1. Let $S = \{2,4,6,8.....20\}$, What are the maximum number of subsets of S.

(a) 10 (b) 20

(c) 512 (d) 1024

2. If a set A contains 3 elements and set B Contains 6 elements. Then what is the minimum number of elements that $(A \cup B)$ Can have.

(a) 3 (b) 6

(c) 8 (d) 9

3. What is the value of $\left(\frac{-1+i\sqrt{3}}{2}\right)^{3n} + \left(\frac{-1-i\sqrt{3}}{2}\right)^{3n}$ where $i = \sqrt{-1}$

(a) 3 (b) 2

(c) 1 (d) 0

4. What is $\sqrt{\frac{1+\omega^2}{1+\omega}}$ equal to, wher ω is the cube root of unity.

(a) 1 (b) ω

(c) ω^2 (d) $i\omega$

5. If $(11101011)_2$ is converted to decima System then the resulting number is.

(a) 235 (b) 500

(c) 160 (d) 126

6. Let a, b, c are in AP and $k \neq 0$ be a real number. which of the following are correct.

1. Ka, kb, kc are in AP
2. $K-a, k-b, k-c$ are AP
3. $\frac{a}{k}, \frac{b}{k}, \frac{c}{k}$ are in AP.

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) All of above

7. What is the sum of n terms of the series $\sqrt{2}+\sqrt{8}+\sqrt{18}+\sqrt{32}+.....$

(a) $\frac{n(n-1)}{\sqrt{2}}$ (b) $\sqrt{2}\,n(n+1)$

(c) $\frac{n(n+1)}{\sqrt{2}}$ (d) $\frac{n(n-1)}{2}$

8. If α and β are the roots of the equation $x^2 - 30x + 221 = 0$ what is the value of $\alpha^3 + \beta^3$

(a) 7010 (b) 7110

(c) 7210 (d) 7240

9. If the roots of the equation $x^2 - nx + m = 0$ differ by 1, then which of the following is correct.

(a) $n^2 - 4m - 1 = 0$

(b) $n^2 + 4m - 1 = 0$

(c) $m^2 + 4n + 1 = 0$

(d) $m^2 - 4x - 1 = 0$

10. ${}^{47}C_4 + {}^{51}C_3 + {}^{50}C_3 + {}^{49}C_3 + {}^{48}C_3 + {}^{47}C_3$ is equal to.

(a) ${}^{47}C_4$ (b) ${}^{52}C_4$

(c) ${}^{52}C_5$ (d) ${}^{47}C_5$

11. The number of different words ending and starting with a consonant which can be made out of the letters of word 'EQUATION'.

(a) 5200 (b) 4320

(c) 3000 (d) 2160

12. If the Constant term in the expansion of $\left(\sqrt{x} + \frac{k}{x^2}\right)^{10}$ is 405 then what can be the value of K.

(a) ± 2 (b) ± 5

(c) ± 3 (d) ± 9

13. The number of terms in the expansion of $(x+a)+(x-a)^{100}$ after simplification is.

(a) 202 (b) 101

(c) 50 (d) 51

14. What is the value of $\log_7, \log_7 \sqrt{7\sqrt{7\sqrt{7}}}$ equal to?

(a) $3\log_2 7$ (b) $1-3\log_2 7$

(c) $1-3\log_2 7$ (d) $\frac{7}{8}$

15. If $A=\begin{bmatrix}1 & 2\\ 2 & 3\\ 3 & 4\end{bmatrix}$ and $B=\begin{bmatrix}1 & 2\\ 2 & 1\end{bmatrix}$

then which of the following is correct.

(a) Both AB and BA exist

(b) Neighter AB nor BA exists

(c) AB exists but BA does not exist

(d) AB does not exist But BA exist

16. If $A=\begin{bmatrix}1 & 2\\ 2 & 3\end{bmatrix}$ and $A^2-KA-I_2=0$ where I_2 is the 2×2 identity matrix, then what is the value of $'K'$.

