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TEST BOOKLET

Sl. No. : **0712**

Subject : BOTANY

Post : Lab. Asst.-cum-Storekeepers

**WRITTEN EXAMINATION FOR RECRUITMENT OF NON-TEACHING POSTS
(JUNIOR ASSISTANTS, PHYSICAL EDUCATION TEACHERS(P.E.Ts) AND
LABORATORY ASSISTANT-CUM-STOREKEEPERS) IN GOVT. DEGREE
COLLEGES, ODISHA**

Time Allowed : 2 Hours

Maximum Marks: 150

: INSTRUCTIONS TO CANDIDATES :

1. **IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET CONTAINS 16 PAGES AND DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.**
2. You have to enter your **Roll No.** on the Test Booklet in the Box provided alongside. **DO NOT** write anything else on the Test Booklet.

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3. The Test Booklet contains **100** questions. Each question comprises four options. You have to select the correct answer which you want to mark (darken) on the OMR Answer Sheet. In any case, choose **ONLY ONE** answer for each question. If more than one answer is darkened, it will be considered wrong.
4. You have to mark (darken) all your answers only on the **OMR Answer Sheet using BLACK BALL POINT PEN** provided by the State Selection Board. You have to do rough work only in the space provided at the end of the Test Booklet. See instructions in the OMR Answer Sheet.
5. All questions carry equal marks. While **1.5** marks will be awarded for each correct answer, each wrong answer will result in negative marking of **0.50** mark.
6. Before you proceed to mark (darken) the answers in the OMR Answer Sheet to the questions in the Test Booklet, you have to fill in some particulars in the OMR Answer Sheet as per the instructions in your Admit Card.
7. On completion of the Examination, you should hand over the **original copy of OMR Answer Sheet** issued to you to the Invigilator before leaving the Examination Hall. You are allowed to take with you the candidate's copy (second copy) of the OMR Answer Sheet along with the Test Booklet for your reference.

Candidate's full signature

Invigilator's signature

P.T.O.

SEAL

1. Capsule of *Acetobacter xylinum* is unique in containing long fibres of _____.
 (A) starch (B) cellulose
 (C) proteins (D) amylopectin
2. The bacterial cell wall contains peptidoglycans which are polymers of _____ and N-Acetyl Muramic Acid.
 (A) N-Ethyl Gluconic Acid (B) N-Methyl Gluconic Acid
 (C) N-Acetyl Glucosamine (D) N-Peptidyl Gluconic Acid
3. One type of rRNA in the 50s ribosomal subunit of bacteria has sedimentation coefficient of _____.
 (A) 16S (B) 18S
 (C) 23S (D) 30S
4. The method of genetic recombination in bacteria in which free DNA fragments are taken up by recipient cell from the surrounding medium is called _____.
 (A) Specialized transduction (B) Generalized transduction
 (C) conjugation (D) transformation
5. Who demonstrated the causal agent of Tobacco Mosaic disease as *contagium vivum fluidum*?
 (A) Mayer (B) Beijerinck
 (C) Stanley (D) Bawden
6. The T₄ bacteriophage that infects *Escherichia* sp. has _____ as nuclear material.
 (A) SS RNA (B) DS RNA
 (C) SS DNA (D) DS DNA
7. Which of the followings is a symbiotic nitrogen-fixing bacterium?
 (A) *Azotobacter* (B) *Clostridium*
 (C) *Azospirillum* (D) *Klebsiella*
8. How many Divisions are there as per Smith's system of classification of algae?
 (A) 6 (B) 7
 (C) 8 (D) 15

