

1. The ratio of escape velocity to the orbital velocity is

[1 Marks]

a. $\sqrt{2}:1$

b. $2:1$

c. $1:\sqrt{2}$

d. $1:2$

2. A particle executing SHM of amplitude 5cm has maximum speed of 31.4cm/s. The frequency of its oscillation is

[1 Marks]

a. 4Hz

b. 3Hz

c. 2Hz

d. 1Hz

3. The device that measures the quantity of heat is

[1 Marks]

a. Thermometer

b. Calorimeter

c. Sonometer

d. Voltmeter



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4. The temperature of sun is measured with

[1 Marks]

- a. Platinum thermometer
- b. Gas thermometer
- c. Pyrometer
- d. Vapour pressure thermometer

5. The differential equation of wave motion is

[1 Marks]

- a. $\frac{d^2y}{dx^2} = \frac{1}{v^2} \frac{d^2y}{dt^2}$
- b. $\frac{d^2y}{dx^2} = \frac{1}{v} \frac{d^2y}{dt^2}$
- c. $\frac{d^2y}{dx^2} = v^2 \frac{d^2y}{dt^2}$
- d. $\frac{d^2y}{dx^2} = v \frac{d^2y}{dt^2}$

6. Which of the following cannot be polarized

[1 Marks]

- a. Radio waves
- b. Sound wave
- c. X-rays
- d. Transverse waves

7. A completely transparent material will be invisible in vacuum when refractive index of material is

[1 Marks]

- a. Unity
- b. More than unity
- c. Less than unity
- d. Infinite

8. During an adiabatic process, the pressure of a gas is found to be proportional to the cube of its absolute temperature. The γ of gas is

[1 Marks]

- a. 1.3
- b. 2
- c. 1.7
- d. 1.5

9. The Cauchy dispersion relation is

[1 Marks]

- a. $\mu = A + \frac{B}{\lambda^2} + \dots$
- b. $\mu = A + \frac{B}{\lambda} + \dots$
- c. $\mu = A + \frac{B}{\lambda^3} + \dots$
- d. $\mu = A + \frac{B}{\lambda^4} + \dots$

10. A $800\mu F$ capacitor is charged at a steady rate of $40\mu C/sec$. Time it takes to raise its potential to 10V is

[1 Marks]

- a. 150sec
- b. 125sec
- c. 100sec
- d. 200sec

11. The dimension of resistance is same as those of..... Where h is Planck's constant and e is the charge of electron.

[1 Marks]

- a. $\frac{h^2}{e^2}$
- b. $\frac{h^2}{e}$
- c. $\frac{h}{e^2}$
- d. $\frac{h}{e}$

12. Lenz's law is a consequence of law of conservation of

[1 Marks]

- a. Energy
- b. Momentum
- c. Mass
- d. Charge

13. Lenz's law is a consequence of law of conservation of

[1 Marks]

- a. Energy
- b. Momentum
- c. Mass
- d. Charge

14. In an electronic transition, atom cannot emit

[1 Marks]

- a. UV radiation
- b. IR radiation
- c. Visible light
- d. Gamma rays

15. Boolean algebra is essentially based on

[1 Marks]

- a. Logic
- b. Truth
- c. Symbol
- d. Number

16. Number of NAND gates used to form an OR gate is

[1 Marks]

- a. 1
- b. 2
- c. 3
- d. 4

17. For any vectors $\vec{A}$ & $\vec{B}$, if $\vec{A} \cdot \vec{B} = \vec{A} \times \vec{B}$, the magnitude of $\vec{A} + \vec{B}$ is

[2 Marks]

- a. $\sqrt{A^2 + B^2 + \sqrt{2}AB}$
- b. $\sqrt{A^2 + B^2 + AB}$
- c. $\sqrt{A^2 + B^2 + 2AB}$
- d. $\sqrt{A^2 + B^2 - \sqrt{2}AB}$

18. A body of mass M and radius R , rolling on horizontal surface, without slipping, with velocity v , rises up an incline plane to maximum height $\frac{7v^2}{10g}$, the body is

[2 Marks]

