



DIPLOMA – COMMON ENTRANCE TEST-2013

EN	COURSE	DAY : SUNDAY DATE : 30-JUNE-2013
	ENVIRONMENTAL	TIME : 9.00 a.m. to 12.00 Noon
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
		125049

DOs :

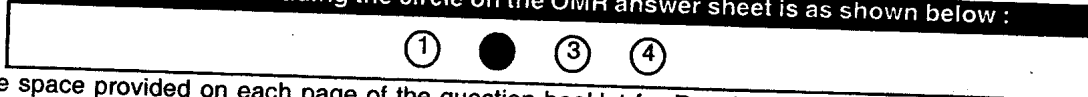
1. Check whether the Diploma CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This question booklet is issued to you by the invigilator after the 2nd bell i.e., after 08.50 a.m.
3. The serial number of this question booklet should be entered on the OMR answer sheet.
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 9.00 a.m., till then;
 - Do not remove the seal / staple present on the right hand side of this question booklet.
 - Do not look inside this question booklet.
 - Do not start answering on the OMR answer sheet.

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 9.00 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 ballpoint 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 12.00 Noon, 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.

[P.T.O.]

040081

DO NOT WRITE HERE



PART – A

It consists of 1 – 40 questions.

1. If $\begin{vmatrix} x+2 & 5 \\ 0 & x-2 \end{vmatrix} = 0$, then $x =$

(1) 1

(2) 2

(3) 3

(4) 0

2. In solving the equations by Cramer's rule for $5x - 3y = 1$ and $2x - 5y = -11$, the value of x and y is

(1) (3, 2)

(2) (-3, -2)

(3) (2, 3)

(4) (-2, -3)

3. If $A = \begin{bmatrix} 2 & 0 & 0 \\ 1 & 2 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ then $A \text{ adj } A$ is

(1) Diagonal

(2) Scalar

(3) Identity

(4) Zero matrix

4. The minor of the element 6 in a matrix $A = \begin{bmatrix} 2 & -3 & 0 \\ 4 & 1 & 6 \\ 3 & 2 & 0 \end{bmatrix}$ is

(1) 10

(2) 11

(3) 12

(4) 13

5. The characteristic equation of the matrix $A = \begin{bmatrix} 5 & -3 \\ 2 & 1 \end{bmatrix}$ is

(1) $\lambda^2 - 6\lambda + 11 = 0$

(2) $\lambda^2 - 6\lambda - 11 = 0$

(3) $\lambda^2 + 6\lambda + 11 = 0$

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

SPACE FOR ROUGH WORK



6. The fourth term in the expansion of $(\sqrt{3} + 2)^7$ is
- (1) 2520 (2) -2520
(3) 1/2520 (4) -1/2520
7. The constant term in the expansion $(x^2 + 1/x)^{12}$ is
- (1) -495 (2) 495
(3) 1/495 (4) 945
8. The projection of vector $(3, 1, 3)$ on vector $(1, -2, 1)$ is
- (1) $2\sqrt{6}/5$ (2) $-2\sqrt{6}/3$
(3) $2\sqrt{6}/3$ (4) $-2\sqrt{6}/5$
9. If vector $a = (1, 1, 1)$ and vector $b = (2, 2, 1)$ then magnitude of vector $a \times b$ is
- (1) $\sqrt{26}$ (2) $\sqrt{28}$
(3) $\sqrt{24}$ (4) 1
10. The cosine of the angle between the vectors $(3, -1, 1)$ and vector $(1, 1, -1)$ is
- (1) $1/\sqrt{11}$ (2) $-1/\sqrt{33}$
(3) $1/\sqrt{33}$ (4) $-1/\sqrt{11}$
11. The value of $(\sec^6 x - \tan^6 x)$ is
- (1) $1 - 3 \sec^2 x \tan^2 x$
(2) $1 + \tan^2 x \sec^2 x$
(3) $1 + 3 \sec^2 x \tan^2 x$
(4) $1 - \tan^2 x \sec^2 x$

SPACE FOR ROUGH WORK



12. If $x \cot 45^\circ \cos 60^\circ = \sin 60^\circ \tan 30^\circ$ then the value of x is
- (1) $\sqrt{3}$ (2) $\sqrt{3}/2$
(3) $1/2$ (4) 1
13. If $\tan x = 15/8$ and x is in the III quadrant then the value of $(2 \sin x - 3 \cos x) / (2 \cos x + 3 \sin x)$ is
- (1) $61/6$ (2) $-61/6$
(3) $-6/61$ (4) $6/61$
14. The value of $\{[\sin(2\pi - \theta) + \cos(-\theta)] / [\tan(-\theta) + \cot(2\pi + \theta)]\} - \{[\sin(\pi/2 + \theta) + \cos(3\pi/2 - \theta)] / [\cot(\pi + \theta) + \tan(2\pi - \theta)]\}$ is
- (1) 0 (2) -1
(3) $+1$ (4) -2
15. If $\sin A = 5/13$ and $\sin B = 4/5$ then the value of $\cos(A - B)$ is
- (1) $65/56$ (2) $56/65$
(3) $16/65$ (4) $-16/65$
16. On simplification the value of $(\cos^3 A - \cos 3A) / \cos A + (\sin^3 A + \sin 3A) / \sin A$ is
- (1) 3 (2) 1
(3) 2 (4) 0
17. The value of $(\sin 100^\circ + \sin 20^\circ) / (\cos 100^\circ + \cos 20^\circ)$ is
- (1) $\sqrt{3}/2$ (2) $1/2$
(3) $\sqrt{3}$ (4) 1
18. The value of $(\tan^{-1} 5/6 + \tan^{-1} 1/11)$ is
- (1) 30° (2) 60°
(3) 90° (4) 45°

