

Question Booklet No.

Question Booklet Series :

A

AUAT — 2024
2-Year M. Sc. in Botany (P15)
(TEST BASED ON MCQ)

Full Marks : 100

Duration : 2 Hours

Roll No. of the Candidate : _____

Date of Examination : _____

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IMPORTANT INSTRUCTIONS

Candidates should read the below instructions carefully and follow them accordingly.

1. The Question Booklet has paper seal pasted on it. Please do **NOT** open the Question Booklet until you are asked to do so by the Invigilator.
2. The candidates must check immediately after breaking the seal that the Question Booklet contains **100 Multiple Choice Questions** in two parts (Part—I and Part—II).
3. Answer of questions of Part—I and Part—II both will have to be given on the **OMR Answer Sheet** provided for this purpose. Fill up the necessary fields that are intended for you by writing and/or shading appropriately. Otherwise the **OMR Answer Sheet cannot** be evaluated and will liable to be rejected. Question numbers progress from **1** to **100** continuously with alternative answers being shown as [A], [B], [C] and [D] for each question. Record your response by completely darkening the corresponding bubble. While responding, you should consider the best alternative answer and shade only one bubble with **black/blue ball point pen only**. For each correct response you will be awarded **1** mark. There will be negative marking for wrong responses. For each wrong response, **-0.25** mark will be awarded. Multiple responses against one **MCQ** will be treated as a wrong response.
4. On leaving the examination hall, candidates must submit the **OMR Answer Sheet**. They are allowed to keep the Question Booklet with them.
5. **OMR Answer Sheet** will be processed by electronic means. Any untoward/irrelevant remarks, folding or putting stray notes on the answer sheet, any damage to the answer sheet will lead to the rejection of the same and the sole liability shall remain with the candidate.
6. Rough Work may be done at the end of the Question Booklet.
7. No candidate will be allowed to leave the examination hall before completion of the examination.
8. Use of any Electronic device like Mobile, Programmable Calculator etc. is strictly prohibited.

DO NOT OPEN THE SEAL UNTIL INSTRUCTED TO DO SO

PART—I
(Core Subject)

1. What is the **correct** chronological sequence of the following division of geological times?

(i) Eocene
(ii) Carboniferous
(iii) Devonian
(iv) Cretaceous

Select the **correct** answer using the codes given below :

Codes :

[A] (ii), (iii), (iv), (i)
[B] (iii), (iv), (ii), (i)
[C] (iii), (ii), (iv), (i)
[D] (ii), (iii), (i), (iv)

2. The evolution of different species in a given area, starting from a point and spreading to other geographical areas, is known as

[A] adaptive radiation
[B] natural selection
[C] migration
[D] divergent evolution

3. The net gain of ATP molecules in anaerobic respiration, i.e. breakdown of one molecule of glucose into two molecules of pyruvic acid, is

[A] two
[B] four
[C] thirty six
[D] thirty eight

4. Respiratory quotient is determined by the formula

[A] O_2 evolved / CO_2 absorbed
[B] CO_2 evolved / O_2 absorbed
[C] O_2 absorbed $\times$ CO_2 evolved
[D] CO_2 absorbed $\times$ O_2 evolved

5. Photophosphorylation in a chloroplast is most similar to which of the following mitochondrial reactions?

[A] Oxidative phosphorylation
[B] Hydrolysis
[C] Oxidative decarboxylation
[D] Substrate-level phosphorylation

6. Beta-oxidation enzymes bring about oxidation of

[A] sugars
[B] fatty acids
[C] amino acids
[D] polypeptides

7. In the leaves of C₄ plants, malic acid formation during CO₂ fixation occurs in the cells of

[A] bundle sheath
[B] phloem
[C] epidermis
[D] mesophyll

8. Which of the following is essential for the photolysis of water?

[A] Manganese
[B] Zinc
[C] Copper
[D] Boron

9. Treatment of seeds at low temperature under moist conditions to break dormancy is called

[A] stratification
[B] scarification
[C] vernalization
[D] chelation

10. Which of the following elements in plants is **not** remobilized?

- [A] Phosphorus
- [B] Calcium
- [C] Potassium
- [D] Sulphur

11. A.J.C. Bose Indian Botanic Garden, Shibpur, Howrah was established by

- [A] Robert Kyd
- [B] Bentham and Hooker
- [C] William Aiton
- [D] Roxburgh

12. The term phylogeny means

- [A] the evolution of a genetically related group of organisms
- [B] reverse mutation
- [C] the evolution of genetically distinct group
- [D] None of the above

