1. What is the SI unit of electrical power?
1. Which one of the following letters is the correct pronunciation of ‘A’?
   a. W  b. J  c. K  d. A

2. A circuit contains two unequal resistances in parallel
   a. current is same in both  b. large current flows in larger resistor
   c. potential difference across each is same  d. none of these

3. When resistances are connected in series:
   a. current flowing through all resistors is same  b. voltage across all resistor can be different
   c. both (a) and (b)  d. voltage is same

4. Good conductors have loosely bound:
   a. electrons  b. protons  c. neutrons  d. atoms

5. Correct relation between current and potential difference is:
   a. V=IR  b. R=V/I  c. I=V/R  d. all of these

6. The R in Ohm’s Law stands for:
   a. conductance  b. resistance  c. resistivity  d. conductivity

7. Breaking down of water in presence of electricity is called…? a. Electrolyte b. Electroplating c. Hydrolysis d. can’t say

8. A fuse wire has:
   a. high melting point  b. low melting point  c. high specific resistance  d. both (b) and (c)

9. The amount of work done in joules, when one unit electric charge moves from one point to another point in an electric circuit is called:
   a. electric current  b. electric resistance  c. electric conductance  d. potential difference

10. How can we increase pressure?
    a. by reducing surface area  b. increasing surface area  c. reducing force  d. none of these

11. Which one of the following devices can be used to measure pressure?
    a. Thermometer  b. pressure cooker  c. radiometer  d. barometer

12. Which one of the following types of weather is associated with low pressure?
    a. dry and sunny  b. cold  c. frosty  d. wet and windy

13. Density of salt water is ______ than the average density of a human body
    a. less  b. more  c. equal  d. less or equal

14. The largest value of static friction is called as
a. Sliding friction    b. Kinetic friction    c. Limiting friction    d. Rolling friction

15. If the force on the surface is doubled and the area is reduced to half, pressure
a. become 2 times    b. becomes 3 times    c. becomes 4 times    d. remain unchanged

16. The pressure due to atmosphere is $5 \times 10^3$ pa. Find the force exerted by the atmosphere on the top surface of a table 2.0 m long and 1.0 m wide.

a. $10 \times 10^3$ pa    b. $2.02 \times 10^3$ pa    c. $2.5 \times 10^3$ pa    d. $10 \times 10^5$ pa

17. As the depth increases in river, pressure……

a. First increases, then decreases    b. Increases    c. Decreases    d. Remains constant

18. The weight of an object is 12 kgf. Express it in SI units.

a. 115.6    b. 117.4    c. 117.6    d. 116.7

19. Smallest planet in our solar system is


20. _________ of a substance is the ratio between the density of substance and the density of water.

a. specific gravity    b. pressure    c. gravity    d. none

21. Pressure in fluids is dependent on _____

a. area    b. density    c. depth    d. both (b) and (c)

22. The natural satellite of earth is:

a. moon    b. sun    c. venus    d. Jupiter

23. Planets shines because:

a. it has its own light    b. it twinkle at night    c. it has fire on it    d. it reflects light received from the sun

24. Planets that lie closer to the sun than the earth are called:

a. outer planets    b. inferior planets    c. superior planets    d. inner planets

25. To be a planet in our solar system an object must be:

a. very close to sun    b. reflect light from sun    c. in orbit around sun    d. both (a) and (b)

26. Which of the following substances is used in place of sulphuric acid in foam type fire extinguisher?

(a) Saponin    (b) Aluminium Sulphate    (c) Sodium Carbonate    (d) Alcohol

27. Which of the following is used for cutting and grinding tools?

(a) Diamond    (b) Graphite    (c) Coke    (d) Coal
28. Coke can be used as
   (a) An oxidizing agent   (b) A household fuel   (c) Printer ink   (d) Electrodes

29. In diamond, the C-atoms are arranged in:
   (a) Octahedral   (b) Tetrahedral   (c) Planar   (d) Trigonal

30. Which of the following gases can turn lime water milky?
   (a) Carbon Dioxide   (b) Oxygen   (c) Carbon Monoxide   (d) Nitrogen Dioxide

