

ENTRANCE EXAMINATION-2016

B.SC. Bio Technology

SECTION-1(MATHEMATICS)

- The mean of 100 observations is 50. If one of the observations which was 50 is replaced by 40, the resulting mean will be:
(a) 50 (b) 49.90
(c) 70 (d) 40
- If the geometric mean of x , 16, 50 be 20, then the value of x is:
(a) 40 (b) 20
(c) 10 (d) 4
- The standard deviation for the data:
7, 9, 11, 13, 15 is:
(a) 2.4 (b) 2.5
(c) 2.7 (d) 2.8
- Water tax is increased by 20% and its consumption is decreased by 20%. The change in the expenditure is:
(a) 5% decrease (b) 4% increase
(c) 4% decrease (d) None of these
- A dishonest dealer professes to sell his goods at cost price but he uses a weight of 920 g for a kg weight. Find his gain percent.
(a) $7\frac{16}{23}\%$ (b) $8\frac{16}{23}\%$
(c) $5\frac{16}{23}\%$ (d) $3\frac{16}{23}\%$
- By selling 332 oranges for Rs 30 a man loses 25%. How many oranges should be sold for Rs 24 so at gain 20% in the transaction?
(a) 16 (b) 24
(c) 32 (d) 40

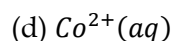
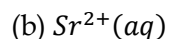
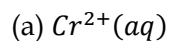
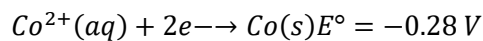
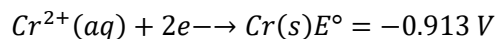
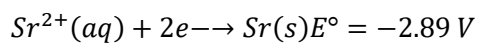
7. The maximum value of $\sin x \cos x$ is:
- (a) 1 (b) $1/2$
(c) 2 (d) $\sqrt{2}$
8. If the length of shadow of a pole on a level ground is twice the length of that pole, the angle of elevation of the sun is:
- (a) 30° (b) 45°
(c) 60° (d) None
9. The equation $x^2 + 4x + k = 0$ has real roots. Then:
- (a) $k \geq 4$ (b) $k \leq 4$
(c) $k \leq 0$ (d) $k \geq 0$
10. If $2^x = 3^y = 6^{-z}$, Then $\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z}\right)$ is equal to:
- (a) 0 (b) 1
(c) $3/2$ (d) $-1/2$
11. The prime factors of 2310 are:
- (a) 2, 3, 4, 7, 11 (b) 2, 4, 5, 7, 11
(c) 2, 3, 5, 7, 11 (d) None
12. The HCF of 0.54, 1.8 and 7.2 is:
- (a) 1.8 (b) 0.18
(c) 0.018 (d) 18
13. If $x:y = 7:9$ and $y:z = 5:4$, Then $x:y:z$ is:
- (a) 7: 45: 36 (b) 35: 45: 36
(c) 28: 36: 35 (d) None
14. A and B can do a piece of work in 12 days; B and C in many days can A alone do it?
- (a) 15 (b) 24
(c) 30 (d) 40

15. If $\log_2[\log_3(\log_2 x)] = 1$, Then x is equal to:
- (a) 512 (b) 128
(c) 12 (d) 0
16. A bag contains 5 blue and 4 black balls. Three balls are drawn at random. What is the probability that 2 are blue and 1 is black?
- (a) 1/3 (b) 2/5
(c) 1/6 (d) 3

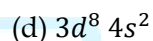
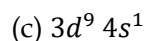
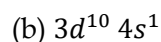
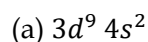
SECTION-2 (CHEMISTRY)

17. Which one of the following is mostly likely to be an ionic compound?
- (a) HNF_2 (b) CH_3Cl
(c) N_2H_4 (d) $CaCl_2$
18. Bond order of the following will be O_2^- , O_2 , O_2^+ are-
- (a) 1, 2, 0 (b) 2, 1.5, 0
(c) 1.5, 1, 2 (d) 1.5, 2, 1
19. The oxidation states of N in N_2O , N_2O_3 , N_2O_5 are-
- (a) 5, 3 (b) 1, 3, 5
(c) 5, 4, 2 (d) 3, 1, 5
20. HNO_3 on reaction with P_2O_5 gives mainly-
- (a) N_2O_5 (b) NO_3
(c) N_2O_4 (d) None of these
21. Which of the following reactions must be carried out in an electrolytic cell, rather than in a voltaic cell?
- (a) $Zn + Cd^{2+} \rightarrow Cd + Zn^{2+}$
(b) $Al + \frac{3}{2}Br_2 \rightarrow Al^{3+} + 3Br$
(c) $2Al^{3+} + 3Fe \rightarrow 2Al + 3Fe^{2+}$
(d) $2H_2 + O_2 \rightarrow 2H_2O$

