

1. A body is moved along a straight line by a machine delivering constant power. The distance moved by the body in time t is proportional to

[1 Marks]

a. t

b. t^2

c. $t^{\frac{1}{2}}$

d. $t^{\frac{3}{2}}$

2. Two spheres are identical in mass and volume, but one is hollow and the other is solid. If both are rolled through same inclined plane then

[1 Marks]

a. Both bodies have same acceleration

b. Solid sphere has greater acceleration

c. Hollow sphere has greater acceleration

d. None of above

3. If the absolute temperature of radiating body is suddenly halved, the radiating power will reduce approximately by

[1 Marks]

a. 25%

b. 12.5%

c. 6.25%

d. 3.125%

4. Two spherical black bodies of radii r_1 & r_2 at temperatures T_1 & T_2 radiate same power. Then $\frac{r_1}{r_2}$ is
[1 Marks]
- $\frac{T_1^2}{T_2}$
 - $\frac{T_2^2}{T_1}$
 - $\frac{T_1^4}{T_2}$
 - $\frac{T_2^4}{T_1}$
5. There is no transference of energy across any section of medium in case of
[1 Marks]
- Progressive wave
 - Beats
 - Standing wave
 - Radio wave
6. A diffraction pattern is observed with red light. If the red light is replaced by blue light, then
[1 Marks]
- No change in diffraction bands
 - Diffraction bands become narrower and crowded together
 - Diffraction bands become broader and farther apart
 - Diffraction band disappear
7. If C be the critical angle and A be the angle of prism, then condition for no emergent of light from a prism is
[1 Marks]
- $A = C$
 - $A > 2C$
 - $A < 2C$
 - $2A > C$

8. In a thermodynamic process, if the volume remains constant, then the process is known as

[1 Marks]

- a. Isothermal
- b. Isobaric
- c. Isochoric
- d. Adiabatic

9. Scattering is only due to the.....Of light waves from the smaller bodies of size smaller than wavelength of light.

[1 Marks]

- a. Reflection
- b. Interference
- c. Diffraction
- d. Refraction

10. A parallel plate capacitor is immersed in an oil of dielectric constant K. The capacitance

[1 Marks]

- a. Decreases K times
- b. Increases K times
- c. Increases K^2 times
- d. Remains same

11. The emf in a thermoelectric current with none junction at 0°C and the other at $t^\circ\text{C}$ is given by $E = At - Bt^2$. The neutral temperature is then

[1 Marks]

- a. $\frac{A}{B}$
- b. $-\frac{A}{2}$
- c. $-\frac{B}{2A}$
- d. $\frac{A}{2B}$

12. The sensitivity of moving coil galvanometer is not affected by a.

[1 Marks]

- a. The number of turns in the coil
- b. Magnetic field of permanent magnet
- c. The current that the galvanometer measures
- d. Restoring couple per unit twist of the suspension fibre

13. The threshold wavelength for a metal whose work function Φ_0 is λ_0 . The wavelength for the metal of work function $\frac{\Phi_0}{2}$ is

[1 Marks]

- a. $\frac{\lambda_0}{2}$
- b. $2\lambda_0$
- c. $4\lambda_0$
- d. $\frac{\lambda_0}{4}$

14. The threshold wavelength for a metal whose work function Φ_0 is λ_0 . The wavelength for the metal of work function $\frac{\Phi_0}{2}$ is

[1 Marks]

- a. $\frac{\lambda_0}{2}$
- b. $2\lambda_0$
- c. $4\lambda_0$
- d. $\frac{\lambda_0}{4}$

15. If Z be the atomic number then the frequency of x-rays is proportional to

[1 Marks]

- a. Z
- b. $\sqrt{Z}$
- c. Z^2
- d. $\frac{1}{Z}$

16. The expected energy of electrons at absolute zero is called

[1 Marks]

