

Time: 1 hour 45 min.

F.M.: 100

Shade the appropriate circle ( ● ) using black ink in the answer sheet.

Subject: Science

F.M.: 40

1. What is the colour of blue litmus paper in acidic solution?  
a. red                      b. blue                      c. yellow                      d. colourless
2. The reaction between strong acid and weak base gives:  
a. acidic salt              b. basic salt              c. neutral salt              d. normal salt
3. ZnO is an example of:  
a. amphoteric oxide                      b. acidic oxide  
c. neutral oxide                      d. basic oxide
4. Which metal can be extracted from bauxite?  
a. Fe                      b. Zn                      c. Al                      d. Cu
5. Pneumatic bones are found in  
a. reptiles                      b. aves                      c. mammals                      d. insects
6. Which of the following statement is correct?  
a. Na is more reactive than K                      b. Ca is less reactive than Mg  
c. O has larger atomic size than S                      d. none of the above
7. Swimming is possible on account of  
a. law of gravitation                      b. first law of motion  
c. second law of motion                      d. third law of motion
8. What is the pH value of products of neutralization reaction?  
a. 5                      b. 6                      c. 7                      d. 8
9. A spring balance carrying mass 20kg in a lift registered 200N. During free fall of lift, balance records  
a. 2000N                      b. 20N                      c. 200N                      d. zero
10. What is the molecular weight of  $\text{Na}_2\text{SO}_4$ ?  
a. 140                      b. 141                      c. 142                      d. 143
11. What is the boiling point of mercury?  
a.  $-39^\circ\text{C}$                       b.  $100^\circ\text{C}$                       c.  $212^\circ\text{C}$                       d.  $357^\circ\text{C}$
12. Phenotypic ratio of Mendel's monohybrid cross is  
a. 9:3:3:1                      b. 1:2:1                      c. 3:1                      d. 3:2
13. The frequency of direct current is  
a. 0Hz                      b. 100Hz                      c. 1000Hz                      d. 10000Hz
14. *Rhizobium*, (a bacterium) takes part in  
a.  $\text{N}_2$  assimilation                      b. nitrification                      c. denitrification                      d.  $\text{N}_2$  fixation
15. Ozone layer is present in .....  
a. troposphere                      b. stratosphere                      c. mesosphere                      d. thermosphere
16. 1 pascal is equal to  
a. 1 Dyne/cm<sup>2</sup>                      b. 1 Newton/m<sup>2</sup>                      c. 1 Newton/m                      d. 1 Joule/m
17. – COOH is the functional group of :  
a. alcohol                      b. ether                      c. aldehyde                      d. carboxylic acid
18. The reaction between ammonia and carbon dioxide gas gives:  
a. urea                      b. dry ice                      c. liquor ammonia                      d. none of these
19.  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  is the molecular formula of :  
a. green vitriol                      b. blue vitriol                      c. white vitriol                      d. none of these
20. Which colour get imparted in the glass by using chromium oxide?  
a. Black                      b. Blue                      c. Green                      d. Yellow
21. Female reproductive part of angiospermic flower is  
a. corolla                      b. androecium                      c. calyx                      d. gynoecium
22. Which one of the following is a form of energy?  
a. pressure                      b. momentum                      c. light                      d. power
23. Gametophyte of fern is  
a. spore                      b. gamete                      c. plant body                      d. prothallus
24. Which group of plants have naked seeds?  
a. Bryophytes                      b. Pteridophytes  
c. Gymnosperms                      d. Angiosperms
25. Which doesn't belong to primary consumer of pond ecosystem?  
a. Phytoplanktons                      b. Zooplanktons                      c. Crustaceans                      d. Mosquito
26. The non living component of blood is  
a. plasma                      b. corpuscles                      c. stroma                      d. matrix

