

TET cum TRT – 2018

TGT - MATHEMATICS

1. National song was first sung at the Calcutta session of the Indian National Congress on
 1. December 29, 1911
 2. **December 27, 1911**
 3. December 11, 1910
 4. December 15, 1905

2. The college of Military Engineering is located in
 1. **Pune**
 2. Dehradun
 3. Shimla
 4. Darjeeling

3. India's longest highway Tunnel is
 1. Bolan Tunnel
 2. Kyber Tunnel
 3. **Chennai –Nashri Tunnel**
 4. Jojila Tunnel

4. This country was withdrawn from U.N in 1965

1. India
2. Pakistan
3. Brazil
4. **Indonesia**

5. European flag has a circle of

1. 100 silver stars
2. **12 gold stars**
3. 50 diamond stars
4. 75 gold stars

6. We get Vitamin A from the following

1. Beetroot
2. Lemon
3. **Yellow fruit**
4. Pulses

7. This melted rock becomes Lava

1. **Magma**
2. Iron
3. Lithium
4. Nickel

8. Expanded form of UNESCO
1. United Nations Educational Scientific and Curricular Organisation
 2. United National Entertainment Scientific and Cultural Organisation
 3. **United Nations Educational Scientific and Cultural Organisation**
 4. United Nations Enjoyment and Scientific and Cultural Organisation
9. Eden Gardens stadium is located at
1. Karnataka
 2. **Kolkatta**
 3. Chennai
 4. Hyderabad
10. In this year iPhone was first released
1. 2010
 2. 2006
 3. 2014
 4. **2007**
11. This tree's bark is used to produce aspirin
1. Palm
 2. Neem
 3. **White Willow tree**
 4. Olive

12. Bengal's sorrow
1. **Dhamodhar River**
 2. Sone River
 3. Padma River
 4. Ganga River
13. Who is considered as father of Psychoanalysis
1. **Sigmund Freud**
 2. Froebel
 3. Armstrong
 4. Rousseau
14. 'Padma' awards are given by
1. The Vice President of India
 2. The Prime Minister of India
 3. The Chief Justice of Supreme Court of India
 4. **The President of India**
15. Grand old man of India
1. LalaLajpat Rai
 2. Rabindranath Tagore
 3. **Dadabhai Naoroji**
 4. Bal GangadarTilak

16. The Headquarters of a Hindi News Paper 'Navbharat Times' is at
1. **Mumbai**
 2. Allahabad
 3. Chennai
 4. Kolkata
17. NCERT signed a pact with this company for internet safety training in schools
1. Face book
 2. Whats App
 3. **Google**
 4. Apple
18. The winner of the 2017 French open Men's singles title is
1. Leander Paes
 2. **Rafael Nadal**
 3. Bopanna
 4. Mahesh Bhupathi
19. Elephant Falls is situated at
1. Simla
 2. **Shillong**
 3. Cherrapunji
 4. Patna

20. The minimum age for IAS entrance is
1. 18 years
 2. 22 years
 3. 17 years
 4. **21 years**
21. During Vedic Education, the students who were keen to pursue the quest of truth and supreme knowledge, enriched their mind in this institution. Name the institution.
1. Sammelan
 2. **Parishad**
 3. Gurukula
 4. Upanishads
22. Which of the following program was introduced by Ishwarbhai Patel Committee 1977?
1. Basic Education
 2. Project Based Home work
 3. **Socially Useful and Productive Work**
 4. Bridge Courses
23. Which of these is correctly matched?
1. General Records- Art works record
 2. **Account Books -Remittance Book**
 3. Correspondence Record-Public Examination Register
 4. Equipment Record- Bill Register