31. Coal on destructive distillation gives:
   (a) Charcoal   (b) Coke   (c) Carbon Black   (d) Animal Charcoal

32. The number of Carbon atoms in Fullerene is -
   (a) 60   (b) 50   (c) 40   (d) 30

33. Which of the following forms of carbon is not a crystalline one?
   (a) Diamond   (b) Charcoal   (c) Graphite   (d) Fullerene

34. Select the lightest gas:
   (a) Hydrogen   (b) Oxygen   (c) Heavy hydrogen   (d) Nitrogen

35. Who called hydrogen as “inflammable air”?
   (a) Henry Cavendish   (b) Lavoisier   (c) Priestley   (d) none of these

36. In free state, hydrogen is present in:
   (a) Natural Gas   (b) Sun   (c) Petroleum   (d) Mineral Salts

37. In metallurgy hydrogen is used:
   (a) As an oxidizing agent   (b) As a reducing agent
   (c) Both as oxidizing agent and as reducing agent   (d) None of these

38. The process of removing oxygen from the compound containing oxygen is called:
   (a) Oxidation   (b) Synthesis   (c) Reduction   (d) Displacement

39. Hydrogen removes metals from:
   (a) metal sulphates   (b) metal oxides   (c) metal nitrates   (d) metal sulphides

40. Hydrogen is used as rocket fuel in which of the following states?
   (a) Solid   (b) Liquid   (c) Semi-solid   (d) Gas

41. Ammonia is manufactured from Hydrogen and Nitrogen by which process?
(a) Cavendish process          (b) Avogadro’s process
(c) Haber’s process           (d) None of these

42. Carbon dioxide impurity is removed from hydrogen during its purification by passing it through:
   (a) Silver Nitrate Solution    (b) Lead Nitrate Solution
   (c) Caustic potash           (d) Calcium chloride

43. Acids taste:
   (a) Sweet                      (b) Sour               (c) Salty          (d) Bitter

44. Which of the following is used in cooking?
   (a) Sodium Chloride           (b) Potassium Bromide
   (c) Copper Sulphate           (d) Ammonium Nitrate

45. Which of the following bases is used in antacids?
   (a) Potassium Hydroxide       (b) Sodium Hydroxide
   (c) Calcium Hydroxide         (d) Magnesium Hydroxide

46. Alkalis react with ammonium salts to liberate:
   (a) Hydrogen                   (b) Water vapour
   (c) Ammonia                    (d) Oxygen

47. Bases turn methyl orange:
   (a) Red                              (b) Blue
   (c) Yellow                           (d) Pink

48. Which of the following is used in Aqua Regia?
   (a) Sulphuric Acid               (b) Hydrochloric Acid
   (c) Acetic Acid                  (d) Lactic Acid

49. Acids react with metals to liberate:
   (a) Hydrogen                   (b) Carbon Dioxide
   (c) Carbon Monoxide            (d) Water vapour

50. Acids turn litmus:
   (a) Red                              (b) Blue
   (c) Green                           (d) Yellow

51. Write the cardinal number of the following set:
    \[ J = \{ x \mid x = a^2, -1 \leq a \leq 0, a \in \mathbb{Z}\} \]
   a) 3     b) 1     c) 0       d) 2

52. Given \( U = \{ x \mid x = 3a, a \leq 10, a \in \mathbb{N} \text{ and } x \in \mathbb{N}\} \), write the complement of the following subset:-
\[ C = \{ x \mid x = 6a, a < 6, a \in \mathbb{N} \} \]

\begin{enumerate}
\item a) \{3,9,15,21,27\}  
\item b) \{6,12,18,24,30\}  
\item c) \{6,12,18,24,30,36\}  
\item d) \{3,6\}  
\end{enumerate}

53. Given \( U = \{ x \mid x \text{ is a letter in the word MATHEMATICIAN} \} \), write the following subset ?
\( E = \{ x \mid x \text{ is a consonant in the word THEMATIC} \} \)
\begin{enumerate}
\item a) \{M,A,T,H,E,I,C,N\}  
\item b) \{T,H,M,C\}  
\item c) \{N\}  
\item d) \{A,E,I\}  
\end{enumerate}