27. The change in Celsius scale corresponding to the change in Fahrenheit scale of  $20^{\circ}\text{F}$  is  
 a.  $\frac{50^{\circ}}{9}^{\circ}\text{C}$       b.  $100^{\circ}\text{C}$       c.  $\frac{100^{\circ}}{9}^{\circ}\text{C}$       d.  $\frac{200^{\circ}}{9}^{\circ}\text{C}$
28.  $\text{O}_2$  transportation from lungs to the body tissues is the function of .....  
 a. erythrocytes      b. leucocytes      c. thrombocytes      d. platelets
29. A concave lens give an image which is  
 a. real and erect      b. real and inverted  
 c. virtual and erect      d. virtual and inverted
30. The thick paste of cement and sand in the ratio of 1:3 with water is called  
 a. cement concrete      b. cement clinker  
 c. cement mortar      d. cement powder
31. Which of the following is not unit of length?  
 a. radius      b. angstrom      c. light year      d. micron
32. Which of the following is not unit of energy?  
 a. kwh      b. nm      c.  $\text{kgms}^{-1}$       d. joule
33. A person suffering from hypermetropia requires which type of spectacle lenses?  
 a. concave      b. convex      c. concave-concave      d. cylindrical
34. Growth movement in plants in response to external stimulus is known as  
 a. taxis      b. tropism      c. stimulation      d. reaction
35. Which gland is heterocrine in nature?  
 a. Thyroid      b. Pancreas      c. Adrenal      d. Pituitary
36. Chromosome divides into two daughter chromosomes in ..... of mitosis.  
 a. prophase      b. metaphase      c. anaphase      d. telophase
37. Pairing of homologous chromosomes is known as  
 a. synapsis      b. tetrads      c. dyads      d. crossing over
38. The solution of calcium hydroxide is also called as  
 a. quick lime      b. slaked lime      c. lime water      d. both 'b' and 'c'
39. Audible range of frequency is  
 a. 20Hz to 20KHz      b. 200Hz to 2000Hz  
 c. 20Hz to 10KHz      d. 2000Hz to 20KHz
40. Which of the following is the unit of electric charge  
 a. Volt      b. Newton      c. Coulomb      d. Ampere

41. Choose the one which best expresses the meaning of the idiom in bold type in the sentence "He came up with a new idea about marketing but he was severely criticized."  
 a. introduced      b. tried to convince others  
 c. rejected      d. criticized
42. He is ..... MA student.  
 a. a      b. an      c. the      d. nothing
43. A place where monks stay .....  
 a. dower      b. monastery      c. igloo      d. chalet
44. A workman who sells miscellaneous articles in the open .....  
 a. vendor      b. blacksmith      c. shopkeeper      d. technocrat
45. Saturday was the day ..... it rained heavily.  
 a. which      b. where      c. when      d. whose
46. I shouldn't drink that wine if I .....you.  
 a. was      b. had been      c. am      d. were
47. Choose the synonym to replace the word in bold type. "The indiscriminate cutting of trees has resulted in poor monsoons in Nepal."  
 a. careful      b. extravagant      c. unselective      d. wasteful
48. He had purchased a plot in this colony. The interrogative form of the given statement is .....  
 a. Has he purchased a plot in this colony?  
 b. Did he purchased a plot in this colony?  
 c. Had he purchased a plot in this colony?  
 d. Was a plot purchased by him in this colony?
49. If the plural of key is keys, the plural of loaf is .....  
 a. leafs      b. leafes      c. leaves      d. leaves
50. Do you know ..... ?  
 a. how to type      b. to type      c. to typing      d. to typed
51. The plural form of the noun "ox" is.....  
 a. oxs      b. oxes      c. oxesses      d. oxen
52. Choose the correct sentence.  
 a. It was well said.      b. It was said well.  
 c. It was said well by her.      d. It is said well.
53. You would have seen my garden at its best if you .....here last week.  
 a. had been      b. were      c. was      d. have had

54. My sister lives in London .....  
a. So did mine.      b. Mine also.      c. So does mine.      d. Mine did also
55. The Principal, as well as other teachers, .....present in the programme.  
a. are      b. am      c. is      d. were
56. Were you impressed by her answer?  
a. Do her answer impress you?      b. Were her answer impressed you?  
c. Was her answer impress you?      d. Did her answer impress you?
57. The indirect form of: He said, "I clean my teeth twice a day." is .....  
a. He said that he cleaned his teeth twice a day.  
b. He said that he used to clean his teeth twice a day.  
c. He said that he has the habit of cleaning his teeth twice a day.  
d. He said he cleans his teeth twice a day.
58. The noun form of the word 'popular' is.....  
a. popularize      b. population      c. popularity      d. popularizing
59. He can't reach the shelf. He is short. Which sentence has the same meaning?  
a. He is enough short to reach the shelf.  
b. He is short enough to reach the shelf.  
c. He is tall enough short to reach the shelf.  
d. He isn't tall enough to reach the shelf.
60. Choose the correct spelling from the given alternatives.  
a. comitte      b. comittee      c. commitee      d. committee