24. Which one is a function of NCERT with respect to Teacher Education?
1. Developing Primary and Secondary Education Curricula
 2. Encouraging parents and society members to take up research in the area of teacher education
 3. Managing University departments
 4. **Disseminating information and new trends in the field**
25. Which one is a protagonist's claim on Private Educational Institutions?
1. Private and minority- oriented Educational Institutions have led to separatism and act as a barrier to bringing the minority population into the mainstream of national life in India.
 2. **Private Educational Institutions are known for student discipline, personality development, good teaching, promotion of extracurricular and sports activities etc.**
 3. Private Educational Institutions cater only to the upper income groups and urban middle class and widened the rich-poor gap and urban rural disparities.
 4. Working and management of Private Educational Institutions have become increasingly politicized.
26. Which of these were established for patrons to donate their books as a part of free distribution of Books scheme launched in 2015?
1. Book Shelves
 2. Book Almirahs
 3. **Book Hundies**
 4. Book Gruha

27. Which one is true about Central Information Commission?
1. Central Information Commission to be constituted by the President in consultation with Supreme Court.
 2. Commission includes one Chief Information Commissioner, one Assistant Information Commissioner and three judges appointed by the Prime Minister of India.
 3. **Oath of Office will be administered by the President of India according to the form set out in the First Schedule.**
 4. Commission will exercise its powers on the direction of the Chief Justice of India.
28. What is the minimum number of working hours per week for the teacher as per RTE Act 2009?
1. 40 teaching including preparation hours
 2. **45 teaching including preparation hours**
 3. 35 teaching including preparation hours
 4. 50 teaching including preparation hours
29. According to NCF 2005, which of the following is NOT a component of comprehensive school health programme included in school curriculum?
1. **vaccination programme**
 2. hygienic school environment
 3. school lunch
 4. health and physical education

30. According to NCF 2005, which one is incorrect about peace education?
1. It inculcates the values, attitudes and skills required for living in harmony with oneself and with others, including nature.
 2. It embodies the joy of living and personality development with the qualities of love, hope and courage.
 3. **It encompasses violation of human rights, justice, tolerance, cooperation, social responsibility, and respect for cultural diversity.**
 4. It encompasses to a firm commitment to democracy and non-violent conflict resolution.
31. To become an engineer, painter, surgeon and the like the type of intelligence required more is
1. Intra personal intelligence
 2. Bodily kinesthetic intelligence
 3. Linguistic intelligence
 4. **Spacial intelligence**
32. The first stage in the creative process is
1. Illumination
 2. **Preparation**
 3. Verification
 4. Incubation

33. Teaching the usefulness of environment in the class can help in forming

1. **Attitude**
2. Personality
3. Motivation
4. Aptitude

34. The attribute that predicts success in a particular field

1. Intelligence
2. Introversion
3. Attitude
4. **Aptitude**

35. Use of demonstration by the teacher in the class, aids in

1. trial and error learning
2. Conditioning
3. **Observational Learning**
4. Motivation

36. Locating information, bringing in to awareness and using is

1. Encoding
2. Chunking
3. **Retrieval**
4. Storage

37. The Psychologist who devised non sense syllables is
1. Thorndike
 2. **Ebbinghaus**
 3. Pavlov
 4. Piaget
38. Records kept of the student's performance in nearly everything he does
1. Terminal examination
 2. Peer evaluation
 3. Subjective assessment
 4. **Continuous assessment**
39. A teacher exhibiting supportive behavior irrespective of what a student says or does is
1. **Unconditional positive regard**
 2. Conditions of worth
 3. Self actualization
 4. Incongruence
40. Knowing what we are feeling in the moment, and using those preferences to guide our decision making is
1. Empathy
 2. **Self awareness**
 3. Motivation
 4. Social skill

Content

41. For doing some work 'A' takes 6 hours less than 'B', but together they can complete the work in 13 hours 20 minutes. Then the time taken by 'B' alone to complete the work is (in hours)
1. 20
 - 2. 30**
 3. 35
 4. 40
42. A machine depreciates every year at the rate of 20% of its value at the beginning of the year. The machine was purchased for ₹ 2,50,000 and when sold was ₹ 1,28,000, then the no. of years that machine used is
1. $2\frac{1}{2}$
 - 2. 3**
 3. 4
 4. $4\frac{1}{2}$

43. A motor boat speed is 9 km/h in still water, goes 12 km down stream and comes back in the time of 3 hours, then the speed of the stream is

