Sikkim Public Service Commission

Written Examination for the post of Scientific Officer under Sikkim State AYUSH Service

PAPER – II

Time Allowed: 3 hours **Full marks: 300**

INSTRUCTIONS TO CANDIDATES

Read the instructions carefully before answering the questions: -

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS BOOKLET DOES NOT HAVE ANY UNPRINTED, TORN OR MISSING PAGES OR ITEMS. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. **Use only Black Ball Point Pen to fill the OMR Sheet.**
3. Do not write anything else on the OMR Answer Sheet except the required information.
4. Candidates must fill in the particulars in the appropriate places in the Answer Sheet and OMR sheet as per given instructions. Any discrepancy/omission will render the Answer Sheet/OMR Sheet liable for rejection.
5. Part - I of this booklet contains questions in MCQ mode to be marked in OMR Sheet. Part - II and Part - III contains Writing Section which must be written on separate answer sheet provided to you.
6. After the examination has concluded, you should hand over the Answer Sheet and OMR sheet to the Invigilator only. You are permitted to take with you the Test Booklet.
7. **THERE WILL BE NEGATIVE MARKING FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBECTIVE TYPE QUESTIONS**
   i. There are four alternatives/answers to every question. For each question for which a wrong answer has been given by the candidate, one-third of the marks assigned to the question will be deducted as penalty.
   ii. If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happen to be correct and there will be same penalty as above to the question.
   iii. If a question is left blank, i.e., no answer is given by the candidate; there will be no penalty for that question.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

PART – I

Choose the correct option for the following: **(50 x 3 =150)**

1. The safety and efficacy testing should be done under _____ regulations/guidelines.

A. GLP
B. GMP
C. Both
D. GSP

2. Deuterium lamps are used as a light source in _____.

A. Nuclear magnetic resonance
B. UV-visible spectrophotometer
C. IR spectrometer
D. X-ray diffractometers

3. The official compendia such as Indian Pharmacopoeia and Ayurvedic Pharmacopoeia of India have given guidelines on optimum moisture content of the crude drugs. As excess water in herbal materials will encourage microbial growth and deterioration due to hydrolysis. Which of the following method gives the direct measurement of the moisture content in crude drug being examined?

A. Azeotropic distillation method
B. Hot extraction
C. Cold maceration
D. Fractional distillation method

4. The certificate of Good Manufacturing Practices to manufacturers of Ayurveda, Siddha or Unani drugs shall be issued for a period of _____to licensees who comply with the requirements under licensed in form_____.

A. Five years, Form 25-D
B. Five years, Form 27-D
C. Three years, Form 25-D
D. Three years, Form 25-D

5. A manufacturing unit of Ayurvedic medicines should be compliant with the GMP guidelines as prescribed in

A. Schedule M
B. Schedule C
C. Schedule H
D. Schedule T

6. The content of acid-insoluble ash measured by

A. mg of acid-insoluble ash per gram of air-dried material
B. mg of acid-insoluble ash per kg of air-dried material
C. mg of acid-insoluble ash per cm^3 of air-dried material
D. gram of acid-insoluble ash per cm^3 of air-dried material

7. Which of the following is a nutritionally modified food?

A. Probiotic
B. Skimmed milk
C. Parmesan cheese
D. Flavoured milk

8. What is the minimum area for the preparation of Churna/Nasya/Manjan/Lepa/ Kwath Churn as per the recommendation for the manufacturing premises?

A. 20 Square feet
B. 25 Square feet
C. 200 Square feet
D. 10 Square feet

9. Theoretical plate number (N) in a given chromatographic system signifies _____.

A. Column temperature
B. Length of column
C. Thickness of Column
D. Column efficiency

10. According to schedule M-II what should be the height of wall from the floor where manufacturing operations will be carried out:

A. 10 feet
B. 9 feet
C. 6 feet
D. 12 feet

11. _____ have affinity but no intrinsic activity.

A. Full agonist
B. Inverse agonist
C. Partial agonist
D. Competitive antagonist

12. If any person wilfully obstructs an Inspector in the exercise of the powers conferred upon him by or refuses to produce any record, register or other document when so required, he shall be punishable

A. With imprisonment extend to three years or with fine or with both
B. With imprisonment extend to one year or with fine or with both
C. With imprisonment extend to two years or with fine or with both
D. With imprisonment extend to four years or with fine or with both

13. Which of the following process is suitable for extraction of thermolabile constituents from crude drugs?

A. Decoction
B. Pressurized liquid extraction
C. Maceration
D. Reflux extraction

14. The department of Ayurveda dealing with treatments related to genetics is:

A. Salya Chikitsa
B. Jara Chikitsa
C. Vajikarama Chikitsa
D. Salakya Chikitsa

15. The log dose-response curve is essentially represented by _____ .

A. Sigmoid curve
B. Hyperbolic curve
C. Parabola curve
D. Linear curve

16. What is the unit of absorptivity in Beer Lambert's law?

A. mol cm^{-1} L^{-1}
B. L gm^{-1} cm^{-1}
C. mol L^{-1}
D. L mol^{-1} cm^{-1}

17. As per the 2004 WHO guidelines on safety monitoring of herbal medicines in pharmacovigilance systems for the therapeutic classification of herbal products, Uppsala Monitoring Centre proposes _____ classification system.

