

1. Two planets are moving round sun. Their mean orbital radii are r_1 & r_2 . The ratio of their time period $\frac{T_1}{T_2}$ is

[1 Marks]

- a. $\frac{r_1}{r_2}$
- b. $\frac{r_1^3}{r_2^3}$
- c. $\frac{r_1^3}{r_2^2}$
- d. $\frac{r_2^3}{r_1^3}$

2. The elongation of a wire under a given load is

[1 Marks]

- a. Directly proportional to diameter
- b. Inversely proportional to diameter
- c. Directly proportional to square of diameter
- d. Inversely proportional to square of diameter

3. If the length of wire is doubled, then its Young's modulus

[1 Marks]

- a. Becomes double
- b. Becomes half
- c. Remains same
- d. Becomes triple

4. Which of the following laws of thermodynamics forms the basis for the definition of temperature?

[1 Marks]

- a. Zeroth law
- b. First law
- c. Second law
- d. Third law

5. When sound wave is reflected from rigid surface, then its

[1 Marks]

- a. Phase gets changed by π
- b. Amplitude changes
- c. Neither phase nor amplitude changes
- d. Phase and amplitude change

6. The phenomenon of interference is based on

[1 Marks]

- a. Conservation of momentum
- b. Conservation of energy
- c. Conservation of momentum and energy
- d. Quantum nature of light

7. The focal length of the lens in human eye is maximum when it is looking at an object at

[1 Marks]

- a. Infinity
- b. 25cm from the eye
- c. 100cm from the eye
- d. A very small distance from the eye

8. An ideal heat engine working between temperature T_1 and T_2 has efficiency η . If both the temperatures are raised by 100K each, the new efficiency of the engine will be

[1 Marks]

- a. η
- b. More than η
- c. Less than η
- d. Depends upon the nature of working substance

9. The capacity of parallel plate condenser depends on:

[1 Marks]

- a. The type of metal used
- b. The thickness of plates
- c. The potential applied across the plates
- d. The separation between the plates

10. The space around a stationary charge has

[1 Marks]

- a. Electric field only
- b. Magnetic field only
- c. Localized electric as well as magnetic field
- d. Electric and magnetic fields that are radiated

11. For a given thermocouple, the temperature of the hot junction at which thermo emf is maximum is known as

[1 Marks]

- a. Critical temperature
- b. Temperature of inversion
- c. Neutral temperature
- d. Curie's temperature

12. The current passing through a chock coil of 5H inductance is decreasing at the rate of 2A/s. The emf developed across the coil is

[1 Marks]

- a. 2.5V
- b. 10V
- c. -2.5V
- d. -10V

13. A coil of inductance 0.5H is connected to a 18V battery. The rate of growth of current is

[1 Marks]

- a. 9A/s
- b. 18A/s
- c. 27A/s
- d. 36A/s

14. The ratio of kinetic energy of an electron in hydrogen atom in $n=1$ to $n=4$ is

[1 Marks]

- a. 1:4
- b. 4:1
- c. 1:16
- d. 16:1

15. the biggest earthquake in the world was Chilean earthquake occurred in 1960 whose magnitude was

[1 Marks]

- a. 10.4 Richter
- b. 9.9 Richter
- c. 9.5 Richter
- d. 9.1 Richter

16. The quark content of proton is

[1 Marks]

- a. uud
- b. udd
- c. uds
- d. udc

17. A mass is thrown at 60° to the horizontal with speed of 10m/s. What % of total energy will be in the form of kinetic energy after 1s?

[2 Marks]

- a. 17%
- b. 27%
- c. 45%
- d. 50%

18. A satellite is moving very close to a planet of density ρ . The time period of satellite is

[2 Marks]

- a. $\sqrt{\frac{3\pi}{\rho G}}$
- b. $\sqrt{\frac{\pi}{\rho G}}$
- c. $\sqrt{\frac{3\pi}{2\rho G}}$
- d. $\sqrt{\frac{\pi}{2\rho G}}$

19. When the load of a wire is increased from 2kg to 4kg, elongation increases from 0.6mm to 1mm. Work done during this extension of wire is

[2 Marks]

- a. 10^{-3}J
- b. $40 \times 10^{-3}\text{J}$
- c. $4 \times 10^{-3}\text{J}$
- d. $14 \times 10^{-3}\text{J}$

20. The horsepower applied by a person while chewing 100gm of ice per minute is

[2 Marks]

- a. 0.7507H.P.
- b. 0.1324H.P
- c. 0.3243H.P
- d. 0.9321H.P.