1. **3 km/h**
2. 4 km/h
3. 6 km/h
4. 12 km/h

44. If $(a - b) : (a + b) = 1 : 11$ then the ratio of $(5a + 4b + 15) \div (5a - 4b + 3)$ is

1. 6 : 1
2. 6 : 5
3. 1 : 5
4. **5 : 1**

45. If $x = \frac{5 - \sqrt{21}}{2}$ then the value of $x + \frac{1}{x}$ is

1. 2
2. **5**
3. 10
4. $\sqrt{21}$

46. The smallest 5-digit number that exactly divisible by 42, 56 and 70 leaves the remainder 3 is

1. 10000
2. 10077
3. 10080
- 4. 10083**

47. A card is drawn randomly from well shuffled pack of 52 cards then the probability of getting black face card is

1. $\frac{1}{26}$
- 2. $\frac{3}{26}$**
3. $\frac{1}{52}$
4. $\frac{3}{52}$

48. Two dice are thrown simultaneously then the probability of getting a same number on the top of the faces is

1. $\frac{5}{36}$
2. $\frac{1}{12}$
3. $\frac{1}{9}$
- 4. $\frac{1}{6}$**

49. If $x = 7 - 4\sqrt{3}$ then the value of $\sqrt{x} + \frac{1}{\sqrt{x}}$ is

1. 1
- 2. 4**
3. 14
4. 48

50. If $\frac{x+y}{xy} = 2$ and $\frac{x-y}{xy} = 6$ then the value of 'y' is

1. $\frac{-1}{4}$
2. $\frac{-1}{2}$
3. $\frac{1}{3}$
- 4. $\frac{1}{4}$**

51. The remainder when the polynomial $5x^3 - x^2 + 6x - 2$ is divided by $1 - 5x$ is

1. 5
2. $\frac{1}{5}$
- 3. $\frac{-4}{5}$**
4. $\frac{-1}{5}$

52. The distance between the points $(a \cos \theta + b \sin \theta, 0)$ and $(0, a \sin \theta - b \cos \theta)$ is

1. $a^2 + b^2$
2. $a^2 - b^2$
3. $\sqrt{a^2 + b^2}$
4. $a + b$

53. If the midpoint of the line segment joining $A\left(\frac{x}{2}, \frac{y+1}{2}\right)$ and $B(x+1, y-3)$ is $C(5, -2)$ then the values of x and y are

1. $x = -6, y = 1$
2. $x = 1, y = -6$
3. $x = 6, y = -1$
4. $x = -1, y = 6$

54.

| Class | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 |
|-------|-------|-------|-------|-------|-------|
| f | 25 | 30 | 27 | 35 | 21 |

From the above data the sum of the upper limit of the median class and lower limit of the modal class is

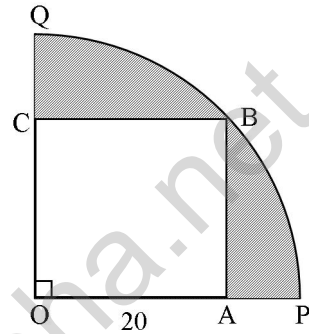
1. 45
2. **50**
3. 55
4. 62

55. If the mean of the following distribution is 6 then the value of P is

| | | | | | |
|-----|---|---|---|----|-------|
| x | 2 | 4 | 6 | 10 | $P+5$ |
| f | 3 | 2 | 3 | 1 | 2 |

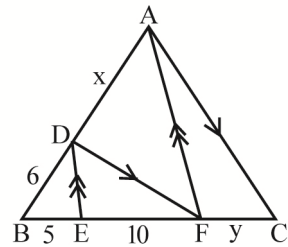
1. 4
2. 5
3. 6
4. 7

56. The adjacent figure OABC is a square inscribed in quadrant of OPBQ. If $OA = 20\text{cm}$ then the area of shaded region is (Take $\pi = 3.14$)



1. **228 cm^2**
2. 400 cm^2
3. 428 cm^2
4. 628 cm^2

57. In the figure $DE \parallel AF$ and $DF \parallel AC$ if $BD = 6\text{cm}$, $BE = 5\text{cm}$, $EF = 10\text{cm}$, then the length of AD and CF are



