# 191/2014

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Durgapur, Bhilai, and Rourkala plants were set up during which plan :
   (A) 2nd (B) 3rd
   (C) 1st (D) 4th

2. Indian constitution reserves the residuary powers to :
   (A) the states (B) the union
   (C) the President (D) the Parliament

3. The tropic of cancer does not pass through :
   (A) Tripura (B) Chatisgarh
   (C) Rajasthan (D) Odisha

4. Rajiv Gandhi National Institute of Youth development is located in :
   (A) Tamil Nadu (B) Karnataka
   (C) Himachal Pradesh (D) Uttaranchal

5. Gandhi undertook the longest Nationalised tour of his life known as the :
   (A) Dandi March (B) Harijan Yatra
   (C) Non-Corporation March (D) Anti Rowlett Act Campaign

6. Who was the President of All India State People's conference in 1939?
   (A) Jayaprakash Narayan (B) Sardar Vallabhai Patel
   (C) Jawaharlal Nehru (D) Sheik Abdulla

7. Man walked on the Moon for the 1st time on July :
   (A) 21st (B) 20th
   (C) 18th (D) 19th

8. The 1st census commissioner of Independent India was :
   (A) M.W.M. Yeatts (B) J.H. Hutton
   (C) J.T. Marten (D) E.A. Gait

9. The latest census commenced on :

(A) 1st Jan 2011 (B) 1st May 2010

(C) 1st April 2010 (D) 31st March 2011

10. 'Ayodhya, 6 Dec. 1992?' was written by whom :

(A) Chandrasekhar (B) P.V. Narasimha Rao

(C) Jaswant Singh (D) Arun Shourie

11. The wage policy in India is based on :

(A) Cost of living (B) Standard of living

(C) Productivity (D) Capital investment

12. Who served as India's first Ambassador to the Soviet Union?

(A) V.K. Krishnamenon (B) K.M. Panicker

(C) K.R. Narayanan (D) Vijayalakshmi Pandit

13. Who was the chairman of the finalisation committee of Fundamental Rights in the constituent Assembly?

(A) Dr. B.R. Ambedkar (B) K.M. Munshi

(C) Sardar Vallabhai Patel (D) Nehru

14. The quorum requirements in the Rajya Sabha is :

(A) 25 (B) 50

(C) 100 (D) 126

15. Which was the 1st country that attained independence from British imperialism?

(A) India (B) South Africa

(C) America (D) Germany

16. The Consumer Protection Act was passed in the year :

(A) 1980 (B) 1984

(C) 1986 (D) 1995

17. The site of Harappa is situated on the bank of river :

(A) a Inchis
(B) Beas
(C) Ravi
(D) Saraswathi

18. Which is at the apex of the three tier system of Panchayat Raj?

(A) Grama Sabha
(B) Panchayat Samiti
(C) Zilla Parishad
(D) Grama Panchayat

19. In Basket Ball how many players are there in each side :

(A) 5
(B) 7
(C) 9
(D) 11

20. The total Number of High Courts in India at present is :

(A) 15
(B) 16
(C) 18
(D) 21

21. Choose the logic gate known as universal gate :

(A) AND
(B) NAND
(C) OR
(D) X-OR

22. For a p-type semiconductor made using Germanium crystal, the correct statement is :

(A) Hole concentration is equal to that of free electron concentration
(B) Electrons are the majority carriers
(C) The crystal is electrically neutral
(D) The crystal is positively charged

23. For the following media, the speed of visible light is minimum in :

(A) Air
(B) Water
(C) Free space
(D) Diamond

24. For a plane polarized light wave in free space :

(A) The electric field vector is parallel to the direction of propagation of the wave
(B) The magnetic field vector is parallel to the direction of propagation of the wave
(C) Both electric field and magnetic field vectors are perpendicular to each other
(D) Both the electric and magnetic field vectors are parallel to the direction of propagation of the wave

25. In a series AC circuit, the current lags behind the voltage by 45°. One of the possible reasons is :

(A) The circuit contains a pure resistance
(B) The circuit contains a resistor and a capacitor connected in series
(C) The circuit contains either a capacitor or an inductance coil and no resistance
(D) The circuit contains a resistor and an inductor connected in series

26. A Foucault pendulum is oscillating at a point where the latitude angle is 30°. The taken for the pendulum to change its plane of rotation by 90° is :