- a. Fermi energy
- b. Emission energy
- c. Work function
- d. Potential energy

17. The velocity of a particle is $v = (3t + 1)$ m/s. When the particle starts from rest, the distance travelled by the particle when $t = 4$ s is

[2 Marks]

- a. 7m
- b. 14m
- c. 21m
- d. 28m

18. A particle of mass m that moves along x-axis has potential energy $Ux = a + bx^2$. It will execute simple harmonic motion with frequency

[2 Marks]

- a. $\frac{1}{2\pi} \sqrt{\frac{2b}{m}}$
- b. $\frac{1}{2\pi} \sqrt{\frac{b}{m}}$
- c. $\frac{1}{2\pi} \sqrt{\frac{b}{2m}}$
- d. $\frac{1}{2\pi} \sqrt{\frac{m}{b}}$

19. The work done in breaking a bigger size spherical oil drop into n smaller size identical droplets is proportional to

[2 Marks]

- a. $\sqrt[3]{n^2}$
- b. $\sqrt[3]{n^2} - 1$
- c. $\sqrt[3]{n} - 1$
- d. $\sqrt[3]{n} - 1$

20. When the temperature of a gas filled in a closed vessel is increased by 1°C , its pressure increases by 0.4%. The initial temperature of the gas is

[2 Marks]

- a. 125K
- b. 250K
- c. 300K
- d. 350K

21. The speed of sound in gas in which two sound waves of wavelengths 1.00m and 1.01 m produces 24 beats in 6 seconds is

[2 Marks]

- a. 330m/s
- b. 360m/s
- c. 390m/s
- d. 404m/s

22. The distance between two coherent sources is 0.1mm. The fringe width on the screen 1.2m away from the source is 6mm. The wavelength of light used is

[2 Marks]

- a. $4000\text{\AA}$
- b. $5000\text{\AA}$
- c. $6000\text{\AA}$
- d. $7200\text{\AA}$

23. The angle of minimum deviation for a prism of refractive index 1.5 is equal to angle of prism. The angle of prism is

[2 Marks]

- a. 60°
- b. 75°
- c. 82°
- d. 87°

24. Three charges $-q$, Q and $-q$ are placed at equal distances on a straight line. If the total potential energy of the system of three charges is zero, the ratio of $Q:q$ is

[2 Marks]

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

25. The number of electrons moving per sec. through a filament of an electric lamp of 60W operating at 220V is

[2 Marks]

- a. 3.7×10^{17}
- b. 1.9×10^{19}
- c. 1.7×10^{18}
- d. 2.8×10^{20}

26. An α particle of mass 6.65×10^{-27} kg travels at right angles to a magnetic field of strength 0.2T with a speed of 6×10^5 m/s. The acceleration of α particle is

[2 Marks]

- a. $3.84 \times 10^{-14} \text{ms}^{-2}$
- b. $5.77 \times 10^{14} \text{ms}^{-2}$
- c. $3.84 \times 10^{-12} \text{ms}^{-2}$
- d. $5.77 \times 10^{12} \text{ms}^{-2}$

27. An oil drop carrying a charge q has mass m kg. It is falling freely in air with terminal speed v . The electric field required to make the drop move upwards with the same speed is

[2 Marks]

- a. $\frac{mg}{q}$
- b. $\frac{2mg}{q}$
- c. $\frac{mgv}{q}$
- d. $\frac{2mgv}{q}$

28. In a transistor, the collector current is 0.95mA and the base current is 50mA. The value of α is

[2 Marks]

- a. 0.85
- b. 0.88
- c. 0.91
- d. 0.95

29. Which of the following is an antecedent?

[1 Marks]

- a. All
- b. The
- c. Always
- d. At

30. Which of the following sentences has the structure 'Subject + Verb + Adjective + to-infinitive'?

[1 Marks]

- a. Suraj was crying out loud
- b. They were glad to meet him
- c. He wanted to join the army
- d. Your sister is a brilliant woman

31. While I was reading, the phone

[1 Marks]

- a. Rung
- b. Was Ringing
- c. Rang
- d. None of the above

32. If I _____ a good match, I would have got married.

[1 Marks]

- a. Had found
- b. Have found
- c. Found
- d. Have

33. The direct speech for "The father warned his son that he should be aware of him" is:

[1 Marks]

- a. The father warned his son, "Beware of him!"
- b. The father warned his son, "Watch that chap!"
- c. The father warned his son, "Be careful about him."
- d. The father warned his son, "Don't fall into the trap."