**Subject: Mathematics**

**F.M.: 40**

61. If  $S_n = S_{n-1} + S_{n-2} - 1$ , what is  $S_4$  when  $S_0 = -10$  and  $S_2 = 3$ ?  
a. -3      b. 0      c. 9      d. 10
62. The value of  $k$  for which  $x^2 - 5x + k$  is divisible by  $(x-3)$  is  
a. 4      b. 5      c. 6      d. 7
63. In an A.P., 5 times the 5<sup>th</sup> term is equal to 8 times the 8<sup>th</sup> term, its 13<sup>th</sup> term is  
a. 0      b. 1      c. 12      d. 2
64. If 1,  $x$ ,  $y$ ,  $z$ , 16 are in G.P., what is the value of  $x + y + z$  ?  
a. 8      b. 12      c. 14      d. 16
65. 1% of 200% of 360 is what percent of 0.1% of 60?  
a) 120%      b. 1200%      c. 12000%      d. 12%
66. If  $f(x) = \begin{cases} 4x+1 & \text{for } x < 2 \\ 1-x & \text{for } x \geq 2 \end{cases}$ , find the value of  $f(2)$ .  
a. 1      b. 9      c. -1      d.  $\frac{1}{4}$

67. The expression  $x*y$  is defined as  $\frac{x^2}{y}$  where  $y \neq 0$ . What is the value of  $9*(6*2)$ ?  
a.  $\frac{1}{2}$       b.  $\frac{9}{4}$       c.  $\frac{9}{2}$       d. 18
68. Find the equation of a circle concentric with the circle  $x^2 + y^2 - 8x + 12y + 15 = 0$  and passing through the point (5, 4).  
a.  $x^2 + y^2 - 8x + 12y + 20 = 0$       b.  $x^2 + y^2 - 8x + 12y + 19 = 0$   
c.  $x^2 + y^2 - 8x + 12y + 15 = 0$       d.  $x^2 + y^2 - 8x + 12y - 49 = 0$
69. What is  $x$ -intercept in the equation  $y = mx + c$  ?  
a.  $c$       b. 0      c.  $-\frac{c}{m}$       d.  $\frac{c}{m}$
70. If a matrix A has order  $m \times n$  and B has order  $p \times q$  then the order of  $AB$  is  
a.  $m \times p$       b.  $m \times q$       c.  $n \times p$       d. answer cannot be determined
71. If  $\vec{a} + \vec{b} + \vec{c} = 0$ ,  $|\vec{a}| = 8$ ,  $|\vec{b}| = 5$  and  $|\vec{c}| = \sqrt{129}$ , find the angle between  $\vec{a}$  and  $\vec{b}$ .  
a.  $0^\circ$       b.  $30^\circ$       c.  $45^\circ$       d.  $60^\circ$
72. What is the area of a circle whose circumference is  $\pi$  ?  
a.  $\frac{\pi}{4}$       b.  $\frac{\pi}{2}$       c.  $\pi$       d.  $2\pi$
73. Two straight lines  $y = m_1x + c_1$  and  $y = m_2x + c_2$  are parallel if  
a.  $m_1 + m_2 = 0$       b.  $m_1 - m_2 = 0$       c.  $m_1x \cdot m_2 = 1$       d.  $m_1 \neq m_2$
74. 8 is  $\frac{1}{3}\%$  of what number?  
a. 0.24      b. 2.4      c. 240      d. 2400
75. Which of the following cannot be expressed as the sum of two prime numbers?  
a. 8      b. 9      c. 10      d. 11
76. If  $R_1$  represents reflection in x-axis and  $R_2$  represents the reflection in y-axis, find  $R_1 \circ R_2(5, -4)$ .  
a. (-5, 4)      b. (5, -4)      c. (-5, -4)      d. (4, 5)
77. The value of  $\tan 70^\circ - \tan 20^\circ$  is  
a.  $\tan 50^\circ$       b.  $2\tan 50^\circ$       c.  $\cot 50^\circ$       d.  $2\cot 50^\circ$
78. The average of  $x$  and  $y$  is 55, the average of  $y$  and  $z$  is 75. What is the value of  $z-x$ ?  
a. 65      b. 20      c. 130      d. 40

79. Find the rate of simple interest when a sum of money triple itself in 25 years.

- a. 4%                      b. 10%                      c. 8%                      d. 12%

80. If  $4^{w+3} = 8^{w-1}$ , what is the value of  $w$ ?

- a. 0                      b. 9                      c. 2                      d. 1

81. If  $\sin x = \frac{1}{2}$  then  $\tan 2x$  is equal to

- a.  $\sqrt{3}$                       b.  $\frac{1}{\sqrt{3}}$                       c.  $2\sqrt{2}$                       d.  $\sqrt{2}$

82. What is the probability of getting 53 Sundays in a non leap year?

- a.  $\frac{1}{7}$                       b.  $\frac{2}{7}$                       c.  $\frac{3}{7}$                       d.  $\frac{4}{7}$

83. The integers  $x$ ,  $y$  and  $z$  are consecutive even integers between 23 and 33. What is the average of  $x$ ,  $y$  and  $z$ ?

