

DIPLOMA - COMMON ENTRANCE TEST-2016

CE	COURSE	DAY : SUNDAY
	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
	A - 1	106781

DOs :

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

DON'Ts :

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

IMPORTANT INSTRUCTIONS TO CANDIDATES

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

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



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

CE-A1



PART - A
APPLIED SCIENCE

1. An example of basic S.I. unit is
(A) Newton (B) Joule
(C) Ampere (D) Watt

2. The prefix used for 10^{+2} is
(A) hecta (B) centi
(C) pico (D) peta

3. An example of dimensionless physical quantity is
(A) surface tension (B) strain
(C) impulse (D) period

4. The velocity of a freely falling body gradually _____ as it falls.
(A) decreases (B) increases
(C) remains same (D) increases and then decreases

5. A main scale is divided into half mm and having a vernier containing 20 divisions has a least count of _____ cm.
(A) 2.5×10^{-2} (B) 0.5×10^{-2}
(C) 0.025×10^{-2} (D) 0.25×10^{-2}

6. For a particular mass of the moving body, its friction is minimum when it is
(A) sliding (B) static
(C) rolling (D) dragged

Space For Rough Work

7. All equations of motion hold good under the condition of
- (A) constant velocity (B) constant acceleration
(C) variable velocity (D) variable acceleration
8. A force of 1.5×10^{-2} N acts for 3 seconds on a body of mass 0.05 kg moving with velocity 4 m/s. The final velocity of the body is
- (A) 4.9 m/s (B) 18 m/s
(C) 9 m/s (D) 7.5 m/s
9. To check the equilibrium of five coplanar concurrent forces, we use law of
- (A) Parallelogram of forces (B) Triangle of forces
(C) Lami's theorem (D) Polygon of forces
10. The S.I. unit of momentum is
- (A) kg m (B) $\text{kg m}^{-1}\text{s}^{-1}$
(C) kg m s^{-2} (D) kg m s^{-1}
11. When three forces acting at a point are in equilibrium, the angle opposite to biggest force is always _____ angle.
- (A) biggest (B) smallest
(C) equal to other (D) obtuse
12. Towing of a boat by two forces is an illustration of
- (A) Law of parallelogram of forces. (B) Lami's theorem.
(C) Law of triangle of forces, (D) Law of polygon of forces.

Space For Rough Work

13. Two forces 3N and 5N acts on a body simultaneously making an angle 60° between them. The resultant force on the body is
- (A) 8 N (B) 4 N
(C) 7 N (D) 49 N
14. Dimensional formula for stress is
- (A) $[LM^{-1}T^{-2}]$ (B) $[L^{-1}MT^{-2}]$
(C) $[L^{-1}M^{-1}T]$ (D) $[L^2M^{-1}T^{-2}]$
15. The pull in the bicycle chain is an example of
- (A) tensile stress (B) volume stress
(C) shear stress (D) shear strain
16. Viscosity of water at 20°C in centipoise is
- (A) 1.792 (B) 0.650
(C) 1.005 (D) 0.470
17. Dimensional formula of surface tension is
- (A) $[LMT^{-2}]$ (B) $[L^2MT^{-2}]$
(C) $[LM^{-1}T^{-2}]$ (D) $[L^0MT^{-2}]$
18. A steel needle can be floated on the surface of water because of the
- (A) density of steel is greater than water
(B) density of steel is less than water
(C) surface tension
(D) viscosity

Space For Rough Work

19. Thrust on the bottom of the container having a base area of 10 m^2 filled with water to a height of 6 m is
- (A) $60 \times 10^2 \text{ N}$ (B) $58.8 \times 10^4 \text{ N}$
(C) 60.8 N (D) 600 N
20. Keeping the temperature constant, if the pressure of the gas is doubled its volume
- (A) remains constant (B) doubles
(C) reduces to one fourth (D) reduces to half
21. Heat transfer in the absence of the medium is
- (A) conduction (B) convection
(C) radiation (D) absorption
22. Zero of absolute scale of temperature is at
- (A) 0°C (B) 100°C
(C) 273°C (D) -273°C
23. Ripples on water surface is an example of
- (A) electromagnetic waves (B) transverse waves
(C) waves travelling in space (D) longitudinal waves
24. The time interval between two consecutive waxing and waning of sound waves is
- (A) beat period (B) wave period
(C) beat frequency (D) wave frequency

