DIPLOMA - COMMON ENTRANCE TEST-2017

CE	COURSE	DAY : SUNDAY DATE : 02-07-2017
	CIVIL	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
					C - 1	205743

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.

CONFIDENTIAL

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. Handover 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.**

PART – A

APPLIED SCIENCE

1. The value of surface tension is 80 dyne/cm. What will be its value in Nm^{-1} ?

   (A) $8\times10^{2}\ Nm^{-1}$ (B) $80\ Nm^{-1}$

   (C) $8\times10^{-2}\ Nm^{-1}$ (D) $8\times10^{3}\ Nm^{-1}$

2. Pressure at the bottom of a container having base area of $10\ m^2$ filled with water to a height of 10 m is

   (A) 9.8×10^{4} Pa (B) 980×10^{4} Pa

   (C) 9.8×10^{-4} Pa (D) 980×10^{-4} Pa

3. 100 °C when expressed in absolute scale is

   (A) 100 K (B) 0 K

   (C) 273 K (D) 373 K

4. Gas law which gives the relation between pressure and volume changes is

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

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

5. Amount of heat required to raise the temperature of one gram of water through 1 °C is

   (A) Heat capacity (B) Conductivity

   (C) Calorie (D) Joule

6. An example of longitudinal wave is

   (A) Sound waves (B) Waves on the surface of water

   (C) Light waves (D) Electromagnetic waves

Space For Rough Work

7. The relation between velocity of sound v, and absolute temperature T is

(A) $v \propto T$ (B) $v \propto \frac{1}{T}$

(C) $v \propto \sqrt{T}$ (D) $v \propto T^2$

8. The distance between a node and the next antinode in a stationary wave is equal to

(A) one wavelength (B) half wavelength

(C) twice wavelength (D) one fourth wavelength

9. Damage caused by marching military columns to the suspension bridge is due to

(A) Echo (B) Resonance

(C) Beats (D) Interference

10. During forced vibrations, if the forced frequency is F_1 and natural frequency is F_2, the body resonates if

(A) $F_1 > F_2$ (B) $F_2 > F_1$

(C) $F_1 = 2.5\, F_2$ (D) $F_1 = F_2$

11. The fundamental frequency of transverse vibrations of the stretched string is inversely proportional to

(A) tension (B) length of string

(C) square root of tension (D) square root of length of string

12. Minimum length of a hall to produce an echo is

(A) 50 m (B) 34 m

(C) 25 m (D) 17 m

Space For Rough Work

13. The property of light that Huygen's wave theory could explain is

(A) Polarisation (B) Photoelectric effect

(C) Interference (D) Compton effect

14. The spectrum of black body radiation is successfully explained by

(A) Newton's corpuscular theory of light

(B) Huygen's wave theory of light

(C) Maxwell's electromagnetic theory of light

(D) Planck's quantum theory of light

15. For constructive interference of light, the path difference should be

(A) $\frac{2n\lambda}{2}$ (B) $(2n+1)\frac{\lambda}{2}$

(C) $(2n+1)\frac{\lambda}{3}$ (D) $(2n+1)\frac{\lambda}{4}$

16. Two very close objects are just resolved if the central maximum of one object is on

(A) central maximum of another

(B) first minimum of another

(C) beyond second minimum of another

(D) between central maximum and first minimum of another