(a) 4 (b) –4

(c) –8 (d) 8

17. If $A=\begin{bmatrix}4 & x+2\\ 2x-3 & x+1\end{bmatrix}$ is symmetric then what is the value of x.

(a) 2 (b) 3

(c) –1 (d) 5

18. The equations $x+2y+3z=1$, $2x+y+3z=2$ and $5x+5y+9z=4$ then which of the following is Correct.

(a) Unique Solution

(b) Infinitely many Solution

(c) No Solution

(d) None of the above

19. If A and B are square matrices of second order such that $|A|=-1$ and $|B|=3$ then what is $|3AB|$ equal to?

(a) 3 (b) –9

(c) –27 (d) None of these

20. What is $\cos 80°+\cos 40°+\cos 20°$ equal to.

(a) 2 (b) 0

(c) 1 (d) –1

21. $\tan 54°$ can be expressed as

(a) $\frac{\sin 9°+\cos 9°}{\sin 9°-\cos 9°}$ (b) $\frac{\sin 9°+\sin 9°}{\sin 9°+\cos 9°}$

(c) $\frac{\sin 36°}{\cos 36°}$ (d) $\frac{\cos 9°+\sin 9°}{\cos 9°-\sin 9°}$

22. If $A+B+C=180°$ then what is $\sin 2A-\sin 2B-\sin 2C$ equal to.

(a) $-4\sin A\sin B\sin C$

(b) $-4\cos A\sin B\cos C$

(c) $-4\cos A\cos B\sin C$

(d) $-4\sin A\cos B\cos C$

23. The equation $\tan^{-1}(1+x)+\tan^{-1}(1-x)=\frac{\pi}{2}$ is Satisfied by

(a) $x=1$ (b) $x=-1$

(c) $x=0$ (d) $x=\frac{1}{2}$

24. From an aeroplane above a straight road the angles of depression of two positions at at a distance 20 m apart on the road are observed to be 30° and 45°. The height of the aeroplane above the ground is .

(a) $10\sqrt{3}\,m$ (b) $10(\sqrt{3}-1)\,m$

(c) $10(\sqrt{3}+1)\,m$ (d) $20\,m$

25. What is the equation of the straight line which is perpendicular to $y=x$ and passes through (3,2).

(a) $x-y=5$ (b) $x+y=5$

(c) $x+y=1$ (d) $x-y=1$

26. What is the acute angle between the lines represented by the equations $y-\sqrt{3}x-5=0$ and $\sqrt{3}y-x+6=0$

(a) 30° (b) 45°

(c) 60° (d) 75°

27. A straight line $x=y+2$ touches the circles $4(x^2+y^2)=r^2$. The value of r is .

(a) $\sqrt{2}$ (b) $2\sqrt{2}$

(c) 2 (d) 1

28. The second degree equation $x^2+4y^2-2x-4y+2=0$ represents ?

(a) A point

(b) An Ellipse

(c) A parabola

(d) A hyperbola

29. The eccentricity of the hyperbola $16x^2-9y^2=1$ is

(a) $\frac{3}{5}$ (b) $\frac{5}{3}$

(c) $\frac{4}{5}$ (d) $\frac{5}{4}$

30. The function $f(x)=\frac{x-1}{x+1}$ what is $\frac{f(x)+1}{f(x)-1}+x$ equal to.

(a) 0 (b) 1

(c) $2x$ (d) $4x$

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31. If $f(x) = \sqrt{25 - x^2}$, then what is the value of $\lim_{x \to 1} \frac{f(x) - f(1)}{x - 1}$?

(a) $\frac{-1}{2}$ (b) $\frac{-1}{3}$

(c) -2 (d) -3

32. If $y = \tan^{-1}\left(\frac{5 - 2\tan\sqrt{x}}{2 + 5\tan\sqrt{x}}\right)$ then what is $\frac{dy}{dx}$ equal to.

(a) $1+1$ (b) 1

(c) -1 (d) $\frac{-1}{2\sqrt{x}}$

33. If $y = x \log x + xe^x$ then what is the value of $\frac{dy}{dx}$ at $x = 1$

(a) $1 + e$ (b) $1 - e$

(c) $1 + 2e$ (d) None of these

34. The maximum value of $\frac{\log x}{x}$ is

(a) e (b) $\frac{1}{e}$

(c) $\frac{2}{e}$ (d) 1

35. $\int \frac{dx}{1 + e^{-x}}$ is equal to.