Space For Rough Work

25. S.I. unit of intensity of sound is
(A) watt per square meter (B) watt per meter
(C) watt square meter (D) watt meter
26. The study of characteristics of buildings with reference to sound is
(A) resonance (B) interference
(C) echo (D) acoustics
27. The distance travelled by the disturbance in the medium for one complete oscillation is
(A) wave velocity (B) wavelength
(C) wave frequency (D) wave amplitude
28. Momentum of a photon is given by
(A) $P = \frac{\lambda}{h}$ (B) $P = \frac{h}{\lambda}$
(C) $P = \lambda h$ (D) $P = \lambda^2 h$
29. The velocity of sound in case of liquids is given by
(A) $\sqrt{\frac{d}{k}}$ (B) \sqrt{kd}
(C) $\sqrt{\frac{k}{d}}$ (D) $\sqrt{\frac{d^2}{k}}$
30. A tuning fork vibrating in air is an example of
(A) damped free vibrations (B) resonant vibrations
(C) undamped free vibrations (D) forced vibrations

Space For Rough Work

31. Raman lines are
- (A) unpolarised (B) polarised
(C) diffracted (D) reflected
32. A crystal which has two optic axes is
- (A) calcite (B) quartz
(C) mica (D) glass
33. Electron microscope is used to
- (A) study virus and bacteria
(B) view three dimensional images
(C) automatic switching on and off of street-lights
(D) electronic industry for soldering
34. Which of the following statements is correct in case of γ -rays ?
- (A) Penetrating power is less than β -rays.
(B) Penetrating power is less than α -rays.
(C) Penetrating power is very high,
(D) γ particles are nothing but electrons.
35. For destructive interference of light the path difference should always be
- (A) $(2n + 1) \frac{\lambda}{2}$ (B) $\frac{n\lambda}{2}$
(C) $(2n + 1) \frac{\lambda}{3}$ (D) $n\lambda$

Space For Rough Work

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

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

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

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

(A) first maximum (B) second maximum

(C) first minimum (D) second minimum

38. Resolving power of microscope is given by

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

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

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

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

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

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

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

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

(A) acidic medium (B) basic medium

(C) neutral medium (D) moisture

Space For Rough Work

PART - B
APPLIED MATHEMATICS

41. The value of the determinant $A = \begin{vmatrix} 1 & 1 & 1 \\ 3 & 3 & 3 \\ 4 & 5 & 6 \end{vmatrix}$ is
- (A) 1 (B) 3
(C) -2 (D) 0
42. The value 'x' by Cramer's rule in $3x + 2y = 4$ and $x - 2y = 8$ is
- (A) 12 (B) 3
(C) -13 (D) 15
43. If $A = \begin{bmatrix} 2 & -3 \\ 1 & 5 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 \\ 4 & -3 \end{bmatrix}$, then $A + 2B$ is
- (A) $\begin{bmatrix} 4 & 1 \\ 9 & -1 \end{bmatrix}$ (B) $\begin{bmatrix} 4 & 1 \\ 9 & 1 \end{bmatrix}$
(C) $\begin{bmatrix} 3 & -1 \\ 5 & 2 \end{bmatrix}$ (D) $\begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix}$
44. If $A = \begin{bmatrix} 2 & 3 & 4 \\ -2 & x & -4 \\ -5 & 6 & 7 \end{bmatrix}$ is singular, then the value of x is
- (A) -3 (B) 3
(C) $\frac{1}{3}$ (D) $\frac{-1}{3}$

