

D 102532

(Pages : 16)

Name.....

Reg. No.....

INTEGRATED P.G. ENTRANCE EXAMINATION, APRIL 2024

INTEGRATED M.Sc. BOTANY/INTEGRATED M.Sc. ZOOLOGY

Time : Two Hours

Maximum : 400 Marks

1. A kingdom common to unicellular eukaryotic plants and animals is :
 - (a) Monera.
 - (b) Protista.
 - (c) Fungi.
 - (d) Plantae.
2. Which of the following tissue perform function of secretion, storage and photosynthesis ?
 - (a) Parenchyma.
 - (b) Collenchyma.
 - (c) Sclerenchyma.
 - (d) Complex tissue.
3. Which of the following group of plants, show dependent alternation of generation having gametophyte dependent on sporophyte.
 - (a) Bryophyta.
 - (b) Pteridophyta.
 - (c) Gymnosperms.
 - (d) Thallophyta.
4. Meiosis in AaBb will produce gametes :
 - (a) AB, aB, Ab, ab.
 - (b) AB, ab.
 - (c) Aa, Bb.
 - (d) AB, BB.
5. Polysome is formed by :
 - (a) Several ribosomes attached to single hnRNA.
 - (b) Many ribosomes attached to strand of ER.
 - (c) Ribosomes with several subunits.
 - (d) Ribosomes attached to single messenger RNA.

Turn over

6. 6-furfuryl adenine is :
- (a) An auxin.
 - (b) A gibberellin.
 - (c) A cytokinin.
 - (d) A vitamin.
7. The embryo in sunflower has :
- (a) One cotyledon.
 - (b) Two cotyledons.
 - (c) Many cotyledons.
 - (d) Non cotyledon.
8. In China rose the flowers are :
- (a) Zygomorphic, hypogynous with imbricate aestivation.
 - (b) Zygomorphic, epigynous with twisted aestivation.
 - (c) Actinomorphic, hypogynous with twisted aestivation.
 - (d) Actinomorphic, epigynous with valvate aestivation.
9. Cell organelles having hydrolases / digestive enzymes are :
- (a) Peroxisomes.
 - (b) Lysosomes.
 - (c) Ribosomes.
 - (d) Mesosomes.
10. A granum is made up of :
- (a) Single thylakoid.
 - (b) Two thylakoids.
 - (c) Many thylakoids arranged one above the other.
 - (d) None of the above.
11. In dark reaction, first reaction is the :
- (a) Carboxylation.
 - (b) Decarboxylation.
 - (c) Dehydrogenation.
 - (d) Deamidation.
12. Which of the following metabolic pathways occurs in the cytoplasm of plant cells and generates a small amount of ATP through substrate-level phosphorylation ?
- (a) Glycolysis.
 - (b) Electron transport chain.
 - (c) Calvin cycle.
 - (d) Krebs cycle.

13. In Yeast during anaerobic respiration, how many glucose molecules are required for production of 38 ATP molecules ?
- (a) 1. (b) 2.
(c) 19. (d) 38.
14. How does pruning help in making the hedge dense ?
- (a) It induces the differentiation of new shoots from the root stock.
(b) It frees axillary buds from apical dominance.
(c) The apical shoot grows faster after pruning.
(d) It releases wound hormones.
15. Persistent nucellus in the seed is known as :
- (a) Perisperm. (b) Hilum.
(c) Tegmen. (d) Chalaza.
16. What is the primary advantage of self-incompatibility mechanisms in flowering plants ?
- (a) Enhanced genetic diversity.
(b) Prevention of inbreeding depression.
(c) Increased seed production.
(d) Facilitation of self-fertilization in adverse conditions.
17. What is the role of a vector in cloning a DNA fragment ?
- (a) To amplify the DNA fragment.
(b) To cut the DNA fragment at specific sites.
(c) To insert the DNA fragment into a host cell.
(d) To visualize the DNA fragment under UV light.
18. The enzyme used to produce complementary DNA (cDNA) from an mRNA template is :
- (a) DNA polymerase. (b) Reverse transcriptase.
(c) DNA ligase. (d) Restriction enzyme.

