RT- 02 posts of Scientific Officer - 2025

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

T.B.C. : VEAN-T-GTD

Test Booklet Series

1000777

A

TEST BOOKLET

GENERAL APTITUDE TEST

Time Allowed : Two Hours ***Maximum Marks : 300***

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 Answer Sheet. Any omission/discrepancy will render the Answer 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 four responses (answers). You will select the response which you want to mark on the Answer 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 Answer Sheet provided. See directions in the Answer Sheet.
6. All items carry equal marks.
7. Before you proceed to mark in the Answer Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instructions sent to you with your Admission Certificate.
8. After you have completed filling in all your responses on the Answer Sheet and the examination has concluded, you should hand over to the Invigilator ***only the Answer Sheet***. You are permitted to take away with you the Test Booklet.
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 A 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, **one-third** 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 to 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.

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

1. Which one of the following properties of paper can be improved by using the fluorescent dye ?

(a) Tensile strength

(b) Water absorbency

(c) Porosity

(d) Whiteness

2. By which one of the following paper making processes can gloss property of the paper be enhanced ?

(a) Drying

(b) Calendering

(c) Pressing

(d) Creping

3. Consider the following statements regarding solubility limit for black liquor in pulp processing :

I. It refers to that concentration at which sodium salts start to precipitate.

II. It refers to that concentration at which dry solids concentration increases above 50 wt%.

III. It refers to the concentration of lignin.

Which of the statements given above is/are correct ?

(a) I only

(b) I and II

(c) III only

(d) I and III

4. Higher degrees of stretch can be built into paper by which one of the following processes ?

(a) Creping

(b) Calendering

(c) Drying

(d) Pressing

5. Why is viscosity of cellulose solution of known concentration determined ?

(a) To check the basis weight

(b) To check the lignin content

(c) To check the degree of polymerization

(d) To check the alpha cellulose

6. Consider the following components :

I. Titanium dioxide

II. Clay

III. Calcium carbonate

How many of the above are pigment coating components ?

(a) None

(b) One

(c) Two

(d) All three

7. Consider the following devices :

I. Electrostatic precipitator

II. Wet scrubber

III. Cyclone separator

How many of the above devices are used for emission control in the paper industry ?

(a) None

(b) One

(c) Two

(d) All three

8. Which one of the following materials is used for surface sizing of paper sheet ?

(a) Glucose

(b) Lignin

(c) Pectin

(d) Starch

9. What is the role of dandy roll in papermaking process ?

(a) For colouring the paper sheet

(b) For barrier properties enhancement

(c) For coating on the paper sheet

(d) For making watermark in paper sheet

10. Which one of the following substances is responsible for darkening the pulp colour ?

(a) Lignin

(b) Cellulose

(c) Pectin

(d) Hemicellulose

11. What are the dispersed phase and dispersion medium, respectively, for fog ?

(a) Solid, Liquid

(b) Solid, Gas

(c) Liquid, Gas

(d) Gas, Liquid

12. Conversion of black liquor into green liquor involves the following two steps :

Black liquor → *Evaporators* —(*Heavy black liquor* 65% – 8% *dry solids (A)*)→

Recovery boilers —(*Water* (*B*))→ Green liquor

Which chemical change takes place at step (B) ?

(a) Decarboxylation

(b) Hydration

(c) Smelting

(d) Electrolysis

13. Consider the following statements regarding Tall oil, which is a byproduct of black liquor recovery in pulp processing :

I. It is separated by centrifugation.

II. It is used in the manufacture of soap and emulsions.

III. It is a vegetable oil.

Which of the statements given above is/are correct ?

(a) I only

(b) II only

(c) I and II only

(d) I, II and III

14. It is important to measure the concentration of hydrogen sulphide as it is corrosive. What is the correct apparatus that measures concentration of hydrogen sulphide ?