SPACE FOR ROUGH WORK



19. If the points $(-3, K)$, $(5, 7)$ and $(-11, 1)$ are collinear, then the value of K is

- | | |
|-------|-------|
| (1) 4 | (2) 3 |
| (3) 2 | (4) 1 |

20. The ratio of the line join of the points $(2, 3)$ and $(-5, 6)$ divided by y - axis is

- | | |
|-----------|-----------|
| (1) 5 : 2 | (2) 2 : 5 |
| (3) 3 : 2 | (4) 2 : 3 |

21. Three vertices of a triangle are $(-2, 3, 1)$, $(-1, 4, 2)$ and $(-6, 5, 2)$, then the centroid of the triangle is

- | | |
|------------------|---------------------|
| (1) $(-3, 4, 1)$ | (2) $(0, 5/3, 1/3)$ |
| (3) $(4, 3, 1)$ | (4) $(-3, -4, -2)$ |

22. The equation to the straight line passing through $(3, 2)$ and perpendicular to the line $5x + 2y - 3 = 0$ is

- (1) $2x - 5y - 4 = 0$
(2) $2x - 5y + 4 = 0$
(3) $2x + 5y + 4 = 0$
(4) $5x - 2y + 4 = 0$

23. The slope of a line passing through the points $(-4, -5)$ and $(2, 3)$ is

- | | |
|-----------|------------|
| (1) $3/4$ | (2) $-3/4$ |
| (3) $4/3$ | (4) $-4/3$ |

24. The acute angle between the lines $2x - y + 3 = 0$ and $x - 3y + 2 = 0$ is

- | | |
|----------------|----------------|
| (1) 30° | (2) 60° |
| (3) 90° | (4) 45° |

SPACE FOR ROUGH WORK



25. The value of $\lim_{n \rightarrow \infty} [(3 - n)(4 - n)(2n - 5)] / (4n^3 - 3)$

(1) $-1/2$

(2) $1/2$

(3) $3/2$

(4) $-3/2$

26. The value of $\lim_{x \rightarrow -3} (x^4 - 81) / (x^3 + 27)$ is

(1) 3

(2) -3

(3) 4

(4) -4

27. $d/dx (\sqrt{\sin^2 x})$ is

(1) $\cos x$

(2) $\sin 2x$

(3) $\cos^2 x$

(4) $\sqrt{\cos x / \sin x}$

28. $d/dx \tan^{-1} \sqrt{(1 - \cos 2x)/(1 + \cos 2x)}$ is

(1) 1

(2) 0

(3) $\tan x$

(4) $\cos x$

29. If $y = \sin x^x$ then dy/dx is

(1) $x \log \sin x$

(2) $\cos x^x$

(3) $\sin x^x (x \cot x + \log \sin x)$

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

30. $d/dx (\sinh^{-1} x)$ is

(1) $1/\sqrt{1+x^2}$

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

(3) $1/\sqrt{x^2-1}$

(4) $1/\sqrt{x^2+1}$

SPACE FOR ROUGH WORK



31. The equation to the normal to the curve $y = 5x^2 + 4x - 11$ at the point $(-1, 2)$ is
- (1) $x - 6y + 11 = 0$
(2) $x + 6y - 11 = 0$
(3) $6x - y + 11 = 0$
(4) $6x + y - 11 = 0$
32. The volume of a sphere is increasing at the rate of 4π c.c./sec, then the rate of increase of the radius is when the volume is 288π cc
- (1) 6 cm/sec
(2) $1/6$ cm/sec
(3) $1/36$ cm/sec
(4) 36 cm/sec
33. $\int \sin^2 x \, dx$ is
- (1) $\cos x + c$
(2) $x/2 - (\sin 2x)/4 + c$
(3) $x/2 + (\cos 2x)/4 + c$
(4) $x/2 + (\sin 2x)/4 + c$
34. $\int (3x^2 + x - 1)^6 (6x + 1) \, dx$ is
- (1) $6(3x^2 + x - 1)^5 + c$
(2) $(3x^2 + x - 1)^6 + c$
(3) $(3x^2 + x - 1)^7 / 7 + c$
(4) $(3x^2 + x - 1)^7 / 21 + c$
35. $\int \tan^{-1} x \, dx$ is
- (1) $x \tan^{-1} x - 1/2 \log(1 + x^2) + c$
(2) $x \tan^{-1} x + 1/2 \log(1 + x^2) + c$
(3) $\tan^{-1} x - 1/2 \log(1 + x^2) + c$
(4) $\tan^{-1} x + 1/2 \log(1 + x^2) + c$

