DIPLOMA - COMMON ENTRANCE TEST-2019

	COURSE	DAY : SUNDAY DATE : 21-07-2019
A	CHEMICAL ENGINEERING	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	210185

Dos :

1. Candidate must verify that the DCET number and Name printed on the OMR Answer Sheet is tallying with the DCET number and Name printed on the Admission Ticket. Discrepancy if any, report to invigilator.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 9.50 am**.
3. The Version Code of this Question Booklet should be entered on the OMR Answer Sheet and the respective circle should also be shaded completely.
4. The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DONTs :

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. The **3rd Bell rings at 10.00 am, till then;**
   - Do not remove the seal present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - 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 am**, remove the paper seal of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent **180** minutes :
   - Read each question (item) carefully.
   - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose only one response for each item.
   - Completely **darken / shade** the relevant circle with a blue or **black ink ballpoint pen against the question number on the OMR answer sheet.**

ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHODS
(A) ● (C) (D)	(A) (B) (C) (D) (A) (B) (C) ✓ (D) (A) ● ● (D) (A) (B) (C) (D) (A) ● (C) (D)

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 pm**, 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**.

CH-A

CONFIDENTIAL

PART – A

APPLIED SCIENCE

1. One of the basic unit in SI is

   (A) Newton (B) Joule

   (C) Kilometer (D) Ampere

2. The pitch of screw is $\frac{1}{2}$ mm. The number of divisions on head scale of screw gauge is 50. The least count of screw gauge is

   (A) 0.1 mm (B) 0.5 mm

   (C) 0.01 mm (D) 0.05 mm

3. Which one of the following is a vector quantity ?

   (A) Speed (B) Density

   (C) Velocity (D) Mass

4. The magnitude of resultant of two forces $\vec{P}$ & $\vec{Q}$ acting perpendicular to each other is

   (A) $\sqrt{P^2 + Q^2}$ (B) $\sqrt{P^2 - Q^2}$

   (C) $P^2 - Q^2$ (D) $P^2 + Q^2$

5. A force of 50 N acts at a point making an angle of 30° with the horizontal. The vertical component is

   (A) 50 N (B) 25 N

   (C) 150 N (D) 1.6 N

Space For Rough Work

6. A couple produces

(A) pure linear motion (B) pure rotational motion

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

7. The resultant of two like parallel forces acts in the direction of

(A) same as that of two forces (B) opposite to two forces

(C) perpendicular to two forces (D) direction cannot be specified

8. The reciprocal of bulk modulus of elasticity is called

(A) Compressibility (B) Rigidity

(C) Modulus of elasticity (D) Viscosity

9. A steel wire has a cross sectional area of 0.05 m^2. If the maximum stress of steel wire is 1000 N/m^2. The force is

(A) 20×10^3 N (B) 50 N

(C) 200 N (D) 20 N

10. The pressure at a point on surface of a liquid is

(A) minimum (B) maximum

(C) zero (D) infinity

11. The pressure exerted by sea water of density 1025 kg/m^3 on a fish at a depth of 10 m ($g = 10\ m/s^2$) is

(A) 1025 kPa (B) 10.25 kPa

(C) 1.025 kPa (D) 102.5 kPa

Space For Rough Work

12. A drop of rain assumes spherical shape due to

(A) Density (B) Viscosity

(C) Surface tension (D) Humidity

13. The phenomenon of rise or fall of liquid in a capillary tube is

(A) Viscosity (B) Capillarity

(C) Density (D) Elasticity

14. The S.I. unit of coefficient of viscosity is

(A) Ns/m^2 (B) Nm^2/s

(C) m^2s/N (D) Ns/m

15. The expression that represents Boyle's law is

(A) PV = constant (B) PT = constant

(C) VT = constant (D) PVT = constant

16. The volume of gas at 30 °C is 2 litres. To what temperature the gas must be heated for its volume to become 4 litres at constant pressure.