(a) Pycnometer

(b) Viscometer

(c) Spectrometer

(d) Tutweiler apparatus

15. The fuel used in the boiler of chemical recovery plant of sulphate process is :

(a) Coal

(b) Biomass from the thickened liquor

(c) Organic carbon from the thickened liquor

(d) Natural gas

16. The raw material for paper industry should have :

(a) Low cellulose and high lignin content

(b) Low cellulose and low lignin content

(c) High cellulose and high lignin content

(d) High cellulose and low lignin content

17. Which one of the following is the slaking reaction ?

(a) $CaO\ (s) + H_2O\ (l) \rightarrow Ca(OH)_2$

(b) $CaCO_3\ (s) \rightarrow CaO + CO_2$

(c) $Na_2CO_3 + Ca(OH)_2 \rightarrow NaOH + CaCO_3$

(d) $Na_2S + Ca(OH)_2 \rightarrow NaOH + CaS$

18. What are the main purposes of the chemical recovery unit of pulp-making process ?

I. Utilization of energy

II. Minimization of air and water pollution

III. Increase the yield of cellulose fibre

IV. Recovery of chemicals from spent cooking liquor

Select the correct answer using the code given below :

(a) I and II only

(b) I, II and IV

(c) III and IV only

(d) II, III and IV

19. The oxidant used in the black liquor oxidation process is :

(a) Water

(b) Ozone

(c) Air

(d) Hydrogen peroxide

20. Multiple-effect evaporators are used to concentrate black liquor as they :

(a) offer high steam economy

(b) are robust

(c) are easy to fabricate

(d) are inexpensive

21. If the paper is coloured in the beater, the alum which is added to coagulate the size, also functions as :

(a) Dye bath

(b) Mordant

(c) Dispersing agent

(d) Binder

22. Consider the following statements in respect of mechanical process for manufacturing of pulp :

I. It involves slashing and debarking of wood.

II. It involves defibration or grinding of the entire wood log or chips into fibres.

Which of the statements given above is/are correct ?

(a) I only

(b) II only

(c) Both I and II

(d) Neither I nor II

23. Consider the following pairs in respect of manufacturing of paper :

I.	Felt blanket	–	Drying roll
II.	Machine	–	Fourdrinier
III.	Second felt	–	Press roll series
IV.	Squeezing roll	–	Remove excess material

How many of the pairs given above are correctly matched ?

(a) One

(b) Two

(c) Three

(d) All four

24. Calendering process involved in manufacturing of paper enhances which of the following ?

I. Smoothness of paper

II. Compactness of paper

III. Sizing of paper

IV. Colour of paper

Select the correct answer using the code given below :

(a) II only

(b) I and III only

(c) I and II only

(d) I, II, III and IV

25. Consider the following statements in respect of black liquor used in paper and pulp industries :

I. It is a source of heat energy.

II. It creates wastewater with high BOD value.

III. It is lignin in caustic soda.

Which of statements given above are correct ?

(a) I and II only

(b) II and III only

(c) I and III only

(d) I, II and III

26. Consider the following statements regarding role of chlorine used for bleaching of paper :

I. It is a greener approach.

II. It increases brightness of paper.

III. It releases chlorinated pollutants such as dioxins.

Which of the statements given above are correct ?

(a) I and II only

(b) II and III only

(c) I and III only

(d) I, II and III

27. Anaerobic digestion process of black liquor from paper industry produces :

(a) LPG

(b) Biogas

(c) Diesel

(d) Chlorofluorocarbons

28. What is the standard test condition for the aging effect for brightness reversion of paper products ?

(a) 100°C oven dry for 4 hours

(b) 105°C oven dry for 6 hours

(c) 105°C oven dry for 4 hours

(d) 100°C oven dry for 6 hours

29. Consider the following statements in respect of Boiling Point Rise (BPR) of black liquor, in pulp processing :

I. It is an example of colligative properties in solutions.

II. It is a critical parameter for the design of black liquor evaporators.

III. It increases rapidly above 50 wt% solids.

IV. It is a chemical change in black liquor.

Which of the statements given above are correct ?