SPACE FOR ROUGH WORK



36. $\int_0^{\pi/2} \sin 3x \cos 2x \, dx$ is
(1) $3/5$ (2) $-3/5$ (3) $5/3$ (4) $-5/3$
37. $\int_0^2 (x-1)(x-2) \, dx$ is
(1) $2/3$ (2) $-2/3$ (3) $3/2$ (4) $-3/2$
38. The area bounded by the curve $y = 2x^2$, the x -axis and the ordinates at $x = -1$ and $x = 2$ is
(1) -6 sq units
(2) 3 sq units
(3) -3 sq units
(4) 6 sq units
39. The differential equation formed by eliminating a and b from $x + y = ae^x + be^{-x}$ is
(1) $d^2y/dx^2 + y = 0$
(2) $d^2y/dx^2 - y = 0$
(3) $d^2y/dx^2 - x - y = 0$
(4) $d^2y/dx^2 + x - y = 0$
40. The solution of the differential equation $dy/dx = (1 + y^2) / (1 + x^2)$ is
(1) $\tan^{-1} y + \tan^{-1} x + c = 0$
(2) $\log(1 + y^2) + \log(1 + x^2) + c = 0$
(3) $\tan^{-1} y - \tan^{-1} x + c = 0$
(4) $\log(1 + y^2) - \log(1 + x^2) + c = 0$

SPACE FOR ROUGH WORK



PART - B

It consists of **41 – 80** questions.

41. The prefix “mega” stands for

- (1) 10^3 (2) 10^{-3} (3) 10^{-6} (4) 10^6

42. Which of the following is dimensional physical quantity ?

- (1) pressure (2) strain
(3) mechanical advantage (4) sp.gravity

43. The principle of vernier is

- (1) $n \text{ VSD} = (n + 1) \text{ MSD}$ (2) $(n - 1) \text{ VSD} = n \text{ MSD}$
(3) $n \text{ MSD} = (n - 1) \text{ VSD}$ (4) $(n - 1) \text{ MSD} = n \text{ VSD}$

44. A screw gauge has a pitch of $\frac{1}{2}$ mm and 50 division on sleeve. The reading when the jaws touch is +5 division. While gripping a wire the reading is PSR = 3 PSD and HSR = 17, then the diameter of wire is

- (1) 1.62 cm (2) 0.162 cm
(3) 0.162 mm (4) 16.2 mm

45. The extension of the material by itself without increase of load takes place

- (1) within elastic limit
(2) beyond elastic limit
(3) beyond yield point
(4) at breaking point

46. If the strain in a wire is 0.1%, then the change in the length of the wire of length 5 m is

- (1) 5×10^{-2} m (2) 5×10^{-3} m
(3) 5×10^{-4} m (4) 5×10^{-3} cm

SPACE FOR ROUGH WORK



47. Poisson's ratio is the ratio of
- | | |
|--|--|
| (1) $\frac{\text{Lateral strain}}{\text{Linear strain}}$ | (2) $\frac{\text{Linear strain}}{\text{Lateral strain}}$ |
| (3) $\frac{\text{Lateral strain}}{\text{Volume strain}}$ | (4) $\frac{\text{Volume strain}}{\text{Lateral strain}}$ |
48. The pressure at a depth of 100 m below the surface of water density 1000 kgm^{-3} is
- | | |
|---------------------------------------|---------------------------------------|
| (1) $98 \times 10^5 \text{ Nm}^{-2}$ | (2) $9.8 \times 10^4 \text{ Nm}^{-2}$ |
| (3) $980 \times 10^4 \text{ Nm}^{-2}$ | (4) $98 \times 10^4 \text{ Nm}^{-2}$ |
49. When two capillary tube of different diameters are dropped vertically in a liquid, the height of the liquid is
- (1) More in the tube of larger diameter
(2) More in the tube of smaller diameter
(3) Lesser in the tube of smaller diameter
(4) Same in both the tubes
50. The property by virtue of which a liquid opposes relative motion between its different layers is
- | | |
|---------------------|----------------|
| (1) Viscosity | (2) Elasticity |
| (3) Surface tension | (4) Inertia |
51. The maximum amount of force acting for a short duration is known as
- | | |
|--------------|-------------|
| (1) Momentum | (2) Inertia |
| (3) Power | (4) Impulse |
52. A bullet of mass 0.01 kg is fired from a rifle of mass 20 kg with a speed of 10 m/s , then the recoil velocity of rifle is _____ m/s.
- | | | | |
|--------|-----------|-------------|------------|
| (1) -1 | (2) -0.05 | (3) -200.01 | (4) -0.005 |
|--------|-----------|-------------|------------|

