NATIONAL SCHOOL OF SCIENCES (NSS)

Lainchour - 26, Kathmandu

Model Test - 2082

Set: A

GENERAL INSTRUCTIONS:
1. Write your information (Name, Roll. Number, Date etc.) on your Answer Sheet.
2. Do not write anything on your Question Sheet
3. Use given extra loose sheet for rough work.
4. Mark your correct answers by blackening the appropriate bubble against each question on your Answer Sheet.
5. There are 100 questions in total each carries **1 MARK**. No negative marks will be given for wrong answers.
6. All pages (Question, Answer Sheet) must be submitted after the examination.
7. Duration of Examination is 2 hours.

Read the following passage carefully and answer the questions (1-5) below.

The Rise of Teotihuacán

The city of Teotihuacán, which lay about 50 kilometers northeast of modern-day Mexico City, began its growth by 200–100 B.C. At its height, between about A.D. 150 and 700, it probably had a population of more than 125,000 people and covered at least 20 square kilometers. It had over 2,000 apartment complexes, a great market, a large number of industrial workshops, an administrative center, a number of massive religious edifices, and a regular grid pattern of streets and buildings. Clearly, much planning and central control were involved in the expansion and ordering of this great metropolis. Moreover, the city had economic and perhaps religious contacts with most parts of Mesoamerica (modern Central America and Mexico).
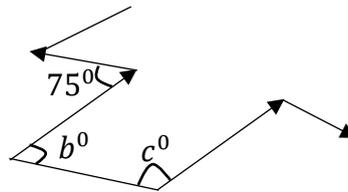
How did this tremendous development take place, and why did it happen in the Teotihuacán Valley? Among the main factors are Teotihuacán's geographic location on a natural trade route to the south and east of the Valley of Mexico, the obsidian1 resources in the Teotihuacán Valley itself, and the valley's potential for extensive irrigation. The exact role of other factors is much more difficult to pinpoint—for instance, Teotihuacán's religious significance as a shrine, the historical situation in and around the Valley of Mexico toward the end of the first millennium B.C., the ingenuity and foresightedness of Teotihuacán's elite, and, finally, the impact of natural disasters, such as the volcanic eruptions of the late first millennium B.C.

This last factor is at least circumstantially implicated in Teotihuacán's rise. Prior to 200 B.C., a number of relatively small centers coexisted in and near the Valley of Mexico. Around this time, the largest of these centers, Cuicuilco, was seriously affected by a volcanic eruption, with much of its agricultural land covered by lava. With Cuicuilco eliminated as a potential rival, any one of a number of relatively modest towns might have emerged as a leading economic and political power in Central Mexico. The archaeological evidence clearly indicates, though, that Teotihuacán was the center that did arise as the predominant force in the area by the first century A.D.

1. Which of the following best describes the layout of Teotihuacán at its peak?

   a) It was a scattered settlement with no organized structure.

   b) It was primarily made up of religious buildings.

   c) It was a well-planned city with organized streets and various functional areas.

   d) It was a small village with a limited population and facilities.

