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1. When a cylinder is twisted, the internal couple of forces developed within it due to elasticity is called :

    (A) elastic couple

    (B) twisting couple

    (C) torsional couple

    (D) none of these

2. In a diesel engine the working substance is :

    (A) Mixture of diesel vapour and air

    (B) Diesel vapour

    (C) Air

    (D) Petrol

3. When a charged particle moves through magnetic field, the force acting on it is called :

    (A) Gravitational force

    (B) Lorentz force

    (C) Dynamic force

    (D) None of these

4. In electronics, the device used to convert a.c power to d.c power is :

    (A) Amplifier

    (B) Rectifier

    (C) Oscillator

    (D) Transistor

5. In Newton's rings arrangement, the radius of curvature of the lens is 1 m. 10th and 15th dark fringes have diameter 0.45cm and 0.56cm respectively. The wavelength of light used to illuminate is

    (A) $5.6 \times 10^7 \, \text{m}$

    (B) $5.6 \times 10^{-7} \, \text{m}$

    (C) $56 \times 10^{-7} \, \text{m}$

    (D) $56 \times 10^7 \, \text{m}$

6. The light is guided in an optical fiber is on the principal of :

    (A) Refraction

    (B) Reflection

    (C) Total internal reflection

    (D) Interference

7. In communication system, the type of modulation which is not widely used in radio and TV transmission is :

    (A) Phase Modulation

    (B) Amplitude Modulation

    (C) Frequency Modulation

    (D) None of these

8. The apparent weight of a person in a freely falling elevator is :
   - (A) Infinity
   - (B) 9.8 Kg
   - (C) 9.8 gm
   - (D) Zero

9. The existence of which elementary particle was confirmed by the data from Large Hadron Collider LHC in 2013?
   - (A) Quarks
   - (B) Higgs Boson
   - (C) Tau Mesons
   - (D) Electron

10. According to Theory of Relativity the time interval measured in a frame moving with very high speed is :
    - (A) Shorter than proper time
    - (B) Longer than proper time
    - (C) Equal to proper time
    - (D) None of these

11. The value of velocity of sound in air is :
    - (A) 3331.6 m/s
    - (B) 333.16 m/s
    - (C) 33.16 m/s
    - (D) 3.31 m/s

12. In LASERs, if N_1 is number of atoms in ground level and N_2 that in higher energy level, the population inversion is achieved when :
    - (A) $N_2 > N_1$
    - (B) $N_1 > N_2$
    - (C) $N_1 = N_2$
    - (D) None of these

13. A pencil is viewed through a calcite crystal. Two images are seen. The cause of this phenomenon is :
    - (A) Diffraction
    - (B) Interference
    - (C) Double refraction
    - (D) None of these

14. In radioactivity, the radiation which is produced by the transformation of particles in the nucleus is :
    - (A) Alpha rays
    - (B) Beta rays
    - (C) Gamma rays
    - (D) Infra red rays

15. The part of electromagnetic radiation with smallest wavelength is :
    - (A) Radio waves
    - (B) Visible spectrum
    - (C) X-ray
    - (D) Gamma ray

16. A gaseous plant hormone is :
    - (A) Auxin
    - (B) Ethylene
    - (C) Gibberellin
    - (D) Cytokinin

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17. Palynology is the study of :
    (A) Fossils
    (B) Sepals
    (C) Palms
    (D) Pollen grains

18. When stomata open, guard cells are :
    (A) Flaccid
    (B) Large
    (C) Turgid
    (D) Small

19. Histogen theory was proposed by :
    (A) Hanstein
    (B) Schmidt
    (C) Nageli
    (D) Haberlandt

20. In Lamiaceae, the androecium is :
    (A) Monodynamous
    (B) Tetradynamous
    (C) Tridyanamous
    (D) Didyanamous

21. A group of organisms which can be a member of Monera or Protista or Plantae :
    (A) Cyanobacteria
    (B) Algae
    (C) Bacteria
    (D) Fungi

22. The source of O_2 is liberated in photosynthesis is :
    (A) H_2O
    (B) CO_2
    (C) H_2O_2
    (D) Carbohydrate

23. Edible part of mango is :
    (A) Epicarp
    (B) Endocarp
    (C) Mesocarp
    (D) Receptacle

24. How many female flowers occur in a cyathodium?
    (A) Two
    (B) One
    (C) Many
    (D) Three

25. In angiosperms, functional megaspore develops into :
    (A) Ovule
    (B) Embryo sac
    (C) Pollen sac
    (D) Endosperm

