

**COMMON P.G. ENTRANCE TEST-2022 (CPET-2022)**

Subject Code : **58**

Test Booklet No.:

Entrance Subject : **Botany**

Hall Ticket No.:

**TEST BOOKLET**

Time Allowed : **90 Minutes**

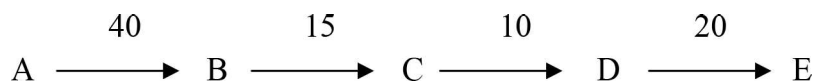
Full Marks : **70**

**INSTRUCTIONS TO CANDIDATES**

1. **Please do not open this Question Booklet until asked to do so.**
2. Check the completeness of the Question Booklet immediately after opening.
3. Enter your **Hall Ticket No.** on the Test Booklet in the box provided alongside. **Do not** write anything else on the Test Booklet.
4. Fill up & darken Hall Ticket No. & Test Booklet No. in the OMR Answer Sheet as well as fill up Test Booklet Serial No. & OMR Answer Sheet Serial No. in the Attendance Sheet carefully. Wrongly filled up OMR Answer Sheets are liable for rejection.
5. Each question has four answer options marked (A), (B), (C) & (D).
6. Answers are to be marked on the Answer Sheet, which is provided separately.
7. Choose the most appropriate answer option and darken the oval completely, corresponding to (A), (B), (C) or (D) against the relevant question number.
8. Use only **Blue/Black Ball Point Pen** to darken the oval for answering.
9. Please do not darken more than one oval against any question, as scanner will read such markings as wrong answer.
10. **Each question carries equal marks. There will be no negative marking for wrong answer.**
11. **Electronic items such as calculator, mobile, etc., are not permitted inside the examination hall.**
12. Don't leave the examination hall until the test is over and permitted by the invigilator.
13. **The candidate is required to handover the original OMR sheet to the invigilator and take the question booklet along with the candidate's copy of OMR sheet after completion of the test.**
14. Sheet for rough work is appended in the Test Booklet at the end.

1. The acidiospores, that are produced in the secondary host of *Puccinia graminis-tritici* containing monokaryotic mycelia, are of
  - (A) diploid type
  - (B) dikaryotic type
  - (C) monokaryotic type
  - (D) only the positive hyphae
2. Which of the following population interactions have similarity among them?
  - (A) syntrophy, synergism, symbiosis
  - (B) mutualism, predation, commensalism
  - (C) symbiosis, parasitism, antagonism
  - (D) opportunism, synergism, mutualism
3. Continuous growth of sporophyte, amphithecial sporogenesis and sunken antheridia are the characteristics of
  - (A) *Anthoceros*
  - (B) *Marchantia*
  - (C) *Sphagnum*
  - (D) *Polytrichum*
4. When a siphonostele is broken by the non-overlapping leaf gaps, the resultant stele becomes a
  - (A) discontinuous siphonostele
  - (B) solenostele
  - (C) meristele
  - (D) atactostele
5. During megasporogenesis and development of female gametophyte, the megasporangium is comparable to
  - (A) embryo sac
  - (B) nucellus
  - (C) ovule
  - (D) ovary

6. The organelle that acts as a connecting link between nucleus and cytoplasm for transfer of materials is
- (A) ribosome  
 (B) mitochondria  
 (C) endoplasmic reticulum  
 (D) Golgi bodies
7. If a hybrid with the genotype AaBbCcddEeFF is test crossed, the number of resulted phenotypes from such cross in the next generation will be
- (A) 8  
 (B) 16  
 (C) 24  
 (D) 64
8. The RNA polymerase remains as a core enzyme in the absence of sigma factor. The catalytically active holoenzyme is formed by the attachment of sigma factor, whose role is
- (A) binding of the polymerase to the gene promoter  
 (B) to start the catalysis of RNA synthesis  
 (C) gliding of polymerase on the template strand  
 (D) termination of RNA synthesis
9. At the level of thylakoid membrane, which of the following occurs by the FQR mediated electron flow from PS I?
- (A) Reduction of NADP<sup>+</sup>  
 (B) Charge separation of PS II and electron flow from PS II to PS I  
 (C) Plastoquinone mediated proton movement across the thylakoid membrane  
 (D) Photolysis of water to produce protons inside the thylakoid membrane
10. In a metabolic pathway with three intermediate metabolites the V<sub>max</sub> (nM/s) of the individual steps are given. The rate limiting reaction of the chain is



