{64}$

99. The property of material that exhibits same elastic property in all directions is

(A) Plastic
(B) Isotropic
(C) Viscoplastic
(D) Elasto plastic

100. Unit of Young's modulus is

(A) N/mm
(B) N – mm
(C) N/mm^2
(D) N – mm^2

101. The value of Poission's Ratio for steel, is in between

(A) 0.01 and 0.1
(B) 0.15 and 0.22
(C) 0.25 and 0.33
(D) 0.4 and 0.6

102. What does the beam of uniform strength have?

(A) Same cross section throughout
(B) Same bending stress at every section
(C) Same bending moment at every section
(D) Same shear stress at every section.

Space For Rough Work

103. The beam is said to be subjected to pure bending, when

(A) It is subjected to constant bending moment and no shear force.

(B) It is subjected to varying bending moment and zero shear force.

(C) It is subjected to zero bending moment and uniform shear force.

(D) It is subjected to varying bending moment and uniform shear force.

104. Neutral axis of symmetrical section lies at a depth of _____ from outermost layer.

(A) d

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

(C) 2d

(D) $\dfrac{d}{\sqrt{2}}$

105. The value of bending stress at neutral axis is

(A) Maximum

(B) Zero

(C) Minimum

(D) Negative

106. Shape of bending moment diagram for any type of beam carrying uniformly distributed load is

(A) Triangular

(B) Circular

(C) Parabolic

(D) None of the above

107. Deflection of simply supported beam of length 'l' subjected to central point load 'ω' is

(A) $\dfrac{\omega l}{16EI}$

(B) $\dfrac{\omega l^2}{16EI}$

(C) $\dfrac{\omega l^2}{48EI}$

(D) $\dfrac{5\,\omega l^4}{384EI}$

108. If a Cantilever of length 'l' and carries a point load 'ω' at free End, then slope is

(A) $\dfrac{\omega l^2}{16EI}$

(B) $\dfrac{\omega l^2}{24EI}$

(C) $\dfrac{\omega l^2}{2EI}$

(D) $\dfrac{\omega l^2}{6EI}$

Space For Rough Work

109. The relation between equivalent length 'L$_e$' and actual length 'l' of the column for both ends fixed is

(A) $L_e = \dfrac{l}{2}$

(B) $L_e = \dfrac{l}{\sqrt{2}}$

(C) $L_e = l$

(D) $L_e = 2l$

110. Euler's formula for long column gives

(A) Critical load

(B) Working load

(C) Failure load

(D) Ultimate load

111. A projecting stone provided to serve as support for roof truss, beam etc in stone Masonry wall is termed as

(A) Cornice

(B) Corbel

(C) Coping

(D) Throating

112. The door that allows free passage of air when closed and at the same time provides sufficient privacy known as

(A) Panelled door

(B) Sliding door

(C) Louvered door

(D) Swing door

113. The type of arch that does not have any rise and all joints radiate from a common point is called

(A) Segmental arch

(B) Semi circular arch

(C) Horseshoe arch

(D) Flat arch

114. The pitch of any stair shall be in the range of

(A) $25°$ to $40°$

(B) $20°$ to $45°$

(C) $15°$ to $30°$

(D) $30°$ to $45°$

Space For Rough Work

115. The type of pointing that is made by making a projection in the form of V Shape is known as

(A) Vee pointing

(B) Weathered pointing

(C) Tuck pointing

(D) Beaded pointing

116. A king post truss is suitable for roof of span varying from

(A) 2m to 5m

(B) 5m to 8m

(C) 8m to 11m

(D) 11m to 14m

117. Sedimentation may not be required for water from a

(A) Shallow well

(B) Deep well

(C) River

(D) Canal

118. For drinking water the amount of free Ammonia should not exceed

(A) 0.15 RPM

(B) 0.30 PPM

(C) 0.45 PPM

(D) 0.60 PPM

119. Which source of water among the following is not a surface source?

(A) River

(B) Well

(C) Lake

(D) Ocean

120. The suitable method for forecasting population for an old developed large city is

(A) Arithmetic mean method