Q 54-Q 57:

Given that \( U \) contains 25 elements and subsets \( A \) and \( B \) contain 12 and 14 elements, respectively, with 4 elements common to \( A \) and \( B \), find the following :

54. \( n(B') \)
\begin{enumerate}
\item a) 11  
\item b) 14  
\item c) 10  
\item d) 8  
\end{enumerate}

55. \( n(A \cap B) \)
\begin{enumerate}
\item a) 0  
\item b) 22  
\item c) 7  
\item d) 4  
\end{enumerate}

56. \( n(A \cup B)' \)
\begin{enumerate}
\item a) 8  
\item b) 3  
\item c) 21  
\item d) 22  
\end{enumerate}

57. \( n(A - B) \)
\begin{enumerate}
\item a) 4  
\item b) 18  
\item c) 8  
\item d) 12  
\end{enumerate}

58. Two sets are said to be equivalent if they have :  
A) same elements  
B) same number of elements  
C) more than one common element  
D) one common element

59. Set \( A \) is a subset of set \( B \) if every element of \( A \) is in \( B \), i.e there is no element in \( A \) which is not in \( B \). Denoted by :
\begin{enumerate}
\item a) \( A \subset B \)  
\item b) \( A \leq B \)  
\item c) \( A \supset B \)  
\item d) \( A < B \)  
\end{enumerate}

60. If there are \( 'n' \) elements in a set, the total number of subsets is :
\begin{enumerate}
\item a) \( 2^n \)  
\item b) \( n^2 \)  
\item c) \( 2n \)  
\item d) \( n^n \)  
\end{enumerate}

61. A train traveling at 100 kmph overtakes a motorbike traveling at 64 kmph in 36 seconds. What is the length of the train in meters?
\begin{enumerate}
\item a) 144m  
\item b) 360m  
\item c) 400m  
\item d) 164 m  
\end{enumerate}

62. Raj covers half of the journey at 20 kmph and the balance at 40 kmph taking total of \( x \) hours to cover the distance of 400 km. Find \( x \)?
\begin{enumerate}
\item a) 12 hours  
\item b) 13 hours  
\item c) 14 hours  
\item d) 15 hours  
\end{enumerate}

63. By walking at \( 1/2^{th} \) of his usual speed, a man reaches office 20 minutes later than usual. What is his usual time?
\begin{enumerate}
\item a) 30 min  
\item b) 20 min  
\item c) 70 min  
\item d) 50 min  
\end{enumerate}
64. A train travelling at a speed of 45km/hr reaches Chennai from Howrah (a distance of 180 km). On the return journey its speed is 36km/hr. Find the average speed of the train in the two journeys.

a) 40.5km/hr  
 b) 37 km/hr  
 c) 39km/hr  
 d) 40km/hr

65. A man travels 100 kms in 5 hrs and another 200 km in 15 hrs. Find the average speed.

a) 15 km/hr  
 b) 10 km/hr  
 c) 20 km/hr  
 d) none of these

66. A 400m long train is running at the speed of 60km/hr. It crosses a bridge of length 800m in:

a) 6\frac{2}{3} seconds  
 b) 20 seconds  
 c) 2 seconds  
 d) 72 seconds

67. A train travelling at 90km/hr, is able to pass a telegraph post in 10 seconds. The length of the train is:

a) 250 meters  
 b) 240 meters  
 c) 242 meters  
 d) 245 meters

68. At what percent per annum, simple interest will double a sum of money in 12 years?

a) 8\frac{1}{3} %  
 b) 24%  
 c) 25\%  
 d) 8.25%

69. A sum of Rs. 500 was lent for 2 years at 2% simple interest. The interest for two years will be:

a) Rs. 20  
 b) Rs.25  
 c) Rs.50  
 d) Rs.20.20

70. Compute the simple interest on Rs. 1000 for 2 years at 10% per annum.

a) Rs. 315  
 b) Rs.200  
 c) Rs.100  
 d) None of these

71. Reena took a loan of Rs. 1200 with simple interest for as many years as the rate of interest. If she paid Rs. 432 as interest at the end of the loan period, what was the rate of interest?