22. Consider the following half reactions and select the strongest oxidizing agent.



23. The most stable last shell electronic configuration of Cu is-



24. When a solid changes directly into a gas, it is called-

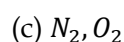
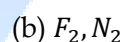
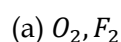
(a) Sublimation

(b) Melting

(c) Evaporation

(d) None of these

25. Which of the following set shows reaction with xenon?



(d) None of these

26. What is the general Gibbs phase rule?

(a) $F = P - C + 1$

(b) $P = C - F + 1$

(c) $F = C - P + 2$

(d) $C = 2 + P - C$

27. In Vander Waal's equation $P_c V_c = 3/8RT_c$ the value of P_c is-

(a) $a/27b^2$

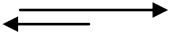
(b) $8a/27b^2$

(c) $a/27b$

(d) $a b/27R$

28. If solute is soluble in solvent it means:

(a) Hydration energy (HE) > Lattice energy (U)

- (b) Lattice energy (U) > Hydration energy (He)
(c) Hydration energy (He) = Lattice energy (U)
(d) U and He does not matter
29.  Arrow represents.
- (a) Retro reaction (b) Forward reaction
(c) Backward reaction (d) None of these
30. What is formula of perchloric acid?
- (a) $HClO$ (b) $HClO_4$
(c) $HClO_3$ (d) $HClO_2$
31. Who is more acidic in nature among the following?
- (a) CH_3COOH (b) CH_2FCOOH
(c) $ClCH_2COOH$ (d) $BrCH_2COOH$
32. General formula of acyl chloride is-
- (a) RCH_2COOH (b) CH_2ClCHO
(c) $ClCH_2COOH$ (d) $BrCH_2COOH$
33. How many grams of zinc are there in 22.7g of $ZnCl_2$?
- (a) 0.35g (b) 0.17g
(c) 1476g (d) 10.9g

SECTION 3 (PHYSICS)

34. Of the following quantities, which one has dimensions different from remaining three:
- (a) Energy per unit volume
(b) Force per unit area
(c) Angular momentum
(d) Product of voltage and charge per unit volume

35. A projectile has a maximum range of 200m. What is the maximum height attained by it?
- (a) 25 m (b) 50 m
(c) 75 m (d) 100 m
36. If vectors $\vec{A} = 2\hat{i} + 4\hat{j} - \hat{k}$ and $\vec{B} = 3\hat{i} - 2\hat{j} + x\hat{k}$ are to each other, the value of x should be:
- (a) 2 (b) -2
(c) 3 (d) -3
37. The shear modulus of a liquid is
- (a) Zero (b) Unity
(c) Some finite non-zero constant (d) Infinity
38. Which of the following is constant during isochoric changes?
- (a) Temperature (b) Pressure
(c) Volume (d) None of these
39. If the surface tension of soap solution is σ , what is the work done in blowing soap bubble of radius r?
- (a) $\pi r^2 \sigma$ (b) $2\pi r^2 \sigma$
(c) $4\pi r^2 \sigma$ (d) $8\pi r^2 \sigma$
40. Three particles of same mass lie in the X-Y plane. The (x,y) coordinates of their positions are (1, 1), (2, 2) and (3, 3) respectively. The (x, y) coordinates of their centre of mass are:
- (a) (1, 2) (b) (2, 2)
(c) (4, 2) (d) (6, 6)
41. An engine delivers 10 KW of power. How much time will take to lift a mass of 200 kg to a height of 10 m? ($g = 10 \text{ ms}^{-2}$)
- (a) 2 s (b) 4 s
(c) 6 s (d) 10 s
42. A Carnot's engine working between 27°C and 127°C takes up 800 J of heat from the reservoir in one cycle. What is the work done by the engine?