17. The light is incident at polarising angle θ_p and the angle of refraction is r, then

(A) $\theta_p + r = 0°$ (B) $\theta_p + r = 90°$

(C) $\theta_p + r = 180°$ (D) $\theta_p + r = 360°$

Space For Rough Work

18. Minimum energy required to remove an electron from the metal surface is called

(A) Kinetic energy (B) Potential energy

(C) Work function (D) Energy function

19. When the size of the scattering particle is small, the intensity of scattered light is inversely proportional to

(A) fourth power of wavelength (B) square of wavelength

(C) square root of wavelength (D) cube of wavelength

20. Time for which an atom stays in metastable state is of the order of

(A) Seconds (B) Milli-seconds

(C) Micro-seconds (D) Nano-seconds

21. If an element emits β-ray then its atomic number

(A) increases by one (B) decreases by one

(C) remains same (D) decreases by two

22. If the concentration of H^+ ions is more than 10^{-7} gm ion per litre, the solution is

(A) Base (B) Acid

(C) Neutral (D) Both Acid and Base

23. A galvanic cell is one in which

(A) chemical energy produce electric energy

(B) electric energy produce chemical energy

(C) chemical energy will not produce electric energy

(D) electric energy will not produce chemical energy

Space For Rough Work

24. The S.I. unit of Coefficient of Viscosity is

(A) Poise (B) NSm^{-2}

(C) $NS^{-1}m^2$ (D) $NS^{-1}m^{-2}$

25. The prefix used for 10^{+9} is

(A) Mega (B) Tera

(C) Giga (D) Hecta

26. The physical quantity which has the dimensional formula $[ML^0T^{-2}]$ is

(A) Force (B) Surface tension

(C) Viscosity (D) Work

27. The least count of slide callipers is given by

(A) 1 MSD + 1 VSD (B) 1 MSD × 1 VSD

(C) 1 MSD – 1 VSD (D) $\frac{1\text{ MSD}}{1\text{ VSD}}$

28. The product of force and time is

(A) Momentum (B) Moment

(C) Impulse (D) Acceleration

29. The change in position of a particle in a particular direction is referred to as

(A) Speed (B) Displacement

(C) Velocity (D) Acceleration

Space For Rough Work

30. The equation of motion of a body for distance travelled 'S_n' in the 'n^{th}' second is given by

(A) $S_n = u + \frac{a}{2}(2n-1)$ (B) $S_n = u - \frac{a}{2}(2n-1)$

(C) $S_n = u + \frac{a}{2}(2n+1)$ (D) $S_n = u - \frac{a}{2}(2n+1)$

31. A bullet of mass 0.01 kg is fired with a velocity of 960 ms^{-1} from a rifle of mass 3 kg, the velocity of recoil of rifle is

(A) $-320\ ms^{-1}$ (B) $-0.32\ ms^{-1}$

(C) $-3.2\ ms^{-1}$ (D) $-32\ ms^{-1}$

32. One of the following is not a scalar quantity :

(A) Mass (B) Density

(C) Force (D) Speed

33. If a body fixed about a point rotates in clockwise direction, the moment of force is measured as

(A) Positive (B) Negative

(C) Zero (D) Equal

34. The resultant magnitude of two forces P and Q acting in same line and in same direction is

(A) P – Q (B) P + Q

(C) Q – P (D) $\frac{P}{Q}$

Space For Rough Work

35. The resultant magnitude of two forces 6 N and 8 N acting at right angles to each other is

(A) 100 N (B) 10 N

(C) 48 N (D) 14 N

36. The value of resultant magnitude of two forces acting at a point is maximum, when the angle between the two forces is

