

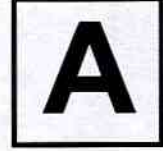
**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO**

Booklet Serial No.

000721

Test Booklet Series


**TEST BOOKLET - 2022**  
**SCIENTIFIC OFFICER DOCUMENT**  
**(07)**



**Time Allowed: Two Hours**

**Maximum Marks: 120**

**INSTRUCTIONS**

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES **NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. Please note that it is the candidate's responsibility to encode and fill in the Roll Number and Test Booklet Series Code A, B, C or D carefully and without any omission or discrepancy at the appropriate places in the OMR Response Sheet. Any omission/discrepancy will render the Response Sheet liable for rejection.
3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. **DO NOT** write anything else on the Test Booklet. 
4. This Test booklet contains **120** items (questions). Each item comprises of four responses (answers). You will select the response which you want to mark on the Response sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **ONLY ONE** response for each item.
5. You have to mark all your responses **ONLY** on the separate Response Sheet provided. See directions in the Response Sheet.
6. All items carry equal marks.
7. Before you proceed to mark in the Response sheet the response to various items in the Test Booklet you have to fill in some particulars in the Response Sheet as per instructions sent to you with your Admission Certificate.
8. After you have completed filling in all your responses on the Response Sheet and the examination has concluded, you should hand over to the Invigilator **only the Response Sheet**. You are permitted to take away with you the Test Booklet and Candidate's Copy of the Response Sheet.
9. Sheets for rough work are appended in the Test Booklet at the end.
10. **Penalty for wrong answers:**  
**THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY THE CANDIDATE.**
  - (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **0.25** of the marks assigned to that 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 happens to be correct and there will be same penalty as above for that 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.

**SEAL**

**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO**

07(A)/2022

[P.T.O.]

187000

1. Who first headed the institution of GEQD at Shimla from 1906?
 

A) F Brewester	B) R Stott
C) V O J Hodgson	D) C R Hardless
  
2. The documents consisting of writing executed from day to day in the course of business, social, or personal affairs may be referred to as?
 

A) Collected standards	B) Dictated standards
C) Request standards	D) Control Standards
  
3. The radiation in the vibrational infrared region of the electromagnetic spectrum is expressed in terms of \_\_\_\_\_.
 

A) Lambda Max	B) Wave length
C) Wavenumber	D) Frequency
  
4. Which among the following is considered as best measure for central tendency?
 

A) Geometric mean	B) Arithmetic mean
C) Mode	D) Harmonic mean
  
5. Who was one of the first to advocate the use of fingerprinting in the identification of criminal suspect?
 

A) Sir Edward Richard Henry	B) Sir William Herschel
C) Sir William Blackstone	D) Alphonse Bertillon
  
6. The resolution of a mass spectrometer is expressed as :
 

A) $m \cdot \Delta m / m$	B) $\Delta m / m$
C) $\Delta m / m \cdot \Delta m$	D) $m / \Delta m$
  
7. What does LASER stand for?
 

A) Light Amplification by Stimulated Emission of Radiation
B) Light Amplification by Simulation Emission of Radiation
C) Light Amplification by Stimulated Energy Radiation
D) Light Amplitude by Stimulated Energy of Radiation.



15. Radiation source used in IR Spectroscopy
- i. Nernst Glower,
  - ii. Gliber Source
  - iii. Nichrome Wire
  - iv. Tungsten Lamp
- A) i, ii and iii only      B) i and ii only  
C) i, ii, iii, and iv      D) iv only
16. The Rama shift generally lies between \_\_\_\_\_.
- A) 100 -1000  $\text{cm}^{-1}$       B) 100 -2000  $\text{cm}^{-1}$   
C) 100 - 3000  $\text{cm}^{-1}$       D) 100 - 4000  $\text{cm}^{-1}$
17. Carbonless paper is
- A) Paper stock not coated with lot of carbon dye particles
  - B) Paper stock coated with pressure activated ink system
  - C) Paper stock coated with secret ink
  - D) Not used to transfer the front sheet information to underlying sheets.
18. F - test of equality of variances is a test for
- A) Null hypothesis that two normal populations have the same variance
  - B) Null hypothesis that two normal populations have different variance
  - C) Alternate hypothesis that two normal populations have the same variance
  - D) Alternate hypothesis that two normal populations have different variance.
19. Detector used in mass spectroscopy
- A) Thermal Detector      B) Conductivity Detector
  - C) Photodiode Array      D) Scintillation Counter.
20. Characteristic of head stamp and self - inking stamp are :
- A) Squeegee Effect
  - B) Even ink coverage
  - C) Absence of indentation in the ink line
  - D) All of the above