Space For Rough Work

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

(A) 3 sq. units

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

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

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

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

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

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

(C) $\tan^2 \theta$

(D) $2 \operatorname{cosec}^2 \theta$

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

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

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

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

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

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

(A) $\sin A$

(B) $\operatorname{cosec} A$

(C) $-\sin A$

(D) $-\operatorname{cosec} A$

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

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

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

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

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

Space For Rough Work

55. The value of $\cos 105^\circ$ is

- (A) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ (B) $\frac{\sqrt{3}+1}{2\sqrt{2}}$
(C) $\frac{2\sqrt{2}}{1-\sqrt{3}}$ (D) $\frac{1-\sqrt{3}}{2\sqrt{2}}$

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

- (A) $\sqrt{2}+1$ (B) $1-\sqrt{2}$
(C) $\sqrt{2}-1$ (D) $-1-\sqrt{2}$

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

- (A) $\cos 8x + \cos 2x$ (B) $\frac{1}{2}(\cos 8x + \cos 2x)$
(C) $\frac{1}{2}(\sin 8x + \sin 2x)$ (D) $\frac{1}{2}(\cos 8x - \cos 2x)$

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

- (A) $\frac{\pi}{4}$ (B) $\frac{\pi}{3}$
(C) 1 (D) $\tan^{-1}\left(\frac{1}{7}\right)$

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

- (A) $\sqrt{29}$ (B) $\sqrt{21}$
(C) $\sqrt{3}$ (D) 29

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

- (A) (-34, -3) (B) (34, 3)
(C) $\left(\frac{14}{5}, \frac{21}{5}\right)$ (D) (34, -3)

Space For Rough Work

61. The area of triangle with the vertices (5, 3), (4, 6) and (5, 8) is
- (A) $\frac{15}{2}$ sq. units (B) 15 sq. units
- (C) $\frac{5}{2}$ sq. units (D) $\frac{45}{2}$ sq. units
62. The slope of the line making an angle 150° with the x -axis is
- (A) $-\frac{1}{\sqrt{3}}$ (B) $\frac{1}{\sqrt{3}}$
- (C) $\sqrt{3}$ (D) $-\sqrt{3}$
63. The two point form of a straight line is
- (A) $y - y_1 = m(x - x_1)$ (B) $\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$
- (C) $\frac{y}{x} = \frac{y_2 - y_1}{x_2 - x_1}$ (D) $\frac{y - y_2}{x - x_2} = \frac{y_2 - y_1}{x_2 - x_1}$
64. The equation of straight line perpendicular to $2x + 5y - 8 = 0$ and passing through $(-1, 2)$ is
- (A) $2x + 5y + 9 = 0$ (B) $5x - 2y + 1 = 0$
- (C) $5x - 2y + 9 = 0$ (D) $5x + 2y - 9 = 0$
65. The value of $\lim_{x \rightarrow 3} \frac{2x^2 - 7x + 3}{2x - 6}$ is
- (A) 3 (B) $\frac{2}{5}$
- (C) $\frac{5}{2}$ (D) 5

Space For Rough Work

66. The value of $\lim_{x \rightarrow 0} \frac{\sqrt{1 - \cos x}}{x}$ is
- (A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{2}$
 (C) $\frac{1}{2}$ (D) 1
67. If $y = e^x (\cos x - \sin x)$, then $\frac{dy}{dx}$ is
- (A) $2e^x \cos x$ (B) $-2e^x \cos x$
 (C) $2e^x \sin x$ (D) $-2e^x \sin x$
68. If $x + y = \log x + \log y$, then $\frac{dy}{dx}$ at $x = -1$ and $y = 2$ is
- (A) $-\frac{1}{4}$ (B) -4
 (C) 4 (D) $\frac{1}{2}$
69. If $x = a \cos^2 \theta$ and $y = b \sin^2 \theta$, then $\frac{dy}{dx}$ is
- (A) $-\frac{b}{a}$ (B) $\frac{b}{a}$
 (C) $\frac{a}{b}$ (D) $-\frac{a}{b}$
70. The second derivative of $y = \log \left(\frac{1}{x} \right)$ is
- (A) x (B) 1
 (C) $\frac{1}{x^2}$ (D) $-\frac{1}{x^2}$