19. What was the amount of human α -lactalbumin in the milk of transgenic cow ?
- (a) 4.2 g/l. (b) 2.4 g/l.
(c) 4.2 mg/g. (d) 2.4 mg/g.
20. The first clinical application of gene therapy over a 4 year old girl was for :
- (a) Adenosine deaminase deficiency.
(b) Adenosine deficiency.
(c) Growth deficiency.
(d) Adenine deficiency.
21. A cuckoo laying eggs in a crow's nest is an example of :
- (a) Ecto-parasitism. (b) brood-Parasitism.
(c) Commensalism. (d) Mutualism.
22. Which of the following factors contributes to the exponential growth of a population ?
- (a) High mortality rate. (b) Limited resources.
(c) High reproductive rate. (d) Predation pressure
23. Number of meiotic and mitotic divisions necessary for the development of female gametophyte in angiosperm is :
- (a) 1 meiosis and 2 mitosis. (b) 1 mitosis and 3 meiosis.
(c) 1 mitosis and 2 meiosis. (d) 1 meiosis and 3 mitosis.
24. How does the availability of nutrients affect ecosystem productivity ?
- (a) Higher nutrient availability leads to higher productivity.
(b) Lower nutrient availability leads to higher productivity.
(c) Nutrient availability has no effect on productivity.
(d) Nutrient availability affects only certain trophic level.

25. How is energy lost between trophic levels in an ecosystem ?
- (a) Through respiration. (b) Through reproduction.
(c) Through excretion. (d) Through heat loss.
26. One Angstrom is equal to :
- (a) 10^{-3} mm. (b) 10^{-6} mm.
(c) 10^{-7} mm. (d) 10^{-9} mm.
27. Which of the following animals have longest lifespan ?
- (a) Horse. (b) Elephant.
(c) Man. (d) Tortoise.
28. All are coelomates *except* :
- (a) *Taenia*. (b) *Nereis*.
(c) *Acidia*. (d) Frog.
29. Which of the following statement is not correct ?
- (a) Pisces have two chambered heart.
(b) Amphibians have three chambered heart.
(c) All reptiles have three chambered heart.
(d) Mammals have four chambered heart.
30. The number and appearance of complete set chromosomes in the nucleus of a eukaryotic cell is known as :
- (a) Diploid. (b) Haploid.
(c) Karyotype. (d) Chromatin.
31. The bond that connects two amino acids is known as :
- (a) Phosphodiester bond. (b) Peptide bond.
(c) Glycosidic bond. (d) None of the above.

32. Human teeth are thecodont. That means :

- (a) Teethes are thick.
- (b) Teethes are thin
- (c) Each tooth is embedded in a socket.
- (d) Differe types of teeth are present.

33. What is tidal volume in respiratory system ?

- (a) Volume of air inspired after a forcible inspiration.
- (b) Volume of air expired after a forcible expiration.
- (c) Volume of air inspired or expired during normal respiration.
- (d) Volume of air remaining in the lungs even after a forcible respiration.

34. The mineral necessary for blood coagulation of blood is :

- (a) Calcium.
- (b) Sodium.
- (c) Potassium.
- (d) Chlorin.

35. If RBC is placed in distilled water, the corpuscles will ———.

- (a) Burst.
- (b) Shrink.
- (c) Stick to each other.
- (d) Divide rapidly.

36. Uremia is a condition in which ?

- (a) The excretion of volume of urine increases.
- (b) The excretion of volume urine decreases.
- (c) The kidney fails to excrete urine.
- (d) Accumulation of urea in blood.

37. Which ion serves as a switch for the initiation of muscle contraction ?

- (a) Na^{++} .
- (b) K^{++} .
- (c) Ca^{++} .
- (d) Cl^- .

