

IRIDOIDS. ESSENTIAL OILS.

1. Indicate the herb listed in the Red Book of Ukraine, which area is limited by the highlands of the Ukrainian Carpathians:

- A* * Yellow gentian
- B* Spring adonis
- C* Killwort
- D* Lily-of-the-valley
- E* Hellebore

2. Herbal raw material should be collected in appropriate phytocenoses. Raw material of which medicinal plants can be collected at the banks of rivers, lakes and swamps?

- A* * Sedge cane (Calamus)
- B* Bearberry
- C* Knotweed
- D* Creeping thyme
- E* Pansy

3. Pharmacy has a plan of birch buds collection. In which stage of vegetation the harvesting of the plant material should be held?

- A* * Before blossoming of buds
- B* During the sap movement
- C* In winter
- D* In autumn
- E* In summer

4. Arnica flowers are used as a hemostatic agent for the treatment of injuries. Collection of this plant material is held:

- A* * At the beginning of flowering
- B* During the bud period
- C* During flowering
- D* In the second period of flowering
- E* Harvesting of flowers and fruits is allowed

5. Wormwood herb is harvested in a certain vegetation phase. Specify the optimal term of the plant material collection:

- A** Beginning of flowering
- B* Before flowering
- C* During the complete flowering
- D* During fruiting
- E* In the bud formation period

6. Creeping thyme herb is harvested in Ukraine. Specify the term of the plant material collection:

- A* * During blossoming

- B** Before blossoming
- C** Before the unripe fruit formation
- D** During fruiting
- E** After fruit harvesting

7. Yarrow herb is harvested in a certain phase of vegetation. Specify the phase.

- A** * During mass flowering
- B** Before flowering
- C** During stem formation
- D** During fruiting
- E** During flower bud formation

8. Pharmacological activity of valerian roots depends on the active ingredients content, most of which are accumulated:

- A** * In autumn, at the end of vegetation
- B** In summer, during the flowering
- C** In summer before blossoming
- D** In winter, during the rest period
- E** In late summer, early fruiting

9. Underground organs of elecampane are collected:

- A** * After ripening of seeds and disappearing of the aerial part
- B** In the phase of blossoming
- C** At the period of unripe fruit
- D** In the phase of bud formation
- E** In the phase of stem formation

10. Drugs of common valerian are used as sedatives. The main feature to distinguish common valerian from its admixtures is:

- A** * Specific odour
- B** Absence of specific odour
- C** Specific taste
- D** Specific colour of the raw material
- E** Remains of stem

11. During the collection of plant material it is possible to find admixture in it. Choose the type of medicinal plant material the admixture for which is *Herba Artemisiae vulgaris*:

- A** * *Herba Absinthii*
- B** *Herba Polygoni avicularis*
- C** *Herba Artemisiae annuae*
- D** *Herba Millefolii*
- E** *Herba Leonuri cardiaca*

12. During calamus rhizomes collection they can be confused with the following

admixture:
A * Yellow iris
B Valerian
C Elecampane
D Marshmallow
E Phlojodicarpus

13. Sage leaves contain volatile oil. That is why a pharmacist must dry this raw material at the temperature:

A * 25-30°C
B 50-60°C
C 100°C
D 60-70°C
E 70-80°C

14. Quality of chamomile flowers medicines depends on the terms of collection and drying. Chamomile flowers should be dried at the temperature:

A * 35-40°C
B 90-100°C
C 60-70°C
D 80-90°C
E 70-80°C

15. Elecampane roots have a wide spectrum of pharmacological activity. This raw material should be dried at the temperature:

A * Not higher than 40°C
B 80-90°C
C 60-70°C
D 50-60°C
E 90-100°C

16. A pharmacy has collected pot marjoram herb. What mode of drying should be used to get the raw material meeting the requirements of Pharmacopoeia?