1. $x = 3, y = 2$
2. $x = 6, y = 15$
3. **$x = 12, y = 30$**
4. $x = 30, y = 12$

58. The diameter of a circle is 10cm. If the length of a chord is 8cm then the distance of a chord from the centre is

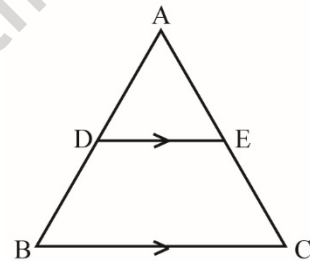
1. 5 cm
2. 4 cm
3. **3 cm**
4. 2 cm

59. If an interior angle of a regular polygon measures 156° then the number of sides of polygon is

1. 18
2. **15**
3. 12
4. 9

60. In the figure, $DE \parallel BC$. If $DE:BC = 3:5$ then the ratio of $\text{ar}(\triangle ADE) : \text{ar}(\text{trap } BCED)$ is

1. 25 : 9
2. 16 : 9
3. 9 : 25
4. **9 : 16**



61. Eight solid spheres of the same size are made by melting a solid metallic cylinder of base diameter 6cm and height 32cm then the diameter of each sphere is

1. 12cm
2. 8cm
3. **6cm**
4. 3cm

62. From the top of the tower, the angle of depression of two points at distance 4m and 9m from the base of the tower are complementary each other. The height of the tower is

1. 12m
2. 8m
3. **6m**
4. 3m

63. The value of $2\left(\frac{\sin 77^\circ}{\cos 13^\circ}\right)^2 + 3\left(\frac{\cos 77^\circ}{\sin 13^\circ}\right)^2 - 2\sec^2 45$ is

1. 4
2. 3
3. **1**
4. 0

64. Sum of first 'n' terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} \dots$ is

1. $\frac{n(n+1)}{2}$

2. $\frac{n(n+1)}{\sqrt{2}}$

3. $\sqrt{2}n$

4. 1

65. The length, breadth and height of a room are 8m 25cm, 6m 75cm and 4m 50cm respectively then the length of the longest rod that can measure the three dimensions of the room exactly is

1. 65cm

2. 70cm

3. **75cm**

4. 85cm

66. If $A = \{x/x = 2a, 3 < a < 8, a \in \mathbb{N}\}$

$B = \{x/x = 3b, b < 5, b \in \mathbb{N}\}$ and $C = \{x/x = C+1, 5 < C < 10\}$

then $n(A - (B \cup C))$ is

1. **1**

2. 3

3. 4

4. 8

67. $\log_2 x + \log_4 x + \log_8 x = \frac{22}{6}$ then the value of 'x' is

1. 0
2. 1
3. 2
4. **4**

68. The solution of $3e^x \cos^2 y dx + (1 - e^x) \cot y dy = 0$ is

1. **Tan y = c (e^x - 1)³**
2. Tan y = c (e^x + 1)³
3. Tan y = c (e^x - 1)²
4. Cos y = c (e^x - 1)³

69. The solution of $(x^2 - 1) \frac{dy}{dx} + 2xy = 1$ is

1. **y (x² - 1) = x + c**
2. y(x² - 1) = x² + c
3. y(x² + 1) = x² + c
4. y²(x² - 1) = x² + c

70. The variance of 35, 40, 42, 36, 27 is

1. 26
2. **26.8**
3. 25.8
4. 26.2

71. A distribution consists of three components with frequencies 45, 40 and 15 having their means 2, 2.5 and 2 respectively. The mean of the combined distribution is
1. 2.1
 2. **2.2**
 3. 2.3
 4. 2.4
72. The arithmetic mean and standard deviation of a set of 9 items are 43 and 5 respectively. If an item of value 63 is added to the set, the new mean of 10 items is
1. **45**
 2. 41
 3. 43
 4. 44
73. Five digit numbers can be formed from the digits 1, 2, 3, 4, 5. If one number is selected at random, the probability that it is an even number is
1. $\frac{4}{7}$
 2. $\frac{2}{5}$
 3. $\frac{7}{16}$
 4. $\frac{1}{16}$