(A) 300 °C (B) 273 °C

(C) 333 °C (D) 606 °C

17. Working of pressure cooker is based on the principle of

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

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

Space For Rough Work

18. Land and sea breeze is an example of

(A) Conduction (B) Convection

(C) Condensation (D) Radiation

19. The measure of average kinetic energy of all the particles in a gas is

(A) Heat (B) Mechanical energy

(C) Chemical energy (D) Temperature

20. When a wave travels through the medium, the particles of the medium are

(A) displaced in the direction of wave

(B) displaced opposite to the direction of wave

(C) mean position remains same

(D) starts rotating

21. Two waves with very little difference in their frequencies overlap on one another to produce

(A) Stationary waves (B) Progressive waves

(C) Beats (D) Transverse waves

22. The acceleration of the particle executing simple harmonic motion is directly proportional to its

(A) displacement from its mean position

(B) period of motion

(C) frequency of vibration

(D) amplitude of wave

Space For Rough Work

23. In the expression for velocity of sound in air, $V = \sqrt{\frac{\gamma P}{\rho}}$, notation γ is equal to

(A) $C_P + C_V$ (B) $C_P - C_V$

(C) $C_P \times C_V$ (D) $\frac{C_P}{C_V}$

24. Velocity of sound in outer space is

(A) 3×10^8 m/s (B) 330 m/s

(C) zero (D) 360 m/s

25. A string of length 1 m and mass 0.04 kilogram vibrates with fundamental frequency of 100 Hz then the tension in the string is

(A) 4000 N (B) 1600 N

(C) 400 N (D) 1000 N

26. Nodes and antinodes are characteristics of

(A) Stationary waves (B) Longitudinal waves

(C) Transverse waves (D) Beats

27. Natural frequency of a string does not vary with

(A) thickness (B) applied force

(C) tension (D) length

28. The electromagnetic radiation used in Forensic Department to study the finger print is

(A) Ultraviolet Ray (UV Ray) (B) Radio wave

(C) Micro wave (D) X-ray

Space For Rough Work

29. The type of light used to study Holography is

(A) Visible light (B) Laser light

(C) Sodium light (D) Mercury light

30. Which technology is used to develop Sun Screen lotion and cosmetics ?

(A) Geo-technology (B) Nano-technology

(C) Electro-technology (D) Micro-technology

31. The process of separating the information signal from the carrier wave at the receiver is known as

(A) Amplification (B) Modulation

(C) Attenuation (D) Demodulation

32. Optical fibre is used in

(A) Pressure sensors (B) Drilling

(C) Holography (D) Welding

33. The mass of copper deposited on the cathode of a copper voltmeter by a current of 2 amperes in 30 minutes is

(Given ece of copper (Z) = 0.0003 gm / coulomb)

(A) 3.2 gm (B) 4.3 gm

(C) 1.08 gm (D) 2.5 gm

34. The process of coating zinc over iron or steel is known as

(A) Galvanizing (B) Tinning

(C) Alloying (D) Non-Metallic coating

Space For Rough Work

35. SOFC is a type of

(A) Primary cell (B) Secondary cell

(C) Fuel cell (D) Solar cell

36. Magnalium is an alloy made by the combination of aluminium and

(A) Phosphorous (B) Zinc

(C) Tin (D) Magnesium

37. Zinc-carbon battery is an example for

(A) Secondary Battery (B) Fuel cell

(C) Primary Battery (D) Solar cell

38. Which of the following is not a polymer ?

(A) Teflon (B) Nylon

(C) Bakelite (D) Glass

39. Ceramic is which type of material ?

(A) Composite material (B) Alloy

(C) Polymer (D) Bio-material

40. The pH value of distilled water is

(A) 13 (B) 7

(C) 2 (D) 11

Space For Rough Work

PART – B

ENGINEERING MATHEMATICS

41. If $A = \begin{bmatrix} -3 & 4 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 \\ -2 & 1 \end{bmatrix}$, then $B^T \cdot A^T$ is

(A) $\begin{bmatrix} 3 & 8 \\ -4 & 0 \end{bmatrix}$

(B) $\begin{bmatrix} -5 & -2 \\ -2 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} 5 & 2 \\ -2 & -4 \end{bmatrix}$