(a) $1 + e^x + c$

(b) $\log(1 + e^{-x}) + c$

(c) $\log(1 + e^x) + c$

(d) $2\log(1 + e^{-x}) + c$

36. $\int_0^{\pi/2} |\sin x - \cos x| dx$ is equal to

(a) 0 (b) $2(\sqrt{2} - 1)$

(c) $2\sqrt{2}$ (d) $2(\sqrt{2} + 1)$

37. What is the solution of the differential equation $\frac{dx}{dy} + \frac{x}{y} - y^2 = 0$

(a) $xy = x^4 + c$

(b) $xy = y^4 + c$

(c) $4xy = y^4 + c$

(d) $3xy = y^3 + c$

38. What is the value of λ for which the vectors $3\hat{i} + 4\hat{j} - \hat{k}$ and $-2\hat{i} + \lambda\hat{j} + 10\hat{k}$ ane perpendicular?

(a) 1 (b) 2

(c) 3 (d) 4

39. The following frequency distribution

x	1	2	3	4	5	6	7	8
y	3	15	45	57	50	36	25	9

What is the value of median of the distribution.

(a) 4 (b) 5

(c) 6 (d) 7

40. 8 Coins are tossed simultaneously. The probability of getting atleast 6 heads is.

(a) $\frac{7}{64}$ (b) $\frac{57}{64}$

(c) $\frac{37}{256}$ (d) $\frac{229}{256}$

➲ ***Direction:-*** *Read each of the following passage carefully and answer the questions that follow.*

Wild peacock live together in large flocks in the forests of Central Africa. They scratch about in the ground during the day for seeds to eat and at nightfall they fly up to the trees where they perch and sleep. Every peacock has several wives, known as pea1hens. The female birds build their nests on the ground and lay from four to six whitish, sometimes spotted eggs. During the mating season the male utters a harsh raucous cry.

41. 'Perch' in the passage means

(a) rest (b) nest

(c) climb (d) fly

42. Peacock eggs are

(a) pure white (b) whitish

(c) spotted (d) both 'b' and 'c'

43. "Harsh raucous cry" in the passage means

(a) loud cry

(b) deep cry

(c) roaring cry

(d) loud and hoarse cry

➲ ***Direction:-*** *Out of the given alternatives, choose the one that best expresses the meaning of the given word.*

44. SUMPTUOUS

(a) Lavish (b) Fancy

(c) Majestic (d) Irritable

45. DETRIMENTAL

(a) Curse (b) Injure

(c) Evade (d) Harmful

46. WAN

(a) Tired (b) Strong
(c) Cheerful (d) Unhappy

➲ ***Direction:*** *In each of the following questions, choose the word opposite in meaning to the given word.*

47. BELITTLE
(a) Allure (b) Disturb
(c) Entangle (d) Magnify

48. HAUGHTY
(a) Pitiable (b) Scared
(c) Humble (d) Cowardly

49. VIVID
(a) Clear (b) Vague
(c) Sharp (d) Clean

➲ ***Directions:-*** *In the following sentences certain words are jumbled up so that the sentence has lost its proper meaning. For your convenience each sentence is broken into various parts and each part is marked P,Q,R,S. There are four alternatives that follow the question line. You have to find out the correct alternatives the order of which will provide proper meaning to the sentence.*

50. S1: In 1857, fighting broke out all over the country.
P: Everywhere the people rose in rebellion
Q: In march 1858 British troops attacked the fort at Jhansi.
R: Thousands of people were killed on both sides.
S: The British fought back.
S6: The Rani's troops fought back bravely.
(a) PSRQ (b) QSPR
(c) RPSQ (d) SQRP

51. S1: Forecasting the weather has always been a difficult business.
S6: He made his forecasts by watching flights of the birds or the way smoke rose from fire.
P: During a period of drought, streams and rivers dried up, the cattle died from thirst and the crops were ruined.
Q: Many different things affect the weather and we have to study them carefully to make an accurate forecast.
R: Ancient Egyptians had no need of this-weather in the Nile valley hardly ever changes.
S: In early times, when there were no instruments, such as thermometer or the barometer, man looked for tell tale signs in the sky.
(a) PRQS (b) QPRS
(c) QRPS (d) SPQR