9. *Vaucheria* has _____ thallus.
 - (A) heterotrichous
 - (B) siphonaceous
 - (C) Parenchymatous
 - (D) multiaxial
10. Gonidia in *Volvox* are related to _____ reproduction.
 - (A) vegetative
 - (B) isogamous sexual
 - (C) anisogamous sexual
 - (D) asexual
11. Dwarf males are seen in –
 - (A) *Vaucheria*
 - (B) *Oedogonium*
 - (C) *Ectocarpus*
 - (D) *Polysiphonia*
12. Which is not a feature of cells of *Ectocarpus*?
 - (A) Uninucleate cells
 - (B) Three-layered pectocellulosic cell wall
 - (C) Cup-shaped chromatophores
 - (D) Fucoxanthin in plastids
13. Which one is the female sex organ in *Polysiphonia*?
 - (A) carpogonium
 - (B) oogonium
 - (C) archegonium
 - (D) tetrasporangium
14. Which one is not a pigment in algae?
 - (A) carotene
 - (B) phycobillin
 - (C) xanthophylls
 - (D) laminarin
15. Which one produces agar-agar?
 - (A) *Laminaria*
 - (B) *Gelidium*
 - (C) *Ascophyllum*
 - (D) *Sargassum*
16. What is the major food reserve in fungi?
 - (A) starch
 - (B) cellulose
 - (C) glycogen
 - (D) glucose
17. The major component of cell wall in fungi is _____.
 - (A) ergosterol
 - (B) chitin
 - (C) melanin
 - (D) pectin

18. Salmon disease in fishes is caused by _____.
 (A) *Saprolegnia parasitica* (B) *Saprolegnia diclina*
 (C) *Saprolegnia multispora* (D) *Saprolegnia aenigmatica*
19. Which Division of fungi includes 'club fungi'?
 (A) Basidiomycota (B) Ascomycota
 (C) Deuteromycota (D) Zygomycota
20. *Mucor* belongs to the class _____.
 (A) Myxomycetes (B) Oomycetes
 (C) Zygomycetes (D) Ascomycetes
21. Which one is not a type of spore in *Puccinia*?
 (A) Pycniospore (B) Aecidiospore
 (C) Uredospore (D) Ascospore
22. *Puccinia* causes _____ disease.
 (A) Early Blight (B) Late Blight
 (C) Black Rust (D) White Rust
23. Based on thallus structure, which one is not a type of lichen?
 (A) Ascolichen (B) Leprose lichen
 (C) Crustose lichen (D) Fruticose lichen
24. The fungal partner in lichen produces which sugar alcohol?
 (A) Sorbitol (B) Mannitol
 (C) Ribitol (D) Erythritol
25. Glomalin glue is produced by _____.
 (A) Arbuscular mycorrhizal fungi (B) Predacious fungi
 (C) Saprophytic fungi (D) Members of Deuteromycetes
26. Which is not a feature of bryophytes?
 (A) They grow in shady and damp habitat (B) Their main plant body is sporophyte
 (C) Vascular system is absent (D) Sexual reproduction is oogamous

27. Peristome is found in case of _____.
 (A) *Riccia* (B) *Anthoceros*
 (C) *Funaria* (D) *Rhynia*
28. Which one is not found in the 'Theca' of capsule of *Funaria*?
 (A) columella (B) spore mother cells
 (C) trabeculae (D) operculum
29. In *Rhynia*, where are the sporangia borne?
 (A) At the tip of aerial branches (B) Borne directly on horizontal rhizome
 (C) On the upper side of foliage (D) At the base of aerial branches
30. In *Selaginella*, the antheridial cell divides to form a group of twelve cells out of which _____ are primary androgonial cells.
 (A) two (B) four
 (C) six (D) eight
31. The transverse section through coralloid root of *Encephalartos* species shows presence of _____ in the algal zone.
 (A) *Chlamydomonas* (B) *Chlorella*
 (C) *Calothrix* (D) Diatoms
32. Which one is not a characteristic feature of leaves of *Pinus*?
 (A) Acicular form (B) Parenchymatous hypodermis
 (C) Sunken stomata (D) Heavily cutinized epidermis
33. Which of the followings shows leaf gap?
 (A) actinostele (B) haplostele
 (C) plectostele (D) solenostele
34. Arrowroot is obtained from _____.
 (A) *Zamia* (B) *Cedrus*
 (C) *Pinus* (D) *Taxus*