21. The Court may direct any person present in Court to write any words or figures for the purpose of comparison with any words or figures alleged to have been written by such person. This power is vested by which section?
- A) Section 73 of the Indian Evidence Act
  - B) Section 73 in The Indian Penal Code
  - C) Section 23 of The Indian Evidence Act
  - D) Section 23 of the Indian Penal Code.
22. The term 'Document' is defined under
- A) Section 3, IPC
  - B) Section 29, IPC
  - C) Section 3, IEA
  - D) Section 29, CrPC
23. A fraudulent signature in which there was no attempt at copying or simulation or imitation of any standard model is known as :
- A) Traced Forgery
  - B) Transposition Forgery
  - C) Practiced Forgery
  - D) Spurious Forgery
24. A small stroke or mark used in writing or printing placed above certain letters in some languages to denote a change in sound is known as
- A) Thil
  - B) Tilde
  - C) All of the above
  - D) Thile
25. In ICP-MS ions flow is pumped into the vacuum system using which of the following?
- A) Dall tube
  - B) Venturi meter
  - C) Orifice
  - D) Nozzle.

26. In MS, which of the following ions pass through the slit and reach the collecting plate?
- A) Positive ions of specific mass
  - B) Negative ions of specific mass
  - C) Negative ions of all masses
  - D) Positive ions of all masses
27. \_\_\_\_\_ is popularly known as father of Questioned Documents.
- A) Albert Sherman Osborn
  - B) Albert Seran Osborn
  - C) Albert Sheran Osborn
  - D) Alban Sheman Osborn
28. Solid samples are introduced into the ICP spectrometer using which of the following?
- A) Probe
  - B) Laser ablation system
  - C) Cuvette having glass windows
  - D) Nebulizer
29. The electric current from photomultiplier tube in case of Atomic Absorption Spectroscopy is fed in to :
- A) Nebulizer
  - B) Atomizer
  - C) Amplifier
  - D) Monochromator
30. FTIR instruments have several significant advantages over older dispersive instruments. One of these is an improvement in the SNR per unit time, proportional to the square root of the number of resolution elements being monitored.
- A) Fellgett advantage
  - B) Jacquinot's advantage
  - C) Speed advantage
  - D) All of the above

31. Which of the following is the principle of Atomic Absorption Spectroscopy.
- A) Medium absorbs radiation and transmitted radiation is measured.
  - B) Colour is simply observed
  - C) Radiation is absorbed by non - excited atoms in vapour state and are excited to higher states.
  - D) Colour is measured.
32. Stroke that rises above the mean line of the body of the letter formation is known as
- A) Bowl
  - B) Arcade
  - C) Ascender
  - D) Apex
33. ICP's principle is similar to which of the following?
- A) Flame emission spectroscopy
  - B) Fourier transforms spectroscopy.
  - C) Atomic Emission spectroscopy
  - D) Absorption spectroscopy
34. Following is a type of Raman Spectroscopy
- i. CARS
  - ii. SERS
  - iii. TERS
- A) i, ii, and iii
  - B) i and ii only
  - C) ii and iii only
  - D) i only
35. Light that is scattered at the same wavelength as the incoming light is called?
- A) Rayleigh scattering
  - B) Raman scattering
  - C) Brillouin scattering
  - D) None of the above
36. The linear relationship between absorbance and concentration of an absorbing species is given by?
- A) Hooke's Law
  - B) Analogous Laws
  - C) Beer - Lambert Law
  - D) Maxwell's Law