a) 3.6  
 b) 6  
 c) 18  
 d) cannot be determined

72. A sum of Rs. 12,500 amounts to Rs. 15,500 in 4 years at the rate of simple interest. What is the rate of interest?

a) 5  
 b) 6  
 c) 3  
 d) 4

73. A man took loan from a bank at the rate of 12% p.a. simple interest. After 3 years he had to pay Rs. 5400 interest only for the period. The principal amount borrowed by him was:

a) Rs. 5000  
 b) Rs. 10000  
 c) Rs. 15000  
 d) Rs. 20000

74. A certain amount earns simple interest of Rs. 1750 after 7 years. Had the interest been 2% more, how much more interest would it have earned?

a) Rs. 35  
 b) Rs. 245  
 c) Rs. 350  
 d) cannot be determined

75. A person borrows Rs. 5000 for 2 years at 4% p.a. simple interest. He immediately lends it to another person at 6\frac{1}{4} % p.a for 2 years. Find his gain in the transaction per year.

a) Rs. 125  
 b) Rs. 150  
 c) Rs. 112.50  
 d) Rs. 167.50
76. Blood cells which transport O₂ are-
(a) Thrombocyte  (b) Erythrocyte  (c) Leucocyte  (d) All of these

77. Food prepared by leaves is transported by -
(a) Phloem  (b) Xylem  (c) Cambium  (d) Tracheids

78. The vessel transporting urine from kidney to urinary bladder is -
(a) Pelvis  (b) Urethra  (c) Ureter  (d) Nephron

79. Number of bones in adult human body is –
(a) 206  (b) 306  (c) 406  (d) 236

80. The basic unit of the kidney is –
(a) Henle’s loop  (b) Nephron  (c) Medulla  (d) Cortex

81. The process of the fusion of male and female gametes is called –
(a) fertilization  (b) germination  (c) pollination  (d) None of these

82. The part of the flower which results information of true fruit-
(a) Ovule  (b) Pistil  (c) Ovary  (d) Anther

83. Carpel consists of –
(a) Stigma  (b) Style  (c) Ovary  (d) All of these

84. After fertilization, ovule transforms into-
(a) Seed  (b) Fruit  (c) Embryo  (d) All of these

85. Anemophily is another name for which agent of pollination?
(a) Water  (b) Wind  (c) Insect  (d) Elephant

86. The vessel which carry blood from lungs to heart
(a) Pulmonary artery  (b) Superior vena cava  (c) Pulmonary vein  (d) None of these

87. Which cells help in clotting of blood?
(a) Plasma  (b) Platelets  (c) Leucocyte  (d) Erythrocyte

88. Urine is released out of the body through-
(a) Ureter  (b) Urethra  (c) Urinary Bladder  (d) Only a & b

89. Removal of waste from the body is termed as-
(a) Digestion  (b) Circulation  (c) Excretion  (d) Respiration
90. Renal vein takes the blood away from-
   (a) Lungs   (b) Heart   (c) Liver   (d) Kidney

91. 1 ml of blood contains how much amount of red blood cells in a normal human?
   (a) 5.5 million   (b) 5.4 million   (c) 5.1 million   (d) 5.0 million

92. Study of cartilage is –
   (a) Chondrology   (b) Cytology   (c) Osteology   (d) Neurology

93. Which of the following is not a mode of asexual reproduction?
   (a) Budding   (b) Fragmentation   (c) Fission   (d) Fertilization

94. Mature red blood cells do not have-
   (a) Iron   (b) Nucleus   (c) Haemoglobin   (d) All of these

95. Grafting is a type of-
   (a) Spore formation   (b) Budding   (c) Vegetative propagation   (d) All of these

96. Gametes are found in-
   (a) Stigma   (b) Corolla   (c) Ovule   (d) Calyx

97. Pollen grain landing on the stigma of the same flower, this process will be called-
   (a) Self pollination   (b) Water pollination   (c) Cross pollination   (d) Water pollination