2. What geographical advantage contributed to Teotihuacán's development?

   a) Its proximity to Mexico City   b) Its closeness to active volcanoes

   c) Its location on a natural trade route   d) Its isolation from other regions

3. Which event most likely allowed Teotihuacán to rise as a dominant power?
   a) The disappearance of trade routes
   b) The eruption that affected Cuicuilco
   c) The discovery of gold mines nearby
   d) The collapse of Teotihuacán's irrigation system
4. What evidence suggests that Teotihuacán had a highly organized administration?
   a) The city had thousands of unplanned residential huts.
   b) The city's layout followed a regular grid pattern with coordinated expansions.
   c) The city had a large population but no evidence of market areas.
   d) The city had no industrial workshops or religious centers.
5. According to the passage, which factor's specific role in Teotihuacán's rise remains uncertain?
   a) The volcanic eruptions of the late first millennium B.C.
   b) The presence of obsidian resources in the valley
   c) Teotihuacán's geographic location on trade routes
   d) The exact religious importance of Teotihuacán as a shrine
6. Identify the word class of the underlined word: "She has a <u>remarkable</u> ability to solve problems."
   a) Noun   b) Adjective   c) Adverb   d) Verb
7. By the time we get there, the movie _____.
   a) will start   b) will have started   c) starts   d) started
8. I'm not very good _____ mathematics.
   a) on   b) in   c) at   d) with
9. If it _____ tomorrow, we will cancel the picnic.
   a) would rain   b) will rain   c) rained   d) rains
10. She is used to _____ up early.
    a) get   b) getting   c) got   d) have got
11. I wish I _____ more time.
    a) will have   b) have   c) had   d) would have
12. I love chocolate.
    a) So do I   b) So I do   c) Neither do I   d) I don't too
13. The committee _____ meeting tomorrow.
    a) have   b) are   c) were   d) is
14. How many syllables are in the word "unbelievable"?
    a) 4   b) 6   c) 5   d) 3
15. What does "beat around the bush" mean?
    a) Avoid saying what you mean   b) To be direct
    c) To argue about something   d) To be in a hurry
16. Choose the synonym of "benevolent".
    a) large   b) Cruel   c) kind   d) Small
17. She said, "I am going to the market." She said that _____.
    a) she was going to market   b) she is going to the market
    c) she went to market   d) she goes to the market
18. Passive of "They built this house in 2010." is:
    a) This house built in 2010.   b) This house is built in 2010.
    c) This house had been built in 2010.   d) This house was built in 2010.
19. In the sentence "She seems happy", the verb "seems" is a _____.
    a) action verb   b) linking verb   c) transitive verb   d) intransitive verb
20. Identify the pattern: "She is a doctor."
    a) SVC   b) SVO   c) SV   d) SVOO
21. If $x - \frac{1}{x} = 7$, then the value of $x^2 + \frac{1}{x^2}$ is …
    a) 49   b) 47   c) 51   d) 7

22. What is the conjugate factor of $\sqrt{5} + \sqrt{2}$?

    a) $\sqrt{5} - \sqrt{2}$ b) $\sqrt{5} + \sqrt{2}$ c) $\frac{1}{\sqrt{5}-\sqrt{2}}$ d) $\frac{1}{\sqrt{5}+\sqrt{2}}$

23. The difference between $\frac{3}{5}$ in of 80 and 30% of 80 is …

    a) 20   b) 24   c) 30   d) 40

24. If $a:b = 3:5$ and $a:c = 5:7$, what is the value of $b:c$?

    a) $3:7$ b) $5:7$ c) $21:25$ d) $25:21$

25. The surface area of a table tennis ball is $\frac{1}{\pi}\ cm^2$. What is its diameter?

    a) $\frac{7}{22}\ cm$ b) $\frac{22}{7}\ cm$ c) $7\ cm$ d) $3\ cm$

26. What is the value of $\frac{3^m + 3^{m+1}}{3^{m+3} - 3^{m+1}}$?

    a) 1   b) 0   c) $\frac{1}{6}$ d) $\frac{1}{12}$

27. The median of $9, 5, 7, 11, 13, 3$ is …

    a) 7   b) 8   c) 9   d) 11

28. The angle subtended by an arc at the centre of the circle is . . . the angle subtended by the same arc at the circumference.

    a) half   b) equal   c) twice   d) thrice

29. Find the value of c^0 is

    a) 75^0
    b) 90
    c) 100
    d) 105^0

30. What is the diameter of a globe if its volume is $38808\ cm^3$?

    a) 42   b) 32   c) 22   d)12

31. The value of m in $2^{m+2} \times 3^{m-4} = 64$ is …

    a) 0   b) 1   c) 3   d) 4

32. A leap year is selected at random. What is the probability that it will contain 53 Sundays?

    a) $\frac{1}{7}$ b) $\frac{2}{7}$ c) $\frac{53}{7}$ d) $\frac{53}{365}$

33. The sum of the first 100 natural numbers is …

    a) 1010   b) 3030   c) 5050   d) 7070

34. The mean deviation from means of the data 13,13,13,13,13 is …

    a) 0   b) 1   c) 13   d) None

35. If $\vec{a}$ is parallel to $\vec{b}$, then the value of $\vec{a}.\vec{b}$ is equal to

    a) $\vec{a} \times \vec{b}$ b) 90^0 c) 0   d) 1

36. If $sin\ \theta = cos\ \theta$, what is the acute value of θ ?

    a) 120^0 b) 90^0 c) 60^0 d) 45^0

37. The equation $4x^2 + 16xy - 4y^2 = 0$ represents a pair of … lines.

    a) coincident   b) parallel   c) perpendicular   d) None

38. Find the value of k if the co-ordinates (1,4), (-3,16) and (k,-2) are collinear.

    a) 0   b) 3   c) -3 d) 2

39. A square matrix A is said to be non-singular if …

    a) $|A| = 0$ b) $|A| \neq 0$ c) $|A| = 1$ d) $|A| = -1$

40. Given a function $f(x) = \frac{1}{x+2}$. Find the points of discontinuity of the function f(x).

    a) -2 b) 0 c) 1 d) 2

41. Rs. 72.50 is paid in rupee, mohar and suki in the ratio of $3:5:7$. How many each were there?

    a) 10, 20, 30   b) 30, 40, 50   c) 50, 60, 70   d) 30, 50, 70

42. If $a \times b = 2a - 3b + ab$, then $3 \times 5 + 5 \times 3 = ?$

    a) 0   b) 10   c) 22   d) 32

43. Ram walks $4 \ km$ North from his house. Then he turns to his left and walks $3 \ km$. How far is he now from his house?