- (a) 100 J (b) 200 J
(c) 400 J (d) 800 J
43. Eight dipoles of charges of magnitude q are placed inside a cube. The total electric flux through the cube is:
- (a) $\frac{q}{\epsilon_0}$ (b) $\frac{8q}{\epsilon_0}$
(c) $\frac{4q}{3\epsilon_0}$ (d) Zero
44. A battery consists of three cells of emfs 2.2 V, 2.0 V and 1.8 V having internal resistance of 0.8 Ohm, 0.5 Ohm and 0.7 Ohm respectively connected in series. The battery is connected to an external resistance of 4.0 Ohm via a very low resistance ammeter. The reading in the ammeter will be:
- (a) 0.1 A (b) 0.5 A
(c) 1.0 A (d) 2.0 A
45. In an interference experiment, interference pattern is obtained with yellow light emitted by sodium lamp. If the sodium lamp is replaced by monochromatic blue light of same intensity, then
- (a) Fringe width will decrease
(b) Fringe width will increase
(c) Fringe width will remain same
(d) Fringes become less intense
46. The frequency of the visible light is of the order of:
- (a) 10^{-10} Hz (b) 10^{-12} Hz
(c) 10^{-15} Hz (d) 10^{-18} Hz
47. The resolving power of a telescope depends upon
- (a) The focal length of its objective
(b) The focal length of the objective and the eye piece
(c) The aperture of the eye piece and the wavelength of light used
(d) The aperture of the objective and the wavelength of light used

48. A convex lens of glass with refractive index 1.5 has a focal length of 8 cm when placed in air. The focal length of the lens when it is immersed in water (refractive index $\frac{4}{3}$) will be:
- (a) 4 cm (b) 8 cm
(c) 12 cm (d) 32 cm
49. At a certain temperature, the number density of charge carriers in a semiconductor is n . When an electric field is applied to it, the charge carriers drift with an average speed v . If the temperature is increased,
- (a) both n and v will increase
(b) both n and v will decrease
(c) n will increase and v will decrease
(d) n will decrease and v will increase
50. The part of the junction transistor which is heavily doped to produce a large number of majority carriers is
- (a) Emitter (b) Base
(c) Collector (d) None of the above

SECTION 4 (BIOLOGY)

51. The process of Glycolysis in the absence of oxygen leads to production of
- (a) Pyruvate (b) Glucose
(c) Lactate (d) Glycogen
52. Which one is a positively charged amino acid?
- (a) Glycine (b) Arginine
(c) Tyrosine (d) Alanine
53. Aminoacyl synthetases are part of which process
- (a) Replication (b) Transcription
(c) Translation (d) Conjugation
54. The structure of DNA was described in detail by –

- (a) Kornberg (b) McClintock
(c) Khorana (d) Watson and Crick
55. The process of artificially putting a plasmid in bacteria is called –
(a) Transduction (b) Translocation
(c) Transformation (d) Transfection
56. Cytoskeletal network is directly involved in
(a) Protein Modification (b) Plasma Membrane
(c) Protein Transport (d) Spindle formation
57. Chromosome separation takes place in
(a) G1-phase (b) G2-phase
(c) M-phase (d) S-phase
58. Anterior Pituitary secretes
(a) Oxytocin (b) Insulin
(c) Estrogen (d) Luteinizing Hormone
59. Astrocyte cells are part of the-
(a) Digestive (b) Central Nervous System
(c) Renal system (d) Circulatory
60. This is the site for folding of protein –
(a) Nucleus (b) Centriole
(c) Mitochondria (d) Endoplasmic Reticulum
61. Allergic reactions are related with –
(a) IgD (b) IgG
(c) IgE (d) IgM
62. Haploid cells contain –
(a) One set of chromosome (b) A pair of chromosome

- (c) Has no nucleus (d) Has no chromosome
63. The function of a clamp loader is needed in the process of
(a) Translation (b) Replication
(c) Hybridization (d) Transcription
64. The speciation is the process of
(a) Dwindling of a species
(b) Extinction of a species
(c) Increase in a number of species
(d) Formation of a new species
65. Each unit of Nucleosome has –
(a) 8 histones (b) 4 histones
(c) 24 histones (d) 16 histones
66. Lysosomal-endosomal system is primarily involved in breaking
(a) Carbohydrate (b) Proteins
(c) DNA (d) RNA
67. Which part of leaf shows venation –
(a) Vagina (b) Mesopodium
(c) Epipodium (d) Leaflet
68. Angiosperms differ from gymnosperms in –
(a) Being evergreen
(b) being smaller in size
(c) Having ovules enclosed in the ovary
(d) Having compound leaves
69. Thalamus is –
(a) Base of flower (b) Base of ovary