- (A) A to B  
 (B) B to C  
 (C) C to D  
 (D) D to E

11. Fatty acids are synthesized and degraded by different pathways. The committed step for synthesis of fatty acid is
- (A) carboxylation of acetyl CoA to malonyl CoA that occurs in the cytoplasm
  - (B) decarboxylation of pyruvate to acetyl CoA by pyruvate dehydrogenase complex
  - (C) attachment of the first product of the pathway to a serine residue of the acyl carrier protein
  - (D) formation of acetoacyl ACP complex
12. For synthesis of glutamine, proline and arginine the precursor amino acid is
- (A) aspartate
  - (B) asparagine
  - (C) glutamate
  - (D) oxo-glutarate
13. Which of the following statement is true for *Selaginella* and *Pteris*?
- (A) primitive ferns
  - (B) heterosporous Pteridophytes
  - (C) members of Lycophyta
  - (D) absence of distinct strobili
14. The rhizoidal groves are formed from the ventral surface in the erectly growing reproductive branches of
- (A) *Riccia*
  - (B) *Marchantia*
  - (C) *Porella*
  - (D) *Funaria*
15. Which of the following plants does not produce flagellated male gamete during reproduction
- (A) *Marsilea*
  - (B) *Funaria*
  - (C) *Cycas*
  - (D) *Pinus*

16. In accordance with provisions of ICN, the rules of priority are not applicable to
- (A) a tautonym
  - (B) earliest published name
  - (C) earliest publishing author
  - (D) a basionym
17. The presence of adelphous stamens and marginal placenta are the characteristics of the family
- (A) Lamiaceae
  - (B) Malvaceae
  - (C) Fabaceae
  - (D) Acanthaceae
18. Which of the following classifications of angiosperms are based on the phylogenetic relationships among the taxa?
- (A) Bentham and Hooker's classification, Gaspard Bauhin classification
  - (B) Hutchinson's system, APG classification
  - (C) Humboldt and Bonpland's classification, Takhtajan's system of classification
  - (D) G. Bauhin's system, Engler and Prantl's system
19. Bicarpellary, syncarpous and inferior ovary are seen in the family
- (A) Cucurbitaceae
  - (B) Acanthaceae
  - (C) Asteraceae
  - (D) Musaceae
20. A segment of DNA, which is with a partly purine and partly pyrimidine sequence, is designated as
- (A) heterogamous
  - (B) heteronomous
  - (C) pleomorphic
  - (D) heteromorphic

21. During photomorphogenetic responses, the blue light signal is perceived by
- (A) phytochromes and cryptochromes
  - (B) phytochromes and phototropins
  - (C) phototropins and cryptochromes
  - (D) cryptochromes and chlorophylls
22. In an interphase, the mitotic preparation through the synthesis of various RNAs and structural and enzymatic proteins occur in
- (A) G1 phase
  - (B) S phase
  - (C) G2 phase
  - (D) the entire interphase
23. In a plant cell, the non-cellulosic polysaccharides, pectins, lignins and phenolic substances are present in
- (A) the primary cell wall
  - (B) the middle lamella
  - (C) the secondary cell wall
  - (D) the entire cell wall
24. Which of the following aneuploid has the least probability of survival and establishment?
- (A) monosomic
  - (B) double monosomic
  - (C) trisomic
  - (D) nullisomic
25. The alleles that produce independent heterozygous conditions are called
- (A) supplementary
  - (B) complementary
  - (C) epistatic
  - (D) co-dominant

26. The term "Anlage" was used for the genes by
- (A) J G Mendel
  - (B) Carl Correns
  - (C) H. de Vries
  - (D) R. C. Punnett
27. A haploid genotype can be produced by tissue culture by taking
- (A) an anther or ovary
  - (B) pollen or ovary
  - (C) anther or egg
  - (D) pollen or egg
28. A long food chain containing more than four trophic levels is not ecologically substantiable because
- (A) the energy content logarithmically decreases with the trophic levels
  - (B) long food chains have high exergy
  - (C) availability of food decreases with the trophic levels
  - (D) climatic conditions become unsuitable
29. When a nucellar epidermis degenerates, an integument layer inner to the nucellar epidermis becomes distinct with prominent nucleus and dense cytoplasm and is called
- (A) epithelium
  - (B) endothelium
  - (C) mesothelium
  - (D) epithecium
30. The collenchyma are the tissues that provide
- (A) cortical mechanical support to the stem
  - (B) cortical mechanical support to stem and underground root
  - (C) stellar mechanical support to stem
  - (D) stellar mechanical support to stem and aerial root