21. The frequency of tuning fork is 384Hz and the velocity of sound in air is 352m/s. The distance traversed by the sound wave while the fork completes 36 vibrations is

[2 Marks]

- a. 33m
- b. 36m
- c. 352m
- d. 72m

22. A double slit arrangement produces interference fringes for sodium light ($\lambda=589\text{nm}$) that are 0.2° apart. The angular fringes separation if the entire arrangement is immersed in water ($\mu=1.33$) is

[2 Marks]

- a. 1.5°
- b. 0.15°
- c. 0.10°
- d. 0.266°

23. A convex mirror of focal length f produces an image $\frac{1}{n}th$ of size of object. The distance of object from the mirror is

[2 Marks]

- a. $fn - 1$
- b. $\frac{f}{n}$
- c. $\frac{f}{n - 1}$
- d. nf

24. Two charges of $+10\mu C$ and $+40\mu C$ respectively are located 12cm apart. The position of the point from $+10\mu C$ where electric field is zero is

[2 Marks]

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

25. A parallel combination of three resistances takes a current of 7.5A from a 30V battery. If the two resistances are 10Ω and 12Ω , the third resistance is

[2 Marks]

- a. 4Ω
- b. 9Ω
- c. 15Ω
- d. 21Ω

26. A 200km long wire has capacity $0.014\mu F$ per km. It carries an alternating current of frequency 5kHz. The inductance to be connected in series so that the impedance is minimum is

[2 Marks]

- a. $360\mu H$
- b. $700\mu H$
- c. $175\mu H$
- d. $1mH$

27. The number of photons emitted per second by a 24W source of monochromatic light of wavelength $6000\text{\AA}$ is

[2 Marks]

- a. 7.57×10^{19}
- b. 5.23×10^{19}
- c. 3.69×10^{19}
- d. 1.98×10^{19}

28. A P-type semiconductor has acceptor level 57meV above the valence band. The maximum wavelength of light required to create the hole is

[2 Marks]

- a. $2.28 \times 10^{-6}m$
- b. $2.18 \times 10^{-5}m$
- c. $2.28 \times 10^{-7}m$
- d. $2.28 \times 10^{-4}m$

29. Which of the following is an adjective?

[1 Marks]

- a. Call
- b. Blue
- c. Box
- d. Shirt

30. Choose the correct sentence.

[1 Marks]

- a. The house is not enough big.
- b. The house are not big enough.
- c. The house are not enough big.
- d. The house is not big enough.

31. Mick usually his dog in the afternoon.

[1 Marks]

- a. Walks
- b. Walk
- c. Is walking
- d. Walked

32. If you spoke less and listened more, you _____ more aware of what people really felt.

[1 Marks]

- a. Will be
- b. Are being
- c. Would be
- d. Be

33. The passive voice for “We have warned you” is:

[1 Marks]

- a. You have been warned.
- b. We have you warned.
- c. Warned you have been.
- d. Have you been warned.

34. Which of these is an assertive sentence?

[1 Marks]

- a. Why waste time in reading trash?
- b. I wish that I were healthy again.
- c. How beautiful is the rainbow!
- d. Please have a look at the brochure.

35. You and I _____ friends.

[1 Marks]

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

36. She suffers _____a heart disease.

[1 Marks]

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

37. Which of these is used between sentences which are grammatically independent?

[1 Marks]

- a. Colon
- b. Semicolon
- c. Comma
- d. Hyphen

38. What is the antonym for Cruel?

[1 Marks]

- a. Honest
- b. Kind
- c. Funny
- d. Serious

39. How many voiced consonant sounds are there in English?

[1 Marks]

- a. 9
- b. 15
- c. 24
- d. 12

40. Which of the following words has its primary stress on the third syllabus?

[1 Marks]

- a. beneficial
- b. beneficent
- c. benefactor
- d. benevolent

41. The number of carbon atoms in 1.12 liters of ethane gas at STP is

[1 Marks]