26. The endosperm of gymnosperm is :
    (A) Haploid
    (B) Triploid
    (C) Diploid
    (D) Polyploid

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27. Polyploidy can be induced with the help of :
    (A) IAA
    (B) Gibberellin
    (C) Colchicine
    (D) Kinetin

28. Algal zone of coralloid root of *Cycas* generally has :
    (A) Green algae
    (B) Blue-green algae
    (C) Red algae
    (D) Brown algae

29. Agar is extracted from the members of :
    (A) Green algae
    (B) Brown algae
    (C) Blue-green algae
    (D) Red algae

30. The individual unit of perianth is :
    (A) Tepal
    (B) Sepal
    (C) Petal
    (D) Anther

31. What is the role of kidney in mammals?
    (A) Removal of water and maintenance of nitrogenous substance
    (B) Removal of salt and retention of water
    (C) Removal of water and retention of salt
    (D) Removal of nitrogenous wastes and maintenance of water levels

32. Hormone Vasopressin helps :
    (A) To increase the amount of water resorbed in the kidney
    (B) To increase the amount of glucose resorbed in the kidney
    (C) To decrease the amount of water resorbed in the kidney
    (D) To decrease the amount of glucose resorbed in the kidney

33. Which of the following statement is correct for a pathogen?
    (A) They are all microscopic
    (B) They are all infectious
    (C) They are all macroparasites
    (D) They are all viral particles

34. Select the most accepted sequence in human evolution :
    (A) Astralopithecus → Ramapithecus → Homo erectus → Homo habilis → Homo sapiens
    (B) Cro-Magnon man → Homo erectus → Homo habilis → Homo sapiens
    (C) Astralopithecus → Ramapithecus → Homo erectus → Homo sapiens → Homo habilis
    (D) Ramapithecus → Homo habilis → Homo erectus → Homo sapiens

35. Convergent evolution will result in :

(A) Homologous organs

(B) Analogous organs

(C) Vestigial organs

(D) Both (A) and (B)

36. Organ transplanted individuals are given drugs to minimize the rejection of transplanted organs. How do these drugs work?

(A) They act as antibiotics

(B) They act as vaccines

(C) They suppress the immune response in the organ transplanted individual

(D) They promote antibody production in the organ transplanted individual

37. What is the major difference between active and passive transport?

(A) Active transport takes place in plants; while passive transport takes place in animals

(B) Active transport takes place in animals; while passive transport takes place in plants

(C) Active transport requires energy input; while passive transport does not

(D) Active transport does not use membranes; while passive transport always uses membranes

38. The number of sex chromosomes that a human female can inherit from mother is

(A) 46

(B) 23

(C) 1

(D) 2

39. T-Lymphocytes are part of :

(A) Antibody mediated immune response

(B) Cell mediated immune response

(C) First line of defense

(D) Autoimmunity

40. Sericulture is associated with :

(A) Termites

(B) Aphids

(C) Bombyx

(D) Mantis

41. Proteins that are designed to be exported outside of the cell are synthesized on/in :

(A) Mitochondria

(B) Rough Endoplasmic Reticulum

(C) Smooth Endoplasmic reticulum

(D) Free Ribosomes

42. Which of the following is our National Animal?

(A) Panthera tigris

(B) Panthera leo

(C) Pava cristatus

(D) Cannis vulpes

43. Good Ozone is found in :
    (A) Thermosphere
    (B) Troposphere
    (C) Mesosphere
    (D) Stratosphere

44. A person with sickle cell anaemia has advantages over the disease :
    (A) Hepatitis
    (B) Chikunguniya
    (C) Malaria
    (D) Typhoid

45. Which group of animals belongs to the same phylum?
    (A) Butterfly, Scorpion, Ants
    (B) Hydra, Starfish, Octopus
    (C) Earthworm, Hookworm, Roundworm
    (D) Volvox, Mosquito, Obelia

46. The slope of the curve $y = \dfrac{1}{x}$ at $x = 1$ equals :
    (A) 2
    (B) 4
    (C) −1
    (D) 1

47. If f is continuous and $\int\limits_1^2 f(x)\,dx = -4$ and $\int\limits_1^5 f(x)\,dx = 6$ then $\int\limits_2^5 f(x)\,dx = $:
    (A) 5
    (B) 10
    (C) 7
    (D) 1

48. $\lim\limits_{x \to 1} \dfrac{1-\sqrt{x}}{1-x}$ is :
    (A) $\dfrac{1}{2}$
    (B) $\dfrac{1}{3}$
    (C) $\dfrac{1}{4}$
    (D) $\dfrac{1}{5}$