A. Herbal anatomical-chemical-biological
B. Herbal anatomical-therapeutic-chemical-biological
C. Herbal therapeutic-chemical-biological
D. Herbal anatomical-therapeutic-chemical

18. What is the permissible limit of the pesticide residue Parathion in herbal drugs as per the Ayurvedic Pharmacopoeia of India 2016?

A. 0.5 ppm
B. 1.0 ppm
C. 3.0 ppm
D. 4.0 ppm

19. _____ method of extraction is preferred for the extraction of thermostable constituents, if nonaqueous solvent is used.

A. Decoction
B. Maceration
C. Soxhlet
D. Infusion

20. In India, the regulatory authority/ies for herbal drugs is/are:

A. Ministry of Chemicals and Fertilizers
B. Ministry of Pharmaceuticals and CDSCO
C. Ministry of AYUSH
D. Ministry of AYUSH and CDSCO

21. In order to ensure proper quality of Homoeopathic medicines manufacture, which schedule was introduced?

A. Schedule M_2
B. Schedule C_1
C. Schedule M_1
D. Schedule C_2

22. In IR spectroscopy, the vibration between atoms is caused due to_____.

A. dipole moments between atoms
B. the number of protons in a nucleus
C. the atomic weight of the atoms
D. the movement of electrons to lower energy levels

23. Foreign matter present in a crude drug sample as mineral admixture can be separated using by sifting the sample through the following sieve.

A. 250 µm
B. 350 µm
C. 400 µm
D. 450 µm

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24. The diameter of coating substance used in TLC plates normally lies in between _____ to _____, and the spreading thickness of suspension varies from _____ to ___ mm, unless otherwise specified in the monograph.

A. 5 to 20 µm and 0.20 to 0.30
B. 5 to 40 µm and 0.15 to 0.25
C. 5 to 40 µm and 0.20 to 0.30
D. 10 to 40 µm and 0.25 to 0.35

25. What is the permissible limit of the heavy metal cadmium in herbal drugs as per the Ayurvedic Pharmacopoeia of India 2016?

A. 0.3 ppm
B. 10 ppm
C. 3 ppm
D. 1 ppm

26. As per the Stability Testing and Shelf-Life Determination for new and existing Ayurvedic Drugs, the accelerated study conditions that fall under Zone IV are

A. 40 ± 2 , 75 % RH ± 5 % for 3 months
B. 40 ± 2 , 75 % RH ± 5 % for 6 months
C. 30 ± 2 , 65 % RH ± 5 % for 6 months
D. 30 ± 2 , 65 % RH ± 5 % for 3 months

27. An Ayurvedic drug can be considered to be stable if "no significant change" occurs at any time of testing at accelerated storage condition or at real time storage condition. "Significant change" for a drug is defined if

A. A + or - 20 % change from the initial assay value (If the drug is analyzed for its marker).
B. A + or - 25% per cent change from the initial assay value (If the drug is analyzed for its active compound).
C. The physico-chemical parameters (moisture, ash, particle size) shall not vary beyond 30 per cent of the initial value.
D. A + or - 15 % change from the initial assay value (If the drug is analyzed for its marker).

28. Under the test for residual solvent, the Residual ethanol limits should not be more than 5000 ppm which is determined by.

A. UV Visible spectroscopy
B. Gas Chromatography
C. Mass spectroscopy
D. Tin layer chromatography

29. Which of the following statement best defines a tamper-evident container?

A. is fitted with a device or mechanism that reveals irreversibly whether the container has been opened.
B. protects the contents from contamination by extraneous liquids solids or vapours, and from loss or deterioration of contents from effervescence, deliquescence or evaporation under normal conditions of handling, shipment, storage and distribution
C. is one that is designed to hold a quantity of the drug product intended for administration as a single finished device intended for use promptly after the container is opened.
D. that permits withdrawals of successive portions of the contents without changing the strength, quality or purity of the remaining portion

30. The Microbial Contamination Permissible Limits for herbal extracts and powders for Salmonella sp./g is

A. Absent
B. 10^3
C. 10^5
D. 10^7

31. The Permissible Limit for aflatoxins B1 is less than

A. 2 ppm
B. 2 ppb
C. 5 ppm
D. 5 ppb

32. Which one of the following is the most commonly used bolometric detector?

A. Thermocouple
B. Resistance temperature detector (RTD)
C. Thermistor
D. Golay cell

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33. In UV, among a series of conjugated polyenes, how values of λ_{max} for the $\pi^* \leftarrow \pi$ transitions vary?

A. Values vary very little.
B. Values shift to shorter wavelength as the number of C=C double bonds increases.
C. Values vary but in no particular pattern.
D. Values shift to longer wavelength as the number of C=C double bonds increases.