34. Convert the affirmative sentence into a negative sentence: Mili is prettier than Neha.

[1 Marks]

- a. Neha is not as pretty as Mili.
- b. Mili is not as pretty as Neha.
- c. Neha is not as prettier as Mili.
- d. Mili is not prettier than Neha.

35. Neither he nor I _____ to suffer.

[1 Marks]

- a. is
- b. are
- c. am
- d. were

36. I am envious _____ them.

[1 Marks]

- a. of
- b. about
- c. in
- d. on

37. Honesty is the _____ policy.

[1 Marks]

- a. Best
- b. Worst
- c. Better
- d. Bad

38. What is the synonym for Objective?

[1 Marks]

- a. Determined
- b. Active
- c. Target
- d. Obvious

39. The sounds of English have been divided into two parts:

[1 Marks]

- a. Vowel sounds and diphthongs
- b. Diphthongs and monophthongs
- c. Vowels and consonant sounds
- d. Short vowel and long vowels

40. Which of the following words has its primary stress on the first syllable?

[1 Marks]

- a. artisan
- b. artificial
- c. artillery
- d. artist

41. Sulphur forms the chlorides S_2Cl_2 & SCl_2 . The equivalent mass of sulphur in SCl_2 is

[1 Marks]

- a. 8 g/mole
- b. 16 g/mole
- c. 64.8 g/mole
- d. 32 g/mole

42. Rydberg constant is

[1 Marks]

- a. same for all elements
- b. different for different elements
- c. a universal constant
- d. different in different temperature

43. Methyl orange is

[1 Marks]

- a. Pink in acidic medium yellow in basic medium
- b. Yellow in acidic medium pink in basic medium
- c. Colourless in acidic medium pink in basic medium
- d. Pink in acidic medium colourless in basic medium

44. The half life of phosphorus -32 is 15 days. 10 gm of phosphorus -32 will decay to 2.5 gm is

[1 Marks]

- a. 15 days
- b. 30 days
- c. 45 days
- d. 60 days

45. In the redox reactions $\text{As}_2\text{S}_3 + \text{HNO}_3 \longrightarrow \text{H}_3\text{AsO}_4 + \text{NO}_2 + \text{H}_2\text{O} + \text{S}$. The equivalent weight of As_2S_3 is.

[1 Marks]

- a. Mol. wt/4
- b. Mol. wt/6
- c. Mol. wt/8
- d. Mol. wt/10

46. SO_2 reacts with Cl_2 in sunlight to form

[1 Marks]

- a. Sulphuryl chloride
- b. Sulphonyl chloride
- c. Sulphur dioxide
- d. None of the above

47. Which of these is not ion-exchanger for removing hardness of water?

[1 Marks]

- a. Organic process
- b. Permutit process
- c. Calgon process
- d. None

48. Carnallite is used for extraction of

[1 Marks]

- a. F_2
- b. Cl_2
- c. Br_2
- d. I_2

49. The secondary suffix for the compound $CH_3COCH_2CH_2OH$ is:

[1 Marks]

- a. – ol
- b. – al
- c. – one
- d. – omol

50. How many isomers of C_3H_2O are possible?

[1 Marks]

- a. 2
- b. 3
- c. 4
- d. 5

51. The product formed by passing acetylene through hot Cu^+ tube is

[1 Marks]

- a. Poly acetylene
- b. Vinyl acetylene
- c. benzene
- d. toluene

52. The equivalent weight of MnSO_4 is half its Molecular weight when it is converted to

[2 Marks]