38. The organ of Corti is associated with :
- (a) Colour vision of the eye.
 - (b) Bright vision.
 - (c) Auditory reception.
 - (d) Maintenance of body balance.
39. Which is the most common STI caused by bacteria ?
- (a) Chlamydia.
 - (b) Genital herpes.
 - (c) Syphilis.
 - (d) Gonorrhoea.
40. Eravikulam National park is famous for —————.
- (a) Elephant.
 - (b) Tiger.
 - (c) Sambar deer.
 - (d) Nilgiri Tahr.
41. Deficiency of anti-diuretic hormone leads to —————.
- (a) Diabetes mellitus.
 - (b) Addison's disease.
 - (c) Diabetes insipidus.
 - (d) Bright's disease.
42. Which of the following statement is not correct with respect to the plasmid pBR322 ?
- (a) It is natural cloning vector.
 - (b) It has two antibiotic resistance genes.
 - (c) Its size is around 4.3 kbp.
 - (d) It is a circular DNA molecule.
43. Which of the following statement is true with respect to Watson and Crick model of DNA ?
- (a) The two DNA strands are anti-parallel and non-complementary.
 - (b) The two DNA strands parallel and complementary
 - (c) The two DNA strands are anti-parallel and complementary
 - (d) None of the above.

44. Which microorganism is used to develop pest resistant plants ?
- (a) *Saccharomyces cerevisiae*.
 - (b) *Bacillus thuringiensis*.
 - (c) *Trichoderma*.
 - (d) *Pseudomonas*.
45. What is menopause ?
- (a) First menstrual cycle.
 - (b) Ovulation.
 - (c) The cessation of menstrual cycle at around age 50.
 - (d) Formation of corpus luteum.
46. The chromosomal formula of an individual is 47, XXY. It indicates _____.
- (a) Down's syndrome.
 - (b) Klienfelter's syndrome.
 - (c) Turner's syndrome.
 - (d) Edward syndrome.
47. Animals eating their own faecal matter are known as _____.
- (a) Coprophagous.
 - (b) Microphagous.
 - (c) Omnivorous.
 - (d) Macrophagous
48. Ligament is a structure which connects _____.
- (a) Nerve to bone.
 - (b) Bone to bone.
 - (c) Muscle to bone.
 - (d) Nerve to nerve.
49. Bilirubin and biliverdin pigments are found in _____.
- (a) Pancreatic juice.
 - (b) Gastric juice.
 - (c) Saliva.
 - (d) Bile of mammals.
50. The heart beats increase when we see a danger ahead. Such an action is carried out by :
- (a) Peripheral nervous system.
 - (b) Central nervous system.
 - (c) Sympathetic nervous system.
 - (d) Parasympathetic nervous system.

51. Which of the following is HCP crystal Structure ?

- (a) NaCl. (b) CsCl.
(c) Zn. (d) RbCl.

52. The rate constant of first order reaction whose half life is 480 sec is :

- (a) $1.44 \times 10^{-3} \text{ sec}^{-1}$. (b) 1.44 sec^{-1} .
(c) $0.72 \times 10^{-3} \text{ sec}^{-1}$. (d) $2.88 \times 10^{-3} \text{ sec}^{-1}$.

53. The oxidation number of Mn in KMnO_4 is :

- (a) + 7. (b) - 7.
(c) + 1. (d) - 1.

54. The reference calomel electrode is made from which of the following ?

- (a) ZnCl_2 . (b) CuSO_4 .
(c) Hg_2Cl_2 . (d) HgCl_2 .

55. The maximum extent of Hydrogen bonding is shown by :

- (a) H_2O . (b) H_2Se .
(c) H_2S . (d) HF.

56. Which of the following has maximum root mean square velocity at the same temperature ?

- (a) SO_2 . (b) CO_2 .
(c) O_2 . (d) H_2 .

57. How much NaOH is required to neutralize 1500 cm^3 of 0.1 N HCl ?

- (a) 60 g. (b) 6 g.
(c) 4 g. (d) 40 g.

58. The total number of inner transition elements is :

- (a) 10. (b) 14.
(c) 28. (d) 30.