(D) $\begin{bmatrix} 5 & 2 \\ 2 & 4 \end{bmatrix}$

42. The value of the $\begin{vmatrix} \tan\theta & 0 & -1 \\ 1 & 0 & \tan\theta \\ 2 & -1 & 3 \end{vmatrix}$ is

(A) $-\sec^2\theta$

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

(C) 1

(D) $\sec^2\theta$

43. The values of x and y in the simultaneous equations $2x - 3y = 13$ and $3x + 4y = -6$ are

(A) $x = -3, y = 2$

(B) $x = -2, y = -3$

(C) $x = 2, y = -3$

(D) $x = 2, y = 3$

44. If $\begin{vmatrix} 3 & -2 & 4 \\ 4 & 0 & x \\ 2 & -5 & 4 \end{vmatrix} = -4$, then the value of x is

(A) 4

(B) –4

(C) $\frac{44}{19}$

(D) $-\frac{44}{19}$

Space For Rough Work

45. The characteristics roots of the matrix $\begin{bmatrix} 2 & 0 \\ 0 & -3 \end{bmatrix}$ are

(A) $\lambda = 2$ and $\lambda = 3$ (B) $\lambda = -2$ and $\lambda = -3$

(C) $\lambda = 2$ and $\lambda = -3$ (D) $\lambda = -2$ and $\lambda = 3$

46. The adjoint of the matrix $\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$ is

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

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

47. If A = (1, 2, –3) and B = (2, 0, –1) then $\overrightarrow{AB}$ is

(A) $i - 2j + 2k$ (B) $-i + 2j - 2k$

(C) $3i + 2j - 4k$ (D) $i + 2j - 2k$

48. The work done by the force $\vec{F} = 2i + 6j - 8k$, whose displacement is $\vec{S} = -2i + 3j - k$ is

(A) 26 units (B) –22 units

(C) 22 units (D) 30 units

49. The vector product of $\vec{a} = 4i - j + k$ and $\vec{b} = 3i - 2k$ is

(A) $2i - 11j + 3k$ (B) $2i + 11j + 3k$

(C) $2i + 5j + 3k$ (D) $2i + 11j - 3k$

50. When a fair coin is tossed two times, the event A "getting exactly one tail" is given by

(A) {HT, TH} (B) {TT}

(C) {TH} (D) {TT, HT}

Space For Rough Work

51. If $\tan\theta = \frac{5}{12}$ and $\pi < \theta < \frac{3\pi}{2}$, then the value of $\sin\theta - \cos\theta$ is

(A) $\frac{17}{13}$ (B) $\frac{7}{13}$

(C) $-\frac{17}{13}$ (D) $-\frac{7}{13}$

52. The value of $\tan 225° \times \cot 405°$ is

(A) 1 (B) –1

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

53. The value of $\sin 50° \cos 20° - \cos 50° \cdot \sin 20°$ is

(A) $\sin 70°$ (B) $\frac{\sqrt{3}}{2}$

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

54. If $\cos A = \frac{15}{17}$ and $\sin B = \frac{3}{5}$, then the value of $\cos(A + B)$ is

(A) $\frac{84}{85}$ (B) $-\frac{36}{85}$

(C) $-\frac{84}{85}$ (D) $\frac{36}{85}$

55. The value of $\sqrt{\frac{1+\sin 2A}{1-\sin 2A}}$ is

(A) $\cot\left(\frac{\pi}{4}+A\right)$ (B) $\cot\left(\frac{\pi}{4}-A\right)$

(C) $\tan\left(\frac{\pi}{4}-A\right)$ (D) $\cot\left(\frac{\pi}{2}-A\right)$

Space For Rough Work

56. The value of $\cos 40° + \sin 10°$ is

(A) $\sin 20°$ (B) $-\cos 20°$

(C) $\cos 20°$ (D) $-\sin 20°$

57. The value of $i + i^2 + i^3 + i^4$ is

(A) i (B) –i

(C) 1 (D) 0

58. $\lim_{x \to 0} \frac{x}{\sqrt{1+x}-1}$ is equal to

(A) 0 (B) 1

(C) 2 (D) ∞

59. $\lim_{x \to \infty} \frac{3x^3 + 4x + 7}{(6 + x^2)(x - 1)} =$

(A) 3 (B) –3

(C) $\frac{1}{2}$ (D) $\frac{1}{6}$

60. $\lim_{x \to 0} \frac{3x + \sin 4x}{2 \sin 3x - 5x} =$

(A) $\frac{4}{3}$ (B) 7

(C) $\frac{3}{5}$ (D) $\frac{7}{11}$

Space For Rough Work