SPACE FOR ROUGH WORK



53. Final velocity of a body thrown downwards is _____
- (1) Maximum (2) Minimum
(3) No change (4) Zero
54. A person throws a sand bag from a boat at rest in a pond then boat moves
- (1) In the same direction
(2) In the opposite direction
(3) In a perpendicular direction
(4) In circular direction
55. Two equal forces at a point, the square of their resultant is equal to three times the product of the forces. Then the angle between the forces is equal to
- (1) 30° (2) 45°
(3) 60° (4) 90°
56. Equilibrant is a force
- (1) Which brings a body in equilibrium
(2) Which moves the body along the resultant force
(3) in zig-zag movement of the body
(4) Which moves the body in opposite direction to equilibrant force
57. A force of 10 N acting on a body fixed at a point the distance from the fixed point to the line of force is 2 m. Then the moment of the force is _____ N-m.
- (1) 0.002 (2) 0.02 (3) 2 (4) 20
58. By Lami's theorem, P Q R are three forces acting in equilibrium and angle between PR, PQ, QR, are α, β, γ respectively then which of the following is correct ?
- (1) $\frac{P}{\sin\beta} = \frac{Q}{\sin\gamma} = \frac{R}{\sin\alpha}$ (2) $\frac{P}{\sin\gamma} = \frac{Q}{\sin\alpha} = \frac{R}{\sin\beta}$
(3) $\frac{P}{\sin\alpha} = \frac{Q}{\sin\beta} = \frac{R}{\sin\gamma}$ (4) $\frac{P}{\sin\alpha} = \frac{Q}{\sin\gamma} = \frac{R}{\sin\beta}$

SPACE FOR ROUGH WORK



59. If the line of action of the force passes through the point of rotation, then the moment of force is

- (1) Maximum
- (2) Less than one
- (3) Greater than one
- (4) Zero

60. 1 Kilo calorie of heat is equal to _____ joule.

- (1) 4.186
- (2) 41.86
- (3) 418.6
- (4) 4186

61. The correct relation between °F and K scale is

- (1) $5K = 9(F - 32)$
- (2) $9K = -5(F - 32)$
- (3) $K = \frac{9}{5}(F - 32) - 273$
- (4) $K = \frac{5}{9}(F - 32) + 273$

62. Absolute zero is the temperature of a gas at which, the _____ of gas is theoretically zero.

- (1) Mass
- (2) Weight
- (3) Volume
- (4) Density

63. When the particle is in SHM having amplitude 'r', then its velocity is

- (1) $v = \omega(r^2 - y^2)$
- (2) $v = \omega\sqrt{r^2 - y^2}$
- (3) $v = r\omega^2$
- (4) $v = r\omega^3$

64. Ripples in water are the example for

- (1) Transverse wave
- (2) Longitudinal wave
- (3) Sound wave
- (4) Ultrasonic wave

SPACE FOR ROUGH WORK



65. The length of one ventral segment in stationary wave is equal to
- (1) Full wavelength of the wave
 - (2) Twice the wavelength of the wave
 - (3) Half a wavelength of the wave
 - (4) Quarter a wavelength of the wave
66. A stretched string under a tension T vibrates with a frequency f . When the tension is increased by 4 times, then the frequency becomes _____
- (1) same
 - (2) doubled
 - (3) tripled
 - (4) zero
67. The best value of reverberation time for speech listener _____
- (1) 0.5 to 1.5 s
 - (2) 0.15 to 0.5 s
 - (3) 0.05 to 0.15 s
 - (4) 0.5 to 5 s
68. 3 strings of equal lengths but stretched with different tensions are made to vibrate, if their masses per unit length are in the ratio 3:2:1 and frequencies are same then the ratio of the tensions _____
- (1) 1:2:3
 - (2) 2:3:1
 - (3) 1:3:2
 - (4) 3:2:1
69. Newton's formula for velocity of sound was corrected by
- (1) Boyle
 - (2) Charles
 - (3) Laplace
 - (4) Hertz
70. Light waves are composed of both electric and magnetic field is proposed by
- (1) Newton's corpuscular theory
 - (2) Huygen's wave theory
 - (3) Maxwell's theory of light
 - (4) Plank's theory

SPACE FOR ROUGH WORK



71. If 'a' and 'b' are the amplitudes of two interfering waves then for destructive interference the amplitude 'R' is

(1) $R = ab$

(2) $R = a/b$

(3) $R = a - b$

(4) $R = a + b$

72. Two coherent sources 2×10^{-4} m apart are illuminated by the light of wave length 5000×10^{-10} m. The distance between the source and screen is 0.2m, then fringe width is

(1) 0.05×10^{-3} m

(2) 5×10^{-3} m

(3) 0.5×10^{-3} m

(4) 50×10^{-3} m

73. Resolving power of microscope is

(1) Equal to the resolution of the microscope

(2) Reciprocal to the resolution of the microscope

(3) Reciprocal to the focal length of the microscope

(4) Product of wave length and semi vertical angle

74. Which of the following phenomenon confirm that light is transverse wave ?

(1) Diffraction

(2) Interference

(3) Refraction

(4) Polarization

75. In Field emission

(1) High positive voltage is used

(2) Secondary electrons are used

(3) High energy is used

(4) High radiations are used

SPACE FOR ROUGH WORK



76. Which of the following is not true ?
- (1) Photoelectric emission is an instantaneous process
 - (2) Photoelectric emission do not takes place below threshold frequency
 - (3) The K.E. of the photoelectron depends on the wavelength of incident radiation
 - (4) Number of photoelectrons emitted is directly proportional to the intensity
77. The appearance of additional frequencies in scattered beam of light is known as
- (1) Raman effect
 - (2) Coherent scattering
 - (3) Incoherent scattering
 - (4) Bipolar scattering
78. Two properties of LASER are
- (1) Highly monochromatic and extremely intense
 - (2) Highly chromatic and extremely fast
 - (3) Very high frequency and extremely high wave length
 - (4) Very high power and extremely low amplitude
79. To form a galvanic cell
- (1) difference in concentration of electrolyte is required
 - (2) difference in concentration of frequency is required
 - (3) difference in concentration of amplitude is required
 - (4) both (2) and (3)
80. pH value is not having its application in
- (1) determination of quality of soil
 - (2) determination of quality of textile dyes
 - (3) determination of quality of chemicals
 - (4) determination of quality of electron