(A) 12 hours (B) 24 hours
(C) 6 hours (D) Infinity

27. The conservation of energy is the consequence of the :

(A) Translational symmetry of space (B) Rotational symmetry of space
(C) Translational symmetry in time (D) Spherical shape of Earth

28. Two plane waves of amplitudes 1 unit and 3 units superpose in a region. The ratio of the maximum and minimum intensities are :

(A) 3:1 (B) 4:1
(C) 2:1 (D) 3:2

29. Multiplying a complex quantity $x + jy$ by j, where $j = \sqrt{-1}$ is equivalent to :

(A) Rotating the complex quantity by 90° in the anticlockwise direction in the Argand diagram
(B) Rotating the complex quantity by 90° in the clockwise direction in the Argand diagram
(C) Inverting the complex quantity in the Argand diagram
(D) Taking its complex conjugate

30. The number of atoms per unit cell of Silicon crystal is :

(A) 1 (B) 2
(C) 4 (D) 8

31. The Pauli's exclusion principle is obeyed by :

(A) All Fermions (B) All Bosons
(C) Electrons only (D) Hydrogen atoms

32. One of the gas that causes Green House effect is :

(A) Nitrogen
(B) Oxygen
(C) Carbon Dioxide
(D) Ozone

33. The magic numbers in nuclear physics is associated with :

(A) Inert gases
(B) Radioactive series
(C) Stability of nuclei
(D) Mass-energy conversion formula

34. According to modern physics, the indivisible particles among the following :

(A) Leptons
(B) Hadrons
(C) Baryons
(D) Mesons

35. The dimension formula of Lagrangian in Classical Mechanics is that of :

(A) Planck's constant
(B) Hamiltonian
(C) Speed of light
(D) Gravitational constant

36. A particle is trapped in a square potential well of width 'L' with infinite potential barrier. The probability of finding the particle at the center of the potential well is zero for :

(A) the ground state
(B) the first excited state
(C) the second excited state
(D) any excited state

37. The Poynting theorem is a consequence of the :

(A) Law of conservation of momentum
(B) Law of conservation of charge
(C) Law of conservation of angular momentum
(D) Law of conservation of energy

38. A stone is projected with a velocity u at an angle 60° with the horizontal. Throughout the motion ———— remains constant.

(A) the vertical component of velocity
(B) its speed
(C) its kinetic energy
(D) the horizontal component of velocity

39. The Compton shift is maximum when the scattering angle is :

(A) 0° (B) 180°

(C) 90° (D) 45°

40. Newton's rings are formed in reflected light using a Plano-convex lens of radius of curvature 1m and a plane glass plate. The radius of the 10th dark ring is ———— (The wave length of the light used is 590 nm.)

(A) 2.428 mm (B) 1.5 mm

(C) 6.28 mm (D) 0.35 mm

41. Which of the following sets of quantum number is not allowable?

(A) $n = 2, l = 1, m = 0, s = +1/2$ (B) $n = 2, l = 2, m = -1, s = -1/2$

(C) $n = 2, l = 1, m = +1, s = -1/2$ (D) $n = 2, l = 0, m = 0, s = +1/2$

42. What is the oxidation state of Fe in $K_4$ [Fe $(CN)_6$]?

(A) +2 (B) +3

(C) +1 (D) 0

43. Lewis Acid is a substance which has a tendency to :

(A) Donate a proton (B) Accept a proton

(C) Donate electron (D) Accept electron

44. Isotonic solutions are solutions with same :

(A) Temperature (B) Osmotic pressure

(C) Viscosity (D) Surface tension

45. Which of the following molecule is chiral?

(A) CHFClBr (B) $H_2O$

(C) $NH_3$ (D) $CH_2 = C = CH_2$

46. The energy production in the sun and the stars is due to :

(A) Nuclear Fission (B) Nuclear Fusion

(C) Thermo chemical reactions (D) Transmutation

47. The pH of a 0.10 M NaOH solution is :

(A) 1 (B) 10

(C) 8 (D) 13

48. Iodine gives blue colour with :
(A) $FeCl_3$ solution
(B) $AgNO_3$ solution
(C) Starch solution
(D) Sodium thiosulphate solution

49. Which one of the following compound is colourless?
(A) $[MnO_4]^-$
(B) $[Ti(H_2O)_6]^{3+}$
(C) $[Zn(H_2O)_6]^{2+}$
(D) $[Co\ F_6]^{3-}$

