

KROK TESTS 2016

PLANT CELL

1. A vegetational microspecimen was treated with Sudan III solution. As a result of it cell membranes turned pink that means they contain:
A. **Suberin** B. Cellulose C. Lignin D. Pectin E. Hemicellulose
2. After a plant microslide had been processed with phloroglucinol together with concentrated hydrochloric acid, the cell membranes turned crimson red. This indicates presence of:
A. **Lignin** B. Pectin C. Cellulose D. Hemicellulose E. Suberin
3. Destruction of intercellular substance and cell breakaway in overripe fleshy fruits is a result of:
A. **Maceration** B. Lignification C. Mineralization D. Sliming E. Gummosis
4. During examination of a plant cell under the electron microscope some structures in form of a stack of flattened membrane cisterns and vesicles were found. What organelles are these?
A. **Golgi apparatus** B. Endoplasmic reticulum C. Plastids D. Mitochondrions E. Microbodies
5. Examination of the leaf epidermis revealed cells containing cystoliths. Presence of cystoliths is typical for plants of the following family:
A. **Urticaceae** B. Brassicaceae C. Fabaceae D. Solanaceae E. Papaveraceae
6. Histochemical test for fixed oils with sudan III results in the following stain colour:
A. **Pink and orange** B. Blue and violet C. Lemon-yellow D. Raspberry-red E. Black and purple
7. It is known that a seed without endosperm and perisperm has its nutrients accumulated in:
A. **Embryo cotyledons** B. Embryo root C. Embryo stalk D. Gemma E. Seed coat
8. It is known that depending on pH of cellular fluid petal coloration can vary from blue-and-violet to pink and light pink. This is caused by presence of:
A. **Anthocyanins** B. Carotins C. Xanthophylls D. Phycobilins E. Chlorophylls
9. Microscopic examination of a ficus leaf revealed in some cells of its epidermis a protrusion of the cell membrane with an accumulation of crystals that dissolve in the hydrochloric acid and release carbonic acid gas. This structure is called:
A. **Cystolith** B. Raphide C. Druse D. Single crystal E. Styloid
10. Microscopic examination of a potato tuber showed some cell inclusions that become blue-violet as affected by Lugol's iodine solution. These inclusions are:
A. **Starch granules** B. Aleurone grains C. Drops of fatty oil D. Insulin crystals E. Calcium oxalate crystals

PLANT TISSUES

11. Microscopic examination of ground tissue of a small branch revealed cork and fello-derm. These are the derivatives of:
A. **Phellogen** B. Cambium C. Procambium D. Protoderm E. Pericycle
12. While studying a stem covered with periderm, the researcher realized that gas exchange takes place through
A. **Lenticels** B. Stomata C. Pores D. Non-suberized (conducting) cells E. Hydatodes
13. A sample section of an axial body shows a complex consisting of phellogen and its derivatives - cork and phellogen. This tissue is called:

- A. **Periderm** B. Colenchyma C. Sclerenchyma D. Epiblema E. Epidermis
14. Anatomico-histochemical analysis of a petiole revealed living parenchyma cells with cellulose, angular thickened membranes under the epiderm and above the fascicle. This is typical for:
A. **Angular collenchyma** B. Spongy perenchyma C. Lamellar collenchyme D. Lacunar collenchyme E. Bast fibers
15. Characteristic peculiarity of mechanic plant tissues is that they consist mainly of dead cells, but there is one type of mechanic tissues consisting of living cells. Which of the listed mechanic tissues contains the living protoplast?
A. **Collenchyme** B. Scleroids C. Libriform D. Perivascular fibers E. Phloem fibers
16. Examination of a root revealed a tissue that has root fibrils and doesn't have stomata and cuticle. What tissue is it?
A. **Epiblema** B. Epiderm C. Periderm D. Endoderm E. Exoderm
17. Having been studied, conifer wood is determined to be composed of cells with pointed ends and lignified ring-porous cell wall. Therefore, this tissue of conifers is represented only by:
A. **Tracheids** B. Vessels C. Sieve tubes D. Companion cells E. Bast fibers
18. In a sample studied under a microscope the multilayer palisade (columnar) parenchyma can be clearly seen. Such structure is typical for:
A. **Leaf** B. Root C. Dicotyledon stem D. Rhizomes of ferns E. Adventitious roots
19. It is known that rhizome and roots of *Inula helenium* have cavities without distinct inner boundaries filled with essential oils. They are called:
A. **Lysigenous receptacles** B. Schizogenous receptacles C. Resin ducts D. Segmented laticifers E. Nonsegmented laticifers
20. It is known that the leaves of *Eucalyptus globulus* have cavities with well-defined internal boundaries and filled with essential oils. They are called:
A. **Schizogenous cavities** B. Non-articulated laticifers C. Schizolysigenous cavities D. Articulated laticifers E. Lysigenous cavities
21. Microscopic examination of a leaf revealed on its serratures some water stomata that serve the purpose of liquid moisture excretion, that is the process of:
A. **Guttation** B. Gaseous exchange C. Internal secretion D. Transpiration E. Photosynthesis
22. Microscopic examination of a stem of a perennial plant revealed integumentary tissue of secondary origin that was formed as a result of activity of:
A. **Phellogen** B. Procambium C. Cambium D. Pericycle E. Protoderm
23. Microscopic examination of leaf serration revealed secretory structures secreting some liquid. What are these structures called?
A. **Hydatodes** B. Nectaries C. Stomata D. Glandules E. Osmophores
24. Microscopical examination of transverse section of a root revealed investing tissue consisting of thin-walled, closely joining cells with root fibrilla. This tissue is called:
A. **Epiblem** B. Root cap (pileorhiza) C. Periderm D. Endoderm E. Epiderm
25. Microscopy of a leaf epidermis of *Convallaria majalis* showed that the stomata had four accessory cells. Two of them were lateral, and two other were polar. What type of stomatal mechanism is it?
A. **Tetracytic** B. Diacytic C. Anisocytic D. Anomocytic E. Paracytic
26. On the photomicrograph of a herbaceous plant stem the bicollateral vascular bundles are clearly visible. The microspecimen represents the stem of the following plant:
A. **Pumpkin** B. Rye C. Flax D. Corn E. Solomon's seal

27. Pulp of a needle leaf consists of living tissue with internal ansiform outgrowths of membrane. Along these outgrowths the chloroplasts are placed. Name the type of this leaf's parenchyma:
 A. **Folded** B. Spongy C. Palisade D. Storage E. Aeriferous
28. When studying a stem covered with periderm a researcher came to conclusion that gaseous exchange takes place through:
 A. **Lenticels** B. Stomata C. Pores D. Throughput cells E. Hydatodes
29. While determining the type and characteristics of conducting bundles of axial organs one should take into account the positional relation between phloem and xylem and...
 A. **Cambium** B. Procambium C. Collenchyme D. Pericycle E. Phellogen

ANATOMY OF THE VEGETATIVE ORGANS

30. A student had to analyze an axial plant organ characterized by radial symmetry, unlimited growth, positive geotropism. It provided nutrition, vegetative propagation, anchorage of plant in the soil. This organ was identified as
 A. **Root** B. Stem C. Leaf D. Rhizome E. Seed
31. Section of *Helianthus annuus* root has a secondary fascicular formation, it means that the section was made in the zone of:
 A. **Fortification and conduction** B. Growth and elongation C. Absorption D. Fissionable cells E. Root cap
32. The study of the main root ontogenesis shows that it has developed from:
 A. **Radicle** B. Apical meristem C. Pericycle D. Lateral meristem E. Intercalary meristem
33. What type of conducting bundles is characteristic of all root zones of oneseeded plants?
 A. **Radical** B. Central phloem C. Central xylem D. Bilateral E. Collateral