74. Three squares of normal chess board are chosen. Then the probability of getting 2 squares of one colour and the other are different colour is

1. $\frac{16}{21}$

2. $\frac{8}{21}$

3. $\frac{8}{61}$

4. $\frac{16}{61}$

75. X is a poisson variate and $2P(x = 1) = P(x = 2)$. Then $P(x = 2) =$

1. 1

2. $\frac{2}{e^2}$

3. $\frac{1}{e}$

4. $\frac{8}{e^4}$

76. If $f: \mathbb{R} \rightarrow \mathbb{R}$, $g: \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = 3x - 2$, $g(x) = x^2 + 1$ then $(f \circ g)(x^2 + 1) =$

1. $3x^4 + 6x^2 + 4$

2. $9x^2 - 1$

3. $3x^2 + 1$

4. $3x^2 - 1$

77. The domain of $\frac{\sqrt{a+x} + \sqrt{a-x}}{x}$, ($a > 0$) is

1. $[-a, a]$
2. $[-a, 0] \cup (0, a)$
3. $[-a, 0) \cup (0, a]$
4. \mathbb{R}

78.
$$\begin{vmatrix} a & b & ax+by \\ b & c & bx+cy \\ ax+by & bx+cy & 0 \end{vmatrix} =$$

1. $b^2 - ac$
2. $(b^2 - ac)(ax^2 + 2bxy + cy^2)$
3. $ac - b^2$
4. $(ac - b^2)(ax^2 + 2bxy + cy^2)$

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79. The inverse of $\begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ is

1. $\begin{bmatrix} 7 & -3 & -3 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$

2. $\begin{bmatrix} 7 & 3 & -3 \\ 1 & 1 & 0 \\ -1 & 0 & -1 \end{bmatrix}$

3. $\begin{bmatrix} -7 & 3 & -3 \\ -1 & -1 & 0 \\ -1 & 0 & -1 \end{bmatrix}$

4. $\begin{bmatrix} 7 & -3 & -3 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$

80. $(a+b)^3 + (aw+bw^2)^3 + (aw^2+bw)^3 =$

1. $a^3 + b^3$

2. $3(a^3 + b^3)$

3. $a^3 - b^3$

4. $a^3 + b^3 + 3ab$

81. $(1 + \cos \theta + i \sin \theta)^n + (1 + \cos \theta - i \sin \theta)^n =$

1. $2^{n+1} \cos^n \frac{\theta}{2} \cos \frac{n\theta}{2}$

2. $2^n \cos^n \frac{\theta}{2} \sin n \frac{\theta}{2}$

3. $2^{n+1} \sin^n \left(\frac{\theta}{2} \right) \cos^n \frac{\theta}{2}$

4. $2^n \sin^n \frac{\theta}{2} \cos n \frac{\theta}{2}$

82. If $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = 2\frac{1}{6}$ then $x =$

1. $\frac{4}{11}$ or $\frac{7}{11}$

2. $\frac{3}{11}$ or $\frac{5}{11}$

3. $\frac{4}{13}$ or $\frac{9}{13}$

4. $\frac{3}{13}$ or $\frac{5}{13}$

83. The maximum value of $\frac{x}{x^2 - 5x + 9}$ is

1. $-\frac{1}{11}$

2. -1

3. $\frac{1}{11}$

4. **1**

84. If α, β, r are the roots of the equation $px^3 + qx^2 + rx + s = 0$ then $\Sigma\alpha^2\beta^2 =$

1. $\frac{r^2 + 2qs}{p^2}$

2. $\frac{r^2 - 2qs}{p^2}$

3. $\frac{ps + r^2}{p^2}$

4. $\frac{ps - r^2}{p^2}$

85. Find the number of ways of arranging 4 boys and 3 girls around a circle so that all the girls sit together

1. **144**

2. 128

3. 6!

4. 120

86. The number of ways of arranging the letters of the word MATHEMATICS

1. 11!