31. Which of the following is used as a uv-light source in a UV-Vis spectrophotometer?
- (A) sodium lamp
  - (B) mercury lamp
  - (C) deuterium lamp
  - (D) infra red lamp
32. The tetrameric DNA unwinding protein, that is responsible for unwinding of ds DNA, binds to the 8-10 nucleotide long binding site as a
- (A) monomer or tetramer
  - (B) dimer or tetramer
  - (C) monomer or dimer
  - (D) tetramer only
33. When spherical bacterial cells are aggregated as irregular bunches, they are termed as
- (A) staphylococci
  - (B) streptococci
  - (C) streptobacilli
  - (D) staphylobacilli
34. The chemical potential of pure water is
- (A) 0
  - (B) 1
  - (C) 18
  - (D) 3
35. According to starch-sugar hypothesis, the increase in size of the guard cells and opening of stomata occurs due to results in
- (A) conversion of sugar to starch in the guard cells
  - (B) conversion of starch to sugar in the guard cells
  - (C) movement of sugar from the mesophylls to guard cells
  - (D) movement of starch from the mesophylls to guard cells



36. Which of the following parts of a T-phage is proteinaceous and contractile?
- (A) the tail fibres
  - (B) the sheath surrounding the core
  - (C) the head capsids
  - (D) the central helical tube
37. The capsomeres in the capsid of a TMV are arranged around the nucleic acid core
- (A) in successive tiers
  - (B) in rows
  - (C) spirally
  - (D) icosehedrally
38. The bacteria that assimilate CO<sub>2</sub> without using the radiant energy are nutritionally defined as
- (A) phototrophs
  - (B) chemo-heterotrophs
  - (C) chemo-lithotrophs
  - (D) chemo-organotrophs
39. Which of the following is an asexual reproductive structure in bacteria?
- (A) akinete
  - (B) autospore
  - (C) exospores
  - (D) endospore
40. Which of the following statement is true for *Chara*, *Coleochaete* and *Oedogonium*?
- (A) they have branched filaments
  - (B) they are attached to the substratum with a unicellular holdfast.
  - (C) they have chlorophyll a but do not contain chlorophyll b
  - (D) they do not contain phycobiliproteins.

41. Some cryophytic algae imparts a red colour to the snow in polar regions due to the presence of a special pigment called
- (A) phytochrome
  - (B) haematochrome
  - (C) chlorophyll d
  - (D) allophycocyanin
42. The asexual reproduction in *Albugo* occurs by the formation of
- (A) conidia and zoospores
  - (B) conidia and oidia
  - (C) oidia and chlamydospores
  - (D) oidia and zoospores
43. The term saccus is applied to which of the following parts of *Pinus*?
- (A) innermost wall layer of ovule
  - (B) uppermost tier of the proembryo
  - (C) wings of the pollen grains
  - (D) outermost layer of the seed
44. When a plant community becomes barren due to some external thrust, the consequent succession taking place in that community is called
- (A) induced succession
  - (B) secondary succession
  - (C) retrogressive succession
  - (D) revised succession
45. In an ecosystem in which the respiratory demand exceeds the gross production, the ecosystem shall have
- (A) low net production accumulated as primary biomass
  - (B) high net production
  - (C) a heterotrophic food web operating in the system
  - (D) additional carbon demand satisfied from the standing biomass.

46. The niche of a species in an ecosystem refers to its
- (A) place of occurrence
  - (B) centre of origin
  - (C) competing ability
  - (D) function at its place of occurrence
47. A vertical section of wood shows a circular arrangement of annual rings at one point. This appears due to
- (A) anomalous secondary growth of stem.
  - (B) false annual ring appearing due to increase in the length of the stem
  - (C) development of a lateral branch
  - (D) multiple cambium rings becoming active simultaneously
48. In a typical dicot embryo, the suspensor is formed by
- (A) several longitudinal divisions of the basal cell of the two celled proembryo
  - (B) several transverse divisions of the basal cell of the two celled proembryo
  - (C) from a suspensor initial developed from the upper cell of the two celled proembryo
  - (D) from a suspensor initial developed from the lower cell of the two celled proembryo
49. The bioactive constituents of saffron are
- (A) carotenoids, monoterpenoids, flavonoids
  - (B) carotenoids, ketone bodies, flavonoids
  - (C) isophorones, monoterpenoids, ketone bodies
  - (D) chlorophylls, monoterpenoids, flavonoids
50. The term "Curing" is associated with the processing of
- (A) tea
  - (B) coffee
  - (C) tobacco
  - (D) saffron