(A) 0° (B) 90°

(C) 180° (D) 45°

37. Rise of liquid in a capillary tube is due to

(A) Energy (B) Viscosity

(C) Surface tension (D) Pressure

38. The ratio of volume stress to volume strain is called

(A) Bulk modulus (B) Young's modulus

(C) Rigidity modulus (D) Poisson's ratio

39. The reciprocal of bulk modulus of elasticity is called

(A) Compressibility (B) Rigidity

(C) Plasticity (D) Modulus of elasticity

40. The force of cohesion is maximum in

(A) Solids (B) Gases

(C) Liquids (D) Plasma

Space For Rough Work

PART – B

APPLIED MATHEMATICS

41. The equation of straight line whose intercepts are 3 and 5 on the axes is

(A) $5x - 3y = 15$ (B) $5x + 3y = 15$

(C) $5x + 3y = 1$ (D) $15x + 15y = 1$

42. The angle between the lines whose slopes are $\sqrt{3}$ and $\frac{1}{\sqrt{3}}$ respectively is

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{3}$

(C) $\frac{\pi}{4}$ (D) $\frac{\pi}{2}$

43. The equation of the straight line passing through (2, 3) and x intercept is twice its y intercept is

(A) $x + 2y = 8$ (B) $x - 2y = 8$

(C) $x + y = 4$ (D) $2x + 2y = 8$

44. The equation to the line passing through the point (–6, 7) and parallel to the line joining (3, 4) and (6, –8) is

(A) $4x + y + 31 = 0$ (B) $x + 4y - 1 = 0$

(C) $x - 4y + 1 = 0$ (D) $4x + y + 17 = 0$

45. $\lim_{\theta \to \pi/2} (\sec \theta - \tan \theta)$ is equal to

(A) 0 (B) 1

(C) $\frac{\pi}{2}$ (D) π

46. $\lim_{x \to 4} \frac{x-4}{3-\sqrt{13-x}}$ is equal to

(A) 3 (B) 9

(C) 6 (D) 0

Space For Rough Work

47. If $y = (1+\log x)^5$, then $\frac{dy}{dx}$ is

(A) $5(\log x)^4$ (B) $\frac{5}{x}(1+\log x)^4$

(C) $5(1+\log x)^4$ (D) $5x^4 \log x$

48. If $x = \cos^{-1} t$ and $y = \sin^{-1} t$, then $\frac{dy}{dx}$ is

(A) -1 (B) 1

(C) $\frac{1}{2\sqrt{1-t^2}}$ (D) $\frac{2}{\sqrt{1-t^2}}$

49. If $y = x \log y$, then $\frac{dy}{dx}$ is

(A) $\frac{\log x^x}{x-y}$ (B) $\frac{\log y^x}{x-y}$

(C) $\frac{\log y^y}{x-y}$ (D) $\frac{\log y^y}{y-x}$

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

(A) $\frac{1}{(x+2)^2}$ (B) $\frac{2x+3}{(x+2)^2}$

(C) $-\frac{1}{(x+2)^2}$ (D) $\frac{2x-3}{(x+2)^2}$

51. The equation of tangent to the curve $y^2 = 4x$ at (1, 2) is

(A) $x + y - 3 = 0$ (B) $x - y + 1 = 0$

(C) $2x - y = 0$ (D) $2x + y - 4 = 0$

Space For Rough Work

52. The maximum value of $7 - 8x - 2x^2$ is

(A) 15 (B) -4

(C) -2 (D) 31

53. The value of $\int \log 2x \, dx$ is

(A) $x \log 2x + x + C$ (B) $x \log 2x - x + C$

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

54. The value of $\int \sec^4 x \cdot \tan x \, dx$

(A) $\frac{\sec^4 x}{4} + C$ (B) $4 \sec^4 x + C$

(C) $3 \sec^2 x + C$ (D) $\frac{\tan^4 x}{4} + C$

55. The value of $\int x \log x \, dx$ is

(A) $\frac{x^2}{2} \log x - \frac{x^2}{2} + C$ (B) $\frac{x^2}{2} \log x + \frac{x^2}{2} + C$

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

56. $\int_0^{\pi/4} \tan^2 x \, dx$ is equal to

(A) $\frac{\pi}{4} - 1$ (B) $1 - \frac{\pi}{4}$

(C) $\frac{\pi^2}{16}$ (D) $\frac{\pi^2}{16} - 1$

Space For Rough Work

57. The value of $\int_0^1 x\sqrt{1-x^2}\,dx$ is

(A) $-\frac{1}{3}$ (B) 0

(C) ∞ (D) $\frac{1}{3}$

58. The volume generated by revolving the line $y = x + 1$ about the x-axis between the ordinates $x = 0$ and $x = 2$

(A) $\frac{26\pi}{3}$ units (B) $\frac{10\pi}{3}$ units

(C) $\frac{26}{3}$ units (D) 4 units

59. The degree and order of the differential equation $\frac{d^2y}{dx^2} = \left[1+\left(\frac{dy}{dx}\right)^2\right]^{1/3}$ are

(A) 2 and 1 (B) 1 and 2

(C) 3 and 2 (D) 2 and 3

60. The solution of differential equation $\frac{dy}{dx} + y \tan x = \sec x$ is

(A) $y \sec x = \tan x + C$

(B) $y \sin x = \sec x + C$

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

(D) $y \sec x = -\cot x + C$

Space For Rough Work

61. The value of x if $\begin{vmatrix} 1 & 2 & 3 \\ 2 & x & 3 \\ 3 & 4 & 3 \end{vmatrix} = 0$ is

(A) 0 (B) -3

(C) 3 (D) 18

62. The value of x, if $4x + y = 7$, $3y + 4z = 5$ and $3z + 5x = 2$ is

(A) 0 (B) 1

(C) 3 (D) -1

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

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

(C) $-\frac{1}{11}\begin{bmatrix} -4 & -3 \\ 1 & 2 \end{bmatrix}$ (D) $-\frac{1}{11}\begin{bmatrix} -4 & 1 \\ -3 & 2 \end{bmatrix}$

64. The characteristic equation of the matrix $A = \begin{bmatrix} 2 & -1 \\ 5 & -6 \end{bmatrix}$ is

(A) $A^2 + 8A - 7I = 0$ (B) $A^2 + 4A - 17I = 0$

(C) $A^2 + 4A + 7I = 0$ (D) $A^2 + 4A - 7I = 0$

Space For Rough Work

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

(A) $\begin{bmatrix} 3 & 2 \\ -2 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 3 & -2 \\ 2 & 0 \end{bmatrix}$

(C) $\begin{bmatrix} -2 & 3 \\ 2 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 3 \\ -2 & 2 \end{bmatrix}$