52. S1: The earliest reference to the playing card has been found in China, as long ago as the tenth century.
P: They appeared in Italy around 1320.
Q: Long before that the Chinese used paper many of which was similar in design to the playing cards.
R: It is believed that perhaps travelling gypsies introduced them to Europe.
S: In olden days cards were used both for telling fortune and playing games.
S6: The current pack of 52 cards was only regulated in the seventeenth century.
(a) QRSP (b) QSRP
(c) RQSP (d) SQRP

➲ ***Direction:-*** *Four parts of each of the following sentences are given. One of these parts has a mistake somewhere. You have to marks only that part which has a mistake. Mind you, you have only to identify the incorrect portion of the sentences and not to correct it. In case of the sentences having three parts a, b & c No error will form part (d).*

53. Judge in him (a)/ prevailed upon the father (b)/and he sentenced his son to death. (c)/ no error (d)

54. Nine tenths (a)/ of the pillar (b)/ have rotted away. (c)/ no error (d)

55. Ashu, Robin and Kajal (a)/ are making a (b)/ project each other. (c)/ no error (d)

56. Our efforts are aimed (a)/ to bring about (b)/ a reconciliation. (c)/ no error (d)

57. I don't know (a)/ Why don't you (b)/ start work hard on this project. (c)/ no error (d)

➲ ***Direction :*** *Given below are some idioms/phrases followed by four alternatives meanings to each. Select the most appropriate response from the options (a), (b), (c) or (d) and mark your response on the Answersheet accordingly.*

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58. At loggerheads
(a) aloof from each other
(b) disagreeing on everything
(c) abusing each other
(d) agree on everything

59. All moonshine
(a) familiar (b) acceptable
(c) concocted (d) excellent

60. A hard nut to crack
(a) generous (b) difficult
(c) careless (d) kind

61. Consider the following statement
A. The Bengal greiss is highly foliated which is distributed in the Eastern Ghat.
B. The Bundekhand gneiss are massive granitoid.
C. The Archean rocks also accur in the roots of Himalaya Zaskars and Laddakh mountain ranges.
On the basis of the statements which o the following statement is true?
(a) A and B (b) Only B
(c) A and C (d) A, B, C

62. Which of the following is wrongly matched?
(a) Champion series— Karnatka
(b) Champaner series—Gujarat
(c) Clospet series— Madhya Pradesh
(d) Rialo series—Rajasthan

63. Where do Karewas find?
(a) Pir Panjal (b) Vindhayachal
(c) Nilgiri (d) Caimur

64. Where is National Fossil Park located?
(a) Rajasthan (b) Tamilnadu
(c) Kerela (d) Meghalaya

65. Which the following statements is/are correct about the Greater Himalaya
A. Average height is 6000 meter
B. There are many passes in this range.
C. Erosion is, however, effective over the greater Himalaya as compared to the lesser Himalaya
D. They have great/big forest area.
Select the correct answer using the the code given below:
(a) A, B and C (b) A and C
(c) Only B (d) Only A

66. Kharduggala Pass is located—
(a) Laddakh
(b) Manipur
(c) Jammu & Kashmir
(d) Uttarakhand

67. The Highest point of the Eastern Ghat—
(a) Devri Munda (b) Aroya-konda
(c) Sindharaju (d) Nimalgiri

68. Which of the following river basin is the largest?
(a) Godawari (b) Mahanadi
(c) Tapi (d) Brahamputra

69. Which of the following is wrongly matched?

Project	**State**
(a) Rana Pratap Sagar	Rajasthan
(b) Shive river	Karnatka
(c) Hirakund	Andhra Pradesh
(d) Salal hydro Project	Jammu & Kashmir

70. Where is Nafud desert located?
(a) Iran (b) Botswana
(c) Namibia (d) Arab

71. Consider the following statement about Arun Yogiraj
A. He carved Shri Ram Lalla idol installed in Ayodhaya Ram Mandir
B. He has carved 30 feet tall Neta ji Subhash Chandra Boss statuo behind Amar Jawan Jyoti.
C. He has carved Sardar Vallabh Bhai Patel Idol.
(a) A, B and C (b) A and C
(c) B and C (d) A and B