Turn over

59. How many Cl⁻ ions are there around Na⁺ ions in NaCl Crystal ?
- (a) 3. (b) 4.
(c) 6. (d) 8.
60. The osmotic pressure of 1M solution at 27° C is :
- (a) 2.46 atm. (b) 24.6 atm.
(c) 1.21 atm. (d) 12.1 atm.
61. Out of Cu, Ag, Fe, and Zn the metal which can displace all others from their salt solution is :
- (a) Ag. (b) Cu.
(c) Zn. (d) Fe.
62. The mass of 112 cm³ of CH₄ gas at STP is :
- (a) 0.16 g. (b) 0.8 g.
(c) 0.08 g. (d) 1.6 g.
63. The Spectrum of He is expected to be similar to that of :
- (a) H. (b) Na.
(c) He⁺. (d) Li⁺.
64. The volume of 1.0 g of hydrogen in liters at N.T.P. is :
- (a) 2.24. (b) 22.4.
(c) 1.12. (d) 11.2.
65. The bond angle in PH₃ is close to :
- (a) 90°. (b) 105°. (c) 109°. (d) 120°.
66. Ostwald's dilution law is applicable to :
- (a) Strong electrolytes only.
(b) Weak electrolytes only.
(c) Non - electrolytes.
(d) Strong as well as weak electrolytes.

67. Oxidation number of P in KH_2PO_2 .

(a) + 3.

(b) + 1.

(c) + 5.

(d) - 4.

68. The outer electronic structure $3s^2 3p^5$ is possessed by :

(a) Br.

(b) O.

(c) Ar.

(d) Cl.

69. A first order reaction is 75 % complete after 32 minutes. When was 50 % of the reaction completed ?

(a) 16 minutes.

(b) 8 minutes.

(c) 4 minutes.

(d) 32 minutes.

70. Body Centered cubic lattice has a co-ordination number.

(a) 6.

(b) 12.

(c) 8.

(d) 4.

71. Which of the ions has the largest ionic radius ?

(a) Be^{2+} .

(b) Mg^{2+} .

(c) Ca^{2+} .

(d) Sr^{2+} .

72. The kinetic energy of two moles of N_2 at 27°C is ($R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$).

(a) 5491.6 J.

(b) 6491.6 J.

(c) 7491.6 J.

(d) 8882.4 J.

73. Which of the following is not isoelectronic ?

(a) Na^+ .

(b) Mg^{2+} .

(c) O^{2-} .

(d) Cl^- .

74. Sulphuric acid molecules contain :

- (a) Only covalent bonds.
- (b) Covalent and ionic bonds.
- (c) Covalent and Co - ordinate bonds.
- (d) Covalent, ionic and co-ordinate bonds.

75. The solubility of a saturated solution of calcium fluoride is 2×10^{-4} moles per litre. Its solubility product is :

- (a) 12×10^{-2} .
- (b) 14×10^{-4} .
- (c) 22×10^{-11} .
- (d) 32×10^{-12} .

76. The gravitational and electrostatic force between two electrons separated by 10 cm. have the ratio.

- (a) 10^{12} .
- (b) 10^{30} .
- (c) 10^{-30} .
- (d) 10^{-43} .

77. How many different wavelengths would appear in the spectrum of hydrogen atom initially in the $n = 5$ state ?

- (a) 4.
- (b) 10.
- (c) 5.
- (d) 12.

78. A satellite revolves around the earth in a circular orbit at a height H above earth's surface. If R is the radius of earth, the period of revolution of satellite so that the astronaut may be in a state of weightlessness is :

- (a) $\frac{2\pi}{R} \sqrt{\frac{(R+H)^3}{g}}$.
- (b) $\frac{2\pi}{R} \sqrt{\frac{(R+H)^2}{g}}$.
- (c) $\frac{2\pi}{R} \sqrt{\frac{R+H}{g}}$.
- (d) $\frac{2\pi}{R} \sqrt{\frac{g}{gR+H}}$.

79. Eight electric dipoles are of charges of magnitude e are placed inside a cube. The total electric flux coming out of the cube will be ?
- (a) $8e/\epsilon_0$. (b) $16e/\epsilon_0$.
(c) e/ϵ_0 . (d) Zero.
80. A listener is at rest with respect to source of sound. A wind starts blowing along the line joining source and observer. Which of the following quantities of sound wave do not change ?
- (a) Frequency. (b) Velocity.
(c) Wavelength. (d) None of these.
81. If a thin transparent sheet is introduced in front of a Young's double slit, the fringe width will.
- (a) Increase. (b) Decrease.
(c) Remains same. (d) Becomes non uniform.
82. A wire can sustain a weight of 20 Kg. before breaking. If the wire is cut into two equal parts, each part can sustain a weight of :
- (a) 10 Kg. (b) 20 Kg.
(c) 5 Kg. (d) 40Kg
83. A p -type semiconductor is :
- (a) Positively charged.
(b) Negatively charged.
(c) Uncharged.
(d) Uncharged at 0K but charged at higher temperatures.
84. The magnetic field energy in an inductor changes from maximum value to minimum value in 5ms when connected to an AC source. The frequency of the source is :
- (a) 20 Hz. (b) 50 Hz.
(c) 200 Hz. (d) 500 Hz.