- a. MnO_3
- b. MnO_2
- c. MnO_4
- d. MnO_4^{-2}

53. An electric current of 1A was passed through acidulated water for 30 minutes. Calculate the volume of the hydrogen at NTP produced. (Z for Hydrogen = 0.00001)

[2 Marks]

- a. 0.1008 litre
- b. 0.2016 litre
- c. 0.4032 litre
- d. 0.8064 litre

54. 20ml of HCl solution required 21.8 ml of 0.1N NaOH for neutralization, vol. of water that should be added to 1 litre of HCl to get exactly decinormal is

[2 Marks]

- a. 1090
- b. 90
- c. 1000
- d. 190

55. 1 litre of saturated solution of BaSO_4 contains 2.33×10^{-3} g of BaSO_4 . The K_{sp} of BaSO_4 is (mol. wt. of $\text{BaSO}_4 = 233$)

[2 Marks]

- a. 1×10^{-9}
- b. 1×10^{-10}
- c. 5×10^{-8}
- d. 5×10^{-9}

56. Which of this forms a ppt with a gas formed by reacting FeS with dilute H_2SO_4 ?

[2 Marks]

- a. Acidified ZnSO_4
- b. Acidified MnSO_4
- c. Acidified FeCl_3
- d. Acidified CdSO_4

57. According to electrochemical theory, rust of iron contains

[2 Marks]

- a. Fe^{++}
- b. Fe^{+++}
- c. OH^-
- d. Both b and c

58. A hydrocarbon formed by electrolysis of potassium acetate on ozonolysis gives :

[2 Marks]

- a. glyoxal
- b. oxalic acid
- c. acetaldehyde
- d. formaldehyde

59. The middle term in the Expression $(a + b)^{12}$ is

[1 Marks]

- a. 6th term
- b. 7th term
- c. 8th term
- d. 9th term

60. Roots of the equation $x^2 + 7x + 12 = 0$ are

[1 Marks]

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

61. The inverse of the matrix exist only if the matrix is

[1 Marks]

- a. rectangular matrix
- b. square matrix
- c. row matrix
- d. column matrix

62. $c(16,11) + c(16,10) =$

[1 Marks]

- a. $c(16,10)$
- b. $c(15,11)$
- c. $c(17,10)$
- d. $c(17,11)$

63. The difference of the two consecutive terms of A.P. is called

[1 Marks]

- a. general term
- b. common ratio
- c. common difference
- d. none of these

64. $\int \frac{dx}{x^2 + 2x + 2}$ equals
[1 Marks]

- a. $x \tan^{-1}x + 1 + c$
- b. $\tan^{-1}x + 1 + c$
- c. $x + 1 \tan^{-1}x + c$
- d. $\tan^{-1}x + c$

65. Area lying between the curves $y^2 = 4x$ and $y = 2$ is:
[1 Marks]

- a. $\frac{2}{3}$
- b. $\frac{1}{3}$
- c. $\frac{1}{4}$
- d. $\frac{3}{4}$

66. $\frac{d}{dx} \left(\sqrt{x} - \frac{1}{\sqrt{x}} \right)^2 =$
[1 Marks]

- a. $1 - \frac{1}{2x}$
- b. $1 - \frac{1}{x^2}$
- c. $1 + \frac{1}{x^2}$
- d. 0

67. $\frac{d}{dx} x^n = nx^{n-1}$ is called
[1 Marks]

- a. Power rule
- b. Product rule
- c. Quotient rule
- d. Constant rule

68. $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x^2 - 4}$ is
[1 Marks]

- a. 4
- b. 0
- c. 1
- d. 3

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 graph represented by the equation $x = \sin^2 t$ and $y = 2 \cos t$ is
[1 Marks]

- a. parabola
- b. hyperbola
- c. ellipse
- d. circle

71. An ellipse has _____ vertices and _____ foci.
[1 Marks]

- a. two, one
- b. one, one
- c. one, two
- d. two, two

72. The value of P for which the lines $3x+y+2=0$, $2x-y+3=0$ and $x+py=3$ are concurrent is

[1 Marks]

