

## FLAVONOIDS.

1. Immortelle flowers are collected at the beginning of blossoming. Specify the phytocenosis for the medicinal plant material collection:

**A** \* Steppe

**B** Forestry

**C** Meadow

**D** Wasteland

**E** Ponds

2. Pharmacy has got a plan of Tickseed (beggar-ticks) herb collection. Which phase of vegetation the plant material should be collected in?

**A** \* In the bud formation period

**B** In the period of flowering

**C** In the period of fruiting

**D** Early spring

**E** Late autumn

3. In the black elder raw material the admissible admixture is:

**A** \* Elder grass – *Sambucus ebulus*

**B** Whortleberry – *Vaccinium myrtillus*

**C** Bird cherry – *Padus racemosa*

**D** Blackcurrant – *Ribes nigrum*

**E** Common buckthorn – *Rhamnus catharica*

4. A pharmacy received a plan for horsetail herb collection. Which horsetail species is officinal, used in medicine and should be collected?

**A** \* *Herba Equiseti arvensis*

**B** *Herba Equiseti hyemalis*

**C** *Herba Equiseti sylvatici*

**D** *Herba Equiseti pratensis*

**E** *Herba Equiseti palustris*

5. Hawthorn flowers are the plant material for various cardiac drugs production. During hawthorn flowers collection it is possible to get the following admixture:

**A** \* Sloe (blackthorn) flower

**B** Alder buckthorn flower

**C** Bird cherry flower

**D** Cinnamon rose flower

**E** European elder flower

6. What species of wild-growing pansy is officinal and is collected along with wild pansy (heartsease)?

**A** \* Field pansy

**B** Sweet violet

- C** Sweet white violet
- D** Scented violet
- E** Pleasant violet

7. Field pansy herb is used as expectorant, sudorific and diuretic drug. During its collection it is possible to confuse it with a similar plant:

- A** \* Blue cow-wheat
- B** Primrose
- C** Spring Adonis
- D** Shepherd's purse
- E** Solomon's seal

8. Immortelle flowers should be dried:

- A** \* Only in shade
- B** In the sunshine
- C** In dryers at 50 – 60°C
- D** Using the convection method
- E** On air

9. Which of the following plants could be named Aronia?

- A** \* Black chokeberry
- B** Immortelle
- C** Common tansy
- D** Pansy
- E** Hawthorn

10. Beggar-ticks (bur-marigold) herb is used as a diuretic and sudorific agent. The officinal species is:

- A** \* *Bidens tripartita*
- B** *Bidens cernua*
- C** *Bidens radiata*
- D** *Bidens frondosa*
- E** *Bidens orientalis*

11. During the commodity research analysis of the raw material it was discovered that it consists of flowers gathered in capituli which form a thick corymb. Regional middle flowers – tubular of bright golden yellow colour. Wrappings of baskets are tiled, leaves are lemon-yellow. It can be concluded that the raw material is the flowers of:

- A** \* Immortelle
- B** Chamomile
- C** Hawthorn
- D** Lily of the Valley
- E** Small-leaved linden

12. A doctor advised to take cornflower flowers extract for kidney diseases treatment. Specify the part of the plant which should be collected:

**A** \* Regional florets (partly taking internal - up to 40 %)

**B** Receptacle and wrapping

**C** Floral baskets without a peduncule

**D** Floral baskets with tailings of peduncules (not longer than 3 cm)

**E** Flower with remains of stem (not longer than 1 cm)

13. The MRM was received for analysis: flowers in baskets up to 4 cm in diameter. Regional florets are sexless, bright blue, funnellform; the inner disk florets – bisexual, of a violet colour, tubular. What plant has these signs?

**A** \* *Centaurea cyanus*

**B** *Solidago virgaurea*

**C** *Polygonum persicaria*

**D** *Scutellaria baicalensis*

**E** *Viola tricolour*

14. Flavonoids are the main active substances of hawthorn fruits. What pharmacological effects do they provide?

**A** \* Hypotensive and sedative

**B** Laxative and sedative

**C** Tonic and anticonvulsive

**D** Diuretic and antihæmorrhagic

**E** Antispasmodic and anti-inflammatory

15. Flavonoids of what medicinal raw material have cardiotoxic activity?

**A** \* *Fructus Crataegi*

**B** *Herba Hyperici*

**C** *Herba Polygoni avicularis*

**D** *Herba Bidentis*

**E** *Fructus Sophorae japonicae*

16. The medicines of hawthorn flowers are prescribed as cardiotonics. The quality of the raw material is characterized by the presence of:

**A** \* Hyperoside

**B** Purpureaglycoside

**C** Lanatoside

**D** Strophanthidin

**E** Adonitoxin

17. A party of *Radix Ononidis* raw material was delivered to a factory. It is used for tincture production. Quantitative standardization of this raw material is carried out in calculation on:

**A** \* Ononin

**B** Hyperoside

- C** Quercetin
- D** Rutin
- E** Alizarin

18. The cornflower flowers (*Flores Cyani*) are used as a diuretic. The quantitative determination of this raw material is carried out in calculation on:

- A** \* Cyanin
- B** Lanatoside
- C** Gallic acid
- D** Dioscin
- E** Ononin

19. A party of medicinal raw material of cudweed (*Gnaphalium*) was received by a pharmacy warehouse. Content of what active agents is the characteristic of quality according to the requirements of Pharmacopoeia:

- A** \* Flavonoids
- B** Essential oils
- C** Saponins
- D** Anthracene derivatives
- E** Coumarins

20. Designing the analytic normative documentation on the new plant material containing flavonols pharmacist has to choose an appropriate qualitative test for these substances:

- A** \* Reaction of cyanidin formation
- B** The test with lactones
- C** The reaction of sublimation
- D** The reaction with quinine hydrochloride
- E** With Wagner's reagent

21. While analyzing immortelle flowers a positive result of the cyanidin formation test was received. This reaction evidence the presence of:

- A** \* Flavonoids
- B** Antocyans
- C** Coumarins
- D** Saponins
- E** Alkaloids

22. To determine the identity of the Japanese pagoda tree fruit hydrochloric acid and metallic magnesium powder were added to the extract. The pink-red color observed indicates the presence of:

- A** \* Flavonoids
- B** Tannins
- C** Coumarins
- D** Anthracene derivatives

## *E* Saponins

23. For flavonoids detection in the beggarticks herb the method of paper chromatography is used. Name the physical property that gives possibility to identify the flavonoids detected:

- A* \* Fluorescence
- B* Luminescence
- C* Optical activity
- D* Density
- E* Refraction index

24. Restharrow (*Ononis*) root is used for a tincture production applied for haemorrhoidal haemorrhages treatment. Isoflavonoids can be identified in the raw material by the means of:

- A* \* Chromatographic method
- B* Cyanidin test
- C* Hemolytic index
- D* Biological standardization
- E* Foam number

25. Determination of flavonoids' content in St. John's wort herb is carried out by spectrophotometric method. Which reaction is the basis for this method?

- A* \* Reaction with aluminium chloride solution
- B* Reaction with Dragendorff's reagent
- C* Reaction with Wagner's reagent
- D* Reaction with Mayer's reagent
- E* Reaction with vanillin in concentrated hydrochloric acid

26. Determination of the flavonoids' content in medicinal plant material – hawthorn fruit – according to the analytical normative documentation is carried out by the following method:

- A* \* Spectrophotometry
- B* Gravimetry
- C* Gas-liquid chromatography
- D* Iodometry
- E* Permanganatometry

27. St. John's wort herb is received by a pharmacy and is processed for antibacterial drugs. Quality of this medicinal plant material is determined according to flavonoids content by:

- A* \* Spectrophotometry
- B* Chromatography
- C* Method of acid-basic titration
- D* Permanganatometry
- E* Steam distillation method

28. Restharrow roots are used as haemostatics and laxatives. Quality of this medicinal plant material is determined according to isoflavonoids content using:

- A** \* Spectrophotometry
- B** Polarography
- C** Chromatography
- D** Gravimetry
- E** Iodometry

29. Quality of St. John's wort herb is defined according to the flavonoids content using:

- A** \* Spectrophotometry
- B** Chromatography
- C** Method of acid-basic titration
- D** Permanganatometry
- E** Steam distillation method

30. Quality of water pepper herb is defined according to flavonoids content by the following method:

- A** \* Spectrophotometry
- B** Chromatography
- C** Titration
- D** Photocolorimetry
- E** Biological standardization

31. Quercetin has P-vitamin activity. What medicinal raw material should be used for quercetin production?

- A** \* *Fructus Sophorae japonicae*
- B** *Fructus Hippophaës*
- C** *Flores Helichrysi arenarii*
- D** *Herba Bidentis*
- E** *Herba Polygoni avicularis*

32. What plant containing lipophilic substances is used for medicine «Aromelin» production?

- A** \* Black chokeberry
- B** Wild pansy
- C** Cornflower
- D** Arnica
- E** Gnaphalium

33. Phytomedicine «Novoimanin» is used as antibacterial remedy. Which medicinal plant material is this medicine obtained from?