A * 35-40°C
B 80-90 °C
C 20-25 °C
D 50-60 °C
E 70-80 °C

17. A warehouse has received a party of medicinal plant material – peppermint leaves. Specify the conditions of this plant material storage:

A * Separately from other types of plant material
B In ordinary conditions
C In metallic containers
D To prevent the action of CO₂

E At the temperature -5°C

18. The pharmacy has received a party of raw material – chamomile flowers. Specify the conditions of this plant material storage:

A * Separately from all types of plant material

B On the B list (these drug substances require caution in handling, storage or use)

C On the A list (poisonous drug substances)

D List of substances equivalent to narcotics

E In a light place

19. To heal an acute respiratory disease a doctor prescribed a patient to use diaphoretic herbal tea which contains: I Flores Tiliae; II Fructus Rubi idaei. Point out which families do the plants of this herbal tea belong to:

A * I Tiliaceae; II Rosaceae

B I Asteraceae; II Elaeagnaceae

C I Tiliaceae; II Asteraceae

D I Scrophulariaceae; II Rosaceae

E I Elaeagnaceae; II Fabaceae

20. Juniper berries are used as diuretic, anti-inflammatory and cholagogue. Its medicinal plant material is:

A * Fruits

B Sprouts

C Leaves

D Roots

E Seeds

21. Chamomile flowers are widely used in medicine. Which plant should be collected for that purpose:

A * Chamomilla recutita

B Leucanthemum vulgare

C Anthemis cotula

D Anthemis arvensis

E Tripleurospermum inodorum

22. A pharmacy has the plan of yarrow collection. Which species of this plant is allowed to use in medicine?

A * Achillea millefolium L.

B Achillea micrantha L.

C Achillea nobilis L.

D Achillea setacea Waldst. et Kit.

E Achillea pannonica L.

23. A pharmacy has received the party of medicinal plant material – valerian roots. Under which conditions the medicinal plant material must be rejected without further

analysis?

- A** * The presence of toxic admixtures
- B** The presence of mineral admixtures
- C** Lack of labelling according to the Analytical documentation
- D** Damaged packaging and high humidity of raw material
- E** The affection of the I-st degree vermin

24. At microscopic analysis of a raw material such diagnostic features were detected: multilayer cork, large parenchymal cells filled with inulin; expressive cambium line; large vessels; schizogenous receptacles with essential oil. For what type of plant material the indicated features can serve as the authenticity confirmation?

- A** * Rhizomata et radices Inulae
- B** Rhizomata et radices Rubiae
- C** Rhizomata cum radicibus Valerianae
- D** Radices Taraxaci
- E** Radices Ononidis

25. At analyzing the raw material such features were detected: lightly waved epidermal cells; “T-shaped” hairs that contain 2-4 cells placed in a line, to which a long ribbon-like cells with narrow ends are attached; glands with essential oil characteristic for the *Asteraceae* family. According to the signs the MRM is:

- A** * Folium Absinthii
- B** Folium Salviae
- C** Folium Urticae
- D** Folium Menthae
- E** Folium Vitis idaeae

26. A doctor advised a teenager with a low appetite to take appetizing medicinal herbal tea of the following composition: Herba Absinthii, Herba Millefolii. Specify the characteristic microscopic indications of *Artemisia absinthium* which point to presence of this herb in the medicinal herbal tea:

- A** * T-shaped hairs at the leaf margin
- B** Simple and capitate hairs
- C** Multiended, simple and ciliar hairs
- D** Stinging and retortshaped hairs
- E** Multiended and capitate hairs

27. It's better to use the cut raw material for extracting essential oils from eucalyptus leaves because the essential oil is placed in:

- A** * Essential oil receptacles
- B** Essential oil glands
- C** Essential oil channel
- D** Essential oil tubules
- E** Parenchymal cells

28. Rose essential oil is used as an anti-inflammatory and spasmolytic remedy. Which excretory formations is it located in?

- A** * Glandular spots
- B** Essential oil glands
- C** Essential oil receptacles
- B** Secretory cells
- E** Glandular hairs

29. It's better to use the whole raw material for extracting essential oil from the peppermint leaves because the essential oil is placed in:

- A** * Essential oil glands
- B** Essential oil receptacles
- C** Essential oil channels
- D** Essential oil tubules
- E** Parenchyma cells

30. What group of biologically active compounds was first named "pseudoindicans" through their ability to form dark blue colour in concentrated acids?