Space For Rough Work

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

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

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

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

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

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

(A) -44

(B) -30

(C) 81

(D) -81

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Space For Rough Work

76. The value of $\int_0^{\pi/2} \sqrt{1+\sin 2x} \, dx$ is

- (A) 0 (B) 1
(C) 2 (D) -2

77. $\int_0^1 \frac{x}{1+x^4} \, dx$ is

- (A) $\frac{\pi}{4}$ (B) $\frac{\pi}{8}$
(C) $\frac{-\pi}{8}$ (D) $\frac{-\pi}{4}$

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

- (A) $\frac{41}{4}$ sq. units (B) 2 sq. units
(C) 20 sq. units (D) 10 sq. units

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

- (A) order 2 and degree 3 (B) order 2 and degree 1
(C) order 1 and degree 2 (D) order 1 and degree 4

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

- (A) $\tan^2 x + \tan^2 y = C$ (B) $\tan x + \tan y = C$
(C) $\tan x \tan y = C$ (D) $x + y + \log(\sec x \sec y) = C$

Space For Rough Work

PART - C
CIVIL ENGINEERING

81. Basalt is an example for
(A) Plutonic rock (B) Hypobysal rock
(C) Volcanic rock (D) Sedimentary rock
82. The presence of excess alumina in brick earth causes
(A) splitting of bricks (B) decay of bricks
(C) shrinkage and warping (D) efflorescence
83. The percentage of residue left after sieving good ordinary Portland cement using IS 90 sieve shall not exceed
(A) 40 (B) 20
(C) 30 (D) 10
84. The process of reducing moisture content in a freshly cut tree to desired level is called
(A) seasoning (B) conversion
(C) slaking (D) tempering
85. The maximum size of fine aggregate used in concrete is
(A) 10 mm (B) 15 mm
(C) 20 mm (D) 4.75 mm
86. The maximum percentage of carbon content allowed in steel is
(A) 1.5 (B) 2.0
(C) 2.5 (D) 3.0
87. In paints turpentine is used as
(A) Base (B) Vehicle
(C) Pigment (D) Solvent

Space For Rough Work

88. The crushing strength of brick shall not be less than
(A) 3.5 MPa (B) 3.0 MPa
(C) 2.5 MPa (D) 2.0 MPa
89. When a column of a building is abutting the boundary line, then the suitable footing advised is
(A) Grillage footing (B) Raft footing
(C) Eccentric isolated footing (D) Pile footing
90. The size of commonly used burnt clay brick is
(A) 200 mm × 100 mm × 100 mm (B) 300 mm × 150 mm × 76 mm
(C) 222 mm × 110 mm × 76 mm (D) 200 mm × 76 mm × 76 mm
91. The attached piers constructed to provide lateral support to walls are called
(A) Quoins (B) Coping
(C) Buttress (D) Thresholds
92. The splayed surface prepared on the top of an abutment or pier to receive the arch is called
(A) Crown (B) Voussoirs
(C) Introdos (D) Skew back
93. A window which is provided on a sloping roof of a building is called
(A) Bay window (B) Clerestory window
(C) Gable window (D) Dormer window
94. The stair which is provided when span available is limited and traffic is casual is
(A) Bifurcated stair (B) Doglegged stair
(C) Open newel stair (D) Spiral stair
95. The top sloping member of a truss is called
(A) purlin (B) tie
(C) cleat (D) principal rafter