MORPHOLOGY OF THE VEGETATIVE AND GENERATIVE ORGANS

34. A medicinal plant under examination has a pistil formed by a big number of carpels, and a fruitcase that opens with small orifices. This is:
 A. **Papaver somniferum** B. *Chelidonium majus* C. *Zea mays* D. *Mentha piperita* E. *Sanquisorba officinalis*
35. One of the plants under examination has a zygomorphic flower and papilionaceous corolla. This plant is called:
 A. **Melilotus officinalis** B. *Mentha piperita* C. *Valeriana officinalis* D. *Urtica dioica* E. *Rosa canina*
36. The fruit of black locust is dry, formed of a single carpel, dehisces by the ventral and dorsal sutures on two sides, the seeds are attached along the ventral suture. Such fruit is called:
 A. Legume B. **Siliqua** C. Follicle D. Capsule E. Silicula
37. A flower has the androecium consisting of two long and two short stamens. Therefore the flower's androecium is:
 A. **Didynamous** B. Tetradyamous C. Diadelphous D. Tetradelphous E. Polyadelphous
38. A fruit under examination is pseudomonocarpic, with woody pericarp and one seed. The seed cuticle remains unfused with the pericarp. Such fruit is called:
 A. **Nut** B. Cremocarp C. Achenocarp D. Caryopsis E. Pseudomonocarpic drupe

39. A leaf of a plant under examination has a membranous ochrea wrapped around the internode base. Presence of such modified stipules is the diagnostic feature of the following family:
 A. **Polygonaceae** B. Gramineae C. Rosaceae D. Legumes E. Solanaceae
40. A medicinal herb under examination has the capsule fruit with laticifers and small openings. This herb is called:
 A. **Papaver somniferum** B. *Chelidonium majus* C. *Zea mays* D. *Mentha piperita* E. *Sanquisorba officinalis*
41. A plant under examination has papilionaceous flower. This plant belongs in the family:
 A. Fabaceae B. Scrophulariaceae C. Ranunculaceae D. Lamiaceae E. Asteraceae
42. A sour cherry has shortened principal axis of inflorescence, pedicels have nearly equal length and emerge like from the same point. It is typical for the following type of inflorescence:
 A. **Umbel** B. Corymb C. Truss D. Ear E. Anthodium
43. During determination of fruit type *Hypericum perforatum* it was found that: the fruit is coebocarpous, dry, opens with valves and contains a big number of seeds. Therefore the fruit of *Hypericum perforatum* is:
 A. **Fruitcase** B. Multifollicle C. Follicle D. Coenobium E. Aggregate achene
44. During morphological analysis of lily-of-the-valley (*Convallaria majalis*) leaf it was noted that lamina has wide elliptic shape and numerous veins are parallel to leaf margin and merge only at the leaf point. What is this venation type called?
 A. **Arcuate** B. Parallel C. Palmate D. Pinnate-reticulate E. Dichotomous
45. During morphological description of common periwinkle it was defined that it has shoot that trails on the ground and takes root. It allows to characterize such shoot as:
 A. **Creeping** B. Recumbent C. Twining D. Scandent E. Tenent
46. During practical field session students have detected plant with diversity of leaves that differ by their placement on stem, parts development, size, shape, lamina division. This phenomenon is called:
 A. **Heterophylly** B. Phyllotaxy C. Metamorphosis D. Leaf mosaic E. Venation
47. During the field practice a student found a plant with disk-shaped structure of its rachis, sessile flowers and husk. This inflorescence is called:
 A. **Anthodium** B. Spike C. Spadix D. Glomus E. Raceme
48. During the morphologic analysis of various plant leaves the students found the leaves, whose length of the leaf blade is 5 times more than its width. Specify the shape of the leaf blade:
 A. **Linear** B. Elliptical C. Lanceolate D. Ovoid E. Reniform
49. Essential oil glandules that consist of 8 secretory cells placed in 2 lines and 4 tiers are typical for most plants of the following family:
 A. **Asteraceae** B. Apiaceae C. Lamiaceae D. Rosaceae E. Scrophulariaceae
50. Examination of a medicinal herb revealed that its leaves were divided down to the base of the leaf blade with segments radiating from a common point in a fan manner. These leaves are:
 A. **Palmatisected** B. Pinnatisected C. Palmatipartite D. Pinnatipartite E. Palmatilobate
51. Examination of an inflorescence of sweet flag *Acorus calamus* L. revealed that it was encircled with a covering leaf (spathe) and small sessile flowers grew compactly on the thickened pulpy axis. Such inflorescence is called:
 A. **Ear** B. Glomus C. Spike D. Umbel E. Corymb