37. CEDAR stands for
- A) Centre of Excellence for Document Analysis and Recognition
  - B) Centre of Examination for Document Analysis and Recognition
  - C) Centre of Examination for Document Analyst and Recognizers
  - D) Centre of Experts for Document Analysis and Recognition
38. Electromagnetic waves travel through a vacuum at a constant velocity of?
- A)  $2.092 \times 10^8$  m/s
  - B)  $2.99 \times 10^8$  m/s
  - C)  $3.992 \times 10^8$  m/s
  - D)  $1.69 \times 10^8$  m/s
39. The unit of sensitivity of an instrument is measured in?
- A) Ampere/sec
  - B) Ohm/volt
  - C) Volt/ohm
  - D) Volt-amp
40. The wavelengths of light, ranging from approximately 0.01 to 10 nm is referred to as?
- A) Microwaves
  - B) IR
  - C) Cosmic Rays
  - D) X-RAY
41. The problem of anachronism while collecting standards of comparison can be overcome by
- A) Collecting Specimen writing on topic selected by writer
  - B) Collecting specimen writing by dictation
  - C) Collecting specimen writing by copying
  - D) Collecting specimen writing from previous established records
42. The evidence which attempts to prove the facts contained in the issue by providing other facts and affords an instance as to its existence is referred to as?
- A) Primary Evidence
  - B) Circumstantial Evidence
  - C) Direct Evidence
  - D) Non - Judicial Evidence

43. The difference between the actual value and the value indicated by the instrument is referred to as?
- A) Error  
B) Accuracy  
C) Standard Deviation  
D) Precision
44. A Gel filtration HPLC is based upon
- A) Reverse Phase chromatography  
B) Normal - Phase or Adsorption Chromatography  
C) Ion - Exchange Chromatography  
D) Size - exclusion chromatography
45. Holography was discovered in 1948 by?
- A) Denis Gabor  
B) E Leith  
C) J Upatnieks  
D) Leith J
46. Taggants in ink are
- A) Pigments  
B) Vehicle  
C) Binders  
D) Markers to identify ink
47. What is defined as the ratio of the changes in the output of an instruments to a change in the value of the quantity being measured?
- A) Precision  
B) Standard Deviation  
C) Accuracy  
D) Sensitivity
48. Factors affecting column efficiency
- A) Dimensions of Column  
B) Particle size of Column Packaging  
C) Pore Diameter of column Packaging  
D) All of the above
49. The toner used in ESDA while deciphering indented writing is \_\_\_\_\_ charged.
- A) Negatively  
B) Positively  
C) Neutral  
D) Discharged



56. What is the SI unit of Magnetic field?

- A) Tesla
- B) Pascal
- C) Ampere
- D) Joule

57. GEQD was brought under the administrative control of CFSLS on the recommendation of \_\_\_\_\_ committee in the year \_\_\_\_\_.

- A) Mishra - Damodaran Committee, 2012
- B) SPAC Report, 2012
- C) Mishra - Damodaran Committee, 2010
- D) SPAC Report, 2010

58. The relation between stress and strain is?

- A) Directly proportional to each other up to an elastic limit
- B) Inversely proportional to each other up to an elastic limit
- C) Indirectly proportional to each other up to and even beyond the elastic limit
- D) Not dependent on each other

59. The frequency of emission or absorption of radiation for a transition between the energy states  $E_0$  and  $E_1$  is given by:  $\nu = (E_1 - E_0)/h$ .

- A)  $\nu = (E_0 - E_1)/h$
- B)  $\nu = (E_1 - E_0)/h$
- C)  $\nu = (E_0 - E_1) \times h$
- D)  $\nu = (E_1 - E_0) \times h$

60. In infrared spectroscopy, the \_\_\_\_\_ usually leads to two bands appearing close together when only one is expected.

- A) Coupling
- B) Overtone and Combination bands
- C) Fermi resonance
- D) Vibration and Rotation bands

61. Lasers based on media such as crystals or glasses doped with rare earth or transition metal ions are referred as?
- A) Solid - state lasers                      B) Excimer Laser  
C) Gaussian Laser                              D) Gas Laser
62. To stabilize the Charred documents which of the following can be used?
- A) Gum Acacia                                      B) Iodine  
C) Starch    D) Methanol
63. Choose non parametric statistical measure from the following :
- A) Mean and median                              B) Median SD  
C) Mean SD    D) Median QD
64. In testing the significance of product moment correlation, degree of freedom for t test is
- A) N-1    B) N+1  
C) N    D) N-2
65. Which of the following is also referred to as "optical density"?
- A) Phosphorescence                              B) Transmittance  
C) Absorbance                                      D) Monochromaticity
66. Choose the correct model in one way ANOVA
- A)  $TSS = SSB + SSE$                               B)  $TSS = SSB - SSE$   
C)  $TSS = SSB \times SSE$                               D)  $TSS = SSB \div SSE$
67. The equation relating the force constant, the reduced mass and the frequency of absorption in infrared spectroscopy is :
- A)  $\nu = (1/2\pi)\sqrt{(\mu/k)(1.8)}$                       B)  $\nu = (1/2\pi)\sqrt{(k/\mu)(1.8)}$   
C)  $\nu = (1/2\pi)\sqrt{(\mu/k)/(1.8)}$                       D)  $\nu = (1/2\pi)\sqrt{(k/\mu)/(1.8)}$