(a) I, II and IV

(b) I, III and IV

(c) I, II and III

(d) II, III and IV

30. Major constituents of TRS (Total Reduced Sulphur) in chemical processing of pulp include which of the following ?

I. Hydrogen sulphide

II. Methyl mercaptan

III. Sulphur dioxide

IV. Dimethyl sulphide

Select the correct answer using the code given below :

(a) I, II and III

(b) I, III and IV

(c) II, III and IV

(d) I, II and IV

31. What are the advantages of Kraft pulping process ?

I. It produces highest strength pulp.

II. It handles wide variety of wood species.

III. It produces brighter unbleached pulp.

Select the correct answer using the code given below :

(a) I and II only

(b) I and III only

(c) II and III only

(d) I, II and III

32. Which of the following factors affect paper stiffness ?

I. Thickness

II. Brightness

III. Young's modulus of pulp

IV. Moisture

Select the correct answer using the code given below :

(a) I, II and III

(b) I, II and IV

(c) I, III and IV

(d) II, III and IV

33. Which of the following are structural properties of a paper ?

I. Thickness

II. Porosity

III. Tear strength

Select the correct answer using the code given below :

(a) I and II only

(b) II and III only

(c) I and III only

(d) I, II and III

34. For which grade of paper is Tensile Energy Absorption (TEA) the critical parameter ?

(a) Sack Grade

(b) Newsprint Grade

(c) Tissue Grade

(d) Fine Paper Grade

35. Which of the following methods/tests are used for determining the Machine Direction (MD) of paper ?

I. COBB test

II. Curl test

III. Relative stiffness

IV. Tensile test

Select the correct answer using the code given below :

(a) I, II and III

(b) I, II and IV

(c) I, III and IV

(d) II, III and IV

36. What is the major content of dissolving pulp ?

(a) Resins

(b) Extractives

(c) Cellulose

(d) Wax

37. Consider the following additives :

I. Starches

II. Gums

III. Titanium dioxide

IV. Latexes

Which of the above are considered dry strength additives ?

(a) I, II and III

(b) I, II and IV

(c) I, III and IV

(d) II, III and IV

38. Paper making process occurs in aqueous medium due to which nature of cellulosic fibres ?

(a) Oleophilic

(b) Hydrophobic

(c) Oleophobic

(d) Hydrophilic

39. What is the standard testing method for aging effect for brightness reversion of paper products ?

(a) TAPPI SM – 200

(b) TAPPI SM – 100

(c) TAPPI SM – 150

(d) None of the above

40. What are the chemicals used for making the solution for cooking of wood chips in Kraft process ?

(a) Sodium hydroxide and Sodium sulphide

(b) Sodium hydroxide and Sodium carbonate

(c) Sodium hydroxide and Sodium sulphate

(d) Sodium sulphide and Sodium sulphate

41. The recovery boiler outlet temperature is maintained above 130°C to prevent the formation of :

(a) Hydrogen sulphide

(b) Carbon dioxide

(c) Sulphuric acid

(d) Ammonia

42. Consider the following statements regarding Lignin, an important by-product from pulp industry :

I. It may be used as a fuel for steam production.

II. It may be used to manufacture camphor.

III. It may be used to produce pigments.

IV. It may be used as road-binder for asphalt emulsions.

Which of the statements given above are correct ?

(a) I and II

(b) I and IV

(c) II and III

(d) III and IV

43. Which one of the following is ***not*** a function of a recovery boiler ?

(a) Burning the organic constituents

(b) Supplying heat for steam generation

(c) Recovering inorganic chemicals in molten form

(d) Producing oxidized sulphur compounds

44. What type of chemical reaction/reactions occurs/occur in a recovery boiler ?

(a) Only oxidation

(b) Only oxidation and pyrolysis

(c) Drying, oxidation and pyrolysis

(d) Only drying and pyrolysis

45. The reaction happening in the slaker is :

(a) Decomposition of slaked lime

(b) Conversion of quick lime into slaked lime

(c) Decomposition of green liquor

(d) Reaction between green liquor and dilute acid

46. The most corrosive gaseous pollutant in chemical recovery unit of pulp mill is :

(a) Carbon monoxide

(b) Methane

(c) Hydrogen sulphide

(d) Carbon dioxide

47. Lime mud, in the context of chemical recovery unit in the pulping process, refers to :

(a) Calcium carbonate

(b) Calcium oxide

(c) Calcium hydroxide

(d) A mixture of calcium oxide and other impurities

48. Why is a fluidized bed used for lime mud reburning ?

I. The combustion of fuel is in intimate contact with the material being calcined.

II. It produces a high quality lime of uniform size.

Select the correct answer using the code given below :