34. During the determination of Salmonella, black or green colony is observed in which of the following medium?

A. Bismuth sulphate agar
B. Brilliant green agar
C. Deoxycholate citrate agar
D. Xylose-lysine-desoxycholate agar

35.The term 'Nutraceutical' was coined by:

A. Stephen L. DeFelice
B. William Miller
C. Emil Fishcher
D. None of the above

36. What does NCCAM stand for?

A. National Council for Complementary and Alternative Medicine
B. National Center for Complementary and Alternative Medicine
C. National Certificate for Complementary and Alternative Medicine
D. National Cabinet for Complementary and Alternative Medicine

37. What is equivalent to 12 Masas?

A. 12 Karsa
B. 24 Tola
C. 12 g
D. 1g

38. Which of the following condition corresponds to Cold Temperature as per "The Ayurvedic Pharmacopoeia of India, 2016"

A. Any temperature between 8° and 25°
B. Any temperature not exceeding 8° and usually between 2° and 8°
C. Any temperature not exceeding 8° and usually between -2° and 8°
D. Any temperature not exceeding 2°

39.The Hydro-alcohol as referred in "The Ayurvedic Pharmacopoeia of India, 2016" corresponds

A. 40 % v/v of ethanol in purified *water*
B. 50 % v/v of ethanol in purified *water*
C. 60 % v/v of ethanol in purified *water*
D. 70 % v/v of ethanol in purified *water*

40. The statements percentage of alcohol refers to the percentage by volume at _____ as per "The Ayurvedic Pharmacopoeia of India, 2016"

A. 15.45 C
B. 15.55 C
C. 15.56 C
D. 14.56 C

41. Which is the most appropriate nutraceutical that act as promising nutritional intervention for insulin resistance in hypertension?

A. Cadmium
B. Coenzyme Q10
C. Vitamin B3
D. Nickel

42. Which of the following is used to indicate the presence of tannins in crude drugs?

A. Chromic Acid Solution
B. Chlorziniciodine
C. Canada Balsam
D. Breamer's Reagent

43. The Standards for Health supplements and Nutraceuticals are specified under

A. Dietary supplement Standards Regulations, 2016
B. Food Supplements Act Regulations, 2016
C. Food Safety and Standards Regulations, 2016
D. Bio-Food Act Regulations, 2016

44. According to quality control methods for herbal materials by WHO, a quality management system appropriate to the scope of its activities, including the quality control manual should contain which of the following.

A. Quality policy statement
B. Quality manual of testing,
C. Validation and verification
D. All of the above

45. As per the guidelines of FSSAI, the viable number of organisms in food with added probiotic ingredients shall be

A. ≥108 CFU/g
B. ≤108 CFU/g
C. = 108 CFU/g
D. <108 CFU/g

46. Ibuprofen is a

A. Non-selective reversible COX inhibitors
B. Selective reversible COX inhibitors
C. Non-selective irreversible COX inhibitors
D. Selective irreversible COX inhibitors

47. Katu rasa comprises of the following elements

A. Earth + Water
B. Earth + Fire
C. Fire + Water
D. Fire + Air

48. What is the disintegration time for sugar coated tablet?

A. 30 minutes
B. 15 minutes
C. 2 hours
D. 60 minutes

49. Karl Fischer titration is a specialized type of titration, which is used to determine

A. Methanol content
B. Pyridine content
C. Water content
D. Ethanol content

50. A diet high in saturated fats can be linked to which of the following?

A. Kidney failure
B. Cardiovascular disease
C. Anorexia
D. Cancer

PART – II

Attempt ANY TEN of the following: (10 x 10 =100)

1. What do you understand by standardization and quality control of ASU&H drugs? What is the importance and relevance?
2. How will you determine the total ash content and acid insoluble acid insoluble ash?
3. Differentiate between GLP and GMP?
4. Briefly give overview of Microscopic evaluation of crude drugs.
5. Give the Applications of IR-spectroscopy.
6. Enlist the various Physical tests for herbal drugs.
7. Give the Applications of TLC in testing of drugs.
8. Give the usage as therapeutic tools of Salicylic acid derivatives.
9. Briefly give the Challenges in monitoring the safety of herbal medicines as laid down in the WHO guidelines on safety monitoring of herbal medicines in pharmacovigilance systems.
10. Differentiate between the mechanisms involving G-protein coupled receptor and ligand gated ion channel receptor.
11. How will you perform the Quantitative analysis of residual solvents?
12. Give the applications of UV spectrophotometry.
13. Briefly discuss the determination of Total Aerobic Microbial Count in extracts.
14. What are arishtas and asavas? What are their uses?
15. Give the method of preparation of bhasmas.

PART – III

Answer ANY TWO of the following: (2 x 25 =50)

1. Elaborate on the role of pharmacognosy in allopathy, Ayurveda, Siddha and Unani systems of medicine. Additionally, throw light on the present status of the same in India.
2. What are the different stages involved in extraction process? Classify and explain in detail the modern methods of extraction.
3. Discuss the types of nutraceuticals available in the market. Discuss health benefits and role of nutraceuticals in the treatment of diabetes, CVS diseases and cancer.
4. Elaborate on the challenges associated with stability testing of herbal drugs. Explain the stability testing protocol of herbal drugs.