- a. Hollow sphere
- b. Solid sphere
- c. Disc
- d. Ring

19. The surface tension of soap solution is $2 \times 10^{-2} \text{ Nm}^{-1}$. Change in surface energy of soap bubble when its radius decreases from 5cm to 1cm is

[2 Marks]

- a. $2.4 \times 10^{-3} \text{ J}$
- b. $1.2 \times 10^{-3} \text{ J}$
- c. $3.4 \times 10^{-3} \text{ J}$
- d. $4.2 \times 10^{-3} \text{ J}$

20. 10 gm of ice at -10°C is converted into steam at 100°C . The amount of heat required in calorie is

[2 Marks]

- a. 725
- b. 7250
- c. 350
- d. 3000

21. A transverse wave described by $y = 0.02\sin x + 30t$ propagates in stretched string of linear density 12g/m . The tension in the string is

[2 Marks]

- a. 10.8N
- b. 1.08N
- c. 0.108N
- d. 0.0108N

22. In Young's double slit experiment, the intensity ratio at a point of observation due to two coherent waves is 4:9. The ratio of the intensity at maxima to the intensity at minima is

[2 Marks]

- a. 25:1
- b. 81:16
- c. 13:4
- d. 9:4

23. If the value of First Cauchy constant is 1.501 and refractive index of prism is 1.514, the value of second Cauchy constant if wavelength of light used is $6563\text{\AA}$ is

[2 Marks]

- a. 5.59×10^{-15}
- b. 4.89×10^{-15}
- c. 3.79×10^{-15}
- d. 9.19×10^{-15}

24. An electron at rest has mass m and charge e . It is accelerated by a constant electric field E . The velocity of the electron after covering a distance S is

[2 Marks]

- a. $\sqrt{\frac{eE}{S}}$
- b. $\sqrt{\frac{eEm}{S}}$
- c. $\sqrt{\frac{2eES}{m}}$
- d. $\sqrt{\frac{2eEm}{S}}$

25. The wire of a fuse in an electric circuit melts when the current density increases to $600Am^{-2}$. The diameter of the wire so that it may limit the current to $0.4A$ is

[2 Marks]

- a. $0.04A$
- b. $0.08A$
- c. $0.12A$
- d. $0.16A$

26. A coil of mean area $500cm^2$ and having 1000 turns is held perpendicular to a uniform field of 0.4 gauss. The coil is turned through 180° in $0.1s$. The average induced emf is

[2 Marks]

- a. $0.04V$
- b. $0.4V$
- c. $-0.04V$
- d. $-0.4V$

27. In Millikan's oil drop experiment, a charge drop of mass $1.8 \times 10^{-14} kg$ is stationary between its plates. The distance between its plate is $0.9cm$ and P.D. is $2kilo$ volts. The no. of electrons on the drop is

[2 Marks]

- a. 500
- b. 50
- c. 5
- d. 0

- 28.** In a npn-transistor, 10^{10} electrons enter the emitter in 10^{-10} s. If 2% of the electrons are lost in the base, the value of β is
[2 Marks]
- a. 45
 - b. 47
 - c. 49
 - d. 51
- 29.** Choose the appropriate word to fill in the blank: A of laughter.
[1 Marks]
- a. Giggle
 - b. Scream
 - c. Sob
 - d. None of the above
- 30.** Among the options, select the correct structure of the given sentence: How clever he is!
[1 Marks]
- a. How + Adjective + Subject + Verb
 - b. Subject + Verb + Pronoun + Complement
 - c. How + adverb + Subject + Verb
 - d. Subject + Verb + Object
- 31.** The town its name from the famous temple andto be one of the oldest settlements in Nepal.
[1 Marks]
- a. Has taken, said
 - b. Take, is
 - c. Takes, is said
 - d. Taking, said

32. You would _____ gotten wet _____ it had rained.

[1 Marks]

- a. Has- when
- b. Have- if
- c. Be- when
- d. Have- when

33. I ... to become successful.

[1 Marks]

- a. Have always wanted
- b. Am always wanted
- c. Was always wanted
- d. Am always wanting

34. Identify the complex sentence from the following:

[1 Marks]

- a. The cow gives milk.
- b. Ram went to the park and played football.
- c. The sky is blue.
- d. When we went there, we found that he had gone.