68. In which type of chromatography, the stationary phase is a solid and the mobile phase is a liquid and is one of the most useful methods for separation and purification of both solids and liquids?
- A) Gas chromatography                      B) Liquid chromatography  
C) Planar chromatography                  D) Column chromatography
69. Which is the instruments is used to measure friction?
- A) Crescograph                                B) Ellipsometer  
C) Bolometer                                  D) Tribometer
70. The Indian Academy of Forensic Sciences (IAFS) was established in the year?
- A) 1964    B) 1970  
C) 1960    D) 1967
71. The process of determining the sequence of events about what occurred during and after a crime is referred to as?
- A) Photogrammetry                          B) Crime Scene Reconstruction  
C) Documentation of crime scene        D) Crime scene evaluation
72. In Mass Spectroscopy, the ion production method is used for analysis of readily volatile organic molecules. Maximum molecular Weight which can be analysed is :
- A) 200 Daltons                                B) 300 Daltons  
C) 400 Daltons                                D) 500 Daltons
73. Which of the following is an acoustical device for reinforcing sound?
- A) Acustek                                      B) Pixel player  
C) Resonator                                  D) Acoustics
74. Partial correlation is computed with the data measured on
- A) Interval Scale                              B) Nominal Scale  
C) Ordinal Scale                              D) Any scale

75. The limits of correlation is
- A) 0 to +1  
B) -2 to +2  
C) -1 to +1  
D) -3 to +3
76. Results of two sample t - test is valid, only if the
- A) Variance of one population is larger than other  
B) Variance of both populations are equal  
C) Variance of both populations are not necessarily valid qual  
D) No assumption is made on population variance
77. Choose most appropriate statement
- A) t - test cannot be used for large sample  
B) z - test cannot be used for large sample  
C) t - test can be used for large sample  
D) Both t - test and z - test can be used for small sample
78. Stahl's Triangle is associated with :
- A) Preparation of thin layer in plates  
B) Sample application in TLC  
C) Preparation of solvent system in TLC  
D) Purification of Silica gel layer
79. Semi - conductor detectors are used in :
- i. X ray fluorescence Spectrometers  
ii. Gamma ray Spectroscopy
- A) Both i and ii  
B) Neither i Nor ii  
C) i only  
D) ii only
80. Atomic emission spectroscopy is
- A) The measurement of intensity of emitted light at a particular wave length from the atoms that are exited thermally.  
B) The measurement of absorbance of emitted light at a particular wave length from the atoms that are exited thermally.  
C) The measurement of intensity of absorbed light at a particular wave length from the atoms that are exited thermally.  
D) The measurement of intensity of emitted light at a particular wave length from the atoms that are excited by monochromatic light.

81. In Atomic Absorption Spectroscopy, with what material is the cathode in Hollow cathode lamp constructed?
- A) Tungsten
  - B) Quartz
  - C) Element to be investigated
  - D) Aluminium
82. Age of ink can be determined by
- A) Column Diffusion
  - B) Chloride diffusion
  - C) Sulphate diffusion
  - D) None of the above
83. Which of the following is not a component of the emission system in Flame photometer?
- A) Burner
  - B) Atomizer
  - C) Chopper
  - D) Fuel gases and their regulation
84. Counter current chromatography is a type of
- A) Gas chromatography
  - B) Liquid Solid chromatography
  - C) Liquid - Liquid Chromatography
  - D) Gel Chromatography
85. Efficiency of Fluorescence is measured in terms of
- A) Quantum yield
  - B) Number of photons emitted
  - C) Radiative lifetime
  - D) Number of photons absorbed