Space For Rough Work

96. A cement concrete flooring made of specially selected aggregate to form hard, abrasion resistant and durable flooring is called
- (A) Granolithic flooring (B) Terrazzo flooring
(C) Mosaic flooring (D) Flagstone flooring
97. The temporary structure required to replace defective foundation of existing wall is called
- (A) Scaffolding (B) Shoring
(C) Underpinning (D) Raking
98. A member provided over an opening to support structure constructed upon it is called
- (A) strut (B) lintel
(C) stanction (D) tie
99. The instrument used for setting out a right angle is
- (A) planimeter (B) clinometer
(C) cross staff (D) line ranger
100. The bearing of a line AB measured from A towards B is known as
- (A) Fore bearing (B) Back bearing
(C) Fore sight (D) Back sight
101. If Back bearing of a line is 60° , then its fore bearing will be
- (A) 30° (B) 120°
(C) 240° (D) 340°
102. The vertical line passing through the intersection of the horizontal and vertical cross hairs and the optical centre of the object glass and its continuation is known as
- (A) axis of level tube (B) horizontal axis
(C) vertical axis (D) line of sight

Space For Rough Work

103. The process of turning the telescope in horizontal plane through 180° about the vertical axis is known as
- (A) Swinging (B) Transiting
(C) Centring (D) Levelling
104. If N is the number of sides of a traverse, then the sum of measured interior angles in case of a closed traverse should be equal to _____ right angles.
- (A) $2N - 4$ (B) $2N + 4$
(C) $4N + 2$ (D) $4N - 2$
105. Pantagraph is used for
- (A) measuring distances (B) measuring areas
(C) enlarging and reducing plan (D) setting out right angles
106. If “ i ” is the stadia distance, ‘ f ’ is the focal length and ‘ d ’ is the distance between the objective and vertical axis of tacheometer, then the additive constant is
- (A) $\frac{f}{i}$ (B) $\frac{i}{f}$
(C) $f + d$ (D) $\frac{f}{d}$
107. The measured distance parallel to the meridian is called
- (A) departure (B) latitude
(C) dip (D) declination
108. The reduced bearing of a line is $N 80^\circ W$. It's whole circle bearing is
- (A) 10° (B) 80°
(C) 180° (D) 280°
109. ABCD is a rectangular plot of land. If the bearing of the side AB is 60° , the bearing of side DC is
- (A) 160° (B) 60°
(C) 150° (D) 140°

Space For Rough Work

110. The distance from the midpoint of a simple circular curve to the point of intersection of tangents known as
- (A) Mid ordinate (B) tangent distance
(C) External distance (D) Long chord
111. The resultant of two forces of equal magnitude 'P' acting at right angles is
- (A) $\frac{P}{\sqrt{2}}$ (B) $\frac{P}{2}$
(C) 2P (D) $\sqrt{2} P$
112. The centroid of a semicircle of radius 'R' from its base is
- (A) $\frac{4R}{3\pi}$ (B) $\frac{4\pi}{3R}$
(C) $\frac{3R}{4\pi}$ (D) $\frac{2R}{3\pi}$
113. The moment of inertia of a square of side 'a' about an axis passing through its centre of gravity is
- (A) $\frac{a^4}{4}$ (B) $\frac{a^4}{8}$
(C) $\frac{a^4}{12}$ (D) $\frac{a^4}{36}$
114. The deformation per unit length within elastic limit is called as
- (A) tensile stress (B) compressive stress
(C) shear stress (D) linear strain
115. When a body is subjected to three mutually perpendicular stresses of equal intensity, the ratio of direct stress to the corresponding volumetric strain is known as
- (A) Young's modulus (B) Modulus of Rigidity
(C) Bulk modulus (D) Poisson's ratio

Space For Rough Work

116. The relationship between modulus of elasticity (E), modulus of rigidity (C) and Poisson's ratio $\left(\frac{1}{m}\right)$ is given by