(B) Geometric mean method

(C) Comparative graphical method

(D) None of the above

121. Sewage contains a major percentage of water and only _____ of solids.

(A) 10%

(B) 1%

(C) 0.1%

(D) 0.01%

Space For Rough Work

122. Sludge digestion is done by the following bacteria:

(A) Aerobic

(B) Anaerobic

(C) Facultative

(D) Pathogenic

123. The waste water coming from kitchens and bathrooms is popularly known as

(A) Sullage

(B) Sewage

(C) Domestic sewage

(D) Sanitary sewage

124. BOD_5 represents 5-day biochemical oxygen demand at a temperature of

(A) $0^\circ C$

(B) $20^\circ C$

(C) $30^\circ C$

(D) $40^\circ C$

125. The type of bacteria responsible for biological oxidation of dissolved solids in tricking filters are

(A) Pathogenic bacteria

(B) Facultative bacteria

(C) Anaerobic bacteria

(D) Aerobic bacteria

126. The most significant primary gaseous pollutant found in Automobile exhausts is.

(A) CO

(B) CO_2

(C) SO_2

(D) NO_2

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

(A) Narrow - crested weir

(B) Broad - crested weir

(C) Ogee weir

(D) Submerged weir

Space For Rough Work

128. 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) $Z - \dfrac{p}{w} - \dfrac{v^2}{2g} = \text{constant}$

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

(A) Critical velocity

(B) Velocity of approach

(C) Subsonic velocity

(D) Supersonic velocity

130. 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

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

(A) Atmospheric pressure

(B) Gauge pressure

(C) Absolute pressure

(D) Mean pressure

132. The unit of dynamic viscosity in SI units is

(A) $N{-}m/sec^2$

(B) $N{-}sec/m^2$

(C) Poise

(D) Stoke

133. The pressure at a point in a given static mass of liquid is given by

(A) $P = wh$

(B) $P = wh^2$

(C) $P = 2wh$

(D) $P = {}^{wh}/_2$

Space For Rough Work

134. The loss of head at the entrance of the pipe

(A) $\dfrac{3v^2}{2g}$

(B) $\dfrac{v^2}{4g}$

(C) $\dfrac{v^2}{2g}$

(D) $0.5\,\dfrac{v^2}{2g}$

135. The hydraulic mean depth is given by

(A) P/A

(B) A/P

(C) A P

(D) A + P

136. The fall of moisture from the atmosphere to the earth surface in any form is called

(A) Evaporation

(B) Transpiration

(C) Precipitation

(D) None of these

137. The amount of precipitation is measured by

(A) Osmoscope

(B) Rain gauge

(C) Turbidimeter

(D) All of these

138. The first watering before sowing the crop is known as

(A) Kor watering

(B) Paleo

(C) Delta

(D) Duty

139. The total depth of water required by a crop during the entire period the crop is in the field is known as

(A) Delta

(B) Duty

(C) Base period

(D) Crop period

140. When reservoir is full, the maximum compressive stress in a gravity dam is across

(A) at the heel

(B) at the toe

(C) middle of the base

(D) None of these

Space For Rough Work

141. The type of spillway generally used for gravity dam is

(A) Straight drop spillway

(B) Ogee spillway

(C) Trough spillway

(D) Siphon spillway

142. The channel used to bypass the excess water entering a canal is called

(A) Canal drop

(B) Canal regulator

(C) Canal escape

(D) None of these

143. What type of C.D. work is provided when the bed level of canal is much higher than the HFL of a stream is

(A) Aqueduct

(B) Super passage

(C) Level crossing

(D) Inlet and Outlet

144. A structure which is constructed by which silt excluded from water entering into the canal.

(A) Approach channel

(B) Divide wall

(C) Silt excluder

(D) Fish ladder

145. Any Excess water from streams, irrigation canals, storm water runoff into the unsaturated zone to reach water slowly underground water table is called