50. Bakelite is prepared by the reaction between :
(A) Phenol & formaldehyde
(B) Urea & formaldehyde
(C) Aniline & urea
(D) Ethylene glycol & dimethyl terephthalate

51. Rise of a liquid in a capillary tube is due to :
(A) Fluidity
(B) Viscosity
(C) Friction
(D) Surface tension

52. Among the following which one is IR inactive?
(A) $CO_2$
(B) $H_2$
(C) HCl
(D) $H_2O$

53. Electronic spectra occur in the ——— region of electromagnetic spectrum.
(A) Microwave
(B) IR
(C) UV/Visible
(D) Electronic

54. Naphthalene can be purified by :
(A) Sublimation
(B) Crystallisation
(C) Distillation
(D) Solvent extraction

55. Which of the following doesn't contain a carboxyl group?
(A) Benzoic acid
(B) Aspirin
(C) Picric acid
(D) Lactic acid

56. The most stable carbocation is :
(A) Methyl carbocation
(B) Primary carbocation
(C) Secondary carbocation
(D) Tertiary carbocation

57. ———————— is an example of a redox indicator.
(A) Diphenyl amine (B) Methyl orange
(C) Phenolphthalein (D) Bromothymol blue

58. Select the anti ferromagnetic substance :
(A) $Fe_3O_4$ (B) $CrO_2$
(C) $ZnFe_2O_4$ (D) MnO

59. The carbon atoms in graphite are in :
(A) sp hybridised state (B) $sp_2$ hybridised state
(C) $sp_3$ hybridised state (D) $dsp^2$ hybridised state

60. After 4 half life periods for a first order reaction, what fraction of the Reactant remains?
(A) 1/2 (B) 1/8
(C) 1/16 (D) 1/32

61. The transfer of genetic material from one bacterium to other bacteria with the help of bacteriophage is called :
(A) Translation (B) Transduction
(C) Transcription (D) Transformation

62. ss RNA act as genetic material in :
(A) Tobacco Mosaic Virus (B) $T_2$ Bacteriophage
(C) Dahlia Mosaic virus (D) Rhizobium

63. The sequence of nucleotide in one chain of DNA is GAATTC. The nucleotide sequence in the other chain shall be :
(A) TGGCCT (B) CTTAAC
(C) CTTAAG (D) CAATTC

64. Select the biologically most resistant plant material :
(A) Polysaccharide (B) Suberin
(C) Chitin (D) Lignin

65. Select the least number of chromosomes among the following :
(A) Onion (B) Ophioglossum
(C) Maize (D) Haplopappus gracilis

66. Chromosomes with more than two chromatids are called :
(A) Polytene chromosome (B) Acrocentric chromosomes
(C) Lambrush chromosome (D) All the above

67. The splitted chromosomes move towards opposite poles during cell division is due to :
(A) Centrioles
(B) Centrosome
(C) Phragmoplast
(D) Microtubules

68. Protein synthesis will terminate by :
(A) UUG, UGA, UCA
(B) UAA, UAG, UGA
(C) UAU, UAG, UGA
(D) UCA, GCG, ACC

69. In the life cycle of wheat rust, the sequence of spore production is :
(A) Teliospore, aeciospores, uredospore, basidiospore, pycniospore
(B) Basidiospore, aeciospores, pycniospore, teliospore, uredospore
(C) Aeciospore, uredospore, teliospore, basidiospore, pycniospore
(D) Teliospore, basidiospore, aecidiospore, pycniospore, uredospore

70. In scalariform conjugation two fusing gametes of Spirogyra are :
(A) Morphologically similar, but physiologically dissimilar
(B) Physiologically similar, but morphologically dissimilar
(C) Morphologically and physiologically similar
(D) Physiologically and morphologically dissimilar

71. Pyrenoids are :
(A) Protein surrounded by oil droplets
(B) Protein surrounded by oil droplets and starch grains
(C) Protein surrounded by starch grains
(D) Protein surrounded by lipid layers

72. In funaria the peristome at maturity consists of :
(A) Two series of curved, narrow triangular teeth, 32 teeth in each series
(B) Two series of curved, narrow triangular teeth, 16 teeth in each series
(C) One series of curved, narrow triangular teeth, 16 teeth in each series
(D) One series of curved, narrow triangular teeth, 32 teeth in each series

73. Endosperm formation in Gymnosperm is by the :
(A) Germination of megaspore
(B) Fusion of one male gamete with two polar nuclei
(C) Germination of polar nuclei
(D) Fusion of one male gamete with one polar nuclei