13. Bentham and Hooker's system of classification has recognised

- [A] 100 families
- [B] 200 families
- [C] 280 families
- [D] 411 families

14. The hanging structures that support the banyan tree are called

- [A] prop roots
- [B] stilt roots
- [C] pneumatophores
- [D] root hairs

15. Fruit is a cremocarp in case of

- [A] *Umbelliferae*
- [B] *Rubiaceae*
- [C] *Liliaceae*
- [D] *Compositae*

16. General floral formula of *Apocynaceae* is

- [A] $\oplus \overline{Q}_{\overline{K}_{3-6}}, C_{3-\alpha}, A_{6-\alpha}, \underline{G_{3-\alpha}}$ or $\overline{G_{3-\alpha}}$
- [B] $\oplus \overline{Q}_{\overline{K}_{(5)}}, C_{(5)}, \overline{A_5}, \underline{G_{(2)}}$
- [C] $\oplus \overline{Q}_{\overline{K}_{(5)}}, \overline{C_{(5)}A_5}, \underline{G_{(2)}}$
- [D] $\% \overline{Q}_{\overline{C_{(5)}A_4}} \text{ or } \underline{2G_{(2)}}$

17. The epidermis and root cap are produced by

- [A] Dermatogen
- [B] Periblem
- [C] Plerome
- [D] Flank region

18. The 'Korper-Kappe Theory' for root apex was given by

- [A] Hanstein
- [B] Schmidt
- [C] Schuepp
- [D] Wolff

19. Abnormal secondary growth is found in

- [A] *Triticum*
- [B] *Dracaena*
- [C] *Zingiber*
- [D] *Mangifera*

- 20.** Grafting is not possible in monocots because they
- [A] are herbaceous
 - [B] lack cambium
 - [C] have parallel venation
 - [D] have scattered vascular bundle
- 21.** Which one of the following statements is **false** for heartwood?
- [A] It is made up of living cells
 - [B] It forms central cylinder of wood
 - [C] It is solid and hard
 - [D] It contains gums and resins
- 22.** Scattered fibrovascular bundles are characteristic of the stele in
- [A] diploxylic
 - [B] dictyostele
 - [C] eustele
 - [D] atactostele
- 23.** The antibiotic Terramycin is obtained from
- [A] *Streptomyces griseus*
 - [B] *Streptomyces rimosus*
 - [C] *Clostridium botulinum*
 - [D] *Sterptomyces venezuelae*
- 24.** Prokaryotic flagella has
- [A] multi fibrillar structure
 - [B] 9 + 2 pattern of fibrils
 - [C] protein coat on outside and hollow structure
 - [D] protein coat on outside and solid structure
- 25.** Bacteria that are killed by oxygen are called
- [A] Archaeobacteria
 - [B] Sporophytes
 - [C] Obligate aerobes
 - [D] Obligate anaerobes

- 26.** Pili of bacteria are useful for
- [A] locomotion
 - [B] sexual contacts
 - [C] asexual reproduction
 - [D] transformation

- 27.** Cryptogram of TMV is

- [A] $\frac{R}{1} : \frac{2}{5} : \frac{E}{E} : \frac{S}{O}$
- [B] $\frac{D}{2} : \frac{130}{40} : \frac{X}{X} : \frac{B}{O}$
- [C] $\frac{R}{2} : \frac{3}{6} : \frac{E}{S} : \frac{S}{O}$
- [D] $\frac{D}{2} : \frac{2}{5} : \frac{E}{S} : \frac{B}{O}$

Where, **Pair I** : Nucleic acid in virus (R = RNA, D = DNA)/Strands of nucleic acid in virus (1 = Single Strand, 2 = Double strand).