SPACE FOR ROUGH WORK



PART – C

It consists of **81-180** Questions :

81. Marble is an example of _____ rock.

- | | |
|-----------------|-----------------|
| (1) Igneous | (2) Sedimentary |
| (3) Metamorphic | (4) Volcanic |

82. Excess of _____ leads to decay of bricks.

- | | |
|-------------------|--------------|
| (1) lime | (2) magnesia |
| (3) oxide of iron | (4) silica |

83. Excess of _____ causes brick to melt and hence loses its shape.

- | | |
|--------------|------------------|
| (1) Magnesia | (2) Lime |
| (3) Alkalies | (4) Iron pyrites |

84. The initial setting time of ordinary Portland cement should not be less than _____ minutes.

- | | |
|----------------|----------------|
| (1) 10 minutes | (2) 20 minutes |
| (3) 30 minutes | (4) 60 minutes |

85. Ordinary portland cement has got the grades

- | | |
|--------------|----------------------|
| (1) 33 grade | (2) 43 grade |
| (3) 53 grade | (4) all of the above |

86. Cement concrete is an example of _____ stone.

- | | |
|----------------|--------------|
| (1) geological | (2) natural |
| (3) artificial | (4) physical |

SPACE FOR ROUGH WORK



87. Workability of cement concrete is determined by

- | | |
|------------------|----------------------------|
| (1) Slump test | (2) Compaction factor test |
| (3) Vee-bee test | (4) All of the above |

88. The cement concrete in plastic stage is known as

- | | |
|--------------------|-------------------------------|
| (1) Fresh concrete | (2) Green concrete |
| (3) Hard concrete | (4) Fibre reinforced concrete |

89. _____ survey is carried out for fixing the property lines.

- | | |
|---------------|-----------------|
| (1) city | (2) mine |
| (3) cadastral | (4) topographic |

90. _____ is an instrument used to range a straight line and prolong it.

- | | |
|------------------------|--------------------|
| (1) French cross-staff | (2) optical square |
| (3) line ranger | (4) prism square |

91. The RB or QB of 160° is

- | | |
|-------------------|-------------------|
| (1) $S20^\circ E$ | (2) $S20^\circ W$ |
| (3) $N20^\circ W$ | (4) $N20^\circ E$ |

92. Reduced bearing is found in

- | | |
|-----------------------|-------------------------|
| (1) Surveyors compass | (2) Prismatic compass |
| (3) Both (1) and (2) | (4) Neither (1) nor (2) |

SPACE FOR ROUGH WORK



93. Magnetic declination is measured towards_____ of true meridian.
(1) East (2) West
(3) Both (1) and (2) (4) Neither (1) nor (2)
94. The MSL in India is considered at
(1) Mumbai port (2) Chennai port
(3) Paradeep port (4) Cochin port
95. In _____ leveling negative reading is recorded.
(1) Differential (2) Fly
(3) Inverted (4) Block
96. The least count of leveling staff is
(1) 0.005 m (2) 0.005 cm
(3) 0.005 mm (4) 0.05 m
97. The mass density of fresh water is
(1) 1000 kg/m³ (2) 1000 N/m³
(3) 1000 kN/m³ (4) 1000 gm/m³
98. The value of atmospheric pressure is
(1) 1.0332 N/mm² (2) 1.0332 kg/cm²
(3) 1.1332 N/mm² (4) 1.1332 kg/cm²
99. The sum total of all pressure acting on a lamina when inserted in water is known as
(1) centre of pressure (2) concentration of pressure
(3) total pressure (4) momentum of pressure

SPACE FOR ROUGH WORK



100. Oil floats over water due to
- (1) water has less specific gravity than oil
 - (2) oil has less specific gravity than water
 - (3) both oil and water have same specific gravity
 - (4) none of the above reason
101. The coefficient of discharge of an orifice is_____ mouth piece.
- (1) same as
 - (2) greater than
 - (3) less than
 - (4) unpredictable than
102. The discharge equation for mouth piece running free is
- (1) $0.65a\sqrt{2gH}$
 - (2) $0.50a\sqrt{2gH}$
 - (3) $0.55a\sqrt{2gH}$
 - (4) $0.60a\sqrt{2gH}$
103. The sheet of liquid flowing over a notch is known as
- (1) Vein
 - (2) Nappe
 - (3) Neither (1) nor (2)
 - (4) Both (1) and (2)
104. Weirs are usually constructed with
- (1) fibre
 - (2) metal sheet
 - (3) neither (1) nor (2)
 - (4) both (1) and (2)
105. A rectangular channel is in its best form to discharge water, if
- (1) breadth equals depth
 - (2) breadth is twice depth
 - (3) breadth is half depth
 - (4) breadth is thrice depth