61. The slope and y-intercept of the line $6x - 4y + 3 = 0$ are respectively

(A) $\frac{3}{2}$ and $\frac{3}{4}$ (B) $\frac{2}{3}$ and $\frac{4}{3}$

(C) $\frac{-3}{2}$ and $\frac{4}{3}$ (D) $\frac{3}{2}$ and $\frac{2}{3}$

62. The equation of the line joining the points (1, 3) and (2, –4) is

(A) $7x - y - 10 = 0$ (B) $7x + y - 10 = 0$

(C) $x + 7y + 10 = 0$ (D) $x - 7y - 10 = 0$

63. If $y = e^{-2x} + 4a^x$, then $\frac{dy}{dx} =$

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

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

64. If $y = \log(\log 3x)$ then $\frac{dy}{dx} =$

(A) $\frac{1}{x \log 3x}$ (B) $\frac{3}{x \log 3x}$

(C) $2 \log 3x$ (D) $\frac{1}{\log x}$

65. If $xy = x + y^2$, then $\frac{dy}{dx} =$

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

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

Space For Rough Work

66. If $x = \tan^{-1} t$ and $y = 3t + t^3$ then $\frac{dy}{dx} =$

(A) 3

(B) $3(1 + t^2)^2$

(C) $\frac{3}{(1 + t^2)^2}$

(D) $\frac{1}{3(1 + t^2)^2}$

67. If $y = (x)^{\frac{1}{x}}$, then $\frac{dy}{dx} =$

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

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

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

(D) $\frac{y[1 - \log x]}{x^2}$

68. Which of the following equations satisfy for the function $y = e^{\tan^{-1} x}$ with usual notations ?

(A) $(1 + x^2)y_2 + (2x - 1)y_1 = 0$

(B) $(1 + x^2)y_2 + 2xy_1 = 0$

(C) $(1 - x^2)y_2 - xy_1 - y = 0$

(D) $xy_2 - 2y_1 - xy = 0$

69. The equation of a normal to the curve $y = 4x^3 + 3x^2 + 4$ at the point $(-1, 3)$ is

(A) $6x + y - 19 = 0$

(B) $x + 6y - 17 = 0$

(C) $x - 6y + 17 = 0$

(D) $6x - y + 19 = 0$

70. The rate of change of surface area of a sphere is 12 cm^2/s. The rate at which the radius is changing when the radius of the sphere is 2 cm is equal to

(A) $\frac{\pi}{4}$ cm/s

(B) $\frac{3\pi}{4}$ cm/s

(C) 3π cm/s

(D) $\frac{3}{4\pi}$ cm/s

Space For Rough Work

71. $\int \left(1 + x - \frac{1}{x} + e^x\right) dx$

(A) $1 - \frac{1}{x^2} + e^x + c$

(B) $1 + \frac{x^2}{2} - \frac{1}{x^2} + e^x + c$

(C) $x + \frac{x^2}{2} - \log x + e^x + c$

(D) $x + 1 - \frac{1}{x^3} - e^x + c$

72. $\int e^{\tan x} \cdot \sec^2 x \, dx =$

(A) $e^{\tan x} + c$

(B) $e^{\sec^2 x} + c$

(C) $e^{\tan^2 x} + c$

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

73. $\int \cot^2 x \, dx =$

(A) $-\text{cosec}\, x + c$

(B) $-\cot x - x + c$

(C) $-\cot x + x + c$

(D) $\cot x + x + c$

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

(A) $x \sin x - \cos x + c$

(B) $x \cos x - \sin x + c$

(C) $x \sin x + \cos x + c$

(D) $-x \cos x + \sin x + c$

75. $\int \sqrt[3]{x^2} \, dx =$

(A) $\frac{5}{2} x^{\frac{5}{2}} + c$

(B) $\frac{3}{5} x^{\frac{5}{3}} + c$

(C) $\frac{5x^{\frac{2}{5}}}{2} + c$

(D) $\frac{x^2}{2} + c$

Space For Rough Work

76. $\int_0^{\pi/2} \cos^2 x \, dx =$

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{6}$

(C) $\frac{\pi}{3}$ (D) $\frac{\pi}{4}$

77. The volume of a solid generated when the curve $y = \sqrt{x^2 + 4}$ is rotated about x-axis between the ordinates $x = -1$ and $x = 1$ is