Pair II : Molecular weight of nucleic acid in millions/percentage of nucleic acid in virus.

Pair III : Shape of the virus/shape of the capsid (S = Spherical, E = Elongated, X = Complex)

Pair IV : Kind of host/kind of vector (B = Bacterium, I = Invertibrates, V = Vertibrates, S = Seeded plants, F = Fungus, O = No vector and so on).

- 28.** In a culture initial concentration of bacteria is 2×10^5 . Each bacterial cell divides in every 40 minutes. What will be the concentration after 3 hours?
- [A] 16×10^5
 - [B] 4.5×10^5
 - [C] 8.5×10^5
 - [D] 32×10^5

- 29.** A Hfr bacterium is one that contains
 [A] many unusual plasmids
 [B] chromosomal material accured from recipient cell
 [C] a plasmid integrated into its genome
 [D] the ability to undergo transduction
- 30.** Which of the following is a foliose lichen?
 [A] *Usnea*
 [B] *Parmelia*
 [C] *Graphis*
 [D] *Lacanora*
- 31.** Fungi lacking cross walls in the mycelium belong to
 [A] Phycomycetes
 [B] Ascomycetes
 [C] Basidiomycetes
 [D] Deuteromycetes
- 32.** *Puccinia graminis f. sp. tritici* is
 [A] Autocious
 [B] Microcyclic
 [C] Heteroecious
 [D] None of the above
- 33.** Clamp connections in Basidiomycetes help in the
 [A] formation of primary mycelium
 [B] formation of dikaryotic hyphae
 [C] formation of conidia
 [D] formation of basidiospores
- 34.** The total number of ascospores in *Penicillium* is
 [A] eight
 [B] sixteen
 [C] four
 [D] two

- 35.** Sexual reproduction is absent in
 [A] Zygomycetes
 [B] Archemycetes
 [C] Ascomycetes
 [D] Deuteromycetes
- 36.** Storage product in *Rhodophyceae* is
 [A] starch and oil
 [B] cellulose
 [C] floridean starch
 [D] glycogen
- 37.** Which one of the following is **not** observed in *Chlamydomonas*?
 [A] Contractile vacuole
 [B] Nucleoid
 [C] Pyrenoid
 [D] Cell wall
- 38.** Life cycle of *Ulotrix* is
 [A] haplontic
 [B] diplontic
 [C] haplodiplontic
 [D] diplohaplontic
- 39.** Meiosis in *Spirogyra* occurs at the time of zygospore germination. Out of the four haploid nuclei formed after meiosis, how may survive?
 [A] One
 [B] Two
 [C] Three
 [D] All of the four

- 40.** During the development of the sporophyte in *Funaria*, the first division of the zygote is
 [A] transverse
 [B] vertical
 [C] irregular
 [D] either transverse or vertical
- 41.** How many neck canal cells are present in the archegonium of *Riccia*?
 [A] 4 to 6
 [B] 4 to 10
 [C] More than 10
 [D] 1 to 10
- 42.** Which special characteristic differentiates Bryophyta from other plants?
 [A] They form spores
 [B] They do not have vascular tissue
 [C] They do not have roots
 [D] The sporophyte is attached to the gametophyte
- 43.** The stem of *Selaginella* has a
 [A] protostele
 [B] siphonostele
 [C] solenostele
 [D] dictyostele
- 44.** Transfusion tissue is present in the leaflet of
 [A] *Cycas*
 [B] *Dryopteris*
 [C] *Marsilea*
 [D] *Funaria*
- 45.** If the number of chromosomes in the foot of a fern embryo is eight, what should be the number in its spores?
 [A] Four
 [B] Eight
 [C] Sixteen
 [D] Twenty three
- 46.** Which of the following is a fossil?
 [A] *Selaginella*
 [B] *Pteris*
 [C] *Rhynia*
 [D] *Psilotum*
- 47.** Conifers are successful in cold climates because of their
 [A] softwood
 [B] evergreen nature
 [C] hard cones
 [D] needle like leaves
- 48.** In gymnosperms, endosperm is formed
 [A] after fertilization
 [B] after the development of embryo
 [C] before fertilization
 [D] at the time of fertilization
- 49.** In which of the following classes are male gametes non-flagellated?
 [A] *Chlorophyceae*
 [B] *Phaeophyceae*
 [C] *Rhodophyceae*
 [D] *Bacillariophyceae*
- 50.** A nucleus that involves duplication of chromosomes but shows no cytokinesis is called
 [A] endomitosis
 [B] restitution nucleus
 [C] euploidy
 [D] polyploidy