66. The middle term of the expansion of $\left(x^2 - \frac{2}{x}\right)^{24}$ is

(A) ${}^{24}C_{10}2^{10}x^{12}$ (B) ${}^{24}C_{11}2^{12}x^{12}$

(C) ${}^{24}C_{13}2^{10}x^{10}$ (D) ${}^{24}C_{12}2^{12}x^{12}$

67. The term independent of x in $\left(x^2 - \frac{4}{3x}\right)^9$ is

(A) ${}^{9}C_{6}(4)^{6}$ (B) ${}^{9}C_{6}(3)^{-6}$

(C) ${}^{9}C_{6}\left(\frac{4}{3}\right)^{6}$ (D) ${}^{9}C_{6}\left(\frac{3}{4}\right)^{6}$

68. If $3i - 2j + k$, $i - 3j + 5k$, $2i + j - 4k$ are the sides of a triangle, then the triangle is

(A) Right angled triangle (B) Equilateral triangle

(C) Isosceles triangle (D) Isosceles right angled triangle

69. If $\vec{a} = (2, -1, 4)$ and $\vec{b} = (2, -3, 4)$, then projection of $\vec{a}$ on $\vec{b}$ is

(A) $\frac{23}{\sqrt{21}}$ (B) $\frac{23}{\sqrt{29}}$

(C) $\frac{-23}{\sqrt{29}}$ (D) $\frac{-23}{\sqrt{21}}$

Space For Rough Work

70. The sine of the angle between the vectors $(2i - 2j + k)$ and $2i + j + 2k$ is

(A) $\frac{\sqrt{65}}{3}$ (B) $\frac{\sqrt{65}}{\sqrt{3}}$

(C) $\frac{\sqrt{65}}{9}$ (D) $\sqrt{65}$

71. If $x \sin^2 45 = \frac{\tan^2 45 + \cot^2 30}{\sin^2 45 + \cos^2 45}$ then the value of x is

(A) 4 (B) 2

(C) 6 (D) 8

72. The value of $\frac{4}{3}\sec^2 \frac{\pi}{3} - \operatorname{cosec}^2 \frac{\pi}{6} + \frac{3}{4}\tan^2 \frac{\pi}{4} - 2\sin^2 \frac{\pi}{3}$ is

(A) $-\frac{11}{12}$ (B) $\frac{53}{12}$

(C) $\frac{7}{12}$ (D) $-\frac{7}{12}$

73. The value of

$$\frac{\sin(90-\theta)}{\cos(360-\theta)} + \frac{\sec\left(\frac{3\pi}{2}+\theta\right)}{\operatorname{cosec}(\pi+\theta)} + \frac{\tan(180-\theta)}{\tan(-\theta)} \text{ is}$$

(A) 1 (B) -1

(C) 3 (D) 2

74. The value of cosec 43 cot 43 cot 47 cos 47

(A) 1 (B) 0

(C) -1 (D) 2

Space For Rough Work

75. The value of $\frac{\tan 69^\circ + \tan 66^\circ}{1 - \tan 69^\circ \tan 66^\circ}$

(A) 1 (B) -1

(C) 0 (D) ∞

76. If $\tan \frac{A}{2} = x$ then sin A + tan A is

(A) $\frac{4x}{1-x^2}$ (B) $\frac{4x}{1+x^2}$

(C) $\frac{4x}{1+x^4}$ (D) $\frac{4x}{1-x^4}$

77. The value of $\sin 70^\circ - \sin 50^\circ - \sin 10^\circ$ is

(A) 1 (B) 0

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

78. $\sin^{-1} x$ is also equal to

(A) $\text{cosec}^{-1}\left(\frac{1}{x}\right)$ (B) $\text{cosec}\, x$

(C) $\text{cosec}^{-1} x$ (D) $\frac{1}{\sin x}$

79. Centroid divides the median in the ratio

(A) 2 : 1 (B) 1 : 2

(C) 1 : 1 (D) 1 : 4

80. The co-ordinates of a point which divides the line join of the points (a + b, a − b) and (a − b, a + b) in the ratio 2 : 3 is

(A) $\frac{5a+5b}{5}, \frac{5a-5b}{5}$ (B) $\frac{a+b}{5}, \frac{a-b}{5}$

(C) $\frac{5a+b}{5}, \frac{5a-b}{5}$ (D) $\frac{5a-b}{5}, \frac{a+5b}{5}$

Space For Rough Work

PART – C
CIVIL ENGINEERING

It consists of **81** to **180** questions :

81. The shear stress at the outer most fibres of a circular shaft under torsion is
(A) zero (B) minimum
(C) maximum (D) infinity

82. The total force exerted by a liquid on an immersed surface in termed as
(A) pressure (B) intensity of pressure
(C) total pressure (D) centre of pressure