- a. -1
- b. -3
- c. 4
- d. 5

73. Find the distance of point (2, 3, 5) from X-Z plane.

[1 Marks]

- a. 2 units
- b. 3 units
- c. 5 units
- d. 1 unit

74. If $f(x) = x$ and $g(x) = x^2$ then the value of $(f \circ g)(x)$ is

[1 Marks]

- a. x^2
- b. x
- c. x^3
- d. x^4

75. Domain of $\cot x$ is

[1 Marks]

- a. $R - \{x \mid x = n\pi, n \in Z\}$
- b. $R - x \mid x = 2n + 1\frac{\pi}{2}, n \in Z$
- c. set of real numbers
- d. none of these

76. A and B play a game where each is asked to select a number from 1 to 25 . If the two numbers match, both of them win a prize. The probability that they will not win a prize in a single trial is

[1 Marks]

a. $\frac{1}{25}$

b. $\frac{24}{25}$

c. $\frac{2}{25}$

d. None of these

77. Which one of the following average is most affected of extreme observations ?

[1 Marks]

a. Median(

b. Mode(

c. G.M.(

d. A. M.

78. If for any frequency distribution, the median is 10 and the mode is 30, then approximate value of mean is equal to:

[1 Marks]

a. 0

b. 10

c. 30

d. 60

79. If α and β are roots of $2x^2 - 4x + 5 = 0$ then $\alpha^2 + \beta^2$ is

[2 Marks]

a. -1

b. 0

c. 2

d. 1

80. $\begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix}$ is
[2 Marks]

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

81. If $n_{C_8} = n_{C_{12}}$ then $n =$
[2 Marks]

- a. 20
- b. 4
- c. 8
- d. 12

82. The 6th term of the arithmetic sequence whose 1st term is 3 and common difference is zero is
[2 Marks]

- a. 18
- b. 6
- c. 3
- d. 0

83. $\int \frac{1}{\sin^2 x \cos^2 x} dx$ is equals
[2 Marks]

- a. $\tan x + \cot x + c$
- b. $\tan x - \cot x + c$
- c. $\tan x \cot x + c$
- d. $\tan x - \cot 2x + c$

84. A function $f(x)$ is such that, at a point $x = c$, $f'(x) < 0$ at $x = c$, then f is said to be

[2 Marks]

- a. Increasing
- b. decreasing
- c. constant
- d. 1-1 function

85. $\frac{d}{dx} (g(x))^n =$

[2 Marks]

- a. $n[g(x)]^{n-1}$
- b. $n(g(x))^{n-1}g(x)$
- c. $n(g(x))^{n-1}g'(x)$
- d. $[g(x)]^{n-1}g'(x)$

86. $\lim_{x \rightarrow -\infty} \frac{4-x^2}{x^2-1}$ is

[2 Marks]

- a. 1
- b. 0
- c. -4
- d. -1

87. If the straight line $y=mx$ is outside the circle $x^2+y^2-20y+90=0$, then

[2 Marks]

- a. $m < 3$
- b. $m < 3$
- c. $m > 3$
- d. $m > 3$

88. The equation of the hyperbola whose transverse eccentricity is $\frac{\sqrt{5}}{2}$ and length of axis is 1 is

[2 Marks]

a. $x^2-4y^2=1$

b. $4x^2-2y^2=1$

c. $x^2-y^2=1$

d. $16x^2-y^2=1$

89. The equation of the straight line passing through (1,1) and parallel to $x^2-5xy+4y^2+x+2y-2=0$ is

[2 Marks]

a. $x^2-5xy+4y^2+3x-3y=0$

b. $x^2+5xy+4y^2+x+2y-2=0$

c. $x^2-3xy+7y^2=0$

d. $x^2+2xy+7y^2+7x+4y=0$

90. The equation of the plane passing through the intersection of the planes $x+2y-z=4$ and $3x+2y+z=3$ and passing through (1,2,-1) is