- a. 24                      b. 25                      c. 25.5                      d. 28

84. In the figure,  $M$  and  $N$  are the mid points of two sides of square  $ABCD$ . What is the perimeter of the shaded region?

- a. 3                      b.  $2+3\sqrt{2}$                       c.  $3+2\sqrt{2}$                       d. 5

85. In an election a candidate secures 35% votes and is defeated by the other candidate by a margin of 450 votes. Find the number of votes.

- a. 1000                      b. 1500                      c. 2000                      d. 2500

86. If the sum of five consecutive integers is  $S$ , what is the largest of those integers in terms of  $S$ ?

- a.  $\frac{S-10}{5}$                       b.  $\frac{S+4}{4}$                       c.  $\frac{S+10}{5}$                       d.  $\frac{S-5}{2}$

87. If  $a = 16b$  and  $b$  is a Prime number greater than 2, how many positive distinct factors does  $a$  have?

- a. 5                      b. 20                      c. 15                      d. 2

88.  $\frac{5}{8}$  of 24 is equal to  $\frac{15}{7}$  of what number?

- a. 7                      b. 8                      c. 15                      d.  $\frac{7}{225}$

89. If CP of 20 chairs is same as the SP of 16 such chairs, the loss or gain percentage is

- a. 25%                      b. 20%                      c. 15%                      d. 30%

90. The longest chord of a circle is

- a. radius                      b. diameter                      c. secant                      d. tangent

91. If the diameter of the circle is 36, what is the length of arc  $ABC$ ?

- a. 8                      b.  $8\pi$                       c.  $28\pi$                       d.  $32\pi$

92.  $A$  and  $B$  can do a piece of work in 20 days. If  $A$  alone can do the whole work in 36 days, in how many days will  $B$  finish the work alone?

- a. 20 days                      b. 30 days                      c. 40 days                      d. 45 days

93. The graphs of the equation  $3x + 6y = 9$  and  $9x + 18y = 27$  are

- a. coincident                      b. parallel                      c. intersecting                      d. perpendicular

94. In a continuous series the mean of 40 observation was 30. If a class interval 5 - 15 having frequency 10 is included in the series, find new mean.

- a. 20                      b. 25                      c. 26                      d. 30

95. A card is drawn randomly from a deck of 52 cards, find the probability of getting red faced card.

- a.  $\frac{5}{26}$                       b.  $\frac{1}{13}$                       c.  $\frac{2}{13}$                       d.  $\frac{3}{26}$

96. In the adjoining figure,  $O$  is the centre of a circle. What is the value of  $x$ ?

- a.  $20^\circ$                       b.  $25^\circ$                       c.  $45^\circ$                       d.  $15^\circ$

97. If  $x$  represents digit at unit place and  $y$  represents the digit at tens place, the number consisting two digits is:

- a.  $xy$                       b.  $10x+y$                       c.  $10y+x$                       d.  $x+y$

98. The shaded region in the diagram is

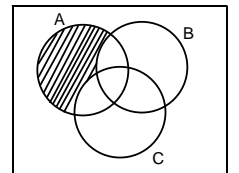
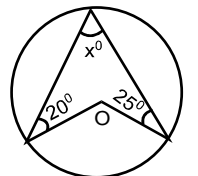
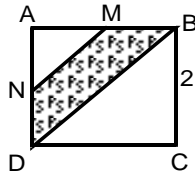
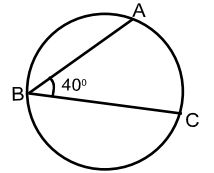
- a.  $(A \cup B) \cap C$                       b.  $(A \cup B) \cup C$   
c.  $A \cap (B \cup C)^c$                       d. None of above

99. If  $a$  is increased by 25% and  $b$  is decreased by 25%, the resulting number will be equal. What is the ratio of  $a$  to  $b$ ?

- a.  $\frac{3}{5}$                       b.  $\frac{3}{4}$                       c.  $\frac{1}{1}$                       d.  $\frac{5}{3}$

100. If there are 24 white marbles and 36 blue marbles in a bag, what is the ratio of blue to white marbles?

- a.  $\frac{2}{3}$                       b.  $\frac{3}{2}$                       c.  $\frac{4}{9}$                       d.  $\frac{9}{4}$



**Best of Luck**