74. In a DNA molecule the distance between two base pairs are :
(A) 0.034 nm
(B) 3.4 nm
(C) 34 nm
(D) 0.34 nm

75. 50s and 30s are the sub units of :

(A) 70 S ribosome
(B) 80 S ribosome
(C) 7 S ribosome
(D) 8 S ribosome

76. The molecular formula of "chlorophyll a" is :

(A) $C_{55}H_{70}O_5N_4Mg$
(B) $C_{55}H_{70}O_6N_4Mg$
(C) $C_{55}H_{72}O_6N_4Mg$
(D) $C_{55}H_{72}O_5N_4Mg$

77. Respiratory quotient in succulents :

(A) one
(B) less than one
(C) zero
(D) more than one

78. A marine angiosperm :

(A) Wolffia
(B) Lemna
(C) Vallisneria
(D) Zostera

79. Colchicum autumnale belongs to the family :

(A) Lamiaceae
(B) Liliaceae
(C) Loranthaceae
(D) Lythraceae

80. Photochemical smog is the combination of :

(A) Nitrogen oxides, $CH_4$ and Ozone
(B) Hydrogen peroxides, HC and Ozone
(C) Nitrogen oxides, PAN and Ozone
(D) Hydrogen peroxides, PAN and ozone

81. Neonatal immunity is associated with :

(A) IgM
(B) IgG
(C) IgE
(D) IgA

82. Cyanide inhibits ———— of electron transport chain.

(A) pyruvate kinase
(B) acetyl CoA
(C) succinyl CoA
(D) cytochrome oxidase

83. Epibolic morphogenetic movements occur only in the prospective :

(A) Ectodermal blastomers
(B) Mesodermal blastomers
(C) Endodermal blastomers
(D) All the above

84. Golgi bodies are involved in the packaging and exocytosis of :

(A) Zymogen secreted by exocrine pancreatic cells
(B) Lactoprotein secreted by mammary gland cells
(C) Mucous secreted by goblet cells
(D) All the above

85. The hydrolytic enzyme present in acrosome is :

(A) Hirudine
(B) Heparine
(C) Hyaluronidase
(D) Hyaline

86. World Forest Day is on :

(A) March 22
(B) March 25
(C) April 22
(D) May 31

87. Lampbrush chromosomes occur at :

(A) Pachytene stage of meiotic prophase
(B) Zygotene stage of meiotic prophase
(C) Diplotene stage of meiotic prophase
(D) Leptotene stage of meiotic prophase

88. Tailless sperms occur in :

(A) Ascaris
(B) Amphioxus
(C) Pila
(D) Ostritch

89. Taq polymerase is an important enzyme used in :

(A) PCR
(B) TLC
(C) PGE
(D) SDS-PAGE

90. Ecotone is the :

(A) area of low population density
(B) measure of index of environmental factors
(C) zone of locally adapted population
(D) transition zone between two or more communities

91. Among the existing mammals, ———— occupy an intermediate position between reptiles and typical mammals.

(A) Marsupialia
(B) Monotremata
(C) Pholidota
(D) Proboscidea

92. Rhabditiform larva occur in the life cycle of :
(A) Taenia (B) Enterobius
(C) Wuchereria (D) Ancyclostoma

93. Eravikulam National Park is famous for its :
(A) Gaur (B) Lion-tailed Macaqua
(C) Nilgiri Tahr (D) Great Indian Bustard

94. Darvin's finches are a good example of :
(A) connecting link (B) industrial melanism
(C) adaptive radiation (D) convergent evolution

95. Which of the following disease is caused by prions?
(A) Muscular dystrophy (B) Madcow
(C) Myopathy (D) Cadang- Cadang

96. The free software movement was initiated by :
(A) Bill Gates (B) Richard Stallman
(C) Linux Kernel (D) Stephan Hawking

97. Deuterostomic body plan is seen in :
(A) Star fish (B) Jelly fish
(C) Cuttle fish (D) Silver fish

98. XXY chromosome composition is found in :
(A) Klinefelter's syndrome (B) Turner's syndrome
(C) Patau's syndrome (D) Down's syndrome

99. Which Part of the brain detects the temperature changes in blood?
(A) Cerebellum (B) Cerebral hemisphere
(C) Hypothalamus (D) Medulla

100. Which enzyme catalyzes the unwinding of DNA helix during replication?
(A) Primase (B) Helicase
(C) DNA-Polymerase (D) Topoisomerase