(A) $\frac{23\pi}{3}$ cubic units (B) $\frac{26\pi}{3}$ cubic units

(C) $\frac{16\pi}{3}$ cubic units (D) 0

78. The order and degree of the differential equation $\frac{dy}{dx} = \sqrt{1 + \frac{d^2y}{dx^2}}$ respectively are

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

(C) 2 and 1 (D) 2 and 2

79. The differential equation formed from the equation $y = ae^x + be^{-x}$ by eliminating arbitrary constants is

(A) $\frac{d^2y}{dx^2} - y = 0$ (B) $\frac{d^2y}{dx^2} + y = 0$

(C) $\frac{dy}{dx} + y = 0$ (D) $\frac{dy}{dx} - y = 0$

80. Solution of the differential equation $\frac{dy}{dx} = \frac{1 + y^2}{1 + x^2}$ is

(A) $\tan^{-1} y + \tan^{-1} x = k$ (B) $\tan^{-1} y - \tan^{-1} x = k$

(C) $\sin^{-1} y + \sin^{-1} x = k$ (D) $\sin^{-1} y - \sin^{-1} x = k$

Space For Rough Work

PART – C

CHEMICAL ENGINEERING

81. Mass number of an element is equal to

(A) number of protons (B) number of neutrons

(C) number of electrons + protons (D) numbers of neutrons + protons

82. Equivalent weight of an element is equal to

(A) $\frac{\text{Atomic weight}}{\text{Valency}}$ (B) $\frac{\text{Atomic number}}{\text{Valency}}$

(C) Atomic weight × Valency (D) Atomic number × Valency

83. The amount of heat liberated or absorbed during conversion of diamond into graphite is termed as

(A) enthalpy of reaction (B) enthalpy of combustion

(C) enthalpy of transition (D) enthalpy of formation

84. Law of conservation of energy was stated by

(A) Arrhenius (B) Lavoisier

(C) Gibb (D) Hess

85. The chemical equilibrium constant K_p for a reversible reaction $N_2 + O_2 \rightleftharpoons 2NO$ is _____

(A) $K_p = \frac{[N_2]\,[O_2]}{[NO]^2}$ (B) $K_p = \frac{P_{N_2} \times P_{O_2}}{P_{NO}^2}$

(C) $K_p = \frac{[NO]^2}{[N_2]\,[O_2]}$ (D) $K_p = \frac{P_{NO}^2}{P_{N_2} \times P_{O_2}}$

Space For Rough Work

86. The concept of free energy was explained by

(A) Willard Gibb (B) G.N. Lewis

(C) Laplace (D) Guldberg and Waage

87. When 6.023×10^{23} molecules of nitrogen react with $3 \times 6.023 \times 10^{23}$ molecules of hydrogen, then the number of molecules of ammonia obtained is

(A) 6.023×10^{23} molecules (B) $2 \times 6.023 \times 10^{23}$ molecules

(C) $3 \times 6.023 \times 10^{23}$ molecules (D) $4 \times 6.023 \times 10^{23}$ molecules

88. For the reaction $H_2 + Cl_2 \xrightarrow{\text{sunlight}} 2HCl$ taking place on water, then the order of the reaction is _____ order.

(A) Zero (B) First

(C) Second (D) Fractional

89. An example of corrosion is _____.

(A) Black coating on silver (B) Green coating on copper

(C) Brown coating on iron (D) All of these

90. The pH value is the measure of

(A) power of hydrogen ion concentration

(B) concentration of an acid

(C) concentration of a base

(D) All of these

91. The chemical which is used for artificial ripening of fruits is

(A) Methane (B) Ethane

(C) Ethene (D) Ethyne

92. Natural Gas primarily contains

(A) Butane (B) Ethane

(C) Methane (D) Propane

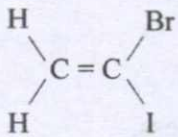
Space For Rough Work

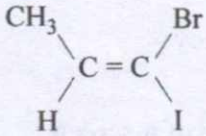
93. Table sugar is a common name of

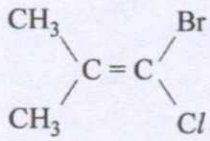
(A) Fructose (B) Glucose

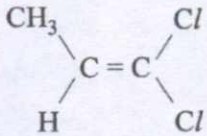
(C) Maltose (D) Sucrose

94. Geometrical isomerism is exhibited by _____.

(A) 

(B) 

(C) 

(D) 

95. IUPAC name of Acetone is

(A) 2, 3-Dimethylketone (B) 1, 1-Dimethylketone

(C) 2-propanone (D) 2-methyl ethanone

96. Two or more organic compounds having the same composition but different chemical structures and different properties are called _____.

(A) Isotopes (B) Allotropes

(C) Isomers (D) Polymers

97. Generally unsaturated hydrocarbons undergo _____ reactions and saturated hydrocarbons undergo substitution reactions.