85. A radioactive nucleus ${}_Z^AX^A$ emits one alpha and 2-beta particles. The resulting nucleus is :
- (a) ${}_Z^AX^{A-4}$. (b) ${}_{Z-2}^AX^{A-4}$.
(c) ${}_{Z-2}^AX^A$. (d) ${}_{Z-2}^AX^{A-2}$.
86. The air between the plates of a capacitor is replaced by a dielectric of constant K . The electric field between the plates
- (a) Decreases K times. (b) Increases K times.
(c) Decreases $\sqrt{K}$ times (d) increases $\sqrt{K}$ times.
87. Which of the following isotopes of uranium is fissionable ?
- (a) U^{238} . (b) U^{235} .
(c) U^{230} . (d) U^{232} .
88. The equation $y(x, t) = 0.005 \cos(\alpha t - \beta x)$ describes a wave travelling along the x -axis. If the wavelength and time period of wave are 0.08 m. and 2 s respectively the values of α and β are :
- (a) $\alpha = \pi, \beta = 25\pi$. (b) $\alpha = 0.08/\pi, \beta = 2/\pi$.
(c) $\alpha = 0.04/\pi, \beta = 1/\pi$. (d) $\alpha = \pi/2, \beta = 12.5\pi$.
89. An ideal gas is compressed to half of its initial volume by several processes. Which of these processes results in maximum work done ?
- (a) Isothermal. (b) Isobaric.
(c) Adiabatic. (d) Isochoric.
90. The de-broglie wavelength of an electron accelerated through a potential of 150 V is :
- (a) 10 Å. (b) 1 Å.
(c) 1 nm. (d) 0.1 Å.

91. In a class of 45 students, it was found that 20 students liked apples and 30 liked bananas. Then the lowest number of students who liked both apples and bananas is :
- (a) 10. (b) 5.
(c) 8. (d) 15.
92. If the third term of an arithmetic progression is 18 and the seventh term is 30, then its first term is :
- (a) 3. (b) 9.
(c) 12. (d) 6.
93. How many three-digit numbers can be formed using the digits 1 to 9, if repetition of the digits is not allowed.
- (a) 84. (b) 504.
(c) 3024. (d) 1008.
94. The slope of the straight line $3x - 4y + 6 = 0$ is :
- (a) $\frac{3}{4}$. (b) $\frac{4}{3}$.
(c) $-\frac{3}{4}$. (d) $-\frac{4}{3}$.
95. Find $\lim_{x \rightarrow 0} \frac{(x+1)^2 - 1}{x}$.
- (a) 1. (b) 4.
(c) 3. (d) 2.

96. If A and B are square matrices of order 3 with $|A| = 3$ and $|B| = 4$, then $|BA|$ is :

- (a) 7. (b) 36.
(c) 21. (d) 12.

97. If $\sin A = \frac{1}{2}$ and $\sin B = \frac{\sqrt{3}}{2}$, then the value of $\sin(A + B)$ is :

- (a) 0. (b) 1.
(c) $\frac{\sqrt{3}}{4}$. (d) $\frac{1}{\sqrt{2}}$.

98. The point on the curve $y = x^2 - 4x$, where the function attains its minimum is :

- (a) (0, 0). (b) (0, 2).
(c) (2, 2). (d) (2, 0).

99. The area of the region formed by the straight lines $y = x$, $x = 2$ and the x -axis is :

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

100. If a coin is tossed two times, the probability of getting at least one head is :

- (a) $\frac{1}{2}$. (b) $\frac{1}{4}$.
(c) $\frac{3}{4}$. (d) $\frac{2}{3}$.