35. Either the executive or the assistant _____ been here.

[1 Marks]

- a. have
- b. has
- c. was
- d. are

36. You can see the doctor _____ 8 am and 12 noon.

[1 Marks]

- a. At
- b. In
- c. Between
- d. On

37. Look _____ you leap.

[1 Marks]

- a. Before
- b. After
- c. Behind
- d. Beside

38. Pick out the word that is most nearly the same in meaning as the word BENEVOLENT.

[1 Marks]

- a. Secretive
- b. Stingy
- c. Kind
- d. Careful

39. Which of these terms refers to the study of speech process?

[1 Marks]

- a. Phonology
- b. Phonetic Substances
- c. Phonetics
- d. Semantics

40. Scientific, is part of the two clear vowels together.

[1 Marks]

- a. True
- b. False
- c. Maybe
- d. None of the above

41. Density of chlorine gas at STP is

[1 Marks]

- a. 2.8 g lit^{-1}
- b. 3.92 g lit^{-1}
- c. 4.12 g lit^{-1}
- d. 3.16 g lit^{-1}

42. A neutral atom of an element has 2K, 8L and 5M electrons. The total number of s electrons is

[1 Marks]

- a. 2
- b. 4
- c. 6
- d. 8

43. Which of the following acid has lowest pKa value?

[1 Marks]

- a. CH_3COOH
- b. HCOOH
- c. $(\text{CH}_3)_2 - \text{CH} - \text{COOH}$
- d. $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{COOH}$

44. Electronegativity values for the elements helps in predicting

[1 Marks]

- a. Polarity of bonds
- b. Dipole moments
- c. Valency of elements
- d. Position in the electrochemical series

45. The indicator used for titration of CH_3COOH and NH_4OH is:

[1 Marks]

- a. Phenolphthalein
- b. Methyl orange
- c. Both a and b
- d. None

46. Which of the following halogens does not exhibit positive oxidation state in its compounds?

[1 Marks]

- a. Cl
- b. Br
- c. I
- d. F

47. During lightening nitrogen is fixed as

[1 Marks]

- a. NO
- b. NO_2
- c. HNO_2
- d. HNO_3

48. Very dil. HNO_3 is reduced by zinc to

[1 Marks]

- a. NO_2
- b. NO
- c. N_2O
- d. NH_3

49. The number of secondary carbon atoms in 2, 3 – dimethyl butane is:

[1 Marks]

- a. 0
- b. 2
- c. 3
- d. 1

50. The number of chain isomers of C_6H_{14} is:

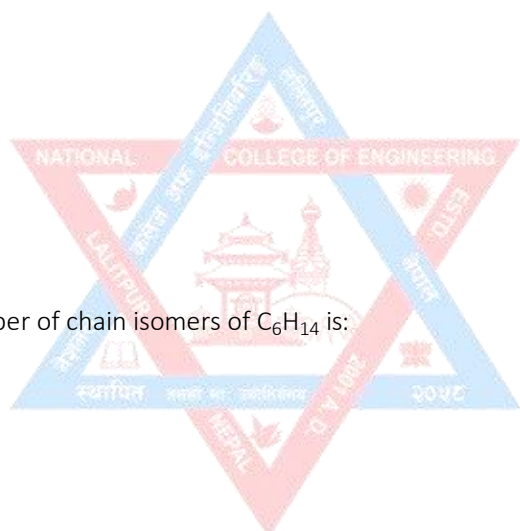
[1 Marks]

- a. 4
- b. 5
- c. 6
- d. 7

51. A hydrocarbon containing 80% of carbon is:

[1 Marks]

- a. CH_4
- b. C_2H_6
- c. C_2H_3
- d. C_2H_4



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52. Two element X (At. Wt. = 75) and Y (At. Wt. = 16) forms a compound which contains 75.8% of X. The formula of the compound is:

[2 Marks]

- a. XY
- b. X_2Y_3
- c. X_3Y_2
- d. XY

53. What current strength in ampere will be required to liberate 10g of copper from copper sulphate solution in one hour?