- A** \* *Herba Hyperici*
- B** *Herba Leonuri*
- C** *Herba Polygoni hydropiperis*

*D Herba Solidaginis canadensis*

*E Herba Equiseti arvensis*

34. A few medicines with various action are produced from the Licorice roots. Offer a patient the medicine based on Licorice flavonoids with antiulcer action:

**A** \* Liquiriton

**B** Glycerine

**C** Glyceram

**D** Licorice root syrup

**E** Convaflavin

35. Phytomedicine «Flacarbin» has spasmolytic, anti-inflammatory and antiulcer properties. The herbal source of this medicine is:

**A** \* Licorice

**B** Jacob's ladder (Great valerian)

**C** Common horse-chestnut

**D** Japanese angelica tree (Aralia)

**E** Calendula

36. Which medicine contains the extract of fresh Ginkgo biloba leaves?

**A** \* Tanakan

**B** Phytolit

**C** Marelin

**D** Flamin

**E** Phytolysin

37. What phytomedicine can be recommended to the patient with cardiac insufficiency, related to the long violation of cardiac activity of coronal vessels:

**A** \* Hawthorn fruit

**B** Calendula flower

**C** Ginseng root

**D** Aralia root

**E** Barberry root

38. Hawthorn flowers are used for cardiogenic drugs production. During this crude drug collection the flowers of the following plant can appear in it:

**A** \* Blackthorn

**B** Buckthorn

**C** Bird-cherry

**D** Brier

**E** Elder

39. A patient appealed to the pharmacy's phytodepartment with a request to give him diuretic medicine. Which medicinal plant material is it better to use?

**A** \* *Herba Equiseti arvensis*

- B Fructus Sophorae japonicae*
- C Herba Leonuri quinquelobati*
- D Cormus Ledi palustris*
- E Radix Araliae*

40. Which purpose are Tansy flowers used in pediatric practice for?

- A \* Antihelminthic*
- B Vasodilatory*
- C Wound healing*
- D Sedative*
- E Cholagogue*

41. Medicines from spotted knotweed are used to stop uterine and hemorrhoidal bleedings. At its absence it is possible to recommend:

- A \* Tinctura Ononidis*
- B Tinctura Sophorae japonicae*
- C Tinctura Crataegi*
- D Tinctura Leonuri*
- E Tinctura Valerianae*

42. The Common horsetail herb is recommended as a diuretic. Specify medicinal plant material which can replace it:

- A \* Herba Aervae lanatae*
- B Herba Leonuri*
- C Herba Menthae piperitae*
- D Herba Convallariae*
- E Herba Adonidis*

43. Bur-marigold herb is a popular medicinal plant. The reserve of this raw material is determined by:

- A \* Method of record plot*
- B Method of model specimens*
- C Method of projective cover*
- D By the Geodesic method*
- E By sight*

44. Motherwort herb is the source of hypotensive and sedative drugs. Collection of this medicinal plant material should be carried out, taking into account the period of this plant recovery:

- A \* Once in 5 years*
- B Once in 2 years*
- C Once in 3 years*
- D Once in 10 years*
- E Every year*



45. Pharmacy has a plan of restharrow collection. Choose its plant material:

- A** \* Roots
- B** Leaves
- C** Tubers
- D** Seeds
- E** Flowers

46. Rutin containing drugs have P-vitamin activity. Which herbal raw material contains the highest quantity of rutin?

- A** \* Japanese pagoda tree buds
- B** Black chokeberry (aronia) fruits
- C** Buckwheat herb
- D** Common motherwort herb
- E** European elder (bourtrees) flowers

47. "Novoimanin" is used as an antibacterial drug. What herbal plant material is the source of it?