- A** * Iridoids
- B** Lignans
- C** Xanthones
- D** Coumarins
- E** Flavonoids

31. The essential oil of peppermint leaves has specific smell. What compound causes it?

- A** * Menthol
- B** Carvacrol
- C** Cymol
- D** Citral
- E** Thymol

32. A party of the MRM of the common thyme herb was received by a pharmacy's storehouse. The content of which active substances, according to the Pharmacopoeian requirements, should be analyzed?

- A** * Essential oil
- B** Flavonoids
- C** Extracted substances
- D** Coumarins
- E** Saponins

33. A doctor advised a pectoral medicinal herbal tea with expectorant activity for treating bronchitis of the following composition: Radices Althaeae, Folium Farfarae, Herba Origani. Which group of biologically active substances *Origanum vulgare* belongs to?

- A** * The essential oil-containing MRM

- B** The saponin-containing MRM
- C** The alkaloid-containing MRM
- D** The anthraquinone-containing MRM
- E** The cardio steroid-containing MRM

34. Birch buds are well-known to be used as a diuretic medicine. The quality of the MRM is regulated according to the content of:

- A** * Essential oil
- B** Vitamins
- C** Lipids
- D** Iridoids
- E** Saponins

35. A patient with heart failure induced by a long-term coronary vessel disorder can be recommended to administer drugs produced out of the following herbal raw material:

- A** * Hawthorn
- B** Calendula flowers
- C** Ginseng roots
- D** Aralia roots
- E** Berberis roots

36. The common St. John's wort herb is used as astringent and antiseptic agent. The raw material standardization is carried out according to the content of:

- A** * Rutin
- B** Salidroside
- C** Avicularin
- D** Quercetin
- E** Gnaphalioside

37. "Memoplant" is prescribed for people with cerebral blood circulation disorders. Which group of biologically active substances provides such pharmacological effect?

- A** * Flavonoids
- B** Alkaloids
- C** Cardiolglycosides
- D** Vitamins
- E** Anthraquinones

38. The water pepper herb is prescribed as an antihemorrhagic remedy. The quality of the raw material is characterized by the content of:

- A** * Sum of Flavonoids
- B** Vitamins
- C** Sum of alkaloids
- D** Sum of coumarins
- E** Sum of chromones

39. Medicines on the base of common valerian are used as sedatives because it contains:

- A** * Valepotriates
- B** Anethole
- C** Cineol
- D** Linalool
- E** Eugenol

40. Medicines of dandelion roots are recommended to use for digestion improvement and as a cholagogue, because this raw material contains:

- A** * Iridoids (bitters)
- B** Essential oils
- C** Balsams
- D** Saponins
- E** Flavonoids

41. The quality of peppermint oil is determined by the menthol content. Which index determines menthol content in the oil?

- A** * Ether value after acetylating (hydroxyl number)
- B** Acid value
- C** Foaming index
- D** Peroxide value
- E** Iodine value

42. In order to determine the purity a drop of lavender essential oil was applied on a filter paper strip and warmed up in the stream of warm air. Some time later the stain increased in diameter. Which impurity was found in the lavender oil?

- A** * Fatty or mineral oil
- B** Phenol
- C** Ethanol
- D** Acetone
- E** Diethyl ether

43. To determine the purity of essential oil ethanol is added to a test tube with peppermint oil and turbidity is observed. Which impurity was found in the essential oil?

- A** * Fatty oil
- B** Phenol
- C** Acetone
- D** Ethylacetate
- E** Diethylether

44. Standardization of juniper fruits (essential oil) is carried out by a method:

- A** * Steam distillation
- B** Photoelectrocolorimetry
- C** Spectrophotometry
- D** Gravimetry

E Iodometry

45. Standardization of Sage leaves is carried out by:

A * Steam distillation

B Photoelectrocolorimetry

C Spectrophotometry

D Gravimetry

E Iodometry

46. On the pharmaceutical factory a consignment of the medicinal raw material - lavender herb – was received. Quality of the raw material was defined using:

A * Steam distillation

B Chromatographic analysis

C Titrimetric analysis

D Biological analysis

E Sublimation

47. Which method is the basis for quantitative determination of essential oil in eucalyptus leaves according to the pharmacopoeia?