(A) $C = \frac{mE}{2(m+1)}$

(B) $C = \frac{2(m+1)}{mE}$

(C) $C = \frac{2mE}{(m+1)}$

(D) $C = \frac{m+1}{2mE}$

117. The maximum bending moment of a cantilever beam of length (l), carrying uniformly distributed load (w) per unit length over its entire span is

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

(B) $\frac{wl}{2}$

(C) wl

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

118. The shear force at the mid span of simply supported beam of length (l), carrying uniformly distributed load (w) per unit length over its entire span is

(A) zero

(B) $\frac{wl^2}{2}$

(C) $\frac{wl^2}{4}$

(D) $\frac{wl^2}{8}$

119. In case of simply supported beam loaded with point load 'w' at its mid span, the maximum deflection is

(A) $\frac{wl^3}{48EI}$

(B) $\frac{5wl^3}{384EI}$

(C) $\frac{wl^3}{192EI}$

(D) $\frac{wl^3}{384EI}$

120. The shear stress at the outer most fibre of circular shaft under torsion is

(A) zero

(B) minimum

(C) maximum

(D) infinity

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121. The ratio of effective length of column to least radius of gyration is
(A) Slenderness ratio (B) Modular ratio
(C) Poisson's ratio (D) Aspect ratio
122. The shape of bending moment diagram for a beam carrying uniformly distributed load acting over a distance is
(A) cubic (B) straight
(C) parabolic (D) hyperbolic
123. The property of a liquid which offers resistance to the movement of one layer of liquid over another adjacent layer is called
(A) Surface tension (B) Compressibility
(C) Capillarity (D) Viscosity
124. The centre of pressure for a vertically immersed surface lies
(A) below centre of gravity (B) above centre of gravity
(C) at centre of gravity (D) at top edge of surface
125. A flow in which the quantity of liquid flowing per second is constant, is called as
(A) streamline flow (B) steady flow
(C) turbulent flow (D) unsteady flow
126. Venturimeter is used to measure
(A) Velocity of a flowing liquid (B) Pressure of a flowing liquid
(C) Discharge of a flowing liquid (D) Viscosity of a flowing liquid
127. The cippoletti weir is a _____ weir.
(A) rectangular (B) triangular
(C) trapezoidal (D) circular

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128. Condition for most economical rectangular channel section having breadth 'b' and depth 'd' is
- (A) $b = d$ (B) $b = 2d$
 (C) $b = \frac{d}{2}$ (D) $b = \frac{d}{4}$
129. If C_d = Co-efficient of discharge
 C_v = Co-efficient of velocity
 C_c = Co-efficient of contraction
 then, the relationship between them is
- (A) $C_d = C_c \times C_v$ (B) $C_c = C_d \times C_v$
 (C) $C_v = C_d \times C_c$ (D) $C_d = \sqrt{C_c \times C_v}$
130. Pelton wheel turbine is
- (A) high head turbine (B) medium head turbine
 (C) low head turbine (D) high discharge turbine
131. The precipitation caused by natural rising of warmer and lighter air in cooler and denser surroundings is called
- (A) Convective precipitation (B) Orographic precipitation
 (C) Cyclonic precipitation (D) Transpiration
132. On a rainfall map a line joining places having the same average annual rainfall is called
- (A) Isohyets (B) Isobars
 (C) Isotherms (D) Isopleaths
133. The first watering after the plants have grown a few centimetres high is known as
- (A) Paleo (B) Delta
 (C) Kor-watering (D) Base period