86. Which of the following is the function of the atomizer in the emission system of Atomic Absorption Spectroscopy?
- A) To break large mass of liquid into small drops
  - B) To reduce the sample into atomic state
  - C) To split the beam into two
  - D) To break the steady light into pulsating light
87. Ink can be removed from the paper for TLC by :
- A) Knife
  - B) Blade
  - C) Hypodermic Needle
  - D) Ethanol
88. "Fluorescence intensity is observed as a function of exciting  $\lambda$  at some fixed emission  $\lambda$ ". The statement relates to :
- A) Emission Spectrum
  - B) Excitation Spectrum
  - C) Absorption Spectrum
  - D) Vibrational Spectrum
89. Fluorescence is favoured when :
- i. Energetic difference between the excited singlet state and triplet state is relatively large.
  - ii. Energetic difference between the first excited state and the ground state is sufficiently large to prevent appreciable relaxation to the ground state by radiationless processes
- A) i is correct, ii is wrong
  - B) ii is correct, i is wrong
  - C) Both i and ii are correct
  - D) Both i and ii are wrong
90. Nigrosine ink is obtained from
- A) Plant
  - B) Colored dyes
  - C) Carbon
  - D) Coal tar

91. Which of the following is an example of anionic interference in atomic emission spectroscopy?
- Interference of high concentration of sodium ions in assay calcium ions
  - Interference by formation of less volatile salt with sulphates by calcium
  - Increased viscosity of the analyte solution by sugars
  - Decreased drop size of the analyte solution by alcohols.
92. Who discovered the mass spectrometer?
- Walter Kaufmann
  - Francis Aston
  - Ernest O. Lawrence
  - J. J Thomson
93. IR Spectroscopy depends on
- Change in polarizability of a molecule
  - Change in the dipole moment
  - Both of the above
  - None of the Above
94. After India got independence from the British rule, \_\_\_\_\_ was the first Indian to be appointed as Government Examiner of Questioned Documents after almost two years of independence in 1949.
- Mr. B. Lal
  - Mr. B.N. Mullick
  - Mr. S N Sen
  - Mr. P Thomas Rey
95. The Raman shift, related to force constant  $k$  and reduced mass  $\mu$ , is given by \_\_\_\_\_
- $1/2\pi c\sqrt{\mu/k}$
  - $1/2\pi\sqrt{\mu/k}$
  - $1/2\pi c\sqrt{k/\mu}$
  - $1/2\pi\sqrt{k/\mu}$
96. What are the two types of coherence?
- Partial and complete
  - Spatial and Temporal
  - Frequency and Temporal
  - None of the above

97. Which of the following is not the measuring technique used to obtain accurate measurements for the sketch?
- A) Triangulation Method
  - B) Baseline Coordinate Method
  - C) Coordinate Method
  - D) Non - Polar Coordinate Method
98. The comparison microscope was invented in the \_\_\_\_\_ by \_\_\_\_\_
- A) 1920s, Col. Boxer
  - B) 1920s, Philip O. Gravelle
  - C) 1930s, Col. Boxer
  - D) 1930s, Philip O. Gravelle
99. Liquid chromatography can be performed in which of the following ways?
- A) Only in columns
  - B) Only on plane surfaces
  - C) Either in columns or on plane surfaces
  - D) Neither in columns nor on plane surfaces
100. Which of the following is not an advantages of Syringe type pumps used in High pressure liquid chromatography?
- A) Unlimited solvent capacity
  - B) High pressure capability
  - C) Pulse - less flow
  - D) Independent of viscosity
101. The long range photographs collected from the crime scene should :
- i. Encompass the entire large scene and be overlapping.
  - ii. Represent a 360 - degree perspective and include a landmark
  - iii. Include identifying marks, such as house number(s) or license plate (s)
  - iv. Keep a scale beside every evidence
- A) i, ii, iii and iv
  - B) i, ii, and iii only
  - C) i and ii only
  - D) ii, iii and iv only