- 51.** Intussusception is a process shown by the primary cell wall. It is the
- [A] deposition of cell wall materials from inside to cause growth
 - [B] deposition of cell wall materials from outside as layers
 - [C] hardening of cell wall
 - [D] None of the above
- 52.** In idioblasts, crystals of calcium oxalate exist in different shapes. Needle-like crystals of calcium oxalate are called
- [A] Cystoliths
 - [B] Raphides
 - [C] Otoliths
 - [D] Sphaeraphides
- 53.** Interphase nucleus is enclosed by
- [A] non-porous nuclear membrane
 - [B] porous double nuclear membrane
 - [C] non-porous double discontinuous nuclear membrane
 - [D] a single porous unit membrane
- 54.** Plant cells are connected by channels through their walls called
- [A] plasmodesmata
 - [B] desmosomes
 - [C] tight junction
 - [D] gap junction
- 55.** The resolving power of an optical microscope is given by (λ = Wavelength, NA = Numerical Aperture)
- [A] λ/NA
 - [B] $\lambda/2NA$
 - [C] $2NA/\lambda$
 - [D] $\lambda \times 2NA$

- 56.** In a proliferating cell system, how many mitotic divisions are required to produce 1024 cells from a single parent cell?
- [A] 10
 - [B] 20
 - [C] 512
 - [D] 1023
- 57.** In chiasmate meiosis, the distal segments of the daughter chromatids segregate from each other at
- [A] the anaphase-I
 - [B] the anaphase-II
 - [C] partially at anaphase-I and partially at anaphase-II
 - [D] diakinesis
- 58.** Alleles of a gene are found on
- [A] same chromosome
 - [B] homologous chromosome
 - [C] non-homologous chromosome
 - [D] any chromosomes
- 59.** Genotype is
- [A] genetic composition of a species
 - [B] genetic composition of plastids
 - [C] genetic composition of germ cells
 - [D] genetic composition of an individual
- 60.** Mendel's second law of 'Independent Assortment' can be demonstrated by
- [A] test cross
 - [B] back cross
 - [C] monohybrid cross
 - [D] dihybrid cross

- 61.** Multiple alleles are situated on the
- [A] same locus on homologous chromosomes
 - [B] same locus on heterologous chromosomes
 - [C] different locus on homologous chromosomes
 - [D] different locus on heterologous chromosomes
- 62.** Jumping genes are called
- [A] Cistrons
 - [B] Recons
 - [C] Transposons
 - [D] None of the above
- 63.** Monosomy and trisomy can be represented as
- [A] $2n + 1$, $2n + 3$
 - [B] $2n - 1$, $2n - 2$
 - [C] $2n$, $2n + 1$
 - [D] $2n - 1$, $2n + 2$
- 64.** In m-RNA, AUG is the initiating codon and UAA, UAG and UGA are the terminating codons, therefore, the polypeptide cannot be synthesized beyond any of these triplets to the end of m-RNA. Then which one of the following m-RNA can be transcribed completely?
- [A] AUG UUG UCC UGA UGG UAU
 - [B] AUG UUC UCC UGG UAA UAU
 - [C] AUG UAU UUC UGC CUG GUU
 - [D] AUG AGG UAU UUC UGA CUC
- 65.** High BOD of a lake suggests
- [A] more inorganic nutrient
 - [B] less inorganic nutrient
 - [C] more oxidisable chemicals
 - [D] more oxidisable organic material
- 66.** Basic unit of ecological hierarchy is
- [A] ecosystem
 - [B] biological community
 - [C] population
 - [D] individual
- 67.** The variety of species and their relative abundance present within a region is
- [A] genetic diversity
 - [B] species diversity
 - [C] ecological diversity
 - [D] relative abundance
- 68.** Wild population of plants and animals and traditional life styles are protected in
- [A] Biosphere reserve
 - [B] Sanctuary
 - [C] National Park
 - [D] None of the above
- 69.** The idea of niche was proposed by
- [A] Joseph Grinnell
 - [B] Hutchinson
 - [C] A. G. Tansley
 - [D] Reiter
- 70.** Synecology is the study of
- [A] human environment of a place
 - [B] biotic environment of a place
 - [C] a biotic component of a place
 - [D] biotic community in relation to environment of a place