    a) $25 \ km$ b) $5 \ km$ c) $4 \ km$ d) $3km$

44. Each exterior angle of an equilateral triangle is

    a) 60^0 b) 90^0 c) 120^0 d) 180^0

45. If $sin\theta = \frac{4}{5}$, then find the value of $cos\theta$.

    a) $\frac{3}{5}$ b) $\frac{4}{5}$ c) $\frac{5}{3}$ d) $\frac{5}{4}$

46. Which acid is present in lemon?

    a) Acetic acid   b) Citric acid   c) Tartaric acid   d) Hydrochloric acid

47. Which of the following metal is stored in kerosene?

    a) Zinc   b) Iron   c) Sodium   d) Copper

48. The general formula of alkane is:

    a) C_nH_{2n} b) C_nH2_{n+1} c) C_nH_{2n-2} d) C_nH_{2n+2}

49. The most electronegative non-metal in a periodic table is:

    a) Fluorine   b) Oxygen   c) Chlorine   d) Nitrogen

50. The SI unit of pressure is:

    a) atm   b) mmHg   c) pascal   d) bar

51. Which law states that volume of given mass of gas is directly proportional to absolute temperature at constant pressure?

    a) Charles' law   b) Boyle's law   c) Avogadro's law   d) Dalton's law

52. Number of atoms in one mole of oxygen gas (O_2) is:

    a) 6.022×10^{23} b) 3.011×10^{23} c) 1.2044×10^{24} d) 6.022×10^{24}

53. Atomic number is equal to:

    a) Number of protons   b) Number of Neutrons

    c) Number of Neutrons + proton   d) Number of Electrons + neutrons

54. Isobars have the same:

    a) Mass number   b) Atomic number   c) Number of neutrons   d) Chemical symbol

55. Which metal is used in galvanization?

    a) Copper   b) Iron   c) Silver   d) Zinc

56. Which chemical is used to test starch in food?

    a) Iodine   b) Phenolphthalein   c) Litmus   d) Methyl orange

57. Lime water turns milky with:

    a) Oxygen gas   b) Carbon dioxide gas   c) Nitrogen gas   d) Chlorine gas

58. What is the chemical formula of 'bleaching powder'?

    a) $Ca(OH)_2$ b) $CaCl_2$ c) $CaOCl_2$ d) $CaCO_3$

59. Which element is most reactive among the following?

    a) Iron   b) Potassium   c) Zinc   d) Copper

60. Which of the following form acidic oxide?
   a) Na   b) Mg   c) S   d) Zn
61. What does the slope of a distance-time graph represent?
   a) speed   b) acceleration   c) displacement   d) distance
62. A body moves 40 m north and then 30 m east. What is the displacement?
   a) 70 m   b) 10 m   c) 50 m   d) 100 m
63. Newton's first law of motion describes the
   a) energy   b) work   c) moment of inertia   d) inertia
64. As defined in physics, work is:
   a) a scalar quantity   b) always a positive quantity
   c) a vector quantity   c) always zero
65. The balls of iron and aluminium of same diameter are dipped in water. Which is the correct statement?
   a) The upthrust on the iron ball will be more than the aluminium ball.
   b) The upthrust on aluminium ball is more than the iron ball.
   c) The upthrust on both balls will be the same.
   d) None of the above
66. At what height from the earth's surface the value of g will become one-fourth of its value at earth's surface? (R=radius of earth)
   a) R   b) R/2   c) R/4   d) 2R
67. Which liquid is commonly used in thermometers?
   a) water   b) mercury   c) alcohol   d) both b and c
68. How much heat is required to raise the temperature of 1 kg of water from 20°C to 70°C? (Specific heat = 4200 J/kg°C)
   a) 210,000 J   b) 252,000 J   c) 180,000 J   d) 50,000 J
69. In a plane mirror, the image formed is:
   a) Real and inverted   b) Virtual and erect   c) Smaller than the object   d) Real and erect
70. Angle of incidence that causes refracted ray to bend through 90^0 is called:
   a) Acute angle   b) obtuse angle   c) Perpendicular   d) Critical angle
71. Electric potential may be expressed in which one of the following units?
   a) coulombs/volt   b) joules/coulomb   c) coulombs/second d) ohms/second
72. Resistance's power wasted is directly proportional to
   a) V^2 b) I^2 c) V   d) a & b are correct
73. What is Transformer?
   a) Transformer is a device used to convert low alternating voltage to high alternating voltage
   b) Transformer is a device used to convert alternating current to direct current
   c) Transformer is a device used to convert low alternating current to a high alternating current
   d) Transformers are used only for low alternating voltage
74. Which process happens in the star
   a) Electron excitation   b) Nuclear fusion   c) Nuclear fission   d) Diffusion
75. Which of the following is known as Saptarishi?
   a) Orion   b) Ursa major   c) Ursa minor   d) Scorpion
76. Which of the following blood group is an extremely universal donor.
   a) A -ve   b) O +ve   c) O -ve   d) B -ve
77. In protozoa, contractile vacuoles primarily help in ……………
   a) Respiration   b) Digestion   c) Excretion   d) Osmoregulation
78. Which of the following is vestigial organ
   a) Wings of Pigeon   b) Wings of Ostrich c) Wings of Butterfly   d) Patagium of bat
79. Which of the following phylum is haemocoelomate?
   a) Aschelminthes   b) Annelida   c) Platyhelminthes d) Arthropoda