(a) I only

(b) II only

(c) Both I and II

(d) Neither I nor II

49. When a combustible material is burnt, heat is released. The net heat of combustion may be defined as :

(a) Gross heat of combustion plus heat absorbed from the surroundings

(b) The heat released if the water vapour formed upon combustion is condensed to form liquid water

(c) The heat released if the water remains as a vapour or gas

(d) Gross heat of combustion minus heat absorbed from the surroundings

50. Consider the following statements regarding flue gas during oxy-fuel combustion :

I. Mass and volume of flue gas will increase significantly.

II. The concentration of pollutants in the flue gas is higher, making separation easier.

Which of the statements given above is/are correct ?

(a) I only

(b) II only

(c) Both I and II

(d) Neither I nor II

51. Parts per million (ppm) is a :

(a) Weight to Volume ratio

(b) Weight to Weight ratio

(c) Volume to Weight ratio

(d) Volume to Volume ratio

52. In oxidation, Na_2S is converted primarily to :

(a) Na_2SO_4

(b) $Na_2S_2O_3$

(c) Na_2CO_3

(d) NaOH

53. Which one of the following statements is correct in respect of thermal conductivity of black liquor ?

(a) It increases with dry solid content but decreases with temperature.

(b) It decreases with dry solid content but increases with temperature.

(c) It has no impact of dry solid content but increases with temperature.

(d) It decreases with dry solid content and has no impact of temperature.

54. The heating value of black liquor depends strongly on :

(a) Inorganic content

(b) pH

(c) Organic content

(d) Viscosity

55. What is the percentage of solid levels above which black liquor exhibits non-Newtonian behaviour ?

(a) 10%

(b) 30%

(c) 40%

(d) 50%

56. Consider the following statements in respect of paper industry :

I. It uses heat-driven process to evaporate black liquor.

II. It attempts to balance capital cost with operating cost by using multiple effect evaporator to improve evaporator economy and to reduce steam demand.

Which of the statements given above is/are correct ?

(a) I only

(b) II only

(c) Both I and II

(d) Neither I nor II

57. What is the role of Na_2S during pulping ?

(a) It acts as a reactant

(b) It acts as an emusifier

(c) It acts as a catalyst

(d) None of the above

58. Which components/component contribute(s) to lignin degradation ?

(a) Hydroxide only

(b) Hydrosulphide only

(c) Both hydroxide and hydrosulphide

(d) Neither hydroxide nor hydrosulphide

59. What kind of pump is generally used in black liquor evaporation ?

(a) Reciprocating pump

(b) Centrifugal pump

(c) Peristaltic pump

(d) Gear pump

60. Which one of the following combinations of various stages of black liquor droplet burning is correct ?

(a) Devolatilization → Drying → Char burning

(b) Drying → Devolatilization → Char burning

(c) Drying → Char burning → Devolatilization

(d) Devolatilization → Char burning → Drying

61. The difference between test value and true value refers to :

(a) Sensitivity

(b) Error

(c) Precision

(d) Reliability

62. Which of the following are the factors affecting the precision and/or accuracy of a test result ?

I. Instrument readability

II. Sampling error

III. Instrument calibration

IV. Procedural differences

Select the correct answer using the code given below :

(a) I, II and III only

(b) I, II and IV only

(c) III and IV only

(d) I, II, III and IV

63. Errors in any test method can be :

(a) Indeterminate (random) only

(b) Determinate (systematic) only

(c) Both indeterminate and determinate

(d) Neither indeterminate nor determinate

64. The smallest variations between tests can be minimized if the tests are carried out :

I. By the same operator

II. On the same sample

III. By using the same instrument

Which of the statements given above are correct ?

(a) I and II only

(b) II and III only

(c) I and III only

(d) I, II and III

65. Standard error of mean can be expressed as :

(a) $S_m = \frac{S}{n}$

(b) $S_m = \frac{S}{\sqrt{n}}$

(c) $S_m = \frac{\sqrt{S}}{n}$

(d) $S_m = \sqrt{\frac{S}{n}}$

where the symbols have their usual meaning

66. The Reynolds Number is 5000. What does it indicate ?

(a) It indicates that the flow is laminar.