[2 Marks]

- a. 507.4
- b. 8.5
- c. 304
- d. 0.85

54. 0.5 g of NaOH is added to 100ml of 0.25N HCl solution. The pH of the resulting solution is

[2 Marks]

- a. 0.3
- b. 0.9
- c. 1.3
- d. 1.9

55. The pH of a mixture formed by mixing equal volumes of 5% HCl solution and 5% NaOH solution is

[2 Marks]

- a. 1.22
- b. 2.22
- c. 11.78
- d. 12.78

56. Which of the followings can be used to test H_2SO_4 ?

[2 Marks]

- a. CaCl_2
- b. SrCl_2
- c. BaCl_2
- d. All

57. In Down's process for manufacture of sodium metal, CaCl_2 is added to NaCl in order to

[2 Marks]

- a. increase ionization of NaCl
- b. increase the melting point of NaCl
- c. decrease the melting point of NaCl
- d. increase conductance of electrolyte

58. A haloalkane (X), reacts with KCN to produce a nitrile, which on acidic hydrolysis gave propanic acid, the compound (X) must be:

[2 Marks]

- a. ethyl halide
- b. iso propyl halide
- c. methyl halide
- d. n – propyl halide

59. The coefficient of x^3y^4 in $(2x + 3y^2)^5$ is

[1 Marks]

- a. 360
- b. 720
- c. 240
- d. 1080

60. $5x^3 + 3x - 1$ is called

[1 Marks]

- a. Polynomial of degree 3
- b. Polynomial of degree 2
- c. Polynomial of degree 1
- d. Polynomial of degree 0

61. A matrix in which the number of rows is not equal to the number of columns is called a

[1 Marks]

- a. diagonal matrix
- b. rectangular matrix
- c. square matrix
- d. scalar matrix

62. $n_{p_n} =$

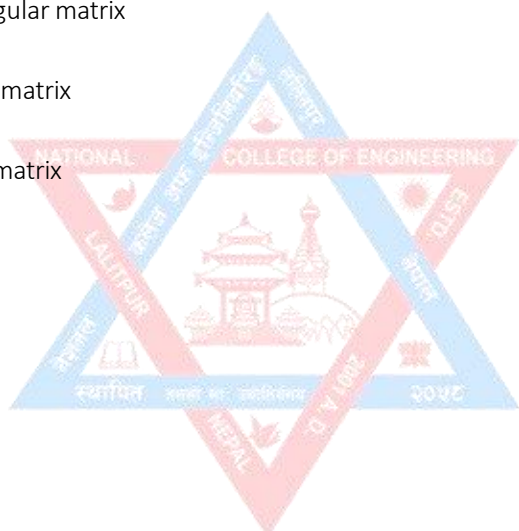
[1 Marks]

- a. $n!$
- b. 0
- c. 1
- d. none of these

63. If $S_n \rightarrow a$ limit as $n \rightarrow \infty$ then the series is said to be

[1 Marks]

- a. divergent
- b. convergent
- c. both of above
- d. none of these



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64. The area bounded by $y = |\sin x|$, the x -axis and the line $|x| = \pi$ is

[1 Marks]

- a. 6 sq. units(
- b. 2 sq. units(
- c. 4 sq. units(
- d. none of these

65. Area bounded by the curve $y = \sin x$ and the x -axis between $x = 0$ and $x = 2\pi$ is

[1 Marks]

- a. 2 sq. units
- b. 3 sq. units
- c. 4 sq. units
- d. None of these

66. If $f'(c)$ does not change before and after $x = c$, then this point is called

[1 Marks]

- a. Stationary point
- b. turning point
- c. critical point
- d. point of inflexion

67. The order of $\frac{dy}{dx} = \frac{4}{3}x^3 + x - 3$ is:

[1 Marks]

- a. 1
- b. $\frac{3}{4}$
- c. $\frac{4}{3}$
- d. -3

68. $\lim_{x \rightarrow 0} \frac{x}{x}$ is

[1 Marks]