49. The Parametric form of $x^2 + y^2 = 4$ is :
    (A) $(2\cos\theta,\ 2\sin\theta)$
    (B) $(\cos\theta,\ \sin\theta)$
    (C) $(-\cos\theta,\ -\sin\theta)$
    (D) $(\sin^2\theta,\ \cos^2\theta)$

50. The value of $\sinh^{-1}1$ using logarithm is :
    (A) $\log(1+\sqrt{2})$
    (B) $\sqrt{3}$
    (C) $\log(\sqrt{2}+\sqrt{3})$
    (D) $\log 1$

51. The degree of the differential equation $(y')^2 + y = x^3 - 4$ is :

    (A) 2   (B) 3

    (C) 4   (D) 5

52. The order of the largest square sub matrix whose determinant is not zero is called :

    (A) Symmetric   (B) Skew symmetric

    (C) Rank   (D) Null matrix

53. The integrating factor of the differential equation $\dfrac{dy}{dx} + y \tan x = \dfrac{x}{3}$:

    (A) $\tan x$ (B) $\cos x$

    (C) $\sec x$ (D) $\cot x$

54. Identify the function which when differentiate or integrate is unaltered :

    (A) $\sin x$ (B) $\log x$

    (C) e^x (D) $\sqrt{x}$

55. The value of $\dfrac{1}{x^{1000}}$ when $x = 1$ is :

    (A) 1   (B) 2

    (C) $\dfrac{1}{1000}$ (D) 1000

56. Projection of $\vec{a}$ in the direction of $\vec{b}$ is :

    (A) $\dfrac{\vec{a} \cdot \vec{b}}{\left|\vec{b}\right|}$ (B) $\dfrac{\vec{a} \times \vec{b}}{\left|\vec{b}\right|}$

    (C) $\dfrac{\vec{a}}{\left|\vec{a}\right|}$ (D) $\dfrac{\vec{b}}{\left|\vec{b}\right|}$

57. A vector point function f is said to be solenoidal in a region if :

    (A) $div\,\vec{f} = 0$ (B) $curl\,\vec{f} = 0$

    (C) $\nabla^2\,\vec{f} = 0$ (D) $grad\,\vec{f} = 0$

58. The matrix $\begin{bmatrix} 5 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 5 \end{bmatrix}$ is a :

    (A) Square matrix   (B) Scalar matrix

    (C) Diagonal matrix   (D) Unit matrix

59. The matrix A is singular if :

    (A) $|A| = 1$ (B) $|A^2| = 1$

    (C) $|A| = 0$ (D) $|A| \neq 0$

60. If $\vec{a}, \vec{b}, \vec{c}$ are coplanar vectors then :

    (A) $\left[\vec{a}, \vec{b}, \vec{c} \right] = 1$ (B) $\left[\vec{a}, \vec{b}, \vec{c} \right] = 0$

    (C) $\left[\vec{a}, \vec{b}, \vec{c} \right] \neq 1$ (D) $\left[\vec{a}, \vec{b}, \vec{c} \right] \neq 0$

61. ———————— is a non reducing sugar.

    (A) Glucose   (B) Galactose

    (C) Maltose   (D) Sucrose

62. ———————— is used particularly to test the adulteration of butter

    (A) Acid number   (B) Iodine number

    (C) Reichert Meissl Number   (D) Saponification number

63. Poly styrene is ———————— polymer.

    (A) Addition   (B) Condensation

    (C) Thermosetting   (D) Natural

64. Hypo is :

    (A) Sodium Sulphide   (B) Sodium Thiosulphate

    (C) Sodium Sulphate   (D) Sodium Tetra Thionate

65. Bond order of zero indicates :

    (A) The species is highly unstable   (B) The species does not exist

    (C) The species exist and stable   (D) None of these

66. Additive sidewise overlap of p orbitals results in the formation of ——————— molecular orbital.

  (A) π (B) π^*

  (C) σ (D) σ^*

67. Which of the following molecule has zero dipole moment?

  (A) NH_3 (B) $CHCl_3$

  (C) CH_2Cl_2 (D) CO_2

68. The permanent displacement of shared electron pairs in a carbon chain towards the more electronegative group is ——————— effect.

  (A) Inductive   (B) Electromeric

  (C) Mesomeric   (D) Hyperconjugative

69. General Formula of alkyne series is :

  (A) $C_n H_{2n+2}$ (B) $C_n H_{2n}$

  (C) $C_n H_{2n-2}$ (D) $C_n H_{2n-4}$

70. Red Lead is :

  (A) Pb (B) PbO_2

  (C) Pb_3O_4 (D) PbO

71. Lead present in silver is removed by :

  (A) Liquation   (B) Cupellation

  (C) Bessemerisation   (D) Reduction

72. ——————— is the purest form of carbon.