(b) It indicates that the flow is intermediate.

(c) It indicates that the flow is turbulent.

(d) None of the above

67. A spectrum limited to band of wavelengths between 380 nm to 720 nm represents which one of the following regions ?

(a) Ultraviolet

(b) Visible

(c) Infrared

(d) Far infrared

68. Which one of the following properties of paper ***cannot*** be determined by a tensile test ?

(a) Young's modulus

(b) Yield strength

(c) Hardness

(d) Ultimate strength

69. Consider the following statements :

I. Tensile and fold are greater in Cross Direction (CD).

II. Tear is greater in Machine Direction (MD).

Which of the statements given above is/are correct ?

(a) I only

(b) II only

(c) Both I and II

(d) Neither I nor II

70. What is the unit of Burst index ?

(a) $kN\ m^2\ kg$

(b) $kPa\ m^2\ kg^{-1}$

(c) $kN\ m^2\ kg^{-1}$

(d) $kPa\ m\ kg^{-1}$

71. Which dimensionless number among the following connects viscous force to surface tension ?

(a) Froude number alone

(b) Ohnesorge number alone

(c) Reynolds number alone

(d) Weber number alone

72. During solvent-based ink drying, which one of the following is the primary limiting factor of drying rate ?

(a) Solvent evaporation rate only

(b) Diffusion through boundary layers only

(c) Both solvent evaporation rate and diffusion through boundary layers

(d) Neither solvent evaporation rate nor diffusion through boundary layers

73. The optical variable ink is used for anti-counterfeiting applications. Which one of the following factors does it rely on ?

(a) Magnetic resonance

(b) Absorptive filtering

(c) Thin film interference

(d) Fluorescence quenching

74. Which one among the following is the effect produced during capillary flow in water-based ink drying ?

(a) Coffee ring effect

(b) Even pigment distribution

(c) Complete pigment reabsorption

(d) Diffusion of solvent towards the centre

75. Which one among the following is the correct cause of decreasing surface tension ?

(a) Increasing pressure

(b) Increasing temperature

(c) Increasing density

(d) Decreasing viscosity

76. Which one of the following is the major difference between a RAW image and a JPEG ?

(a) RAW files store compressed colour data

(b) JPEG files include all sensor data

(c) RAW files preserve linear unprocessed data

(d) JPEG files maintain higher dynamic range

77. Which one of the following factors most significantly affects the signal-to-noise ratio in a digital image sensor ?

(a) Pixel size and photon shot noise

(b) Focal length of lens

(c) Shutter speed noise

(d) Bit depth of analog to digital converter

78. Which one of the following correctly describes the colour changes of interference and diffraction pigments between the two extreme observation angles ?

(a) Colour flop

(b) Lightness flop

(c) Short flop

(d) Dark flop

79. Which one of the following describes the colourfulness of colourants, and does not change by further increase of the colourant concentration ?

(a) Lightness

(b) Colour tone

(c) Saturation

(d) Chroma

80. Which one of the following is the correct range of colour value of a single channel per pixel in a 14 bit RAW image file ?

(a) 0 to 16383

(b) 0 to 16384

(c) 0 to 1023

(d) 0 to 1024

81. Which one of the following is the primary difference between phosphorescent and fluorescent materials ?

(a) Fluorescent materials have larger quantum yield as compared to phosphorescent materials.

(b) Phosphorescent materials emit shorter wavelengths as compared to fluorescent materials.

(c) Phosphorescent materials have larger quantum yield as compared to fluorescent materials.

(d) Phosphorescent materials have a persistent afterglow after excitation removal.

82. Which one of the following pertaining to the Bayer filter is correct ?

(a) They use equal number of R, G, B pixels.

(b) They use larger number of G pixels as compared to R pixels or B pixels

(c) They use larger number of R pixels as compared to G pixels or B pixels.

(d) They use larger number of B pixels as compared to R pixels or G pixels.

83. Which one of the following pertaining to fluorescent UV photography for taggant revelation is correct ?

(a) It uses UV light for exposure of object and visible light is fluorescently emitted by the object.

(b) It uses visible light for exposure of object and UV light is fluorescently emitted by the object.