2. $\frac{11!}{(2!)^3}$

3. $\frac{10!}{(2!)^2}$

4. $\frac{11!}{2!}$

87. The sum of $C_0C_3 + C_1C_4 + C_2C_5 + \dots + C_{n-3}C_n$

1. $2nC_{n+1}$

2. $2nC_{n-1}$

3. **$2nC_{n+3}$**

4. $2nC_n$

88. The approximate value of $\frac{1}{\sqrt[3]{999}} =$

1. 0.2003
2. 0.201
3. 0.1159
4. **0.10003**

89. If O (0, 0), A(3, 4), B(4, 3) are the vertices of a triangle then the length of the altitude from O is

1. $4\sqrt{2}$
2. $7\sqrt{2}$
3. $\frac{7}{\sqrt{2}}$
4. $\frac{7}{2\sqrt{2}}$

90. The area of the triangle formed by the line passing through the points (5, -3) (2, 6) with the coordinate axes is

1. **24 sq.units**
2. $\frac{49}{8}$ sq.units
3. $\frac{1}{2}$ sq.units
4. $\frac{49}{12}$ sq.units

91. If the lines $3x + y + 2 = 0$, $2x - y + 3 = 0$, $2x + ay - 6 = 0$ are concurrent then $a =$

1. 2
2. 4
3. 6
4. **8**

92. If the pair of lines $x^2 - 2pxy - y^2 = 0$ and $x^2 - 4xy - y^2 = 0$ be such that each pair bisects the angle between the other pair, then $p =$

1. **$-\frac{1}{2}$**
2. $\frac{1}{2}$
3. $\frac{1}{3}$
4. $-\frac{1}{3}$

93. If $xy + x + y + 1 = 0$, $x + ay - 3 = 0$ are concurrent, then $a =$

1. 3
2. 4
3. **-4**
4. -3

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94. The equation of the circle with centre (2, 3) and touching the line $3x - 4y + 1 = 0$ is

1. $x^2 + y^2 - 4x - 6y = 0$
2. $x^2 + y^2 - 4x - 6y + 12 = 0$
3. $x^2 + y^2 + 4x + 6y + 12 = 0$
4. $x^2 + y^2 + 4x + 6y - 12 = 0$

95. If (4, k) and (2, 3) are conjugate points with respect to the circle $x^2 + y^2 = 17$ then $k =$

1. 2
2. 4
3. 5
4. 3

96. The angle between the circles $x^2 + y^2 = a^2$, $x^2 + y^2 - ax - ay = 0$ is

1. $\frac{\pi}{2}$
2. $\frac{\pi}{3}$
3. $\frac{3\pi}{4}$
4. $\frac{2\pi}{3}$

97. The focus of the Parabola $x^2 = -4y$ is

1. (4, 0)
2. (0, -1)
3. (0, 1)
4. (0, 2)

98. The condition for the line $lx + my + n = 0$ to be a normal to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is

1. $\frac{a^2}{l^2} + \frac{b^2}{m^2} = \frac{(a^2 - b^2)^2}{n^2}$

2. $\frac{a}{l} + \frac{b}{m} = a^2 - b^2$

3. $a^2l^2 + b^2m^2 = n^2$

4. $\frac{a}{m} + \frac{b}{l} = a^2 + b^2$

99. If A (2, -1, 4), B (0, 1, 5), C (4, 3, 5), D (6, 4, 3) then the length of the projection of \overline{AB} on \overline{CD} is

1. $+\frac{4}{3}$

2. $\frac{3}{4}$

3. $+\frac{2}{3}$

4. $\frac{2}{5}$

100. The area of the triangle formed by $\frac{x}{4} + \frac{y}{3} - \frac{z}{2} = 1$ with x-axis and y-axis is

1. 2

2. 3

3. 6

4. 12

101. If $\sec \theta = a + \frac{1}{4a}$ then $\sec \theta + \tan \theta =$

1. a
2. $2a$
3. $3a$
4. $4a$

102. $\frac{1}{\sin 10^\circ} - \frac{\sqrt{3}}{\cos 10^\circ} =$

1. 1
2. 2
3. 3
4. 4

103. If $A + B + C = 180^\circ$ then $\cos A + \cos B + \cos C =$

1. $1 + 4 \sin \frac{A}{2} \sin \frac{B}{2} \sin \frac{C}{2}$
2. $1 + 4 \cos \frac{A}{2} \cos \frac{B}{2} \cos \frac{C}{2}$
3. $1 + 4 \cos \frac{A}{2} \cos \frac{B}{2} \sin \frac{C}{2}$
4. $1 + 4 \cos \frac{A}{2} \sin \frac{B}{2} \cos \frac{C}{2}$