35. Jackson divided meristems into three types. Which of the followings is not one of those?
 (A) Ground meristem (B) Rib meristem
 (C) procambium (D) protoderm
36. Which one is not a theory regarding organization of shoot apex?
 (A) Korper-kappe theory (B) Tunica-corpus theory
 (C) Apical cell theory (D) Histogen theory
37. Which one is not a characteristic feature regarding typical dicot root?
 (A) taproot system present
 (B) parenchymatous conjunctive tissue present
 (C) numerous (more than 8) vascular bundles present
 (D) broad zone of ground tissue present
38. In plant anatomy, the term 'wood' refers to _____.
 (A) Mature vascular bundles (B) Secondary xylem
 (C) Growth rings (D) Hardened phloem fibres
39. In the cell wall of higher plants, the network of pectins consists of cross-linked _____.
 (A) proteins (B) lipids
 (C) lipoproteins (D) polysaccharides
40. Porins are _____.
 (A) Membrane-bound oligosaccharides
 (B) Lipid channels across plasma membrane
 (C) Transmembrane proteins
 (D) Glycolipids on plasma membrane
41. Fluid-Mosaic model of cell membrane was proposed by _____.
 (A) Robertson (B) Danielli-Davson
 (C) Singer and Nicolson (D) Nageli and Cramer
42. Which cell organelle plays a crucial role in conversion of fatty acids to carbohydrates during germination of oil seeds?
 (A) Glyoxysomes (B) Golgi apparatus
 (C) Endoplasmic reticulum (D) Lysosomes
43. Generally, which phase is of longest duration in cell cycle?
 (A) G_1 (B) G_2
 (C) S (D) M

44. 'Bouquet stage' is seen during _____.
 (A) leptotene (B) zygotene
 (C) pachytene (D) diplotene
45. Chromosomes can be microscopically best studied at which phase?
 (A) Interphase (B) Prophase
 (C) Metaphase (D) Telophase
46. Which phase in cell cycle is also known as 'quiescence'?
 (A) G_0 (B) G_1
 (C) G_2 (D) S
47. Choice of Pea plants by Mendel had certain advantages as experimental material. Which of the followings is not one of those?
 (A) Pea flowers are relatively large
 (B) The duration of Pea crop is of a single season
 (C) Flower structure in Pea crop ensures cross pollination.
 (D) Pea seeds are large and plants are relatively easy to grow.
48. In case of gene interaction, the phenotypic ratio 15:1 denotes _____.
 (A) Additive factor (B) Inhibitory factor
 (C) Epistatic factor (D) Duplicate factor
49. Beling's copy-choice theory explains the mechanism of _____.
 (A) Linkage (B) Crossing over
 (C) Gene interaction (D) Inversion
50. In case of which cross over within the inversion loop of a paracentric inversion, normal cross-over chromosome is produced?
 (A) Two strand double cross over (B) Two strand multiple cross over
 (C) Three strand double cross over (D) Four strand double cross over
51. In the case where a cell has two or more distinct genomes with two copies of each genome, it is called _____.
 (A) Autotetraploid cell (B) Autopolyploid cell
 (C) Allopolyploid cell (D) Allotetraploid cell