A * Steam distillation

B Enfleurage

C Compression

D Organic solvent extraction

E Fatty oil extraction

48. Eucalyptus oil is used as bactericidal agent. Quality index for the oil is:

A * Acid value

B Iodine value

C Swelling index

D Haemolytic index

E Foam index

49. The content of active substances is determined by the biological method in cases when the major biologically active substances in tinctures are:

A * Cardiac glycosides and bitter substances

B Flavonoids and coumarins

C Tannins and alkaloids

D Hormones and saponins

E Essential oils and anthracene derivatives

50. Menthol, the main component of peppermint oil, is a part of many drugs. Choose method of menthol obtaining from essential oil?

A * Freezing

B Organic solvent extraction

C Enfleurage

- D* Compression
- E* Fat oil extraction

51. Rose petals essential oil is obtained by the following method:

- A* * Enfleurage
- B* Steam distillation
- C* Biological standardization
- D* Sublimation
- E* Chromatographic analysis

52. One of the methods of essential oil obtaining is enfleurage or maceration. Specify which medicinal plant material the oil is obtained from by this method.

- A* * Damask rose petals
- B* Lemon peel
- C* Coriander fruits
- D* Peppermint leaves
- E* Chamomile flower

53. Peppermint leaves and herb contains 1-3% of essential oil. Choose the best method of peppermint oil obtaining:

- A* * Steam distillation
- B* Compression
- C* Ethanol extraction
- D* Enfleurage
- E* Activated charcoal adsorption

54. Natural, synthetic and semi-synthetic camphor is used in medical practice. Name the plant, which is the source of semisynthetic camphor:

- A* * Siberian fir
- B* European fir
- C* Camphoric bay
- D* Forest pine
- E* Juniper

55. Thymol has expressed antiseptic effect. Choose medicinal plant material - the source of thymol:

- A* * Herba Thymi vulgaris
- B* Folia Salviae
- C* Folia Eucalypti
- D* Folia Betulae
- E* Folia Absinthii

56. While analyzing the volatile oil anethol was detected. What medicinal raw material was used to obtain this volatile oil?

- A* * Anisum vulgare

- B** *Coriandrum sativum*
- C** *Valeriana officinalis*
- D** *Allium sativum*
- E** *Allium cepa*

57. What plant material is the source of volatile oil used in pharmaceutical, confectionery and perfume industries?

- A** * Peppermint
- B** Common tansy
- C** Ephedra
- D** Restharrow
- E** Horse sorrel

58. Menthol has anaesthetic and antiseptic effects. Choose medicinal raw material, that is the source of menthol.

- A** * *Folia Menthae piperitae*
- B** *Folia Salviae*
- C** *Folia Eucalypti*
- D** *Folia Betulae*
- E** *Folia Absinthii*

59. Medicine «Canephron» is used for treating chronic kidney diseases. What medicinal plant material should be used to obtain this medicine?

- A** * Lovage (*Levisticum officinale*) root
- B** Holy thistle seed
- C** Parsnip fruit
- D** Bird cherry tree fruit
- E** Creeping thyme herb

60. What plant could be used for industrial production of expectorant medicine «Pertussinum»:

- A** * *Thymus serpyllum*
- B** *Capsella bursa-pastoris*
- C** *Hypericum perforatum*
- D** *Erysimum diffusum*
- E** *Polygonum aviculare*

61. Plant medicine «Salvin» is used as astringent, anti-inflammatory and antimicrobial agent. What medicinal raw material should be used for this drug production:

- A** * Sage leaves
- B** Sylvan horsetail herb
- C** Common horsetail herb (*Equisetum*)
- D** Peppermint leaves
- E** Motherwort herb

62. The sage leaves have antimicrobial, astringent and anti-inflammatory activity. Medicines on its basis are used in stomatological practice. Specify medicine which is the acetone extract from sage leaves:

- A** * Salvin
- B** Rotokan
- C** Chlorophyllipt
- D** Urolesan
- E** Vicair

63. What medicinal raw material is used for obtaining the ointment «Eucamon»?

- A** * Folia Eucalypti
- B** Folia Salviae
- C** Fructus Coriandri
- D** Flores Chamomillae
- E** Folia Absinthii

64. Phytomedicine «Phytolysine» contains extract from medicinal plant:

- A** * Pot marjoram
- B** Locoweed
- C** Marshmallow
- D** Restharrow
- E** Wormwood

65. A pharmacy collects the medicinal raw material, which contains bitters for the increase of gastric juice secretion. Which plant is not permitted to collect because it is included in the Red book?

- A** * Gentiana lutea L.
- B** Acorus calamus L.
- C** Artemisia absinthium L.
- D** Achillea millefolium L.
- E** Tanacetum vulgare L.

66. Gentian contains bitter glycosides. What type of biological activity do the Gentian medicines possess?

- A** * Appetite stimulation
- B** Tonic
- C** Diuretic
- D** Hepatoprotective
- E** Venotonic

67. Medicinal plant material which contains bitters is used for appetite stimulation. The source of these substances is:

- A** * Radix Gentianae
- B** Radix Ipecacuanhae
- C** Radix Rhodiolae

D Radix Belladonnae

E Radix Althaeae

68. Which medicinal plant can be used for the appetite stimulation?

A * Common dandelion

B Red-seeded dandelion

C White-flowering dandelion

D Japanese dandelion

E Chinese dandelion

69. Choose the medicinal plant material used for production of expectorant remedies:

A * Anise

B Scholar-tree

C Devil's plague

D Magnolia-vine chinese (Schizandra)

E Globe thistle

70. Some types of medicinal raw material are used as insecticides. Specify the plant material:

A * Pyrethrum dalmatian (*Crysanthemum*) flowers

B Tillet flowers

C Arnica flowers

D Foalfoot flowers

E Mullein flowers

71. A patient appealed to the pharmacy to give him «Pertussin» to cure cough. The extract of which medicinal raw material can be recommended at the absence of this remedy:

A * Herba Thymi serpylli

B Cortex Frangulae alni

C Folium Cassiae acutifoliae

D Folium Menthae piperitae

E Herba Leonuri quinquelobati

72. Medicines of valerian are used as sedatives. The reserve of valerian raw material is determined by:

A * Method of model specimens

B Method of record plot

D Method of projecting cover

D By the Geodesic method

E By sight

73. For determination of reserves of wild-growing medicinal plant it is necessary to know two parameters – brushwood area and its productivity. Productivity of Creeping thyme is determined by:

- A** * Method of projecting cover
- B** Method of record plot
- C** By sight
- D** Method of model specimen
- E** By a geodesic method

74. The receptacle of wild chamomile has characteristic features. Choose the correct answer:

- A** * Oblong, narrow-conical, inside hollow
- B** Protuberant, conical, inside empty
- C** Obtuse-conical, without a cavity
- D** Oblong-conical, on top with membranes, without a cavity
- E** Conical without a cavity

75. Trim-Hill's reagent (mixture of acetic acid, concentrated hydrochloric acid and 0,2 % copper sulfate water solution) was added to the common snowball (high cranberry) bark infusion. Solution turned blue, and then purple-black sediment appeared that confirmed the presence of:

- A** * Iridoids
- B** Anthracene derivatives
- C** Saponins
- D** Flavonoids
- E** Tannins

76. Chamomile flowers contain blue essential oil, the main component of which is:

- A** * Chamazulene
- B** Limonene
- C** Bornylisovalerianate
- D** Cineol
- E** Thymol

77. Common wormwood (*Absinthium*) herb is collected in certain vegetation phase. Choose the optimal collection term:

- A** * At the beginning of blossoming
- B** Before blossoming of plants
- C** During blossoming
- D** During fruiting
- E** During budding

78. Personnel collects herbal raw material of common valerian. Which morphological part of the plant is used in medicine?