72. Fundamental Duties have been taken from which country?
(a) Former Soviet Union
(b) Japan
(c) America
(d) Britain

73. Who appoints the governor?
(a) Prime Minister
(b) President
(c) Chief Justice
(d) Chief Minister

74. Who was the chairman of the drafting committee of the constituent assembly?
(a) Jawahar Lal Nehru
(b) K.M. Munshi

(c) Sardar Patel
(d) B.R. Ambedkar

75. Which article is called 'Heart of the constitution'?
(a) Article 32 (b) Article 54
(c) Article 19 (d) Article 72

76. What is the tenure of Legislative Assembly?
(a) 05 year (b) 06 year
(c) 03 year (d) 07 year

77. When will National space Day be celebrated?
(a) 22 August (b) 21 July
(c) 21 October (d) 23 August

78. Who was the Project Director of Chandrayan-3?
(a) S.Somnath
(b) P. Veerauthuval
(c) M. Vanitha
(d) S.Kiran Kumar

79. The relation of Gandhi ji was not with which of the following?
(a) Phoneix Farm
(b) Tolstoy Farm
(c) Pavnar Ashram
(d) Sabarmati Ashram

80. Who was the last British General of Indian Army?
(a) Francis Butcher
(b) James Airy
(c) Lionard Addison
(d) Herbert Aston

81. Who was the author Abhigyan Sankuntlam?
(a) Kalidas (b) Patanjali
(c) Vishakhdutt (d) Panini

82. A motor car is moving with a velocity of 108 km/h and it takes 4 sec to stop after the brakes are applied.

Calculate the force exerted by the brakes on the motor car if its mass along with the passengers is 1000 kg.
(a) –7500 N (b) 7500 N
(c) 8000 N (d) –8000 N

83. Conservation of momentums is based upon the following :
(a) First law of motion
(b) Second law of motion
(c) Third law of motion
(d) None of the above

84. Longitudnal waves cannot travel through
(a) Vaccum (b) Solid
(c) Liquid (d) Gas

85. Lamberts Law is related to
(a) Refraction (b) Reflection
(c) Illumination (d) Scattering

86. When a person sitting on a swing stands up on the swing, the frequency of oscillation.
(a) increases
(b) decreases
(c) constant
(d) Does not change

87. Microphone is a device which transforms
(a) Sound signal into current signal
(b) Current signal into sound signal
(c) Light signal into sound signal
(d) Sound signal in light signal

88. Alternating current is converted into direct current by a
(a) by transformer
(b) Dynamo
(c) Oscillator
(d) rectifier

89. Lens is made up of
(a) Flint Glass
(b) Pyrex Glass
(c) Cobalt Glass
(d) Ordinary Glass

90. The sparkling of a diamond is due to
(a) Refraction of Light
(b) Scaltering of Light
(c) Interference of Light
(d) Total internal reflection of Light

91. Milk of Magnesia is—
(a) Sodium bicarbonate
(b) Magnesium Hydroxide
(c) Magnesium Carbonate
(d) Magnesium Sulphate

92. Rusting of Iron takes place
(a) Oxidation (b) Carbonation
(c) Exfoliation (d) Corrosion

93. For extinguishing fire, we use
(a) Marsh gas
(b) Carbon dioxide
(c) Hydrogen
(d) Carbon mono oxide

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94. The number of chambers in a human heart is
(a) Two (b) Three
(c) Four (d) Six

95. What determines the sex of a child—
(a) Rh factor of the father
(b) Rh factor of the mother
(c) Chromosomes of the mother
(d) Chromosomes of the father

96. Where is Dalal street?
(a) Kolkata (b) Mumbai
(c) Delhi (d) Chennai

97. When is world Wetlands day celebrated?
(a) 2nd January (b) 2nd February
(c) 2nd March (d) 2nd April

98. Which of the following leader's biography was being read by Bhagat Singh in his last days of two Jail?
(a) Lenin
(b) Musolini
(c) Abraham Licoln
(d) Hitlar

99. The chief guest on the accassion of the Republic day dated 26th January 2024 was—
(a) The president of the France
(b) The president of America
(c) The President of Malaysia
(d) The Chancellor of Germany

100. Where will the Olympic 2024 be Lasted?
(a) Los Angles (b) Tokyo
(c) Paris (d) London