(A) addition (B) electrophilic substitution

(C) nucleophilic substitution (D) All of these

98. Among the following organic compounds _____ gives more smoke when burnt in air.

(A) Methane (B) Ethene

(C) Acetylene (D) Benzene

Space For Rough Work

99. Aniline and Methyl amine are the derivatives of

(A) Benzene (B) Methane

(C) Ammonia (D) Both (A) and (B)

100. Octane number of gasoline is a measure of its

(A) Ignition delay (B) Ignition temperature

(C) Knocking tendency (D) Smoke point

101. Increasing the capacity of a screen _____ the screen effectiveness.

(A) decreases (B) increases

(C) does not affect (D) None of these

102. Temperature of the product during ultrafine grinding

(A) increases (B) decreases

(C) remains constant (D) may increase or decrease

103. Vertical transportation of materials can be done by

(A) Apron conveyor (B) Pneumatic conveyor

(C) Bucket elevator (D) Both (B) and (C)

104. In a ball mill, the volume occupied by the balls (when the mill is stopped) is about _____ percent of the volume of the mill.

(A) 35 (B) 50

(C) 70 (D) 85

105. Optimum ratio of operating speed to critical speed of a trammel is

(A) 0.33 – 0.45 (B) 1.33 – 1.45

(C) 0.5 – 2 (D) 1.5 – 2.5

106. Cyclones are used primarily for separating

(A) solids (B) solids from fluids

(C) liquids (D) solids from solids mixture

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107. _____ mills are termed as impactors.

(A) Hammer (B) Cage

(C) Rolling compression (D) Tube

108. Separation of the material of the same density based on their sizes by using their different rates of flow is called

(A) Sorting (B) Sizing

(C) Elutriation (D) Flocculation

109. Use of baffles in agitators help in minimising the _____ tendency.

(A) swirling (B) vortexing

(C) Both (A) and (B) (D) Neither (A) nor (B)

110. In paint industries, blending of light paste is done by using a

(A) Bambury mixer (B) Change can mixer

(C) Muller mixer (D) Kneader

111. The efficiency of a pump does not depend upon the

(A) Discharge head (B) Suction head

(C) Motor efficiency (D) Fluid density

112. When the flowrate increases, NPSH

(A) required increases

(B) available increases

(C) required decreases

(D) available and required both increase

113. In a centrifugal pump, the velocity energy is converted into pressure by

(A) Casing (B) Impeller

(C) Diffuser (D) Throttle valve

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114. In potential flow, wall drag is

(A) infinite (B) zero

(C) finite and non-zero (D) None of these

115. For free settling in intermediate range terminal velocity of a particle varies as

(A) d_p (B) $d_p^{0.5}$

(C) d_p^2 (D) $d_p^{1.14}$

116. For an ideal fluid flow, the Reynold's number is

(A) 2100 (B) 4000

(C) 0 (D) ∞

117. The flow of an incompressible fluid with no shear is known as _____ flow.

(A) Potential (B) Laminar

(C) Turbulent (D) Couette

118. For pipes that must be broken at intervals for maintenance, the connector used should be

(A) Union (B) Tee

(C) Reducer (D) Elbow

119. Check valves are used

(A) at high pressure (B) in bends

(C) for controlling water flow (D) for unidirectional flow

120. The head loss due to sudden expansion is

(A) $\frac{v_1^2 - v_2^2}{2g_c}$ (B) $\frac{(v_1 - v_2)^2}{2g_c}$

(C) $\frac{v_1 - v_2}{2g_c}$ (D) $\frac{v_1^2 - v_2^2}{g_c}$

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121. Input = Output, holds good for the system at steady state

(A) with chemical reaction

(B) without chemical reaction and losses

(C) with recycle and bypass reactions

(D) None of these

122. 1 gram mole of methane (CH_4) contains

(A) 6.02×10^{23} atoms of hydrogen

(B) 4 gram atoms of hydrogen

(C) 3.01×10^{23} molecules of methane

(D) 3 grams of carbon

123. Number of gram moles of solute dissolved in one litre of a solution is called its

(A) Equivalent weight (B) Molality

(C) Molarity (D) Normality

124. 80 kPa = _____ atm.