SPACE FOR ROUGH WORK



106. The loss of head due to sudden enlargement of a pipe is

- | | |
|----------------------------|----------------------------|
| (1) $(V_2 - V_1)^2 / 2g$ | (2) $(V_2^2 - V_1^2) / 2g$ |
| (3) $(V_1^2 - V_2^2) / 2g$ | (4) $(V_1 - V_2)^2 / 2g$ |

107. The basic unit of heat is

- | | |
|--------------------|-----------------------|
| (1) Degree Celsius | (2) Fahrenheit |
| (3) Calorie | (4) Degree Centigrade |

108. Solid residues along with containers are cooled in

- | | |
|-------------------|------------------|
| (1) Refrigerators | (2) Incubators |
| (3) Desiccators | (4) Preservators |

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

- | | |
|------------------|---------------------|
| (1) Colorimetric | (2) Gravimetric |
| (3) Volumetric | (4) Chromatographic |

110. When an acid is added to water, the hydroxyl ion activity

- | | |
|---------------|---------------|
| (1) Increases | (2) Decreases |
| (3) Null | (4) No Change |

111. _____ are the most common interferences in the determination of chlorine residuals.

- | | |
|--------------|--------------|
| (1) Nitrates | (2) Nitrogen |
| (3) Ammonia | (4) Nitrites |

112. The solubility of atmospheric oxygen in fresh water at 0°C is

- | | |
|---------------|---------------|
| (1) 1.46 mg/l | (2) 14.6 mg/l |
| (3) 7.0 mg/l | (4) 7.6 mg/l |

SPACE FOR ROUGH WORK



113. The presence of _____ in domestic wastewater causes corrosion of sewers.

- | | |
|--------------|---------------|
| (1) Sulphate | (2) Phosphate |
| (3) Nitrate | (4) Sulphite |

114. The stable oxidation state of iron is

- | | | | |
|------------|-------------|------------|-----------|
| (1) Fe(II) | (2) Fe(III) | (3) Fe(IV) | (4) Fe(V) |
|------------|-------------|------------|-----------|

115. The rate of BOD reactions are _____ reaction.

- | | |
|------------------|-----------------|
| (1) Zero Order | (2) First Order |
| (3) Second Order | (4) Third Order |

116. Polyphosphate can be converted to orthophosphate by

- | | |
|---------------|----------------|
| (1) Boiling | (2) Oxidation |
| (3) Reduction | (4) Hydrolysis |

117. The surface run-off is the quantity of water

- (1) absorbed by soil
- (2) intercepted by building and vegetative cover
- (3) required to fill surface depression
- (4) that reaches the stream channel

118. The Kuichling's formula for fire demand is

- | | |
|------------------------|------------------------|
| (1) $Q = 318\sqrt{P}$ | (2) $Q = 3282\sqrt{P}$ |
| (3) $Q = 3182\sqrt{P}$ | (4) $Q = 328\sqrt{P}$ |

119. _____ is not a type of springs.

- | | |
|----------------------|-------------------------|
| (1) Artesian Springs | (2) Gravity Springs |
| (3) Surface Springs | (4) Sub-Surface Springs |

SPACE FOR ROUGH WORK



127. There are 3 samples X, Y and Z of water having pH value of 4.5, 5.5 and 6.5 respectively, calculate how many times X is acidic than Z
- (1) 1 (2) 100 (3) 2 (4) 200
128. For an area developed in a haphazard way, the type of layout recommended for distribution is
- (1) Dead End System (2) Ring System
(3) Radial System (4) Grid Iron System
129. If the ground water is saline and the sub-soil depth in the river is shallow, then the best source to develop is
- (1) Tube Well (2) Infiltration Galleries
(3) Infiltration Wells (4) Springs
130. Which treatment unit is used to remove hydrophilic impurities?
- (1) Coagulation (2) Sedimentation
(3) Screening (4) All the above
131. If a filter has been out of service and allowed to go dry, which filter control valve should be used to refill it with water?
- (1) Effluent Valve (2) Influent Valve
(3) Re-Wash Valve (4) Wash Valve
132. _____ indicates the sewage which is undergoing the treatment process.
- (1) Weak Sewage (2) Fresh Sewage
(3) Sullage (4) Septic Sewage
133. The condition favorable for separate system of sewerage is
- (1) Flat topography (2) Even rainfall
(3) Steep slopes (4) Restricted space

SPACE FOR ROUGH WORK



120. In intakes, the coarse screens are usually placed about _____ apart.

- | | |
|----------------|-----------------|
| (1) 25 – 50 mm | (2) 50 – 75 mm |
| (3) 25 – 75 mm | (4) 50 – 100 mm |

121. The efficiency of air lift pumps varies from

- | | |
|----------------|----------------|
| (1) 10 to 35 % | (2) 20 to 45 % |
| (3) 30 to 55 % | (4) 40 to 65 % |