PART—II

(Islamic History and Culture, General English & General Knowledge)

71. Alhamdulillah means
আলহামদুলিল্লাহ এর অর্থ
[A] Praise be to Allah
[B] Glory be to Allah
[C] Allah is almighty
[D] Allah is the most gracious
72. As per Islam, which of the following is **true** about intoxicants?
ইসলাম অনুসারে মাদকদ্রব্যের ব্যাপারে কোন্ বক্তব্যটি সঠিক?
[A] Totally allowed
[B] Marginally allowed
[C] Marginally forbidden
[D] Strongly forbidden
73. The *Holy Qur'an* is revealed
'পবিত্র কুরআন' অবতীর্ণ হয়েছে
[A] at a time
[B] over a period of 12 years
[C] over a period of 23 years
[D] over a period of 32 years
74. The saying 'Cleanliness is half of faith' is made by
'পবিত্রতা ঈমানের অর্ধেক' এই উক্তিটি করেছেন
[A] Prophet Muhammad
[B] Hazrat Umar
[C] Ibn Taymiyya
[D] Imam Bukhari
75. The prayer at the noon is called
দুপুরের নামাযকে বলা হয়
[A] Fajr
[B] Zuhr
[C] Asar
[D] Isha
76. Mother of Prophet Muhammad (PBUH) died when he was _____ year(s) old.
পয়গম্বর মুহাম্মদ(সা.) মাতৃহারা হন _____ বছর বয়সে।
[A] 1
[B] 3
[C] 6
[D] 12
77. Which of the following is a festival of sacrifice?
নিম্নের কোনটি ত্যাগের উৎসব?
[A] Laylat al-Qadr
[B] Muharram
[C] Eid al-Fitr
[D] Eid al-Adha
78. The first woman martyr in Islam is
ইসলামের প্রথম মহিলা শহীদ হলেন
[A] Asma
[B] Nusaybah
[C] Al-Khansa
[D] Sumayyah
79. Hijri calendar is enumerated from the time of
কোন্ সময় থেকে হিজরি ক্যালেন্ডার গণনা করা হয়?
[A] birth of Prophet Muhammad
[B] migration of Prophet Muhammad to Madinah
[C] journey of Prophet Muhammad into heaven
[D] death of Prophet Muhammad
80. Islam acknowledges
ইসলাম স্বীকৃতি দেয়
[A] only the last Prophet
[B] only the last four Prophets
[C] only the last ten Prophets
[D] all the Prophets

81. On which day Muslims pray Jummah Prayer?

কোন দিনে মুসলমানরা জুমার নামায পড়ে?

- [A] Sunday
- [B] Saturday
- [C] Tuesday
- [D] Friday

82. The term Waqf refers to ____.

ওয়াকফ শব্দটি বোঝায় ____।

- [A] Bill of exchange
- [B] What is due to the State treasury?
- [C] Promissory note
- [D] Charitable foundation or trust

83. The Arabic term Haq means

আরবি শব্দ হক এর অর্থ হলো

- [A] legal rights
- [B] credit proposal
- [C] taking full responsibility
- [D] kind of sale

84. How many gates of Jannah are there?

জান্নাতের দরজা কয়টি?