52. Examination of five herbarium specimens of medicinal plants showed that one of them belonged to the legume family, namely:
 A. **Glycyrrhiza glabra** B. Atropa belladonna C. Hyoscyamus niger D. Datura stramonium
 E. Solanum dulcamara
53. Inflorescence of greater plantain grows out at apex, the main axis is long, and flowers are sessile. This type of inflorescence is called:
 A. **Spike** B. Panicle C. Spadix D. Capitulum E. Thyrsus
54. Inflorescence of Ledum palustre has a significantly shortened rachis, connivent nodes, pedicles of the quite similar length. This inflorescence is called:
 A. **Umbel** B. Glomus C. Bostryx D. Spike E. Ament
55. Leaves of a plant under examination have a distinct main nerve in the middle with regularly diverging side nerves. What type of nervation is it?
 A. **Pinnate** B. Digitate C. Arcwise D. Parallel E. Dichotomic
56. Leaves of Aesculus hippocastanum are composed of 5-7 assidenous folioles that are oblongobovate shaped with dentate-serrated margin, are attached to petiole (leaf rachis), and therefore are:
 A. **Palmately compound** B. Pinnately compound C. Pinnatisected D. Palmatisected E. Palmatilobed
57. Monopodial inflorescences of plantain (spike) and maize (ear) have one trait in common: their flowers are placed on the well-developed principal axis. This is typical for the following inflorescences:
 A. **Simple botrioid** B. Complex botrioid C. Cymose D. Aggregate E. Thyrsoid
58. Morphological analysis of an inflorescence revealed that its flowers were attached to the same axis at different levels but due to different length of peduncle they grew in the same plane. Such inflorescence is called:
 A. **Corymb** B. Anthodium C. Glomus D. Umbel E. Spike
59. Morphological analysis of leaves revealed that each vein runs along the lamina separately and the veins join together only at the top of the lamina. This kind of venation is called:
 A. **Arcuate** B. Pinnate C. Dichotomous D. Palmate
60. Morphological analysis of poplar inflorescence showed that it is a simple monopodial inflorescence: main axis is drooping, the flowers are sessile, unisexual. Specify the type of inflorescence:
 A. **Catkin** B. Head C. Capitulum D. Cyme E. Panicle
61. One of fleshy fruits under examination is characterized by essential oil exocarp, spongy mesocarp and overgrown endocarp consisting of juice sacs. What fruit was examined?
 A. **Hesperidium** B. Pepo C. Cinarodium D. Drupe E. Bacca
62. One of the common characteristics of subfamily Prunoideae a representatives (family Rosaceae) is that their fruit is:
 A. **Drupe** B. Aggregate-accessory fruit C. Bacca D. Pome E. Pepo
63. The analyzed plant has hollow ribbed stems, compound umbel inflorescence, schizocarpic fruit (cremocarp) and is rich in essential oils, which is a characteristic of:
 A. **Apiaceae** B. Fabaceae C. Ericaceae D. Brassisaceae E. Asteraceae
64. The birch has compound inflorescences with drooping main axis bearing dichasia composed of unisexual cells. Therefore, this inflorescence is called:
 A. **Ament** B. Raceme C. Spadix D. Spike E. Glomus
65. When studying the diagnostic features of Origanum vulgare, the students noticed that the plant had a compound monopodial inflorescence. It is called:

- A. **Corymbose panicle** B. Cluster of heads C. Cincinnus D. Bostyx E. Head
66. When studying white mistletoe, - perennial medicinal semiparasite plant, - it was revealed that its embryonic root buries into higher plant stem tissue and reaches vascular tissue system. This type of roots is called:
 A. **Haustorial roots** B. Photosynthetic roots C. Aerating roots D. Contractile roots E. Aerial roots
67. You need to specify a monocarpous one-seeded fruit with hard scleroid endocarp and soft mesocarp. This fruit is:
 A. **Monodrupe** B. Legume C. Silique D. Capsule E. Bacca