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134. Area of a crop irrigated per cumec of discharge running for a base period and expressed in hectare/cumec is called
- (A) Delta (B) Duty
(C) Kor depth (D) Paleo
135. Elementary profile of a gravity dam is
- (A) Right angled triangle (B) Rectangular
(C) Trapezoidal (D) Elliptical
136. A canal aligned almost at right angle to the contour of a country is known as
- (A) Contour canal (B) Side slope canal
(C) Water shed canal (D) Branch canal
137. When the bed level of the canal is higher than the Highest Flood Level (HFL) of the drainage, then the cross drainage work is said to be
- (A) Aqueduct (B) Syphon aqueduct
(C) Super passage (D) Canal system
138. A deflecting groyne in a river is
- (A) inclined towards upstream (B) perpendicular to the bank
(C) inclined towards downstream (D) parallel to the bank
139. The characteristic strength of TOR 50 grade steel bar is
- (A) 250 MPa (B) 415 MPa
(C) 500 MPa (D) 550 MPa
140. The use of sealing compound to form impervious film, to prevent evaporation of moisture from concrete is
- (A) Chemical curing (B) Membrane curing
(C) Wet curing (D) Pressure curing

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141. If ' f_{ck} ' is the characteristic strength of material and ' r_m ' is the partial safety factor, then the valid expression for design compressive strength is
- (A) $f_{ck} + r_m$ (B) $f_{ck} - r_m$
 (C) $\frac{f_{ck}}{r_m}$ (D) $r_m \cdot f_{ck}$
142. The maximum strain in concrete at the outermost compression fibre of a beam in limit state method is
- (A) 0.002 (B) 0.0035
 (C) 0.446 (D) 0.67
143. The ultimate moment of resistance of a balanced RC beam of effective size $b \times d$ and Fe 415 steel is given by
- (A) $1.38 f_{ck} b d^2$ (B) $0.133 f_{ck} b d^2$
 (C) $0.148 f_{ck} b d^2$ (D) $0.138 f_{ck} b d^2$
144. The minimum percentage of tensile reinforcement in beams shall satisfy the condition
- (A) $\frac{A_{st}}{bd} \geq \frac{0.85}{f_y}$ (B) $\frac{A_{st}}{bd} \leq \frac{0.85}{f_y}$
 (C) $\frac{A_{st}}{bd} \geq \frac{f_y}{0.85}$ (D) $\frac{A_{st}}{bd} \leq \frac{f_y}{0.85}$
145. The curtailment of reinforcement in RC members is done mainly
- (A) to control deflection of beam (B) to optimize steel
 (C) to prevent cracking (D) to prevent sudden failure
146. The maximum shear strength of footing in two way shear action in limit state method of design is
- (A) $0.25 \sqrt{f_{ck}}$ (B) $0.16 \sqrt{f_{ck}}$
 (C) $0.7 \sqrt{f_{ck}}$ (D) $\sqrt{f_{ck}}$

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147. For a masonry retaining wall to be safe in overturning, the ratio of resisting moment to overturning moment about the toe shall not be less than
- (A) 0.5 (B) 2
(C) 0.4 (D) 0.45
148. If 'S' is size of fillet weld and 'l' is the effective length of weld, then the actual length L of weld on an unsymmetrical section is taken as
- (A) $L = l - 2S$ (B) $L = l + 2S$
(C) $L = l + S$ (D) $L = 2l + S$
149. The gusset plate is used in gusseted base connection to
- (A) increase the thickness of base plate
(B) decrease the number of fasteners
(C) reduce the bearing stress on the plate
(D) reduce the bearing stress on soil
150. The procedure for concrete mix design in India is covered in BIS code
- (A) IS 269 (B) IS 800
(C) IS 456 (D) IS 10262
151. The natural outflow of ground water at the earth surface is
- (A) Spring (B) Jackwell
(C) Infiltration well (D) Infiltration galleries
152. Air relief valves are provided at
- (A) Summits (B) depressions
(C) dead ends (D) corners
153. A ferrule is a right angled sleeve used to
- (A) connect directly to water main
(B) connect two pipes of same diameter
(C) connect two pipes of different diameter
(D) connect two pipes at junctions