- [A] Six
- [B] Seven
- [C] Eight
- [D] Nine

85. Name the Angel who was appointed to deliver messages to Prophet Muhammad (SAW) from Allah (SWT)?

আল্লাহর (সুবাহানাহু ওয়া তায়ালা) পক্ষ থেকে নবী মুহাম্মদ(সা.)-এর কাছে বার্তা পৌঁছে দেওয়ার জন্য নিযুক্ত ফেরেশতার নাম কি?

- [A] Jibreel (AS)
- [B] Mikael (AS)
- [C] Israfil (AS)
- [D] Azrael (AS)

86. Which Country is called the 'Land of Prophets'?

কোন দেশকে 'নবীদের দেশ' বলা হয়?

- [A] Saudi Arabia
- [B] Syria
- [C] Palestine
- [D] Iraq

87. Which word is mentioned most times in the *Holy Qur'an*?

'পবিত্র কুরআনে' কোন শব্দটি সবচেয়ে বেশি বার উল্লেখ করা হয়েছে?

- [A] Qul
- [B] Allah
- [C] Rahman
- [D] Āmana

88. What is the name of the fountain which each person of paradise will drink before entering?

জান্নাতে প্রত্যেক ব্যক্তি প্রবেশের পূর্বে যে ঝর্ণার জল পান করবে তার নাম কি?

- [A] Zamzam
- [B] Kawsar
- [C] Tasneem
- [D] None of the above

89. How many times does 'Bismillah' repeat in the *Holy Qur'an*?

'পবিত্র কুরআনে' কতবার 'বিসমিল্লাহ' এসেছে?

- [A] 112
- [B] 113
- [C] 114
- [D] None of the above

90. Which is the longest Surah in the *Holy Qur'an*?

'পবিত্র কুরআনের' দীর্ঘতম সূরা কোনটি?

- [A] Surah Al - Maidha
- [B] Surah An - Nisa
- [C] Surah Al - Imran
- [D] Surah Al - Baqarah

91. The study of various aspects of ageing is called

- [A] Psephology
- [B] Chronology
- [C] Gerontology
- [D] Entomology

92. The fear of being without your mobile phone is called

- [A] Philophobia
- [B] Claustrophobia
- [C] Ophidiophobia
- [D] Nomophobia

93. His courage won him honour. Identify the type of the underlined noun.

- [A] Proper
- [B] Collective
- [C] Abstract
- [D] Common

94. Fill in the blank with the **correct** alternative.

When I met her _____ years after, she looked old and haggard.

- [A] a few
- [B] the few
- [C] few
- [D] some

95. Choose the **correct** alternative from the given sentences :

- [A] Those never fail who dies in great cause
- [B] They never fail who die in a great cause
- [C] They never fails who dies in a great cause
- [D] They never fails who die in a great cause

96. Who is called the first female teacher of India?

ভারতের প্রথম মহিলা শিক্ষক কাকে বলা হয়?

- [A] Sarojini Naidu
- [B] Savitribai Phule
- [C] Rani Lakshmibai
- [D] None of them

97. Mount Etna is a famous volcano located in

মাউন্ট এটনা একটি বিখ্যাত আগ্নেয়গিরি অবস্থিত

- [A] Argentina
- [B] Italy
- [C] Mexico
- [D] Philippines

98. The Battle of Kalinga was fought in the year

কলিঙ্গের যুদ্ধ কবে সংঘটিত হয়েছিল?

- [A] 540 BC
- [B] 320 AC
- [C] 440 BC
- [D] 261 BC

99. In which year the First World War was fought?

প্রথম বিশ্বযুদ্ধ কত সালে সংঘটিত হয়েছিল?

- [A] 1917 – 1920
- [B] 1914 – 1918
- [C] 1912 – 1916
- [D] 1910 – 1914

100. Which country is the largest tea producer in the world?

বিশ্বের বৃহত্তম চা উৎপাদনকারী দেশ কোনটি?

- [A] India
- [B] China
- [C] Bhutan
- [D] Nepal

SPACE FOR ROUGH WORK