- a. 1
- b. ∞
- c. -1
- d. nonexistent

69. The equation of the tangent to the circle $x^2 + y^2 = 5$ at point (1,2) is

[1 Marks]

- a. $x + 2y = 5$
- b. $2x + 3y = 4$
- c. $3x - 4y = 7$
- d. $2x + y = 5$

70. The focus of the parabola $y^2 = 4y - 4x$ is

[1 Marks]

- a. (0, 2)
- b. (1, 2)
- c. (2, 0)
- d. (2, 1)

71. Separate equation of lines represented by the equation $6x^2 + 5xy - 4y^2 = a$ is

[1 Marks]

- a. $x - 2y = 0$ and $x + 3y = 0$
- b. $2x - y = a$ and $3x + 4y = 0$
- c. $x + y = 0$ and $x - 4y = 0$
- d. None of the above

72. If line joining (1, 2) and (7, 6) is perpendicular to line joining (3, 4) and (11, x).

[1 Marks]

a. 12

b. 16

c. -16

d. -12

73. The direction cosine of the line joining (7,-5,9) and (5,-3,8) are:

[1 Marks]

a. $1/3, 2/3, -2/3$

b. $-2/3, 2/3, -1/3$

c. $-4/3, 1/3, 2/3$

d. $1/\sqrt{3}, 2/\sqrt{3}, -2/\sqrt{3}$

74. The graph of a linear function represents a

[1 Marks]

a. circle

b. line

c. parabola

d. ellipse

75. Range of $\cos x$ is

[1 Marks]

a. $[-1, 1]$

b. $\mathbb{R}$

c. negative real no.

d. $\mathbb{R} - \{x \mid -1 < x < 1\}$

76. Two dice are tossed. The probability that the total score is a prime number is:

[1 Marks]

- a. $1/6$
- b. $5/12$
- c. $\frac{1}{2}$
- d. $7/9$

77. If $F\vec{r} = 3i\vec{r} - j\vec{r} + k\vec{r}$ and $d\vec{r} = 2i\vec{r} + j\vec{r} + 4k\vec{r}$ then work done is

[1 Marks]

- a. -9
- b. 9
- c. 12
- d. -1

78. A distribution with two modes is called:

[1 Marks]

- a. Unimodel
- b. Bimodal
- c. Multimodal
- d. Normal

79. $(1 + w - w^2)^8 =$

[2 Marks]

- a. 256
- b. $256w$
- c. -256
- d. $-256w$

80. If the matrix $\begin{bmatrix} k & 4 \\ 3 & 2 \end{bmatrix}$ is singular then $k =$

[2 Marks]

- a. 2
- b. 6
- c. 4
- d. 8

81. How many signals can be given by 5 flags of different colors, using 3 at a time

[2 Marks]

- a. 120
- b. 60
- c. 24
- d. 15

82. Write the first four terms of the arithmetic sequence if $a_1 = 5$ and other three consecutive terms are 23, 26, 29

[2 Marks]

- a. 23, 26, 29, 32
- b. 5, 8, 11, 14
- c. 8, 11, 14, 17
- d. none of these

83. $\int_0^{\pi} \cos^3 x dx$ is

[2 Marks]

- a. $5/3$
- b. $5/4$
- c. $1/3$
- d. $1/6$

84. If $f'(c) = 0$ or $f'(c)$ is undefined, then the number c is called critical value and the corresponding point is called
[2 Marks]

- a. Stationary point
- b. turning point
- c. critical point
- d. point of inflexion

85. $\frac{d}{dx} \operatorname{cosec}^{-1} x =$
[2 Marks]

- a. $\frac{1}{|x| \sqrt{x^2 - 1}}$
- b. $\frac{-1}{|x| \sqrt{x^2 - 1}}$
- c. $\frac{1}{|x| \sqrt{1 + x^2}}$
- d. $\frac{-1}{|x| \sqrt{1 + x^2}}$

86. $\lim_{x \rightarrow \infty} x \sin \frac{1}{x}$ is
[2 Marks]