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154. The pipe receiving discharge from urinals, water closets, gullies etc. is called
- (A) Vent pipe (B) Anti-siphonage pipe
(C) Soil pipe (D) Clean outs
155. Street washing is an example for _____ type of reuse of waste water.
- (A) Agricultural (B) Industrial
(C) Municipal (D) Recreational
156. The process of removing bacteria from water is
- (A) Disinfection (B) Coagulation
(C) Sedimentation (D) Screening
157. The process of removing excess chlorine from water is known as
- (A) Pre-chlorination (B) De-chlorination
(C) Post-chlorination (D) Super-chlorination
158. The side slopes provided for an highway in embankment is
- (A) 1 : 1 (B) 1 : 1.5
(C) 1 : 2 (D) 1 : 2.5
159. The value of ruling gradient recommended by IRC in hilly terrain is _____
- (A) 1 in 14 (B) 1 in 17
(C) 1 in 20 (D) 1 in 30
160. A bituminous road is an example of _____ pavement.
- (A) Flexible (B) Semi flexible
(C) Rigid (D) Semi rigid

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- 161.** A number of sleepers used per rail length is known as
(A) Sleeper length (B) Sleeper ratio
(C) Sleeper density (D) Composite sleeper index
- 162.** A track assembly provided for diverting trains from one track to another is known as
(A) Turn table (B) Turn out
(C) Crossing (D) Junction
- 163.** A home signal is located at
(A) entry of a station (B) exit of a station
(C) 180 metres beyond the station (D) 180 metres before the station
- 164.** The longitudinal movement of rails with respect to sleepers in a track is known as
(A) Creep (B) Coning
(C) Cant (D) Tilting
- 165.** The area used for repairing ships or vessels is known as
(A) Wharf (B) Wet dock
(C) Dry dock (D) Jetties
- 166.** The path that connects the runway to apron is known as
(A) Road way (B) Air way
(C) Taxi way (D) Carriage way
- 167.** The process of removing excavated earth from tunnels is termed as
(A) Benching (B) Mucking
(C) Heading (D) Blasting

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168. A bridge super structure supported on pontoons is classified as _____ bridge.
- (A) Suspension (B) Cable stayed
(C) Floating (D) Flying
169. The space of water area between two adjacent piers where ships are berthed is known as
- (A) Moles (B) Slip
(C) Fender (D) Dolphin
170. PERT is
- (A) activity oriented (B) event oriented
(C) time oriented (D) resource oriented
171. The offer in writing to execute some specified work or to supply the materials is called
- (A) Tender (B) Contract agreement
(C) Invoice (D) Indent
172. 10% of tendered amount deposited with the department on acceptance of tender is termed as
- (A) Security money deposit (B) Earnest money deposit
(C) Fixed money deposit (D) Recurring money deposit
173. Material from stock issued on demand prepared by engineer incharge of work in proper format is termed as
- (A) bin card (B) measurement book
(C) indent (D) invoice
174. The technique of finding the fair price of an existing building or property is known as
- (A) Estimation (B) Valuation
(C) Pricing (D) Costing

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175. If 'B' is the width of formation, 'd' is the height of embankment, side slope sill, for a highway with no transverse slope, the area of cross section is
- (A) $B + d + Sd$ (B) $Bd + Sd^2$
 (C) $\sqrt{Bd + Sd^2}$ (D) $\frac{1}{2}(Bd + Sd^2)$
176. Measurement for plastering is taken in
- (A) metre (B) square metre
 (C) cubic metre (D) kilometre
177. The original cost of property minus the amount of depreciation upto the previous year is termed as
- (A) Salvage value (B) Market value
 (C) Book value (D) Rateable value
178. The conic section, when the ratio of distance of the tracing point from the focus to its perpendicular distance from the directrix is less than one is
- (A) Parabola (B) Hyperbola
 (C) Circle (D) Ellipse
179. In plan, building components above sill level are shown in _____ line.
- (A) Continuous (B) Chain
 (C) Hidden (D) Leader
180. Return wing walls provided in irrigation and bridge structures are inclined at an angle of _____ to the abutment.
- (A) 30° (B) 45°
 (C) 60° (D) 90°

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