83. Mathematically, the Bernoulli's equation can be stated as
(A) $z_1 + \frac{v_2^2}{2g} + \frac{P_1^2}{w} = \text{constant}$ (B) $3z_1 + \frac{v_1^2}{2g} + \frac{P_1}{w} = \text{constant}$
(C) $z + \frac{v^2}{2g} + \frac{P}{w} = \text{constant}$ (D) $z + \frac{v^2}{2g} + \frac{P^3}{w} \neq \text{constant}$

84. The theoretical velocity of the jet at vena contracta is given by the relation _____. Where, 'h' is the head of water at vena contracta.
(A) $v = \sqrt{gh}$ (B) $v = \sqrt{2gh}$
(C) $v = \frac{\sqrt{h^2}}{2g}$ (D) $v = \sqrt{3gh}$

85. The discharge Q over a triangular notch is given by _____.
Where, θ = angle of the notch and
H = Head over the match
(A) $\frac{8}{15} Cd \sqrt{2g} \tan\frac{\theta}{2} H^{\frac{3}{2}}$ (B) $\frac{8}{15} Cd \sqrt{2g} \tan\frac{\theta}{2} H^{\frac{5}{2}}$
(C) $\frac{15}{8} Cd \sqrt{2g} \tan\frac{\theta}{2} H^{\frac{5}{2}}$ (D) $\frac{8}{15} Cd \sqrt{2g} \tan\frac{\theta}{4} H^{\frac{5}{2}}$

86. If there are 'n' number of end contractions, then the Francis formula for discharge over a rectangular weir becomes
(A) $Q = \frac{2}{3} Cd (L - H) \sqrt{2g} H^{\frac{5}{2}}$ (B) $Q = \frac{3}{2} Cd L \sqrt{2g} H^{\frac{3}{2}}$
(C) $Q = \frac{2}{3} Cd (L - 0.1 nH) \sqrt{2g} H^{\frac{3}{2}}$ (D) $Q = \frac{2}{3} Cd (L - 0.1 H) \sqrt{2g} H^{\frac{3}{2}}$

Space For Rough Work

87. The hydraulic mean depth of an open channel is given by

(A) $m = \frac{P}{A}$ (B) $m = A \times P$

(C) $m = \frac{A}{P}$ (D) $m = A + P$

88. The loss of head at the entrance of the pipe is given by _____.
Where 'v' is the velocity of flow in the pipe.

(A) $0.375 \frac{v^2}{2g}$ (B) $\frac{v^2}{2g}$

(C) $0.5 \frac{v^2}{2g}$ (D) $\frac{v^2}{4g}$

89. In case of Francis turbine, after doing the work, water discharged to the tail race through the

(A) nozzle (B) penstock

(C) draft tube (D) impeller

90. The moisture condensed from the atmosphere in small drops upon cool surfaces is known as

(A) drizzle (B) snow

(C) dew (D) glaze

91. Where steep land is available, the method of irrigation adopted is

(A) free flooding (B) border flooding

(C) check flooding (D) basin flooding

92. A canal aligned at right angles to the contour of a country is known as

(A) side slope canal (B) contour canal

(C) watershed canal (D) branch canal

93. Gravity dams are generally provided with

(A) free fall spillway (B) Ogle spillway

(C) Chute spillway (D) Tunnel spillway

Space For Rough Work

94. An arrangement which is made at the junction of water courses and distributers in a canal is called

(A) canal regulator (B) canal outlet

(C) canal inlet (D) sluice gate

95. _____ groynes are constructed in such a way that it is pointing towards upstream of an angle of $10^{\circ} - 30^{\circ}$ to the normal to the bank.

(A) Attracting groynes (B) Deflecting groynes

(C) Repelling groynes (D) Compelling groynes

96. An aquifer where water is collected in a cup like shape of an impervious strata below the ground surface is called _____ aquifer.

(A) unconfined aquifer (B) confined aquifer

(C) Aquiclude (D) perched aquifer

97. The curve which join the new water level to the unaffected water table and thus forming a depression is called

(A) Cone of depression (B) Radius of depression

(C) Depression head (D) Depression yield

98. In limit state method of design the partial safety factor for concrete is

(A) 1.4 (B) 1.2

(C) 1.15 (D) 1.5

99. Minimum percentage of reinforcement in slabs for Fe250 grade steel is

(A) 0.12 % (B) 0.15%

(C) 0.20% (D) 0.30%

100. The tension member in a truss is known as

(A) strut (B) tie

(C) column (D) bracing

Space For Rough Work

101. The limiting value of moment of resistance of a balanced RC beam of effective size b × d and Fe415 steel is given by