[2 Marks]

a. $5x+2y+3z=6$

b. $7x+3y+z=1$

c. $4x-3y+5z=9$

d. $9x-12y+2z=5$

91. The solution of $3x^2 - 12x = 0$ when

[2 Marks]

a. $x \in N$ is $\{4\}$

b. $x \in I$ is $\{0, 4\}$

c. $x \in S = a + ib: b \neq 0, a, b \in R$ is ϕ

d. All of these

92. $\tan^{-1} \frac{2A}{1-A^2} =$
[2 Marks]

- a. $\tan^{-1}A$
- b. $\tan^{-1}2A$
- c. $2\tan^{-1}A$
- d. none of these

93. If $\vec{a} = 2\hat{i} - 3\hat{j} - \hat{k}$ and $\vec{b} = \hat{i} + 4\hat{j} - 2\hat{k}$ then $(\vec{a} + \vec{b}) \times (\vec{a} - \vec{b}) =$
[2 Marks]

- a. $\hat{i} - 6\hat{j} + 22\hat{k}$
- b. $-20\hat{i} - 6\hat{j} - 22\hat{k}$
- c. $20\hat{i} + 6\hat{j} + 22\hat{k}$
- d. None of these

94. The CCl_4 is used as a fire extinguisher because
[2 Marks]

- a. It is an organic compound
- b. Its vapour is heavier and non-combustible
- c. It is a volatile compound
- d. It is a compound of Cl

95. Mercury is transported in metal containers made of
[2 Marks]

- a. iron
- b. silver
- c. gold
- d. lead

96. which of the following is used as a dehydrating agent for alcohols?

[1 Marks]

- a. H_2SO_4
- b. Al_2O_3
- c. P_2O_5
- d. All of these

97.

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

John did not think much about wealth or sources of inequality in life. It was his firm belief that if this world was not good then the Hereafter would be good and this belief sustained him. He was not like some of the other people he knew, who would sell their souls to the devil. He always thought of God before doing anything. He lived the life of an honest man. He did not marry but did not desire another man's wife. He believed that women make men weak as described in the story of Samson and Delilah.

Q. What was John's perspective on wealth and sources of inequality in life?

[2 Marks]

- a. He thought a lot about it and believed it was important
- b. He didn't think much about it and believed in the afterlife
- c. He believed that wealth was the key to happiness
- d. He believed that inequality was necessary for society to function

98. How did John feel about people who would sell their souls to the devil?

[2 Marks]

- a. He admired them
- b. He was indifferent to them
- c. He disapproved of them
- d. He was envious of them

99. What was John's approach to making decisions?

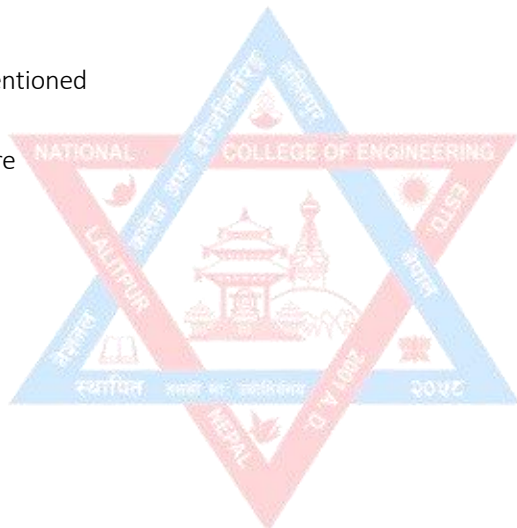
[2 Marks]

- a. He always thought of God before doing anything
- b. He always thought of the consequences before doing anything
- c. He always thought of himself before doing anything
- d. He always thought of others before doing anything

100. Was John married?

[2 Marks]

- a. Yes
- b. No
- c. Not mentioned
- d. Not sure



NCE