- a. $0.1N_A$
- b. $0.05N_A$
- c. $0.1580N_A$
- d. $1.2N_A$

42. Total no. of orbitals in M shell is

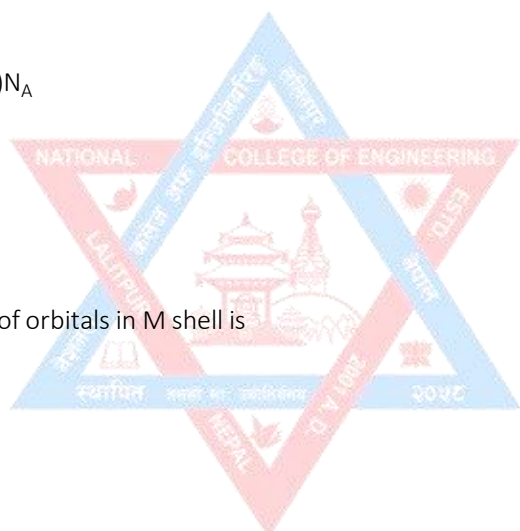
[1 Marks]

- a. 3
- b. 9
- c. 18
- d. 6

43. BF_3 is acid according to

[1 Marks]

- a. Arrhenius
- b. Lewis
- c. Bronsted and Lowry
- d. All of these



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44. 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

45. Representative elements are those which belong to

[1 Marks]

- a. p and d block
- b. s and d- block
- c. s and p block
- d. s and f – block

46. Which of these can reduce both conc. H_2SO_4 and FeCl_3 solution?

[1 Marks]

- a. HF
- b. HCl
- c. HBr
- d. HI

47. During lightening nitrogen is fixed as

[1 Marks]

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

48. Which of these is used as flux in the extraction of Zn by vertical retort process?

[1 Marks]

- a. P_2O_5
- b. CaO
- c. SiO_2
- d. None

49. The IUPAC name of glyoxal is

[1 Marks]

- a. Ethane dioic acid
- b. Ethane dial
- c. Ethane dione
- d. Ethanediol

50. The formula $C_nH_{2n}O_2$ (where $n \geq 3$) represents

[1 Marks]

- a. carboxylic acid
- b. aldehyde
- c. acid and ester
- d. aldehyde and ketone

51. During addition of HBr to propene in presence of peroxide, the intermediate formed is

[1 Marks]

- a. carbonium ion
- b. carbanion
- c. free radical
- d. carbene

52. The volume of CO_2 at STP formed by reacting 4 g of methane with 20 g of oxygen is

[2 Marks]

- a. 5.6 liters
- b. 6 liters
- c. 7.5 liters
- d. 7 liters

53. The mass of copper deposited by passing 2A current for half an hour through CuSO_4 solution with a current efficiency of 80% is

[2 Marks]

- a. 0.947g
- b. 0.847g
- c. 0.1g
- d. 0.933g

54. 10 ml of 1M NaOH solution will be neutralized by the following volume of 1M H_2SO_4 ?

[2 Marks]

- a. 25 ml
- b. 20 ml
- c. 10 ml
- d. 5 ml

55. The solubility of silver chromate in presence of centimolar potassium chromate is (K_{sp} for $\text{Ag}_2\text{CrO}_4 = 2.4 \times 10^{-13}$)

[2 Marks]

- a. 6.21×10^{-5} moles/litre
- b. 4.89×10^{-6} moles/litre
- c. 4.89×10^{-7} moles/litre
- d. 4.89×10^{-5} moles/litre

56. A gas formed by reacting FeS with dilute H_2SO_4 doesn't give precipitate with

[2 Marks]

- a. acidified CuSO_4
- b. acidified ZnSO_4
- c. alkaline MnSO_4
- d. alkaline NiSO_4

57. Stainless steel contains

[2 Marks]

- a. Fe + C + Ni
- b. Fe + Ni + Cu
- c. Fe + Cr + Cu
- d. Fe + Ni + Cr

58. An alkene 'X' on ozonolysis gives acetone and formaldehyde. The product obtained by reacting alkene 'X' on reaction with HBr in presence of organic peroxide is :

[2 Marks]

- a. 2 – bromo propane
- b. 1 – bromo propane
- c. 2 – bromo – 2 – methyl propane
- d. 1 – bromo – 2 – methyl propane

59. The coefficient of y in the expansion of $y^2 + \frac{c}{y}^5$ is:

[1 Marks]

- a. $10c$
- b. $29c$
- c. $10c^3$
- d. $20c^3$

60. If ω is complex cube root of unit then $\omega =$

[1 Marks]

- a. 0
- b. 1
- c. ω^2
- d. ω^{-2}

61. If matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ than $|A| =$

[1 Marks]

- a. 0
- b. 1
- c. -2
- d. 10

62. In a family, 5 males and 3 females are there. In how many ways we can select a group of 2 males and 2 females from the family?