PLANT SYSTEMATIC

68. Choose a plant whose apical sprouts are used in medical practice for sedative drug production:
 A. **Leonurus cardiaca** B. Glycyrrhiza glabra C. Digitalis purpurea D. Ledum palustre E. Fagopyrum sagittatum
69. Spore and pollen analysis revealed in the pollen some tetrahedral spores with a semi-circular base and a reticular surface, which may belong to:
 A. **Lycopodiophyta** B. Equisetiphyta C. Bryophyta D. Polypodiophyta E. Pinophyta
70. A common species of the Pinaceae family is a tall, evergreen, shade-enduring tree. The needles are solid, prickly, quadrangular in cross-section, spirally arranged. This tree is:
 A. Picea abies B. **Larix sibirica** C. Pinus sylvestris D. Juniperus communis E. Ephedra equisetina
71. A herb under analysis relates to the Malvaceae family and is used as an expectorant and coating agent. The stem is erect, with simple palmate three to five lobed leaves, large pink flowers growing in short panicles. The herb has schizocarpic fruit - a capsule. Identify the plant:
 A. **Althaea officinalis** B. Fragaria vesca C. Potentilla erecta D. Tussilago farfara E. Thymus serpyllum
72. A herbaceous plant under examination has segmented laticifers with anastomoses filled with white latex. This is typical for:
 A. **Taraxacum officinale** B. Urtica dioica C. Chelidonium majus D. Anethum graveolens E. Thymus vulgaris
73. A higher nonvascular plant has distinct alternation of dominant sexual (gametophyte) and reduced asexual (sporophyte) generations. This indicates that the plant belongs to the following division:
 A. **Bryophyta** B. Lycopsida C. Equisetophyta D. Pteridophyta E. Gymnospermae
74. A macroscopic alga of brown colour with trunk, rhizoids and foliaceous part rich in alginates and iodine is ranked with genus of:
 A. **Laminaria** B. Chlorella C. Chlamydomonas D. Sirogira E. Ulothrix
75. A plant under examination has a rhizome, big pinnatisected leaves with sori and sporangia on their undersurface. According to this data the plant should be related to one of the following divisions:
 A. **Polypodiophyta** B. Pinophyta C. Magnoliophyta D. Equisetophyta E. Lycopodiophyta
76. A plant under examination has a storage root; its stems are ribbed and channelled, hollow; leaves are many times pinnatisected, leafstalk has a boot; inflorescence is the compound umbel; fruit is the cremocarp with essential oil canaliculi in the pericarp. Such characteristics are typical for the plants of the following family:

- A. **Apiaceae** B. Solanaceae C. Fabaceae D. Brassicaceae E. Scrophulariaceae
77. An annual plant of the Asteraceae family has tripartite leaves, apical anthodia with tubular flowers, flat achenocarps that are tenent due to 2-3 bristly serratures. This plant is:
A. **Bidens tripartita** B. Chamomilia recutita C. Centaurea cyanus D. Echinacea purpurea E. Artemisia vulgaris
78. An essential oil plant has a tetraquetrous stem, flowers with bilabiate corolla, its fruit is coenobium. These signs are typical for the following family:
A. **Lamiaceae** B. Papaveraceae C. P olygonaceae D. Solanaceae E. Scrophulariaceae
79. Astragalus dasyanthus has sessile flowers gathered into inflorescences with a short thick axis. This inflorescence is called:
A. **Capitulum** B. Cyme C. Truss D. Spike E. Head
80. Bacca fruit is typical for the following representative of Solanaceae family:
A. **Atropa belladonna** B. Hyoscyamus niger C. Datura stramonium D. Nicotiana tabacum E. Datura innoxia
81. Calendula officinalis which a representative of the aster family is characterized by the following inflorescence type:
A. **Flowerhead** B. Umbel C. Catkin D. Glome E. Cyme
82. Choose a plant whose apical sprouts are used in medical practice for sedative drug production:
A. **Leonurus cardiaca** B. Glycyrrhiza glabra C. Digitalis purpurea D. Ledum palustre E. Fagopyrum sagittatum
83. Crop production includes cultivation of medicinal essential oil plants that don't grow in Ukraine wildely, namely Mentha piperita, Ortosiphon stamineus, and also:
A. **Salvia officinalis** B. Origanum vulgare C. Leonurus cardiaca D. Thymus serpyllum E. Leonurus quinquelobatus
84. Diaphoretic herbal tea includes dichasial cymes with light-yellow, oblong, wing-like, squamelliferous perianth. The flowers are fragrant, yellowish. These inflorescences belong to:
A. **Tilia cordata** B. Viburnum opulus C. Robinia pseudoacacia D. Mentha piperita E. Padus avium
85. During identification of a perennial herb of Ranunculaceae family it was found to have: apical flowers of regular form up to 6 cm in diameter; 5 downy violetand-green calyx lobes of irregular serrate form; up to 20 bright yellow glossy petals without nectarostigma. What plant is it?
A. **Adonis vernalis** B. Helleborus purpurascens C. Ranunculus acris D. Delphinium elatum E. Aconitum napellus
86. In the practice of harvesting herbal raw material of Asteraceae family the term "flowers" means both individual flowers and inflorescences. However, the notion of "flowers" is botanically correct only for:
A. **Centaurea cyanus** B. Gnaphalium uliginosum C. Arnica montana D. Echinops ritro E. Bidens tripartite
87. It is known that leaves of most gymnosperm species are represented by needles. Which one of the species listed below has macropodous leathery leaves with solid flabellate lamina, dichotomous venation and one or several notches along the upper margin?
A. **Ginkgo biloba** B. Cedrus libani C. Juniperus communis D. Picea abies E. Abies sibirica

88. One of the herbarium specimens of medicinal plants relates to the Asteraceae family. This plant is:
A. **Arctica lappa** B. *Atropa belladonna* C. *Cassia acutifolia* D. *Urtica dioica* E. *Rubus idaeus*
89. Prevailing plants of a foliage forest are monoecious high trees coated with thick dark-grey rind with deep cracks. Their leaves are short-petioled, pinnatifid. Their fruit is acorn. Therefore, the dominating species is:
A. **Quercus robur** B. *Robinia pseudoacacia* C. *Aesculus hippocastanum* D. *Tilia cordata* E. *Betula verrucosa*
90. The figwort family Scrophulariaceae includes a biennial plant up to 1,5 m high, with golden-yellow flowers gathered in spiked inflorescences. The flowers have five stamens. Specify this plant:
A. **Verbascum thapsus** B. *Digitalis purpurea* C. *Digitalis grandiflora* D. *Digitalis lanata* E. *Digitalis Ferruginea*
91. Which medicinal plant of the Asteraceae family has only disk flowers in the flowerhead?
A. **Three-part beggarticks (*Bidens tripartita*)** B. Dandelion (*Taraxacum officinale*) C. *Echinacea purpurea* D. Cornflower (*Centaurea cyanus*) E. Common yarrow (*Achillea millefolium*)
92. Which of the following plants has pome fruit?
A. **Sorbus aucuparia** B. *Prunus domestica* L. C. *Amygdalus communis* D. *Rosa majalis* E. *Prunus padus*
93. Which representative of the Rosaceae family has spring bloom in form of white, fragrant flowers gathered in pendulous racemes at the ends of short shoots?
A. **Padus racemosa (*P. avia*)** B. *Potentilla erecta* C. *Sorbus aucuparia* D. *Cerasus vulgaris* E. *Crataegus sanguinea*

Ecology

94. Common nettle, hop, black elderberry relate to the plants that require soils rich in nitrogen compounds, that is, such plants are called:
A. **Nitrophytes** B. Nitrophobes C. Calciphiles D. Calciphobes E. Halophytes