(A) 1.38 fck bd^2 (B) 0.133 fck bd^2

(C) 0.138 fck bd^2 (D) 0.148 fck bd^2

102. The maximum strain in concrete at the outer most compression fibre of a beam in limit state method is

(A) 0.05 (B) 0.0035

(C) 0.446 (D) 0.67

103. The minimum percentage of steel in case of an axially loaded RCC column is given by

(A) 1% (B) 0.8%

(C) 0.5% (D) 0.2%

104. Admixtures which cause early setting and hardening of concrete are called

(A) Retarders (B) Accelerators

(C) Air entraining agents (D) Water proofing agents

105. The limiting value of the depth of neutral axis i.e. $\frac{\chi_{umax}}{d}$ for Fe415 steel is

(A) 0.48 (B) 0.46

(C) 0.53 (D) 0.32

106. The required section modulus (z) for a steel beam bending is

(A) $Z = \frac{M}{fbc}$ (B) $Z = M\ fbc$

(C) $Z = \frac{fbc}{M}$ (D) $Z = M$

Where fbc = permissible bending stress

and M = maximum bending moment

Space For Rough Work

107. The strength of material below which not more than 5% of the test results are expected to fall is

(A) characteristic strength (B) ultimate strength

(C) yield strength (D) elastic limit

108. The pressure variation diagram of water pressure on a masonry dam is

(A) Trapezoidal (B) Rectangular

(C) Circular (D) Triangular

109. If R is the rise, T is the tread and W is the weight of waist slab on the slope, then the equivalent weight on the horizontal plane will be equal to

(A) $\frac{W(R+T)}{T}$ (B) $\frac{WT}{R+T}$

(C) $\frac{W\sqrt{R^2+T^2}}{T}$ (D) $\frac{W\sqrt{R^2+T^2}}{R}$

110. The vertical wells provided along the banks of a river to draw ground water in dry season are called

(A) open wells (B) tube wells

(C) Artesian wells (D) infiltration wells

111. Per capita domestic consumption of water per day on an average in India is taken as

(A) 185 litres (B) 135 litres

(C) 300 litres (D) 200 litres

112. The permissible pH values of water for public supplies shall range from

(A) 5.5 to 7.5 (B) 6 to 7.5

(C) 6.5 to 8.5 (D) 5.1 to 9.2

113. The process of purifying water by passing it through a bed of fine granular material is called

(A) screening (B) filteration

(C) coagulation (D) sedimentation

Space For Rough Work

114. The system which is suitable for well planned roads and streets :

(A) Dead end system
(B) Grid iron system
(C) Ring system
(D) Radial system

115. Burning of solid waste is done in

(A) digester
(B) incinerator
(C) hopper
(D) filter

116. Aerosol is

(A) carbon particle of microscopic size
(B) dispersion of small solid or liquid particles in gas media
(C) finely divided particles of ash
(D) diffused liquid particles

117. The ruling gradient in plain terrain for roads is

(A) 1 in 20
(B) 1 in 30
(C) 1 in 15
(D) 1 in 50

118. Expansion joints in cement concrete pavements are provided at an interval of

(A) 10 m
(B) 15 m
(C) 18 m to 21 m
(D) 25 to 30 m

119. In a bituminous pavements, cracking is mainly due to

(A) Inadequate wearing course
(B) Inadequate thickness of sub base course of pavements
(C) Use of excessive bituminous materials
(D) Fatigue arising from repeated stress application

120. A WBM road is an example of

(A) rigid pavement
(B) semi-rigid pavement
(C) flexible pavement
(D) concrete road

Space For Rough Work

121. The temporary structure constructed in a river for excluding water from a given site to enable the construction of a bridge is called

(A) culvert
(B) low level bridge
(C) coffer dam
(D) caisson

122. The orientation of preferential run way in an airport is influenced by

(A) Direction of prevailing wind and adequate length
(B) Adequate waiting and service facilities
(C) Convenience of terminal and control facilities
(D) Stable ground and adequate turning space.

123. The number of sleepers used per rail length on the track is known as

(A) sleeper intensity
(B) sleeper volume
(C) sleeper density
(D) sleeper index

124. _____ yard is required to separate goods wagons received from various centres in the order of stations to which they are to be sent.