[1 Marks]

- a. 3
- b. 10
- c. 30
- d. 40

63. The third term of the sequence $a_n = (-1)^{n-1}(n-7)$ is

[1 Marks]

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

64. The area bounded by the curves $y^2 = 20x$ and $x^2 = 16y$ is equal to

[1 Marks]

- a. 80π sq. units(
- b. 100π sq. units(
- c. $320 / 3$ sq. units(
- d. none of these

65. The area of the region bounded by the curve $y^2 = x$, the y-axis and between $y = 2$ and $y = 4$ is

[1 Marks]

- a. $52/3$ sq. units
- b. $54/3$ sq. units
- c. $56/3$ sq. units
- d. None of these

66. Find the maximum profit that a company can make, if the profit function is given by $P(x) = 41 + 24x - 18x^2$

[1 Marks]

- a. 56
- b. 49
- c. 23
- d. 89

67. The derivative of $\ln(\tanh x)$ is:

[1 Marks]

- a. $\frac{1}{\tanh x}$
- b. $\frac{\operatorname{sech}^2 x}{\tanh x}$
- c. $\operatorname{sech}^2 x$
- d. $\operatorname{sech} x$

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

[1 Marks]

- a. 0
- b. 1
- c. π
- d. The limit does not exist.

69. The Centre and the radius of the circle is $x^2+y^2-4x-4y-8 = 0$ are

[1 Marks]

- a. (2, 2), 4
- b. (1, 2), 3
- c. (-1, 3), 6
- d. (2, 2), 8

70. The eccentricity of the curve $x^2-y^2=a^2$ is

[1 Marks]

- a. 1
- b. $\sqrt{2}$
- c. $1/2$
- d. 2

71. Equation of parabola which is symmetric about y-axis with vertex (0, 0) and pass through (6, 3).

[1 Marks]

- a. $y^2 = 6x$
- b. $x^2 = 12y$
- c. $y^2 = 12x$
- d. $x^2 = 6y$

72. If (3,3) lies on the line joining the points (h,0) and (0,k) then

[1 Marks]

a. $h+k = 9$

b. $\frac{1}{h} + \frac{1}{k} = \frac{1}{3}$

c. $hk = 3$

d. $3h-3k = 1$

73. The locus of the points which is equidistance from the point (1,2,3) and (3,2,-1) is

[1 Marks]

a. $x-2y=0$

b. $2x-y=0$

c. $x-2z=0$

d. $2x-z=0$

74. The domain of binary relation $y^2 = -4x$ is,

[1 Marks]

a. R

b. Z

c. R^+

d. Negative real numbers including zero.

75. A function $f(x)$ is said to be the periodic function if for all x in the domain of f , there exists a smallest positive number p such that $f(x+p) = f(x)$

[1 Marks]

a. $f(p)$

b. $f(x)$

c. $f(0)$

d. none of these

76. The mean and variance of a random variable X having a binomial distribution are 4 and 2 respectively, then $P(X = 1)$ is

[1 Marks]

- a. $\frac{1}{32}$
- b. $\frac{1}{16}$
- c. $\frac{1}{8}$
- d. $\frac{1}{4}$

77. The mean of 5 observations is 4.4 and their variance is 8.24. If three observations are 1, 2 and 6, the other two observations are

[1 Marks]

- a. 4 and 8
- b. 5 and 7
- c. 5 and 9
- d. 4 and 9

78. If $|\vec{a}| = 3$, $|\vec{b}| = 4$ and $\vec{a} + \vec{b} = 5$, then $|\vec{a} - \vec{b}| =$

[1 Marks]

- a. 3
- b. 4
- c. 5
- d. 6

79. If $x^3 + ax^2 - a^2x - a^3$ is divided by $x + a$, then the remainder is

[2 Marks]

- a. 0
- b. a^3
- c. $2a^3$
- d. $-2a^3$

80. If the area of triangle is 35 square units with vertices 2,6, 5,4 and $(k,4)$.Then k is

[2 Marks]

- a. 12
- b.-2
- c.-12,-2
- d. 12,-2

81. $(n+2)(n+1)n$ in factorial form

[2 Marks]

a. $(n+2)!$

b. $\frac{(n+2)!}{(n-1)!}$

c. $\frac{(n+2)!}{n!}$

d. none of these

82. Arithmetic mean between $3\sqrt{5}$ and $5\sqrt{5}$ is

[2 Marks]

a. $8\sqrt{5}$

b. $2\sqrt{5}$

c. $\sqrt{5}$

d. $4\sqrt{5}$

83. $\int \frac{10x^9 + 10^x \log 10}{x^{10} + 10^x} dx$ equals to

[2 Marks]

a. $10^x - x^{10} + c$

b. $10^x + x^{10} + c$

c. $(10^x - x^{10})^{-1}$

d. $\log(10^x + x^{10}) + c$

84. The function $f(x) = ax^2 + bx + c$ has minimum value if:

[2 Marks]