- A** \* *Herba Hyperici*
- B** *Herba Leonuri*
- C** *Herba Polygoni hydropiperis*
- D** *Herba Solidaginis canadensis*
- E** *Herba Equiseti arvensis*

48. Motherwort phytomedicines are popular hypotensive and sedative drugs. What time should the herbal raw material be collected at?

- A** \* At the blossoming period
- B** At the beginning of blossoming
- C** At the end blossoming
- D** In the stage of buds formation
- E** In the stage of fruiting

49. Hawthorn infusion and liquid extract are used as cardiogenic drugs. The quality of this raw material is determined according to the flavonoids composition by the means of:

- A** \* Spectrophotometry
- B** Biological standardization
- C** Steam distillation
- D** Gravimetry
- E** Permanganometry

50. Japanese pagoda tree buds are an industrial source of rutin. What qualitative reaction can be carried out to confirm that rutin is a flavonoid:

- A** \* With metallic magnesium and concentrated hydrochloric acid
- B** With iron alum solution
- C** With picric acid
- D** With solution of phosphorus-molybdic acid

**E** With iodine solution in potassium iodide

51. The herbs are collected during blossoming of plants. Exception is beggar ticks (bug marigold) herb, which is collected in a phase:

**A** \* Budding

**B** Stems formation

**C** Green fruiting

**D** Growing of stems

**E** Ripe fruiting

52. According to the Pharmacopoeia, cornflower is used as diuretic. Choose the plant material which is collected as a crude drug:

**A** \* Regional flowers

**B** Inflorescences

**C** Receptacle and wrapper

**D** Leaves

**E** Herb

53. Source of the antibacterial drug “Novoimanin” obtaining is:

**A** \* St. John’s-wort herb

**B** Scullcap roots

**C** Locoweed herb

**D** Lavender flowers

**E** Wormwood herb

54. The officinal species of St-john's-wort herb is:

**A** \* *Hypericum maculatum*

**B** *Hypericum hirsutum*

**C** *Hypericum elegans*

**D** *Hypericum montanum*

**E** *Hypericum linariodes*

55. Rutin exhibits P-vitamin activity. What medicinal plant is used as starting materials for the industrial production of rutin?

**A** \* *Fructus Sophorae japonicae*

**B** *Fructus Hippophaes rhamnoides*

**C** *Flores Helichrysi arenarii*

**D** *Herba Bidentis tripartitae*

**E** *Herba Polygoni avicularis*

56. Under the SPhU (appendix 2), leaves of ginkgo are standardized by the content of:

**A** \* Flavonoids

**B** Saponins

**C** Alkaloids

**D** Coumarins

***E*** Chromones

57. Field horsetail grass is recommend as a diuretic. What herbal material can be used as a substitute?

- A*** \* *Herba Aervae lanatae*
- B*** *Herba Leonuri*
- C*** *Herba Menthae piperitae*
- D*** *Herba Convallariae*
- E*** *Herba Adonidis*

58. The medicinal plants of the *Fabaceae* family contain various groups of bioactive substances. What representative of this family contains flavonoids and is used as an industrial source of rutin?

- A*** \* *Styphnolobium japonicum*
- B*** *Ononis arvensis*
- C*** *Thermopsis alterniflora*
- D*** *Glycyrrhiza glabra*
- E*** *Bidens tripartita*

59. A pharmaceutical warehouse has received a batch of herbal raw material - hawthorn flowers. Merchandise analysis revealed in one of the sacks a significant amount of bird-cherry flowers besides the hawthorn flowers. What parameter of the raw material quality should be determined?

- A*** \* Acceptable admixtures
- B*** Moisture content
- C*** Extractive values
- D*** Mineral admixtures
- E*** Ash values (Total ash)

60. The 'Aromeline' phytodrug exhibits P-vitamin activity. What herbal raw material is used in production of this drug?

- A*** \* *Fructus Aroniae melanocarpae*
- B*** *Fructus Sorbi*
- C*** *Fructus Sambuci nigrae*
- D*** *Fructus Viburni*
- E*** *Fructus Crataegi*

61. Grass of *Equisetum arvense* is often recommended as a diuretic. What herbal raw material can be used as its substitute?

- A*** \* *Herba Aervae lanatae*
- B*** *Herba Menthae piperitae*
- C*** *Herba Convallariae*
- D*** *Herba Leonuri*
- E*** *Herba Adonidis*