(A) Passenger yard
(B) Goods yard
(C) Marchalling yard
(D) Locomotive yard

125. Creep is the _____ movement of rail.

(A) longitudinal
(B) lateral
(C) vertical
(D) circular

126. Two cross overs are laid between two tracks in the case of

(A) Diamond crossings
(B) Scissors crossings
(C) Level crossings
(D) Square crossing

127. Tunnel alignment is carried out by

(A) surface theodolite traverse
(B) triangulation
(C) compass traverse
(D) aerial photography

Space For Rough Work

128. Structures built parallel to the shore line to prolict a shore area is

(A) Jetties (B) Break water

(C) Moors (D) Wharfs

129. CPM is oriented with

(A) event (B) time

(C) activity (D) money

130. The measurement recorded by junior engineer to be scrutinized for its accuracy by the executive engineer is called

(A) pre measurement (B) check measurement

(C) post measurement (D) actual measurement

131. An offer in writing to execute some specified work or to supply materials is

(A) contract agreement (B) indent

(C) security deposit (D) tender

132. The person responsible for setting of a business or an enterprise is called

(A) enterpreneur (B) owner

(C) contractor (D) engineer

133. A technique of determining the fair price of a property such as a building is known as

(A) Estimating (B) Quantity surveying

(C) Valuation (D) Rent fixation

134. _____ is the value of a property of a particular year which is obtained by deducting the amount of depreciation up to the previous year from the original cost.

(A) Capital value (B) Market value

(C) Book value (D) Capitalized value

Space For Rough Work

135. The quantity of earth work of a trapezoidal channel of base width B, depth d and side slopes S and length of chainage L can be calculated by using the formula

(A) $(Bd + Sd^2)\ L$ (B) $(Bd + S^2d)\ L$

(C) $(Bd^2 + Sd)L$ (D) $(Bd + Sd)\ L$

136. A book which is maintained by PWD showing the rate of all the items of works, materials and labour is known as _____ book.

(A) Schedule of estimate (B) Schedule of account

(C) Schedule of materials and labour (D) Schedule of rate

137. A line of 1 metre is shown by 1 cm on a scale. Its representative fraction is

(A) 1 (B) 100

(C) $\frac{1}{100}$ (D) $\frac{1}{50}$

138. The Isometric projection of a circle is a/an

(A) circle (B) ellipse

(C) hyperbola (D) parabola

139. Ease water of an intermediate pier in a deck slab bridge shall be

(A) semi circular (B) rectangular

(C) hexagonal (D) pentagonal

Space For Rough Work

140. The physical classification divides the rocks into

(A) Calcareous, Argillaceous and Silicious

(B) Igneous, Sedimentary and Metamorphic

(C) Stratified, Unstratified and Foliated

(D) Organic, Semi-organic, Inorganic

141. Formation of white deposits on the bricks due to presence of salt in brick earth is called

(A) warping (B) efflorescence

(C) disintegration (D) solidifying

142. The initial setting time of cement for ordinary cement is

(A) 60 minutes (B) 120 minutes

(C) 90 minutes (D) 30 minutes

143. The preservative used to prevent the timber against the attack of white ant is

(A) Oil paint (B) ASCU treatment

(C) Coaltar (D) Chemical salt

144. The defect caused by the rupture of tissue in a circular direction is

(A) Heart shake (B) Star shake

(C) Cup shake (D) Radial shake

145. Aluminium Bronze is an alloy of

(A) aluminium and tin (B) aluminium and copper

(C) aluminium and steel (D) aluminium and zinc

146. Varnish is applied to

(A) metal (B) wood

(C) concrete surface (D) masonry surface

Space For Rough Work

147. The liquid part in a paint is called

(A) vehicle (B) pigment

(C) solvent (D) drier

148. The bearing capacity is maximum for

(A) Hard rocks (B) Black cotton soil

(C) Dry, coarse, sandy soil (D) Fine sandy soil

149. Exposed vertical surface perpendicular to the door frame is known as

(A) jamb (B) reveal

(C) mullion (D) scabling

150. A brick which is half as made as a full brick is called

(A) king closer (B) mitred closer

(C) bevelled closer (D) queen closer

151. The brick laid with it's length parallel to the face of the wall is called as

(A) closer (B) course

(C) stretcher (D) header

152. The vertical window provided in the sloping side of a pitched roof is called

(A) Dormer window (B) Louvered window

(C) Bay window (D) Corner window

153. The highest point on the extrados of an arch is called

(A) skewback (B) crown

(C) voussoir (D) keystone

154. The tapering step radiate from a common centre to change the direction of a flight is called

(A) winder (B) baluster

(C) soffit (D) pitch

Space For Rough Work

155. The type of stair in which the flights run in opposite direction and there is no space between them :

(A) spiral stair (B) circular stair

(C) doglegged stair (D) straight stair

156. A temporary structure required to support an unsafe structure is called

(A) underpinning (B) scaffolding

(C) raking (D) shoring

157. The process of covering rough surfaces of walls, columns, ceilings and other building components with mortar is called