- A** * Rhizomes and roots
- B** Roots
- C** Herb
- D** Seeds

E Inflorescences

79. Common valerian drugs have sedative effect because they contain valepotriates, that belong to the class:

- A* * Iridoids
- B* Coumarins
- C* Alkaloids
- D* Saponins
- E* Flavonoids

80. Wild chamomile flowers should be dried at the temperature:

- A* * 25-35 °C
- B* 10-15 °C
- C* 50-60 °C
- D* 70-75 °C
- E* 80-85 °C

81. The herbal raw material – valerian rhizomes and roots – is collected in a phase of:

- A* * Dying out of aerial part
- B* Budding
- C* At the beginning of blossoming
- D* Complete blossoming
- E* Fruiting

82. Peppermint leaves and herb contain 1-3% of essential oil. Choose the most suitable method of peppermint oil obtaining.

- A* * Distillation with water and steam
- B* Extraction by ethanol
- C* Enfleurage
- D* Expression
- E* Adsorption by activated carbon

83. Pharmacy received chamomile flowers. How this raw material should be stored?

- A* * Separately from other types of raw material
- B* As poisonous raw material
- C* As narcotic raw material
- D* In polyethylene bags
- E* In opened glasses

84. A pharmacy procured common origanum herb. What drying condition should be applied for producing high-quality crude drug:

- A* * 35-40 °C
- B* 80-90 °C
- C* 60-70 °C
- D* 50-60 °C

E 70-80 °C

85. A biennial or perennial plant from the Apiaceae family has a blue-grey stem branching in its lower part. Its leaves are also blue-grey, finely dissected, with the ultimate filiform segments. The flowers are yellow, in compound umbels. Its fruit is used for production of "dill water". Which plant is it?

A * *Foeniculum vulgare*

B *Carum carvi*

C *Petroselinum crispum*

D *Coriandrum sativum*

E *Conium maculatum*

86. The raspberry fruit infusion is used as a diuretic and sudorific agent at flu. The raspberry plant material can be substituted by:

A * *Flores Tiliae*

B *Flores Crataegi*

C *Herba Chelidonii*

D *Radices Scutellariae*

E *Semina Lini*

87. Plants containing which of the following groups of compounds should be stored separately from other plant material?

A * Essential oils

B Flavonoids

C Coumarins

D Xanthones

E Tannins

89. *Caryophylli flos* are used for the production of antiseptic phytotherapies. According to the Pharmacopoeia requirements the identification is carried out by TLC method. After plate derivatization spots corresponding to the following compounds are found:

A * Eugenol and caryophyllene

B Scopoletin and umbelliferon

C Scopolamine and hyoscyamine

D Apigenin and luteolin

E Quercetin and rutin

90 According to the State Pharmacopoeia of Ukraine, the herbal raw material used in production of plantaglucide should be tested by means of thin- layer chromatography. The resulting chromatogram will have a weak blue zone, which will indicate the presence of:

A * Aucubin

B Atropine

C Acteoside

D Azulene

E Acorone

91. Essential oil of a certain plant contains up to 80% of cineole. Specify the herbal raw material that is harvested to obtain this oil:

- A** * Folia Eucalypti
- B** Folia Menthae piperitae
- C** Folia Betulae
- D** Folia Melissa
- E** Folia Absinthii

92. Menthol has an antispasmodic and analgesic effect. What herbal raw material is a source of menthol?

- A** * Folia Menthae piperitae
- B** Folia Salviae
- C** Folia Eucalypti
- D** Folia Absinthii
- E** Folia Betulae

93. Microscopy of a root of a certain medicinal plant reveals the following features: parenchyma cells contain inulin, there are laticifers, cambium line is clearly visible. This root belongs to:

- A** * Taraxacum officinalis
- B** Sanguisorba officinalis
- C** Zingiber officinale
- D** Althaea officinalis
- E** Inula helenium

94. A pharmacy received an infusion formulation. What herbal raw material can be used to make this dosage form?

- A** * Rhizomata cum radicibus Valerianae
- B** Cortex Quercus
- C** Cortex Frangulae
- D** Cortex Viburni