51. According to the Vavilov's concept of the center of origin and diversity of crop plants, potato originated in
- (A) Europe
  - (B) South America
  - (C) Africa
  - (D) North America
52. The value of biodiversity, upon which all the ecosystem functions depend, is called
- (A) consumptive value
  - (B) primary value
  - (C) productive value
  - (D) total economic value
53. When the value of the covariance of two variables equals the product of their standard deviations, the value of correlation coefficient will be
- (A) 0
  - (B) 0.5
  - (C) 1
  - (D) 2
54. In a sample with 400 replicates and a standard deviation of 5, the value of standard error is
- (A) 80
  - (B) 4
  - (C) 0.25
  - (D) 0.0125
55. In *Lathyrus* the dominant gene P is responsible for the petal colour that is complemented by the dominant gene C. which of the following genotype shall produce white coloured flower?
- (A) PpCc
  - (B) PPCc
  - (C) Ppcc
  - (D) PPCC

56. Genes located on the same locus of chromosomes are
- (A) multiple allele
  - (B) polygenes
  - (C) polymorphic genes
  - (D) isogenes
57. If the large ear size of maize is due to two forms of dominant genes, how many offsprings in the F<sub>2</sub> generation shall have typically intermediate size of the ears.
- (A) 1/16
  - (B) 3/16
  - (C) 4/16
  - (D) 6/16
58. When two genes are not separated during crossing over, the appearance of recombinant types, for the characters controlled by the said genes in the next generation, shall be
- (A) 0%
  - (B) 25%
  - (C) 50%
  - (D) 100%
59. The arginine rich nuclear histone protein is
- (A) H<sub>2</sub>a
  - (B) H<sub>3</sub>
  - (C) H<sub>2</sub>b
  - (D) H<sub>1</sub>
60. Which of the following pigments is not present in the thylakoids of a typical plant chloroplast?
- (A) zeaxanthin
  - (B) carotene
  - (C) lycopene
  - (D) phototropin

61. A thin plate of cells oriented at right angles to the axis of the petiole of a leaf, after maturation, is called
- (A) conducting layer
  - (B) abscission layer
  - (C) translocation layer
  - (D) epidermal layer
62. When a seed shows its responsiveness to light during germination, it is called
- (A) photosynthetic
  - (B) photoblastic
  - (C) phototropic
  - (D) photonastic
63. The white rust disease of crucifers is caused by
- (A) *Puccinia graminis*
  - (B) *Phytophthora infestans*
  - (C) *Claviceps purpurea*
  - (D) *Albugo candida*
64. Which of the following statement is correct?
- (A) simple and reciprocal translocations occur at the same rate
  - (B) simple translocations is rarer than reciprocal translocations
  - (C) reciprocal translocations is rarer than simple translocations
  - (D) simple and reciprocal translocations occur simultaneously in a cell
65. A plant with which of the following genomic constitution has a greater possibility of being sterile?
- (A) AABB
  - (B) AAAABB
  - (C) AABBBB
  - (D) AAA

66. The amount of DNA in the haploid genome of a living species is called
- (A) C-value
  - (B) gene density
  - (C) exons
  - (D) R-value
67. When one mutation with visible expression is neutralized by a second mutation, the phenomenon is called
- (A) neutral mutation
  - (B) inert mutation
  - (C) silent mutation
  - (D) reverse mutation
68. The Ti plasmids are present in
- (A) *Escherichia coli*
  - (B) *Agrobacterium rhizogenes*
  - (C) *Agrobacterium tumifens*
  - (D) *Agrobacterium tumifaciens*
69. The enzyme EcoR1 recognises which of the following sequences at the site as indicated by the “hyphen”?
- (A) 5’G-AATTC3’
  - (B) 5’GA-ATTC3’
  - (C) 5’GAA-TTC3’
  - (D) 5’GAAT-TC3’
70. Which of the following is not an advantage of the embryo culture?
- (A) understanding the nutrient requirements of a developing embryo
  - (B) production of miniature seedlings instead of fully grown seedlings
  - (C) study of embryo differentiation
  - (D) production of embryo of hybrids

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# ROUGH WORK