(A) Irrigation

(B) Water supply

(C) Drip irrigation

(D) Aritificial recharge

146. The ease with which the concrete can be mixed is termed as

(A) Bleeding

(B) Segregation

(C) Workability

(D) Creep

147. The attachment used to determine initial setting time of cement in a vicat apparatus is

(A) 1 mm square needle

(B) 1 mm circular needle

(C) 1 mm hexogonal needle

(D) 1 mm square needle with annular ring

Space For Rough Work

148. The aperature size of IS-Sieve used to determine fineness of cement is

(A) 50 Micron

(B) 70 Micron

(C) 90 Micron

(D) 100 Micron

149. For pavement quality concrete, the required value of compaction factor is in the range

(A) 0.7 to 0.75

(B) 0.75 to 0.8

(C) 0.8 to 0.85

(D) 0.85 to 0.9

150. To determine the target mean strength in concrete mix design, the value of standard deviation assumed for M20 grade concrete as per IS 10262 – 2009 is

(A) 3.5

(B) 4

(C) 4.5

(D) 5

151. In ND Test using ultra pulse velocity test apparatus, the pulse velocity obtained for good quality concrete will be in the range of

(A) Above 4.5

(B) 3.5 to 4.5

(C) 3.0 to 3.5

(D) Below 3.0

152. As per IS 456-2000 standard grade of concrete ranges from

(A) M10 to M20

(B) M25 to M55

(C) M60 to M80

(D) M25 to M80

153. As per IS 456-2000 modulus of Elasticity (E_c) of concrete with reference to characteristic compressive strength of concrete (F_{ck}) is given by

(A) $E_c = 5100 \sqrt{fck}$

(B) $E_c = 5500\ fck$

(C) $E_c = 5000\ fck$

(D) $E_c = 5000 \sqrt{fck}$

154. While designing a Cantilever beam, the span to depth ratio considered as per IS 456–2000 shall be

(A) 5

(B) 7

(C) 20

(D) 26

Space For Rough Work

155. The maximum distance between main bars in tension shall not be more than 3 times the dia of main bar or 300 mm whichever is less as per IS 456–2000 is applied to

(A) beam

(B) Slab

(C) Columns

(D) Brockets

156. Minimum percentage of main reinforcement in column as per IS 456–2000 is

(A) 0.6

(B) 0.8

(C) 0.4

(D) 1.0

157. In a discontinuous oneway slab maximum Bending moment is calculated using the formula

(A) $\dfrac{w l^2}{12}$

(B) $\dfrac{w l^2}{10}$

(C) $\dfrac{w l^2}{8}$

(D) $\dfrac{w l^2}{4}$

158. As per IS 456–2000, load carrying capacity of short column if the minimum eccentricity does not exceed 0.05D is given by

(A) 0.4 fck Ac + 0.67 fy Asc

(B) 0.45 fck Ac + 0.67 fy Asc

(C) 0.67 fck Ac + 0.87 fy Asc

(D) 0.45 fck Ac + 0.87 fy Asc

159. In the design of Isolated footing on soil, the minimum thickness of footing shall not be less than

(A) 75 mm

(B) 100 mm

(C) 125 mm

(D) 150 mm

160. When the height of brick masonry above the lintel is more than effective length of lintel load from brick masonry is taken as weight of brick work contained in

(A) Rectangle of height equal to effective span

(B) Rectangle of actual height above the lintel

(C) Equilateral triangle of side l

(D) None of the above

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161. As per IS 456–2000 with usual notation for isolated beam, effective flange width of beam b_f is given by

(A) $b_f = \dfrac{lo}{\left(\dfrac{lo}{b}\right)+4} + bw$

(B) $b_f = \dfrac{lo}{\left(\dfrac{lo}{bw}\right)+4} + bw$

(C) $b_f = \dfrac{lo}{\left(\dfrac{lo}{b}\right)+4} + b$

(D) $b_f = \dfrac{0.5\,lo}{\left(\dfrac{lo}{b}\right)+4} + bw$

162. One of the advantages of steel as a structural material is

(A) They do not require skilled labour for erection

(B) Steel members are cheap

(C) They can be made to any desired size and shape.