122. The efficiency of diesel engine for the running of pumps is about

- | | |
|----------------|----------------|
| (1) 50 to 60 % | (2) 60 to 70 % |
| (3) 70 to 80 % | (4) 80 to 90 % |

123. Jackson turbidimeter can record turbidities above

- | | |
|-------------|--------------|
| (1) 1 ppm | (2) 10 ppm |
| (3) 100 ppm | (4) 1000 ppm |

124. The unit of electrical conductivity is

- | | |
|-------------|----------------------|
| (1) mhos/cm | (2) Siemens |
| (3) ohms/cm | (4) Both (1) and (2) |

125. The minimum water pressure maintained in fire hydrant is

- | | |
|------------------------------------|-----------------------------------|
| (1) 0.1 to 0.15 kg/cm ² | (2) 1.0 to 1.5 kg/cm ² |
| (3) 10 to 15 kg/cm ² | (4) 10 to 20 kg/cm ² |

126. Which natural coagulants are used in rural areas of India?

- | | |
|-----------------------|---------------------|
| (1) Nirmali Seeds | (2) Drumstick Seeds |
| (3) Lady finger seeds | (4) All the above |

SPACE FOR ROUGH WORK



134. The design period for sewage treatment plant is about

- | | |
|--------------------|--------------------|
| (1) 10 to 20 Years | (2) 10 to 30 Years |
| (3) 20 to 30 Years | (4) 10 to 40 Years |

135. Manholes are constructed on sewer under

- (1) every change of alignment
- (2) change of gradient
- (3) change of alignment, gradient and diameter
- (4) change of diameter

136. The percentage of solids present in sewage is

- | | |
|----------|----------|
| (1) 99.9 | (2) 90.0 |
| (3) 0.1 | (4) 0.01 |

137. Disposal of sewage in large cities is done by

- | | |
|--------------------|-------------------|
| (1) Sewage farming | (2) Dilution |
| (3) Oxidation Pond | (4) Land disposal |

138. Lowest point in sewer is called

- | | |
|------------|-------------|
| (1) Invert | (2) Summit |
| (3) Soffit | (4) Culvert |

139. In BOD test, oxygen consumed by bacteria after 5 day incubation is 6.5 mg/l, the value of BOD_5 is

- | | |
|--------------|---------------|
| (1) 6.5 mg/l | (2) 3.25 mg/l |
| (3) 13 mg/l | (4) 26 mg/l |

SPACE FOR ROUGH WORK



140. BOD removal efficiency of oxidation pond is
- (1) 99% (2) 90% (3) 95% (4) 96%
141. If the diameter of circular sewer is 1.2 m, the width of egg shaped sewer section is
- (1) 1.0 m (2) 1.2 m (3) 0.6 m (4) 0.8 m
142. Parshall flume is provided to control velocity of flow in
- (1) Trickling Filter (2) Grit Chamber
(3) Activated Sludge Process (4) Oxidation Ditch
143. _____ is provided in the last manhole of house drainage system.
- (1) S-trap (2) Floor trap
(3) Gully Trap (4) Intercepting Trap
144. _____ is situated just near the point of sewage disposal into the stream.
- (1) Degradation Zone (2) Active Decomposition Zone
(3) Recovery Zone (4) Clear Water Zone
145. The gases liberated during digestion of sewage sludge in digesters are
- (1) CH_4 , H_2S (2) CH_4 , H_2S , CO_2
(3) CO_2 , H_2S (4) CO_2 , N_2 , O_2
146. Septic tanks should be cleaned for every
- (1) 1 to 3 months (2) 2 to 6 months
(3) 4 to 12 months (4) 6 to 12 months

SPACE FOR ROUGH WORK



147. Dried sewage after treatment is used as

- | | |
|----------------|-------------------------------|
| (1) Fertilizer | (2) Building material |
| (3) Chemical | (4) Base materials for paints |

148. _____ method of neutralizing an acid waste has high neutralization capacity.

- | | |
|---------------------------------------|----------------------------|
| (1) Mixing with highly alkaline waste | (2) Lime Stone Treatment |
| (3) Lime Slurry treatment | (4) Caustic Soda Treatment |

149. Which method is very effective in strength reduction?

- | | |
|-----------------------------|--------------------------------|
| (1) Equipment modification | (2) Reuse of waste |
| (3) Changing the production | (4) Conservation of Wastewater |

150. By-product recovery is practiced in _____ industries.

- | | |
|-------------|--------------------|
| (1) Dairy | (2) Sugar |
| (3) Tannery | (4) Pharmaceutical |

151. The yield of energy in an wastewater treatment is more in _____ systems.

- | | |
|---------------|-----------------|
| (1) Anaerobic | (2) Anoxic |
| (3) Aerobic | (4) Facultative |

152. In a plug-flow reactor model _____ mixing does not occur.

- | | |
|--------------|------------------|
| (1) Traverse | (2) Longitudinal |
| (3) Deep | (4) Rapid |

153. _____ settling occurs in a primary sedimentation tank of wastewater treatment.