(A) 2.56 (B) 5.258

(C) 0.286 (D) 0.789

125. The gram moles of oxygen present in 500 grams

(A) 15.62 gram moles (B) 5.82 gram moles

(C) 12.89 gram moles (D) 8.46 gram moles

126. The equivalent weight of calcium chloride ($CaCl_2$) is

(A) 68.3 g (B) 55.5 g

(C) 7.0 g (D) 48.2 g

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127. 98 grams of H_2SO_4 is dissolved in water to prepare 1 litre of solution. Then the Normality of the solution is

(A) 1 N (B) 4 N

(C) 5 N (D) 2 N

128. The weight fraction for binary system [A & B] is

(A) 1 (B) 0

(C) 2 (D) 10

129. HNO_3 and H_2O forms azeotrope containing 62.2% water by weight. The mole % of HNO_3 is

(A) 10.25% (B) 14.79%

(C) 17.85% (D) 15.2%

130. Average molecular weight is the ratio of

(A) $\frac{\text{Total pressure}}{\text{Partial pressure}}$ (B) $\frac{\text{Individual mole}}{\text{Total moles}}$

(C) $\frac{\text{Total mass}}{\text{Total moles}}$ (D) $\frac{\text{Individual weight}}{\text{Total weight}}$

131. Volume percent for gases is equal to the

(A) weight percent

(B) mole percent

(C) weight percent only for ideal gases

(D) mole percent only for ideal gases

132. Average molecular weight of air is about

(A) 21 (B) 29

(C) 23 (D) 79

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133. One Newton is equal to _____ dynes.

(A) 10^2 (B) 10^3

(C) 10^4 (D) 10^5

134. A limiting reactant is the one which decides the _____ in the chemical reaction.

(A) equilibrium constant (B) conversion

(C) rate constant (D) equivalent weight

135. Molality is defined as the number of gram moles of solute per _____ of solvent.

(A) litre (B) gram mole

(C) kg (D) gram

136. Density of carbon-di-oxide is _____ kg/m^3

(A) 44/22400 (B) 44/22.4

(C) 22.4/44 (D) 44/2240

137. A solution of caustic soda contains 20% by weight. The density of solution is 1.196 kg/l. Then molality of solution is

(A) 6.25 (B) 4.20

(C) 3.5 (D) 5.5

138. The molecular weight of sodium carbonate is

(A) 95 grams (B) 80 grams

(C) 106 grams (D) 100 grams

139. Conversion of 85 ft/min into m/s is

(A) 7.197×10^{-3} (B) 3.567×10^{-3}

(C) 5.265×10^{-4} (D) 2.42×10^{-2}

140. Atomic _____ of an element is a whole number.

(A) weight (B) number

(C) volume (D) radius

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141. Zieglar process

(A) produces high density polythene

(B) uses no catalyst

(C) produces low density polythene

(D) employs very high pressure

142. Poly Vinyl Chloride (PVC) is a _____ material.

(A) thermoplastic (B) thermosetting

(C) fibrous (D) chemically active

143. Starting material for the production of SBR is

(A) ethyl alcohol (B) ethylene

(C) Both (A) and (B) (D) Neither (A) nor (B)

144. Polymers are

(A) Micromolecules (B) Macromolecules

(C) Sub-micromolecules (D) None of these

145. Plasticizers are added to synthetic plastics to

(A) impart flexibility

(B) improve workability during fabrication

(C) develop new improved properties not present in the original resin.

(D) All (A), (B) and (C)

146. Phenol formaldehyde is also known as

(A) Teflon (B) Bakelite

(C) Polyester (D) Nylon-6, 6

147. Polypropylene compared to polythene is

(A) harder (B) stronger

(C) lighter (D) All (A), (B) and (C)

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148. Which of the following is a copolymer ?

(A) PVC (B) Bakelite

(C) Polythene (D) Teflon

149. Which of the following is the lowest cost plastic commercially available ?

(A) PVC (B) Teflon

(C) Bakelite (D) Polythene

150. Catalyst used in the production of high density polythene by low pressure Zieglar process is

(A) Aluminium triethyl activated with $TiCl_4$

(B) Platinum

(C) Molybdenum

(D) Nickel

151. Servo problem means that the _____ is constant.

(A) Set point (B) Load

(C) Both (A) and (B) (D) Neither (A) nor (B)

152. The offset

(A) varies with time

(B) varies exponentially with time

(C) does not vary with time

(D) varies as square of the time

153. Thermistor is a

(A) semiconductor whose resistance decreases with temperature rise.

(B) metal whose resistance increases linearly with temperature rise.

(C) metal whose resistance does not vary with temperature.

(D) device for measuring nuclear radiation.

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154. Iron-constantan thermocouple can be used within a temperature range of _____ °C.

