

191/2014

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Durgapur, Bhilai, and Rourkela plants were set up during which plan :  
(A) 2<sup>nd</sup> (B) 3<sup>rd</sup>  
(C) 1<sup>st</sup> (D) 4<sup>th</sup>
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 1<sup>st</sup> time on July :  
(A) 21<sup>st</sup> (B) 20<sup>th</sup>  
(C) 18<sup>th</sup> (D) 19<sup>th</sup>
8. The 1<sup>st</sup> 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) 1<sup>st</sup> Jan 2011 (B) 1<sup>st</sup> May 2010  
(C) 1<sup>st</sup> April 2010 (D) 31<sup>st</sup> 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 1<sup>st</sup> 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  $45^\circ$ . 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  $30^\circ$ . The time taken for the pendulum to change its plane of rotation by  $90^\circ$  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  $90^\circ$  in the anticlockwise direction in the Argand diagram
  - (B) Rotating the complex quantity by  $90^\circ$  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  $60^\circ$  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)  $0^\circ$  (B)  $180^\circ$   
(C)  $90^\circ$  (D)  $45^\circ$
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)  $CHFCIBr$  (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)  $\text{FeCl}_3$  solution (B)  $\text{AgNO}_3$  solution  
(C) Starch solution (D) Sodium thiosulphate solution
49. Which one of the following compound is colourless?  
(A)  $[\text{MnO}_4]^-$  (B)  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$   
(C)  $[\text{Zn}(\text{H}_2\text{O})_6]^{2+}$  (D)  $[\text{Co F}_6]^{3-}$
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)  $\text{CO}_2$  (B)  $\text{H}_2$   
(C)  $\text{HCl}$  (D)  $\text{H}_2\text{O}$
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)  $\text{Fe}_3\text{O}_4$  (B)  $\text{CrO}_2$   
(C)  $\text{ZnFe}_2\text{O}_4$  (D)  $\text{MnO}$
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