- a. 0
- b. ∞
- c. non existent
- d. 1

87. The point P (- 5,6) lies..... the circle $x^2 + y^2 + 4x - 6y = 12$
[2 Marks]

- a. Inside
- b. Outside
- c. On
- d. None of these

88. The conjugate axis of the hyperbola $16x^2 - 9y^2 - 64x + 54y + 127 = 0$ is

[2 Marks]

- a. 8
- b. 3
- c. 4
- d. 6

89. The general equation of second degree in x and y, $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a pair of straight line if

[2 Marks]

a. $af^2 + 2fgh + 2g^2 + c = 0$

b. $\begin{vmatrix} a & g & f \\ g & b & h \\ f & h & c \end{vmatrix} = 0$

c. $abc + 2fgh - af^2 - bg^2 - ch^2 = 0$

d. $af^2 + bg^2 + ch^2 - 2fgh + abc = 0$

90. A point P lies on a line whose ends are A (1,2,3) and B (2,10,1). If Z component of P is 7, then the co-ordinates of P are

[2 Marks]

- a. (-1,-14,7)
- b. (1,-14,7)
- c. (-1,14,7)
- d. (1,14,7)

91. If A, B and C are non-empty subsets of a set, then $(A - B) \cup (B - A)$ equals

[2 Marks]

- a. $(A \cap B) \cup (A \cup B)$
- b. $(A \cup B) - (A \cap B)$
- c. $A - (A \cap B)$
- d. $(A \cup B) - B$

92. $\cos^{-1}A + \cos^{-1}B =$

[2 Marks]

a. $\cos^{-1}(A\sqrt{1-B^2} - B\sqrt{1-A^2})$

b. $\cos^{-1}(AB - \sqrt{1-A^2}\sqrt{1-B^2})$

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

d. $\cos^{-1}(AB + \sqrt{1-A^2}\sqrt{1-B^2})$

93. If $\vec{AB} = i\vec{r} + 2j\vec{r} - 2k\vec{r}$ and $\vec{AC} = -2i\vec{r} + 2j\vec{r} + k\vec{r}$ are two adjacent sides of a triangle then area of triangle

[2 Marks]

a. $\frac{8}{2}$

b. $\frac{9}{2}$

c. $\frac{7}{2}$

d. None of these

94. Which of the following is tear producing?

[2 Marks]

a. Ester

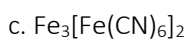
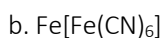
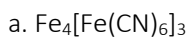
b. Ketone

c. Acid Chloride

d. Amide

95. What is the chemical formula for Prussian blue?

[2 Marks]



96. The most unreactive compound is :

[1 Marks]

- a. phenol
- b. nitrobenzene
- c. toluene
- d. aniline

97.

Read the following passage and answer the four question that follow:

It is not luck but labour that makes fortune, says an American writer, sometimes something is waiting to happen: Labor with sharp eyes and strong will makes something happen. Fortune lies in bed and the postman wants to bring him news of the inheritance, labor turns to six o'clock and lays the foundation of skill with a busy pen and ringing hammer. Fortune moans, labour watches, fortune depends on chance, labour depends on character. Fortune slides down into self-indulgence; Labor moves upward and aspires to freedom. Conviction, therefore, is the mother of good fortune. In other words, a man's success in life will be proportional to his efforts, his art and his attention to the little things.

Q. Who said, "It is not luck but labour that makes fortune"?

[2 Marks]

- a. An American writer
- b. An English writer
- c. A French writer
- d. A German writer

98. According to the writer, what makes something happen?

[2 Marks]

- a. Luck
- b. Labour with sharp eyes and strong will
- c. Chance
- d. Self-indulgence

99. What does the writer say about fortune and labour?

[2 Marks]

- a. Fortune depends on chance and labour depends on luck
- b. Fortune depends on chance and labour depends on character
- c. Fortune depends on luck and labour depends on chance
- d. Fortune depends on the character and labour depends on luck

100. What is the mother of good fortune according to the writer?

[2 Marks]

- a. Conviction
- b. Luck
- c. Labour
- d. Attention to the little things



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