80. Which organ is involved in filtration of blood?
    a) Kidney　　　　　　b) Liver　　　　　　c) Heart　　　　　　d) Urinary bladder
81. Study of birds is called
    a) Entomology　　　　b) Herpetology　　　c) Ichthyology　　　d) Ornithology
82. Which is the largest phylum of animal kingdom
    a) Mollusca　　　　　b) Protozoa　　　　　c) Arthropoda　　　d) Nemathelminthes
83. Who is the father of biology?
    a) Alexander the Great b) Aristotle　　　　c) Darwin　　　　　d) Leeuwenhoek
84. Multicellular producer belong to the kingdom
    a) Protista　　　　　b) Mycota　　　　　c) Plantae　　　　　d) Animalia
85. On the basis of life span trees are
    a) Annual　　　　　　b) Biennial　　　　　c) Ephemerals　　　d) Perennial
86. The reserve food of plant is
    a) Carbohydrate　　　b) Protein　　　　　c) Fat　　　　　　　d) Starch
87. Which of the following gas is the major cause of greenhouse effect?
    a) SO_2　　　　　　b) O_3　　　　　　c) CO_2　　　　　d) CO
88. Zygote formed after fertilization is
    a) single celled　　　b) doubled celled　　c) multi celled　　　d) poly celled
89. Which is the smallest national park of Nepal?
    a) Rara national park　　　　　　　　b) Chitwan national park
    c) Bardiya national park　　　　　　　d) Sagarmatha national park
90. Which plant tissue is responsible for transport of water from roots to other parts of plant?
    a) Phloem　　　　　　b) xylem　　　　　　c) Parenchyma　　　d) Collenchyma
91. Which of the following is the brain of the computer?
    a) RAM　　　　　　　b) Hard Disk　　　　c) CPU　　　　　　d) Monitor
92. Which device is used to convert digital signals into analog and vice versa?
    a) Router　　　　　　b) Switch　　　　　　c) Modem　　　　　d) Printer
93. What does "www" stand for in a website browser?
    a) World With Web　　b) World Wide Web　c) Web With World　d) Wide World Web
94. Which of the following is an input device?
    a) Speaker　　　　　　b) Monitor　　　　　c) Keyboard　　　　d) Printer
95. Which programming language is commonly taught as a foundation language?
    a) Java　　　　　　　b) Python　　　　　　c) C　　　　　　　　d) Kotlin
96. Which of the following is a volatile memory?
    a) ROM　　　　　　　b) SSD　　　　　　　c) HDD　　　　　　d) RAM
97. Which number system is used by computers to perform operations?
    a) Decimal　　　　　b) Binary　　　　　　c) Hexadecimal　　d) Octal
98. What is the full form of GUI?
    a) General User Input　　　　　　　　b) Graphical User Interface
    c) Guided User Interface　　　　　　　d) Graphic Usage Index
99. Which one of these is not an operating system?
    a) Windows　　　　　b) Linux　　　　　　c) Android　　　　　d) Oracle
100. In C programming, which symbol is used to end a statement?
    a) . (dot)　　　　　　b) , (comma)　　　　c) ; (semicolon)　　d) : (colon)