- (c) Modification of pollen (d) Modification of petal
70. Which one of the following is not assumption underlying Hardy Weinberg Equilibrium?
- (a) Random mating (b) Generations are over-lapping
(c) No Mutation
(d) No Migration
71. Polyadenylation is found in the processing of mRNA of
- (a) Prokaryotes (b) Eukaryotes
(c) Prokaryotes and Eukaryotes (d) Virus
72. Which of these is not a green house gas?
- (a) CFS (b) Methane
(c) Carbon Dioxide (d) Hydrogen gas
73. A frame shift mutations generally leads to –
- (a) An altered protein sequence
(b) No change in protein sequence
(c) Stops transcription
(d) Is a silent mutation
74. Ependymal cells helps in the formation of-
- (a) Mucus (b) Blood Brain barrier
(c) Saliva (d) Cerebrospinal fluid
75. Resting Membrane potential of the nerve cell is around –
- (a) -10 mV (b) -70 mV
(c) 100 mV (d) 0 mV
76. Cell wall bacterial is composed of –
- (a) Cellulose (b) Mucopeptide
(c) Chitin (d) Protein and cellulose

77. Angiosperms have—
(a) Tracheids only (b) Vessels absent
(c) Vessels present (d) Sieve tube absent
78. ΔG° is equal to $-T\Delta S^\circ$, if the enthalpy change for a reaction is:
(a) Zero (b) Infinite
(c) One (d) Maximum
79. Factor VIII mutations are linked with
(a) Platelet aggregation (b) Bleeding disorder
(c) RBC count (d) Blood clot formation
80. Auxin is a —
(a) Plant hormone (b) Animal hormone
(c) Is found in brain (d) Is not a hormone
81. Most common method of reproduction in bacteria is —
(a) Mostly asexually (b) Mostly sexually
(c) Asexually only (d) Sexually only
82. Skeletal muscle contraction involves —
(a) Troponin (b) Tubulin
(c) Selectin (d) Calmodulin
83. Nuclear Pore consists of —
(a) Aquaporin (b) Nucleoporin
(c) Karyophoren (d) Nerosporin
84. TATAAT is the
(a) Promoter region of the prokaryotes
(b) Promoter region of the eukaryotes
(c) Translation start site in prokaryotes

- (d) Translation start site in eukaryotes
85. Major constituent of bone is –
- (a) Calcium phosphate (b) Magnesium phosphate
(c) Calcium carbonate (d) Sodium chloride
86. Treatment of root tip meristem cells with the microtubule inhibitor colchicines results in all of the following except
- (a) Induction of polyploidy
(b) Prevention of cytokinesis
(c) Inhibition of mitotic spindle assembly
(d) Cessation of DNA replication
87. In lactose operon is regulated in the presence of –
- (a) Only Glucose (b) Only Lactose
(c) Both lactose and Glucose (d) Only Galactose
88. Emasculation means
- (a) Removal of flowers (b) Removal of petals
(c) Removal of Anthers (d) Removal of Stigma
89. If a single base mutation modifies the codon to a stop codon, such mutations are called –
- (a) Frame shift mutation (b) Non-sense mutation
(c) Mis-sense mutation (d) germinal mutation
90. Malarial disease is linked with
- (a) E. coli (b) S. Cerevisease
(c) Plasmodium Falciparum (d) Candida Albican
91. Shine Delgarno sequence is important for initiation of
- (a) Transcription (b) Translation
(c) Recombination (d) Transposition

92. The hydrolytic enzymes of the lysosomes work most effectively under condition of
- (a) High pH (b) Low pH
(c) Neutral pH (d) Salinity
93. Vitreous Fluid is part of this system
- (a) Vision (b) Touch
(c) Olfactory (d) Auditory
94. In prokaryotic cells 70S ribosome unit splits into
- (a) 40S and 60S subunits (b) 30S and 40S subunits
(c) 30S and 50S subunits (d) 50S and 20S subunits
95. Glycolate is oxidized to glyoxylate during photorespiration in –
- (a) Peroxisomes (b) Chloroplast
(c) Mitochondria (d) Lysozymes
96. Guttation usually takes place
- (a) Early in the morning (b) In the mid-day
(c) In the night (d) In the evening
97. Allosteric site on an enzyme –
- (a) Is same as active site
(b) Is non-protein site
(c) Mostly involved in feedback inhibition
(d) Site on enzyme where ATP attaches
98. Vent Polymerase efficiency performs DNA synthesis at?
- (a) Low temperature (b) High Temperature
(c) Freezing temperature (d) Ambient Temperature
99. Which one of these is a start codon
- (a) AUG (b) AAU

(c) UGA

(d) AUU

100. It is a precursor of Prostaglandin –

(a) Arachidonic acid

(b) Glucocorticoids

(c) GMP

(d) Insulin