(A) –200 to 300 (B) –30 to 350

(C) –30 to 1100 (D) –30 to 1500

155. On increasing temperature, the resistance will decrease for

(A) Platinum (B) Carbon

(C) Copper (D) Constantan

156. An input which increases linearly with time is known as

(A) step input (B) impulse input

(C) sinusoidal input (D) ramp input

157. Capacitance of a first order system is defined as the ratio of the change in

(A) driving force to the change in flow.

(B) storage of a quantity to the change in driving force.

(C) storage of a quantity to change in flow.

(D) driving force to the change in storage of a quantity.

158. An algebraic equation relating the Celsius (centigrade) and Fahrenheit scale is

(A) $°C = \frac{9}{5}(°F - 32)$ (B) $°C = \frac{5}{9}(°F - 32)$

(C) $°C = \frac{5}{9}°F$ (D) $°C = \frac{9}{5}°F$

159. Absolute pressure is measured by

(A) a Bourdon Gauge (B) an aneroid barometer

(C) a differential manometer (D) a vacuum gauge

160. Heat input in case of a water heater is a _____ variable.

(A) controlled (B) manipulated

(C) load (D) None of these

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161. Thermal conductivity among the following is maximum for

(A) Coke (B) Gasoline

(C) Steel (D) Air

162. Heat transfer by conduction is described by

(A) Fourier's law (B) Newton's law of cooling

(C) Stefan-Boltzmann law (D) Fick's law

163. In natural convection fluid moves under the influence of

(A) buoyant forces arising from changes in density.

(B) changes in fluid pressure produced by external work.

(C) surface tension forces.

(D) elastic forces.

164. Heat transfer by radiation is described by

(A) Fourier's law (B) Fick's law

(C) Newton's law of cooling (D) Stefan-Boltzmann law

165. Absorptivity of the perfectly black body is

(A) 1 (B) 0

(C) 0.5 (D) ∞

166. Shell and tube type heat exchanger is used for large heat transfer area requirement because

(A) it is more economical (B) its space requirement is small

(C) it is easy to operate and maintain (D) All of these

167. 1-4 shell and tube exchanger means

(A) 1 shell side pass and 4 tube side passes

(B) 1 tube side pass and 4 shell side passes

(C) 4 tubes per pass

(D) 4 shell side passes and 4 tube side passes

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168. If only thermal conductivity had to be considered in selecting a tube material which metal would be the best ?

(A) Carbon steel (B) Stainless steel

(C) Copper (D) Aluminium

169. Capacity of an evaporator is defined as the

(A) number of kg of solvent vaporized per hour.

(B) number of kg of solvent vaporized per kg of steam fed.

(C) number of kg of steam consumed per hour.

(D) number of kg of steam consumed per kg of solvent vaporized.

170. Orange juice can be concentrated in

(A) once-through falling film evaporator.

(B) long tube evaporator with upward flow.

(C) forced circulation evaporator.

(D) Any of these

171. Milk powder is made from milk by drying in a

(A) drum dryer (B) rotary dryer

(C) spouted bed dryer (D) spray dryer

172. Cylinder driers are used in

(A) Detergent industry (B) Dairy industry

(C) Pharmaceutical industry (D) Paper industry

173. Rotary driers are suitable for

(A) sticky materials

(B) slurries and solutions

(C) wet lumpy solids

(D) free flowing granular materials

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174. Which is the controlling factor for a drum drier ?

(A) Diffusion (B) Heat transfer

(C) Both (A) and (B) (D) Neither (A) nor (B)

175. During constant rate period, vaporization rate per unit drying surface area

(A) decreases with time

(B) increases with time

(C) does not change with time

(D) does not affect the moisture content of the wet solid

176. Large scale drying of sugar is done in a _____ dryer.

(A) spouted (B) tray

(C) rotary (D) truck

177. Which of the following is not a continuous dryer ?

(A) Drum dryer (B) Spray dryer

(C) Tunnel dryer (D) Tray dryer

178. During drying operation, it is easier to remove the _____ moisture.

(A) equilibrium (B) critical

(C) unbound (D) bound

179. Drying of a wet solid under constant drying conditions means the exposure of the wet solid to the air of constant

(A) humidity (B) velocity

(C) temperature (D) All (A), (B) and (C)

180. Calcium Ammonium Nitrate (a fertilizer) is dried in a _____ dryer.

(A) rotary (B) vacuum

(C) tunnel (D) tray

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