- a. $a > 0$
- b. $a < 0$
- c. $a = 0$
- d. $a = -1$

85. If $f(x) = x \sec x$ then $f(\pi) =$

[2 Marks]

- a. -2π
- b. $-\pi$
- c. π
- d. 2π

86. $\lim_{x \rightarrow \infty} \frac{1 - \cos x}{x}$ is

[2 Marks]

- a. nonexistent
- b. 1
- c. ∞
- d. none of these

87. If a cone is cut by a plane perpendicular to its axis, then section is

[2 Marks]

- a. An ellipse
- b. A parabola
- c. A hyperbola
- d. None of these

88. If e and e_1 are the eccentricities of a hyperbola and its conjugate, then

[2 Marks]

- a. $e^{-2} - e_1^{-2} = 1$
- b. $e^2 - e_1^2 = 1$
- c. $e^2 + e_1^2 = 1$
- d. $e^{-2} + e_1^{-2} = 1$

89. If the line $(2x-3y+4) + k(-x+y+5) = 0$ is horizontal, then the value of $k =$

[2 Marks]

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

90. The angle between the diagonals of a cube is

[2 Marks]

- a. $\cos^{-1}(1/2)$
- b. $\cos^{-1}(1/3)$
- c. $\cos^{-1}(1/\sqrt{3})$
- d. $\frac{\pi}{3}$

91. If $n(U) = 60$, $n(A) = 35$, $n(B) = 24$ and $n(A \cup B)' = 10$ then $n(A \cap B)$ is

[2 Marks]

- a. 9
- b. 8
- c. 6
- d. none of these

92. Range of $2\tan x$ is

[2 Marks]

- a. $\mathbb{R}$
- b. $[-1, 1]$
- c. $[-\frac{1}{2}, \frac{1}{2}]$
- d. none of these

93. The projection of $\vec{a} = \vec{j} + \vec{k}$ along $\vec{b} = \vec{i} - \vec{k}$ is

[2 Marks]

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

d. None of these

94. Drinking of which alcohol may cause blindness?

[2 Marks]

- a. Wood Spirit
- b. Ethanol
- c. Absolute Alcohol
- d. Rectified Spirit

95. Mercury is the only metal which is liquid at 0°C , this is due to its

[2 Marks]

- a. high atomic weight
- b. high vapours pressure
- c. low ionization potential
- d. very high ionization energy and weak metallic bond

96. The reaction of alcohol and carboxylic acid is

[1 Marks]

- a. esterification
- b. hydrolysis
- c. saponification
- d. hydrogenation

97.

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

Over the past 50 years, doctors around the world have adopted the practice of prescribing antibiotics at the first sign of a minor infection or treating patients with a handful of antibiotics. Nowadays it is not unusual that practitioners are prescribing multiple antibiotics without any real indication or relevance for such drug combinations. Antibiotics have traditionally been known as miracle drugs, but there is growing evidence that they are overworked miracles, especially in countries like ours where there is easy access to over-the-counter drugs including antibiotics. We can't imagine going back to the pre-antibiotic days. Yet the unbridled use of these agents is driving us in that direction.

Q. How long has the practice of prescribing antibiotics at the first sign of a minor infection been in use?

[2 Marks]

- a. The past 10 years
- b. The past 20 years
- c. The past 30 years
- d. The past 50 years

98. What is the common practice of practitioners prescribing antibiotics?

[2 Marks]

- a. Prescribing multiple antibiotics without any real indication or relevance for such drug combinations
- b. Prescribing antibiotics only when necessary
- c. Prescribing single antibiotics for minor infections
- d. Not prescribing antibiotics at all

99. How have antibiotics traditionally been known?

[2 Marks]

- a. As miracle drugs
- b. As dangerous drugs
- c. As unnecessary drugs
- d. As over-the-counter drugs

100. What is the growing evidence about antibiotics?

[2 Marks]

- a. They are overworked miracles
- b. They are not overworked
- c. They are not miracles
- d. They are not necessary



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