(c) It uses infrared light for exposure of object and UV light is fluorescently emitted by the object.

(d) It uses UV light for exposure of object and infrared light is fluorescently emitted by the object.

84. Which one among the following pertaining to taggants in security printing is correct ?

(a) They are tags corresponding to different weights.

(b) They are microscopically covert additives.

(c) They are varnish layers added to the film.

(d) They are super adhesives used to enhance the strength of film.

85. The orthochromatic film is insensitive to :

(a) Green light

(b) Blue light

(c) Red light

(d) UV light

86. Which one of the following is correct regarding rub resistance of inks ?

(a) It depends largely on paper position alone.

(b) It depends largely on binder hardness and adhesion.

(c) It depends largely on hue angle.

(d) It depends largely on printing pressure.

87. Which one of the following is correct regarding the lenses used in process camera ?

(a) They are designed for depth imaging.

(b) They are designed for macro magnification.

(c) They are designed for wide angle coverage.

(d) They are designed for flat field reproduction and minimal distortion.

88. A covert fluorescent marker can be engineered by doping organic fluorophore with lanthanide ions. Which one of the following is the primary purpose of this ?

(a) To increase refractive index only

(b) To shift emission to narrow band sharp spectral lines in visible/NIR region

(c) To improve ink viscosity only

(d) To improve both ink viscosity and tack stability and increase refractive index

89. For an optically variable interference pigment, which one among the following will cause the angle of colour shift to increase ?

(a) A decrease in refractive index contrast between layers

(b) An increase in refractive index contrast between layers

(c) An increase in the film thickness

(d) A decrease in the layer count

90. Which one of the following is the primary cause of breaking of ink droplet into smaller droplets ?

(a) Viscosity only

(b) Temperature gradient only

(c) Both temperature gradient and viscosity

(d) Surface tension and internal forces

91. Which memory in the hierarchy has the fastest access time but smallest capacity ?

(a) Cache memory

(b) Main memory

(c) Secondary storage

(d) Registers

92. Which components are typically integrated into a microcontroller ?

(a) CPU, RAM, ROM, I/O ports

(b) CPU, ROM, External memory, Bus

(c) RAM and ROM only

(d) CPU only

93. What type of memory is typically used as a cache memory ?

(a) DRAM

(b) SRAM

(c) ROM

(d) Hard disk

94. Which register holds the address of the next instruction to be fetched from memory ?

(a) Instruction Register (IR)

(b) Memory Address Register (MAR)

(c) Accumulator (ACC)

(d) Program Counter (PC)

95. What is the primary purpose of virtual memory in an operating system ?

(a) It increases the physical memory size.

(b) It provides the large addressable memory space to programs.

(c) It manages input and output devices in a virtual way.

(d) It speeds up the CPU processing using virtual processor.

96. What is the result of shifting a binary number one place to the right ?

(a) Divides the number by 2

(b) Multiplies the number by 2

(c) Adds 2 to the number

(d) Subtracts 2 from the number

97. What is the main function of the control unit in the CPU ?

(a) Performs addition and subtraction

(b) Stores data permanently

(c) Maintains the sequence of operations

(d) Runs application software

98. How do compilers and assemblers differ in code conversion ?

(a) Compilers convert the entire code at once and assemblers convert in multiple passes.

(b) Assemblers convert the entire code at once and compilers do incremental conversion.

(c) Both compilers and assemblers convert the entire code at once.

(d) Both compilers and assemblers convert the code line-by-line.

99. How does Intranet differ from Internet ?

(a) Intranet is publicly accessible.

(b) Internet is completely private.

(c) Intranet is private and restricted.

(d) There is no difference between Intranet and Internet.

100. Which protocol is primarily used for communication over the Internet ?

(a) FTP

(b) HTTP

(c) SMTP

(d) TCP/IP

101. What does a firewall do in Internet security ?

(a) It encrypts data automatically.

(b) It manages user account secretly.

(c) It stores password securely.

(d) It filters incoming and outgoing network traffic.

102. What is a Virtual Private Network (VPN) used for ?

(a) Accelerating Internet speed

(b) Encrypting Internet traffic for privacy and security

(c) Removing viruses or malware from the system

(d) Managing Wi-Fi

103. What is the main difference between SRAM and DRAM ?

(a) SRAM is volatile whereas DRAM is non-volatile.