98. The process of seed developing into a plant is termed
   (a) Fertilisation   (b) Germination   (c) Budding   (d) All of these

99. Male reproductive part of flower is called-
   (a) Pistil   (b) Sepal   (c) Stamen   (d) Both a & c

100. Drooping of leaflets of Mimosa pudica is an example of –
    (a) phototropism   (b) geotropism   (c) thigmotropism   (d) hydrotropism

Directions : (1 to 5) In each of the following questions, choose the correct mirror image from alternative (A), (B), (C), (D) of the given words.

101. VINAYAKA   (A) INVAYAKA   (B) AKAYANIV   (C) AKAYANIV   (D) AKAYANIV

102. CONSOLIDATE   (A) ETADILOSNOC   (B) CONSOLIDATE   (C) TAECONSOLID   (D) OCNSOLIDATE

103. PHILOSOPHER   (A) REHPOSOLIHP   (B) PHILOREHPOS   (C) PHILOREHPOS   (D) RHEPOSOLIHP
104 PAMPER
   (A) PAMPER  (B) REPMAP  (C) REPAMP  (D) RPAPME

105 KALINGA261B
   (A) B162AGNILAK  (B) KALINGA261B  (C) KALINGA261B  (D) KALINGA261B

Directions : (106 to 110) In each of the following questions, choose the correct mirror image from alternative (A), (B), (C), (D) of the figure (X)
Directions: (111 to 115) In each of the following question, a figure marked (X) is followed by four figures (A), (B), (C) and (D) which show the possible water images of figure (X). Choose one out of these four figures which shows the correct water image of the figure (X).

111 Monday
   (A) vadnom    (B) νδανμον    (C) λανδονμ    (D) δωνμαλν

112 Wrote
   (A) ωρέθε    (B) ωρόμεθ    (C) ωμόρεθ    (D) ωμόρεθ

113 Player
   (A) βιβλευλ    (B) βιβλευλ    (C) βιβλευλ    (D) βιβλευλ

114 FAMILY
   (A) ΦΑΜΙΛΙΑ     (B) ΦΑΜΙΛΙΑ     (C) ΦΑΜΙΛΙΑ     (D) ΦΑΜΙΛΙΑ

115 U4P15B7
   (A) 6 4 2 1 3 2 (B) 6 4 2 1 3 2 (C) 6 4 2 1 3 2 (D) 6 4 2 1 3 2

116 Which number is on the face opposite 6:
   (A) 1    (B) 2    (C) 3    (D) 4

117 If the total of dots on opposite faces of a cubical block is always 7, find the figure which is correct:
   (A)    (B)    (C)    (D)

118 Find the number of dots on the face opposite the face bearing 3 dots:
   (A) 5    (B) 6    (C) 4    (D) cannot be determined

119 What is the number of dots at the bottom face of the left hand side dice?
120 What is the number of dots on the face opposite 2 dots?

(A) 1  (B) 3  (C) 4  (D) 6

121 A watch reads 4:30. If the minute hand points to West in which direction does the hour hand point?
(A) North-West  (B) South-East  (C) South-West  (D) West

122 Rakesh Started from his house, walked 4 km towards East, then 3 km towards North then 6 km towards South. How far away from his house was he then?
(A) 2 kms  (B) 3 kms  (C) 4 kms  (D) 5 kms

123 Raj walked 20 meters towards South. Then he turned to his left and walked 25 meters. He then turned to his left and walked 20 meters. He again turned to his right and walked 10 meters. At what distance is he from the starting point and in which direction?
(A) 35 meters, East  (B) 35 meters, North  (C) 40 meters, East  (D) 60 meters, East

124 Aadi stand on his head and his face pointing North words, in what direction will his left hand point?
(A) East  (B) West  (C) North  (D) South

125 If east become North-West, North-West become south and so on then what will South become?
(A) North-West  (B) South-West  (C) West  (D) North-East