52. Which statement is wrong?
- (A) Nullisomics in Tobacco are represented by ' $2n-2$ '
 - (B) Monosomics show a variable reduction in vigour
 - (C) Chromosome pairing in nullisomics is ordinarily abnormal
 - (D) The extra chromosome present in a secondary trisomic is an isochromosome
53. Which is not a component of DNA?
- (A) Hexose sugar
 - (B) Phosphate group
 - (C) Purine
 - (D) pyrimidine
54. Which statement is wrong?
- (A) In Adenine, amino ($-NH_2$) group is present at the 6th position
 - (B) In Guanine, amino ($-NH_2$) group is present at the 2nd position
 - (C) All Pyrimidines contain keto ($=O$) group at 2nd position
 - (D) In Uracil, amino ($-NH_2$) group is present at the 6th position
55. Which DNA shows left-handed coiling, contains 12 base pairs per turn and has a pitch of $69\text{\AA}$?
- (A) A-DNA
 - (B) B-DNA
 - (C) C-DNA
 - (D) Z-DNA
56. The experiment by _____ *et al* of California showed that Peptidyl transferase is a ribozyme.
- (A) E.V. McCollum
 - (B) Harry Noller
 - (C) Bruce Alberts
 - (D) Dorothy Hodgkin
57. The segment of DNA, that structurally resembles a gene but cannot code for a protein, is called _____.
- (A) Pseudogene
 - (B) Alternative gene
 - (C) Interrupted gene
 - (D) Overlapping gene
58. The transcription factor TFIID binds to the _____.
- (A) Promoter sequence
 - (B) Regulator sequence
 - (C) Operator sequence
 - (D) structural gene sequence

59. Which sequence is added at the 3' end of t-RNA during processing?
- (A) C-A-C sequence (B) C-C-A sequence
(C) A-C-A sequence (D) C-C-C sequence
60. Which is not a structural gene in Lac operon?
- (A) A-gene (B) I-gene
(C) Y-gene (D) Z-gene
61. Which enzyme in recombinant DNA technology helps in joining DNA fragments with cloning vector?
- (A) Restriction Endonuclease (B) Ligase
(C) Nuclease (D) Polynucleotide kinase
62. Who developed techniques to chemically synthesize polynucleotides in 1960s?
- (A) James Watson (B) Barbara McClintock
(C) Fredrick Sanger (D) Har Gobind Khurana
63. Klenow fragment is produced by the action of _____.
- (A) DNA ligase (B) DNA polymerase I
(C) DNA polymerase II (D) Reverse transcriptase
64. Southern Blotting involves _____.
- (A) Attachment of probes to DNA fragments
(B) Transfer of DNA fragments from electrophoretic gel to a membrane support
(C) Comparison of DNA fragments from two different sources
(D) Transfer of DNA fragments to electrophoretic gel from cellulose membrane
65. Golden Rice variety is rich in _____.
- (A) Vitamin C (B) Biotin
(C) Lysine (D) Beta-carotene
66. Sticky ends of DNA fragments are due to _____.
- (A) Endonuclease (B) Ligase
(C) Unpaired bases (D) methylation

67. Expression of a transgene in the target tissue is identified by _____.
 (A) A second transgene (B) Reporter
 (C) Enhancer (D) Promoter
68. Which hormones are required for callus differentiation?
 (A) Auxin and Ethylene (B) Auxin and Absciscic acid
 (C) Auxin and Cytokinin (D) Auxin and Gibberellin
69. Formation of embryoids from pollen grains in tissue culture medium is due to _____.
 (A) Cellular totipotency (B) organogenesis
 (C) fertilization (D) test tube culture
70. Which chemical is used for encapsulation in formation of synthetic seeds?
 (A) Sodium acetate (B) Sodium alginate
 (C) Sodium nitrate (D) Sodium thiosulfate
71. The cells that immediately surround the stomatal opening are called _____.
 (A) Epidermal cells (B) Subsidiary cells
 (C) Epithelial cells (D) Guard cells
72. Water potential is denoted as _____.
 (A) ψ (B) α
 (C) ω (D) ω_p
73. Which theory is the most convincing in explaining the mechanism of ascent of sap?
 (A) Relay Pump theory (B) Capillary theory
 (C) Root pressure theory (D) Cohesion-Adhesion-Tension theory
74. Which one is a seed germination gene?
 (A) HDC1 (B) ACO5
 (C) H3K14 (D) HDA6
75. In case of physiological dormancy of seeds, scarification increases _____.
 (A) germination (B) dormancy
 (C) dehydration (D) stratification