(D) The properties of steel do not change appreciably with time.

163. Rolled steel flats designated by 50 ISF 8 means that the flat is of

(A) 50 mm length and 8 mm thick

(B) 50 mm width and 8 mm thick

(C) 50 mm thick and 8 mm length

(D) 50 mm thick and 8 mm width

164. The transfer of load from column to base by direct bearing takes place in case of

(A) Gusseted base

(B) Slab base

(C) Grillage base

(D) None of the above

165. If the effective length of the strut is 2.5 m and the radius of gyration of that strut section is 20 mm, then its slenderness ratio is

(A) 125 mm

(B) 0.08 mm

(C) 0.008 mm

(D) 12.5 mm

Space For Rough Work

166. The IRC was established in

(A) 1928　　　　　　　　　　　(B) 1934

(C) 1939　　　　　　　　　　　(D) 1952

167. The transverse slope provided to the road surface is called

(A) Gradient　　　　　　　　　(B) Super elevation

(C) Camber　　　　　　　　　　(D) Longitudinal slope

168. A cement concrete road is an example for _____ pavement.

(A) Flexible　　　　　　　　　(B) Rigid

(C) Semigrid　　　　　　　　　(D) Pervious

169. The impact test is performed on road aggregate to evaluate

(A) Hardness　　　　　　　　　(B) Soundness

(C) Strength　　　　　　　　　(D) Toughness

170. The inner to inner distance between two rails in a broad gauge in Indian Railways is

(A) 1.676 m　　　　　　　　　(B) 0.676 m

(C) 1.00 m　　　　　　　　　　(D) 1.840 m

171. For broad gauge track in Indian Railways, the standard length of Rail is

(A) 12.80 m　　　　　　　　　(B) 10.97 m

(C) 11.89 m　　　　　　　　　(D) 10.50 m

172. The height of center of arm of a semaphore signal above the ground is

(A) 6.0 m　　　　　　　　　　(B) 7.50 m

(C) 8.50 m　　　　　　　　　　(D) 9.0 m

173. A number of sleepers used per rail length is known as

(A) Sleeper length　　　　　　(B) Sleeper ratio

(C) Sleeper density　　　　　　(D) Composite sleeper index

Space For Rough Work

174. The heading up of the water above its normal level while passing under a bridge is known as

(A) Afflux

(B) Free board

(C) Scour

(D) Waterway

175. The Engineer is responsible for

(A) The conception of idea for any construction work.

(B) Economic and safe design and construction of the work.

(C) Organizing, planning and execution of the work as per given drawings and specifications.

(D) Financing the construction work.

176. Graphical representation of various activities involved in a construction work is known as

(A) Critical path

(B) Gantt chart

(C) Flow chart

(D) Job layout

177. An event in the construction project is graphically represented by _____ on the network.

(A) Circle

(B) Straight line

(C) Arrow

(D) Dotted line

178. The decrease in the value of a property due to structural deterioration, wear and tear & obsolescence is called

(A) Sinking fund

(B) Depreciation

(C) Salvage value

(D) Scrap value

179. The contractor undertakes contract for the labour portion only is called

(A) Cost plus percentage contract

(B) Labour contract

(C) Item rate contract

(D) Lumpsum contract

180. The value of an asset according to its Balance Sheet Account balance is

(A) Market value

(B) Book value

(C) Scrap value

(D) Salvage value.

_____

Space For Rough Work

A1