  (A) Diamond   (B) Graphite

  (C) Coke   (D) Coal

73. ——————— is a measure of the heat content of the reactants compared to products

  (A) ΔS (B) ΔH

  (C) ΔU (D) ΔG

74. Acidity of sodium bicarbonate is :

  (A) 2   (B) 3

  (C) 0   (D) 1

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75. Secondary Standard is :

    (A) $K_2Cr_2O_7$ (B) Na_2CO_3

    (C)   NaOH   (D) $H_2C_2O_4$

76. DDT is :

    (A)   Insecticide   (B)   Herbicide

    (C)   Fungicide   (D)   Fertilizer

77. The number of vibrational degrees of freedom of CO molecule is :

    (A)   3   (B)   2

    (C)   1   (D)   0

78. Which of the following regarding 3d orbital is correct?

    (A) $n=3$ $l=1$ $m=0$ (B) $n=3$ $l=0$ $m=1$

    (C) $n=3$ $l=3$ $m=-2$ (D) $n=3$ $l=2$ $m=1$

79. The hybridization of Be in $BeCl_2$ molecule is :

    (A)   sp   (B) sp^2

    (C) sp^3 (D) dsp^2

80. Butter is an example of ——————— type colloid.

    (A)   Emulsion   (B)   Gel

    (C)   Sol   (D)   Foam

81. Who was the founder of "Samathua Samajam"?

    (A)   Ayya guru   (B)   Velayuda Panikker

    (C)   Vaikunda Swamikal   (D)   Brahmanda Sivayogi

82. Who is the author of the work "Jathikummi"?

    (A)   Anandatheerthan   (B)   Pandit Karupan

    (C)   T.K. Madhavan   (D)   Agamananda Swami

83. Arnnos Pathiri, who prepared the first Malayalam Dictionary belongs to which country?

    (A)   U.K.   (B)   France

    (C)   Hungari   (D)   Poland

84. Who wrote "Kudiyozhikkel"?

    (A) Vailoppally   (B) Edassery

    (C) Changampuzha   (D) Urube

85. Channar agitation come to an end under the direction of the Madras governor :

    (A) Cornwallis   (B) Haris

    (C) Wellesley   (D) Clive

86. Point out the importance of the satellite 'Meghatropics' in relation to its field of study :

    (A) Environment   (B) Climate change

    (C) Health   (D) Oceanography

87. Vakhan Pass exists in which country?

    (A) India   (B) Pakistan

    (C) Afganistan   (D) Iran

88. Which is the major reason for global warming?

    (A) Carbon Dioxide   (B) Oxygen

    (C) Nitrogen   (D) Hydrogen

89. Barmuda Triangle belongs to which ocean :

    (A) Pacific   (B) Indian

    (C) Artic   (D) Atlantic

90. Which country controls the military camp 'Diagogartia'?

    (A) U.S.A.   (B) France

    (C) Britain   (D) China

91. Who is the Indian citizen, who reached the north pole and the south pole?

    (A) Rakesh Sharma   (B) Ajith Bajaj

    (C) Kalpana Chawla   (D) None of the above

92. Author of the work "Long walk to Freedom" :

    (A) Fideral Castro   (B) Leon Trotesky

    (C) Cheguvara   (D) Nelson Mandela

93. Which is supposed to be the reason for the death of Yaser Arafath?

    (A) Uranium   (B) Radium

    (C) Thorium   (D) Poloniyam

94. Who is the first Indian woman to be appointed to the post of right to information commissioner?

(A) Sushama Singh

(B) Deepak Sandu

(C) Aruna Roy

(D) Arundathi Roy

95. The project 'Obama Care' is related to :

(A) Food security

(B) Health care

(C) Nuclear policy

(D) None of the above

96. Which British Prime Minister expressed regrets on the Jallianwala Bagh tragedy?

(A) Clement Atley

(B) Winsten Churchil

(C) Margrate Thatcher

(D) David Cameron

97. Which country gave political asylum to Edward Snoden?

(A) U.S.A.

(B) France

(C) China

(D) Russia

98. 'Burgegaleefa' is situated in which city?

(A) Abudabi

(B) Dubai

(C) Sharja

(D) Rasal Khaima

99. Who is the leader of the protest movement against Kudamkulam nuclear reactor project?

(A) Medhapadekar

(B) Arundhathi Roy

(C) Sundar Lal Bahuguna

(D) Udaya Kumar

100. Who is the only Indian woman to be appointed to the post of Chief Election Commissioner?

(A) Kiran Bedi

(B) V.S. Ramadevi

(C) Anna Chandi

(D) E.P. Janaki