(A) plastering (B) damping

(C) pointing (D) facing

158. The bearing of line AB measured from B towards A is known as

(A) Fore bearing (B) Back bearing

(C) Fore sight (D) Back sight

159. The area enclosed in a contour map is found by

(A) planimeter (B) line ranger

(C) pantagraph (D) cross staff

160. The staff reading taken on a point of known elevation in levelling is called

(A) Fore sight (B) Back sight

(C) Intermediate sight (D) Fore bearing

161. If the whole circle bearing of a line is 280°. Its reduced bearing is

(A) S 10° W (B) S 80° W

(C) N 10° W (D) N 80° W

162. The horizontal angle between true meridian and magnetic meridian is known as

(A) dip (B) bearing

(C) magnetic declination (D) convergence

Space For Rough Work

163. If L = Latitude, D = Departure, the closing error(e) in case of a closed traverse is given by

(A) $e = \Sigma L^2 + \Sigma D^2$ (B) $e = \sqrt{\Sigma L^2 + \Sigma D^2}$

(C) $e = \Sigma L^2 - \Sigma D^2$ (D) $e = \sqrt{\Sigma L^2 - \Sigma D^2}$

164. If the long chord and tangent length of a circular curve of radius R are equal, then the deflection angle is

(A) 30° (B) 60°

(C) 90° (D) 120°

165. If Δ is the deflection angle of a simple circular curve of radius R, the length of the curve is

(A) $\frac{\pi R\Delta}{90}$ (B) $\frac{\pi R\Delta}{180}$

(C) $\frac{\pi R\Delta}{270}$ (D) $\frac{\pi R\Delta}{360}$

166. One of the tacheometric constant is additive, the other constant is

(A) Indicative constant (B) Multiplying constant

(C) Dividing constant (D) Subtractive constant

167. The measured distance perpendicular to the meridian is called

(A) Latitude (B) Departure

(C) Dip (D) Declination

168. Turning of the theodolite telescope in vertical plane by 180° about the horizontal axis is known as

(A) centring (B) setting

(C) transiting (D) swinging

169. In an optical square the mirrors are fixed at an angle of

(A) 30° (B) 45°

(C) 60° (D) 90°

Space For Rough Work

170. The moment of inertia of a triangular lamina whose height is 'h' and base 'b' about its centroidal X-X axis is

(A) $\frac{bh^3}{36}$ (B) $\frac{bh^3}{12}$

(C) $\frac{b^3h}{36}$ (D) $\frac{b^3h}{12}$

171. Hook's law holds good up to

(A) yield point (B) elastic limit

(C) plastic limit (D) breaking point

172. The resultant of force system will have same moment as the sum of the moments of each force of concurrent, coplanar system. The statement relates to

(A) Variynons' theorem (B) Lauri's theorem

(C) reciprocal theorem (D) law of polygon of forces

173. The change in length due to tensile or compressive force acting on a body is given by

(A) $\frac{P/A}{E}$ (B) $\frac{P/}{AE}$

(C) $\frac{E}{P/A}$ (D) $\frac{AE}{P/}$

Where,

P = Tensile or compressive force acting on the body

/ = Original length

A = Cross-sectional area of the body, and

E = Young's modulus for the material of the body

174. The total strain energy stored in a body is termed as

(A) resilience (B) proof resilience

(C) Impact energy (D) modulus of resilience

Space For Rough Work

175. The bending moment at the free-end of a cantilever beam is

(A) zero (B) minimum

(C) infinity (D) maximum

176. The shear force of a cantilever beam of length 'l' carrying a uniformly distributed load w/unit length is _____ at the free-end.

(A) zero (B) $\frac{wl}{4}$

(C) $\frac{wl}{2}$ (D) wl

177. The neutral axis of the cross section of a beam is that axis at which the bending stress is

(A) zero (B) minimum

(C) maximum (D) infinity

178. The section modulus of a rectangular section about an axis through centre of gravity, is

(A) $\frac{b}{2}$ (B) $\frac{d}{2}$

(C) $\frac{bd^2}{2}$ (D) $\frac{bd^2}{6}$

179. The relation between equivalent length (L) and actual length (l) of a column for both ends fixed is

(A) $L = \frac{l}{2}$ (B) $L = \frac{l}{\sqrt{2}}$

(C) $L = l$ (D) $L = 2l$

180. When a shaft is subjected to a twisting moment, every cross-section of the shaft will be under

(A) tensile stress (B) compressive stress

(C) shear stress (D) bending stress

Space For Rough Work

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