(b) SRAM has faster access time and does not require refreshing whereas DRAM requires refreshing.

(c) SRAM stores data in capacitors whereas DRAM uses flip-flops.

(d) DRAM is faster and more expensive than SRAM.

104. Which one of the following is considered a low-level programming language ?

(a) Java

(b) Java Script

(c) Assembly language

(d) Python

105. A line printer prints 1000 lines/minute. It is given that each line contains 132 characters approximately. How many bytes are printed in one hour if each character takes 1 byte ?

(a) 8·24 MB

(b) 8·0 MB

(c) 7·92 MB

(d) 7·2 MB

106. At which layer of TCP/IP model do IP, ICMP and ARP protocols function ?

(a) Physical layer

(b) Application layer

(c) Network layer

(d) Transport layer

107. Which one of the following logic gates generates false output only when both of the inputs have the same value ?

(a) NAND

(b) XNOR

(c) XOR

(d) AND

108. A sequential electronic circuit that is used to store 1-bit of information is a :

(a) Flip-flop

(b) Register

(c) Asynchronous counter

(d) Synchronous counter

109. In the context of derived logic gates, NAND gate is a combination of :

(a) AND and NOT gates

(b) AND and NOR gates

(c) AND and XNOR gates

(d) AND and XOR gates

110. Which device is used for connecting computers in a star topology ?

(a) Router

(b) Bridge

(c) Hub

(d) Repeater

111. Consider the following statements in respect of frequency division multiplexing :

I. Signals to be transmitted must be analog signals.

II. All signals in the physical channel travel simultaneously.

III. Each logical channel is distinct and carries an independent signal.

IV. All signals in the physical channel travel sequentially.

Which of the statements given above are correct ?

(a) I and II only

(b) III and IV only

(c) I, III and IV

(d) I, II and III

112. Consider the following statements regarding RFID tags :

I. No physical contact is required to read.

II. The speed of reading is high.

III. Many RFID tags can be read simultaneously.

Which of the statements given above are correct ?

(a) I and II only

(b) II and III only

(c) I and III only

(d) I, II and III

113. Consider the following statements :

I. Flash memory is non-volatile.

II. Flash memory is volatile.

III. Flash memory is a fast read-slow write device.

IV. Flash memory is a slow read-fast write device.

Which of the statements given above are correct ?

(a) I and IV

(b) II and III

(c) II and IV

(d) I and III

114. The property of a solid state disk in comparison with a hard disk is :

(a) Low latency and low seek time to access data

(b) Low latency and high seek time to access data

(c) High latency and low seek time to access data

(d) High latency and high seek time to access data

115. In the context of computer networking, which one of the following is ***not*** an application layer protocol of TCP/IP ?

(a) HTTP

(b) FTP

(c) IP

(d) SMTP

116. Consider the following :

I. Satellite

II. Microwave

III. Coaxial cable

How many of the above use light pulses for carrying information ?

(a) One

(b) Two

(c) Three

(d) None

117. If $A = (321)_4$ and $B = (233)_4$, then what is base 4 expansion of (A + B) ?

(a) $(2230)_4$

(b) $(1220)_4$

(c) $(1113)_4$

(d) $(1033)_4$

118. A publishing company wants to scan old book pages, edit them digitally and reprint them. Which one of the sequences is the most appropriate ?

(a) Plotter → OCR → Inkjet Printer

(b) Scanner → OCR → Laser Jet Printer

(c) Line Printer → Plotter → MICR Reader

(d) OCR → MICR → Dot Matrix Printer

119. A person is running a small publishing house that prints 3000 pages/day with high quality images. He wants the best balance between speed, quality and cost per page. Which printer is most suitable ?

(a) Inkjet Printer

(b) Dot Matrix

(c) Laser Jet

(d) Line Printer

120. A Flat-bed Plotter differs from a Drum Plotter because :

(a) It uses ink instead of a pen.

(b) The paper is fixed and the pens can be moved both along X and Y axes.

(c) It rotates the paper continuously.

(d) It is used for text printing.

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