- | | |
|----------------|---------------|
| (1) Type - I | (2) Type - II |
| (3) Type - III | (4) Type - IV |

SPACE FOR ROUGH WORK



154. The major toxic pollutant of fertilizer industry is
- | | |
|--------------|-------------|
| (1) Arsenic | (2) Cadmium |
| (3) Chromium | (4) Mercury |
155. For a balanced growth of micro-organisms in an anerobic biological reactor the BOD:N:P ratio should be
- | | |
|-----------------|-----------------------|
| (1) 100:25:5 | (2) 100:2.5:5 |
| (3) 100:2.5:0.5 | (4) None of the above |
156. In Kraft process, the green liquor is converted to white liquor by the addition of
- | | |
|------------|--------------|
| (1) Lime | (2) Alum |
| (3) Oxygen | (4) Chlorine |
157. In chrome-tanning process, the tanning is carried out by the addition of
- | | |
|-----------------------|-----------------------|
| (1) Chromium Chloride | (2) Chromium Sulphate |
| (3) Chromium Nitrate | (4) Chromium Sulphide |
158. _____ is the basic carbohydrate consumed in human diet.
- | | |
|---------------|-------------|
| (1) Starch | (2) Sugar |
| (3) Cellulose | (4) Glucose |
159. _____ is the rich source of Proteins.
- | | |
|------------|------------------|
| (1) Fruits | (2) Vegetables |
| (3) Egg | (4) Green Leaves |
160. Deficiency of _____ causes night blindness.
- | | |
|-----------------|-----------------|
| (1) Vitamin – A | (2) Vitamin – B |
| (3) Vitamin – E | (4) Vitamin – K |

SPACE FOR ROUGH WORK



161. _____ are called "Power House" of cells.
- | | |
|---------------|---------------------|
| (1) Ribosomes | (2) Mitochondria |
| (3) Lysosome | (4) Golgi Apparatus |
162. The chemistry which deals with chemical changes brought about by living organisms is known as
- | | |
|-----------------------|-------------------------|
| (1) Organic Chemistry | (2) Inorganic Chemistry |
| (3) Bio-Chemistry | (4) Colloidal Chemistry |
163. The study of fungi is known as
- | | |
|---------------|----------------|
| (1) Mycology | (2) Cytology |
| (3) Phycology | (4) Algaeology |
164. Disinfection of water is done to kill _____
- | | |
|-----------------------------|-------------------------|
| (1) Spores of Bacteria | (2) Pathogenic Bacteria |
| (3) Non-Pathogenic Bacteria | (4) Pathogenic Viruses |
165. Hepatitis-B is an acute infection of
- | | |
|---------------|------------------|
| (1) Intestine | (2) Stomach |
| (3) Liver | (4) Gall Bladder |
166. Presence of excess fluorine in water causes
- | | |
|----------------------|-------------------|
| (1) Dental Fluorosis | (2) Dental Caries |
| (3) Both (1) and (2) | (4) Fluorosis |
167. _____ method of pasteurization is most widely used.
- | | |
|----------------|-----------------|
| (1) Vat Method | (2) HTST Method |
| (3) UHT Method | (4) HST Method |

SPACE FOR ROUGH WORK



168. _____ plume is the most favorable to control air pollution.
- (1) Coning (2) Looping
(3) Fumigation (4) Lofting
169. Under normal conditions, oxygen concentration present in atmospheric air is
- (1) 10.9 (2) 15.9
(3) 20.9 (4) 25.9
170. _____ is generally not considered as air pollutant.
- (1) CO (2) CO₂ (3) NO₂ (4) SO₂
171. Silica dust particles causes _____ occupational disease.
- (1) Asbestosis (2) Fluorosis
(3) Anthracosis (4) Silicosis
172. Exposure to noise above _____ may rupture ear membrane.
- (1) 200 dB (2) 180 dB
(3) 160 dB (4) 140 dB
173. In a major construction project _____ prepares estimates.
- (1) contractor (2) owner
(3) architect (4) quantity surveyors
174. _____ is not a function of construction management.
- (1) organizing (2) directing
(3) financing (4) coordinating

SPACE FOR ROUGH WORK



175. Preparation of detailed drawing and specification comes under

- | | |
|---------------------|------------------------|
| (1) Job planning | (2) Technical planning |
| (3) Pre tender plan | (4) Post tender plan |

176. _____ is not a type of schedule.

- | | |
|-----------------------|--------------------------|
| (1) planning schedule | (2) expenditure schedule |
| (3) labour schedule | (4) equipment schedule |

177. Dummy activity requires _____ time.

- | | |
|----------|------------------|
| (1) unit | (2) zero |
| (3) real | (4) hypothetical |

178. _____ is not a type of contract.

- | | |
|-----------------------|------------------------|
| (1) labour contract | (2) material contract |
| (3) lump sum contract | (4) item rate contract |

179. EMD means

- | | |
|---------------------------|-------------------------|
| (1) Earnest Money Demand | (2) Early Money Demand |
| (3) Earnest Money Deposit | (4) Early Money Deposit |

180. e-tendering avoids

- | | |
|-----------------------------|----------------------|
| (1) non serious contractors | (2) corruption |
| (3) favoritism | (4) all of the above |

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A-1