76. What is the precursor of IAA?
- (A) Acetyl CoA (B) Glucan
(C) Tryptophan (D) Zeatin
77. Which intermediate product of C_3 cycle has seven carbons atoms?
- (A) Erythrose (B) Xylulose
(C) Ribulose (D) Sedoheptulose
78. Which one is not required during the oxidation of pyruvate to acetyl CoA?
- (A) Lipoic acid (B) TPP
(C) NAD (D) NADP
79. Stickland reaction is included under _____.
- (A) Krebs cycle (B) C_4 cycle
(C) Oxidative phosphorylation (D) fermentation
80. Bread wheat, the hexaploid wheat variety, has resulted due to hybridization between *Triticum* (tetraploid wheat) and _____.
- (A) *Secale* (B) *Raphanus*
(C) *Aegilops* (D) *Equisetum*
81. As regards estimation of heterosis, which one is not a type?
- (A) Average heterosis (B) heterobeltiosis
(C) Useful heterosis (D) Harmful heterosis
82. According to Vavilov, wheat is believed to have originated in which centre?
- (A) Central American (B) Central Asia
(C) South American (D) Asia Minor

83. In case of self-sustaining healthy ecosystem, the pyramid of productivity shows _____ at the bottom.
- (A) producers (B) primary consumers
(C) top carnivores (D) decomposers
84. Which is not a stage of hydrosere?
- (A) Reed-swamp stage (B) Herbaceous stage
(C) Sedge-Meadow stage (D) Woodland stage
85. Which of the followings is called secondary air pollutant?
- (A) Peroxy acetyl nitrate (B) Carbon monoxide
(C) Nitrogen dioxide (D) Ozone
86. Which green house gas has highest contribution towards global warming?
- (A) Carbon dioxide (B) Methane
(C) Chlorofluorocarbon (D) Nitrous oxide
87. A mature ovule of angiosperm is typically a _____ structure.
- (A) 4-celled (B) 5-celled
(C) 6-celled (D) 7-celled
88. Egg apparatus includes _____.
- (A) Polar nuclei (B) Filiform apparatus
(C) Antipodals (D) Central cell
89. Myrmecochory is facilitated by _____.
- (A) caruncle (B) hypostase
(C) obturator (D) aril
90. *Penaea* type embryo sac typically contains _____ number of antipodals.
- (A) 3 (B) 6
(C) 9 (D) 11

91. Which is not a type of endosperm?
- (A) nuclear (B) cellular
(C) helobial (D) perisperm
92. During embryo development in *Najas lacerata*, the central core of cells in the 'q', 'm' and 'n' tiers differentiate to form _____.
- (A) dermatogen (B) plerome
(C) epicotyl (D) radicle
93. Co. 213 is an improved type of _____.
- (A) Rice (B) Sugarcane
(C) Tobacco (D) Ground nut
94. The place 'Kangra' is known for production of _____.
- (A) Green tea (B) Protein-rich ground nut
(C) Strong-fibre jute (D) Rubber
95. To which family Rubber plant belongs?
- (A) Apiaceae (B) Dipterocarpaceae
(C) Euphorbiaceae (D) Rubiaceae
96. Which system of classification is commonly followed in herbaria for arrangement of plant materials?
- (A) Bentham & Hooker's system (B) Engler's system
(C) Rendle's system (D) Hutchinson's system
97. AJCB Botanical Garden is situated in _____.
- (A) Kerala (B) Karnataka
(C) West Bengal (D) Uttar Pradesh

98. Which one is not a characteristic feature of family Ranunculaceae?
- (A) Solitary terminal inflorescence (B) Sepals 5
(C) Stamen single (D) Stem herbaceous
99. Verticillaster inflorescence is seen in which family?
- (A) Asclepiadaceae (B) Asteraceae
(C) Liliaceae (D) Lamiaceae
100. In bundle sheath cells, _____ is decarboxylated to provide CO_2 for RUBISCO-catalysed reaction.
- (A) Malate (B) Oxaloacetate
(C) Pyruvate (D) Glycerate

SPACE FOR ROUGH WORK

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SEAL