- 102.** Which of the following is not a search methodology type to search a crime scene?
- |                |                |
|----------------|----------------|
| A) Zone Search | B) Lane search |
| C) Quad search | D) Grid search |
- 103.** What refers to the chronological and careful documentation of collection and transfer of evidence to establish its connection to an alleged crime?
- |                      |                     |
|----------------------|---------------------|
| A) <i>Panchanama</i> | B) Chain of Custody |
| C) Case File         | D) Documentation    |
- 104.** The most accurate description of glowing phenomenon found in firefly is :
- |                    |                      |
|--------------------|----------------------|
| A) Fluorescence    | B) Chemiluminescence |
| C) Bioluminescence | D) Phosphorescence   |
- 105.** Polarizing microscopy can be used with
- |                        |                       |
|------------------------|-----------------------|
| i. Reflected light     | ii. Transmitted light |
| iii. Unpolarized light | iv. Absorbed light    |
- |                    |                     |
|--------------------|---------------------|
| A) i, ii, iii & iv | B) i & ii only      |
| C) ii & iii only   | D) i, ii, & iv only |
- 106.** The progress of Fire is due to which of the following reasons?
- A) Availability of combustible material and oxygen
- B) Direction and velocity of wind
- C) Temperature of fire
- D) All of the above
- 107.** Fax machines print a header at the top of each fax page that may become a very important point of comparison. What is this header called?
- |                               |                               |
|-------------------------------|-------------------------------|
| A) Transmission Time interval | B) Time Transmission Interval |
| C) Transmission Time Index    | D) Time Transmission Index    |
- 108.** In the time flight analyzer, the relationship between the time - of - flight  $t$  and the distance  $d$  travelled through a field - free tube to reach the detector is given by:
- |                         |                          |
|-------------------------|--------------------------|
| A) $t^2 = m/z(d^3/3Ve)$ | B) $t^2 = m/z 2(d^3/Ve)$ |
| C) $t^3 = m/z(d^2/2Ve)$ | D) $t^2 = m/z(d^2/2Ve)$  |

109. Holography is best known for its ability to produce?
- A) Two dimensional images                      B) Flashy images  
C) Three - dimensional images                D) Secret images
110. Which is the nature of force produced by moving electric charges?
- A) Coherence                                      B) Resistance  
C) Magnetism                                     D) Electronegativity
111. A predictable correlation of the amplitude and phase at any one point with another point is called?
- A) Monochromaticity                          B) Coherence  
C) Convergence                                 D) Directionality
112. Ultra - performance liquid chromatographic system can operate at pressure in the range
- A) 2000-4000 psi                                B) 4000-6000 psi  
C) 6000-15000 psi                              D) 2000-12000 psi
113. A fluorescent lamp consists of a glass tube filled with a mixture of which of the following
- A) Helium and Hydrogen                      B) Argon and Mercury  
C) Mercury and Hydrogen                    D) Carbon and Mercury
114. Feathering of ink while writing on document happens in case of
- A) Documents having undergone chemical erasure  
B) Documents with indented writings  
C) Charred documents  
D) Documents having paper of 70 GSM and above
115. Which of these constitutes an act of hiding the information or writing behind any text or picture?
- A) Secret ink                                      B) Steganography  
C) Encryption                                    D) Decryption

116. Which section from the following states “Any document purporting to be a report under the hand of government scientific expert to whom this section applies, upon any matter or thing duly submitted to him for examination or analysis and report in the course of any proceeding under this code, may be used as evidence in any inquiry, trial or other proceeding under this code”.
- A) Section 293, IPC                      B) Section 293, CrPC  
C) Section 293, IEA                      D) All of the above
117. The world’s first Finger Print Bureau was set up in?
- A) Calcutta                                  B) Chandigarh  
C) Shimla                                    D) Hyderabad
118. The shifting of absorption maximum towards shorter wavelength which may be caused by removal of conjugation in a system or by change of solvent is referred to as :
- A) Hypochromic effect                      B) Hypsochromic shift  
C) Hyperchromic effect                      D) Bathochromic shift
119. Which of the following is not true about Hydraulic capacitance flow control system used in HPLC?
- A) It can be used only for liquids with low viscosity  
B) It maintains a constant flow  
C) It is irrespective of solvent compressibility  
D) It smoothens high pressure pump pulsations
120. With reference to UV spectrophotometer, which are the correct advantages offered by the double beam system over single beam system :
- i. It is not necessary to continually replace the blank with the sample or to zero adjust at each wavelengths.  
ii. The ratio of the powers of the sample and reference beams is constantly obtained and used.  
iii. Any error due to variation in the intensity of the source and fluctuation in the detector is maximized.  
iv. Rapid scanning over a wide wavelength region and to the use of a recorder or digital read out.
- A) i, ii, iii and iv                              B) i, ii and iv only  
C) i, ii and iii only                              D) ii, iii and iv only

# ROUGH WORK

# ROUGH WORK