104. If $\tan^{-1}\left(\frac{x-1}{x-2}\right) + \cot^{-1}\left(\frac{x+2}{x+1}\right) = \frac{\pi}{4}$ then $x =$

1. $\frac{1}{\sqrt{5}}$

2. $\pm \frac{1}{\sqrt{2}}$

3. $\pm \frac{1}{\sqrt{3}}$

4. $\frac{1}{\sqrt{7}}$

105. If the angles of a triangle are in the ratio 1 : 2 : 3, the corresponding sides are in the ratio

1. 2 : 3 : 1

2. $\sqrt{3} : 2 : 1$

3. $2 : \sqrt{3} : 1$

4. $1 : \sqrt{3} : 2$

106. In a ΔABC , $\left(\frac{1}{r} - \frac{1}{r_1}\right)\left(\frac{1}{r} - \frac{1}{r_2}\right)\left(\frac{1}{r} - \frac{1}{r_3}\right) =$

1. $\frac{abc}{\Delta^3}$

2. 0

3. $4R^2$

4. $\frac{1}{r}$

107. Let A (4, 7, 8), B (2, 3, 4) and C (2, 5, 7) be the position vectors of the vertices of a triangle ABC then the length of the internal bisector of the angle at A is

1. $\frac{3\sqrt{34}}{2}$

2. $\frac{2\sqrt{34}}{3}$

3. $\frac{\sqrt{34}}{2}$

4. $\frac{\sqrt{34}}{3}$

108. The angle between the diagonals of the parallelogram with the vectors $2\hat{i} + \hat{j}$ and $\hat{k} - 2\hat{j}$ as adjacent sides is

1. $\frac{\pi}{2}$

2. $\frac{\pi}{6}$

3. $\frac{\pi}{3}$

4. $\frac{\pi}{4}$

109. If $\bar{r} \times \bar{b} = \bar{c} \times \bar{b}$, $\bar{r} \cdot \bar{a} = 0$, $\bar{a} = 2\bar{i} + 3\bar{j} - \bar{k}$, $\bar{b} = 3\bar{i} - \bar{j} + \bar{k}$, $\bar{c} = \bar{i} + \bar{j} + 3\hat{k}$ then $\bar{r} =$

1. $\frac{1}{2}(\hat{i} + \hat{j} + \hat{k})$

2. $2(\hat{i} + \hat{j} + \hat{k})$

3. $2(-\hat{i} + \hat{j} + \hat{k})$

4. $\frac{1}{2}(\bar{i} - \bar{j} + \bar{k})$

110. $[\bar{b} \times \bar{c} \quad \bar{c} \times \bar{a} \quad \bar{a} \times \bar{b}] =$

1. $[\bar{a} \bar{b} \bar{c}]$

2. $2[\bar{a} \bar{b} \bar{c}]$

3. $[\bar{a} \bar{b} \bar{c}]^2$

4. $\bar{0}$

111. $\lim_{n \rightarrow \infty} \left(\frac{1^2+1}{n^3} + \frac{2^2+2}{n^3} + \frac{3^2+3}{n^3} + \dots + \frac{n^2+n}{n^3} \right) =$

1. $\frac{1}{6}$

2. $\frac{1}{4}$

3. $\frac{1}{3}$

4. $\frac{1}{2}$

112. If $x\sqrt{1+y} + y\sqrt{1+x} = 0$, $x \neq y$ then $\frac{dy}{dx} =$

1. $\frac{1}{(1+x)^2}$

2. $\frac{-1}{(1+x)^2}$

3. $\frac{1}{1+x^2}$

4. $\frac{1}{1-x^2}$

113. If $y = \sqrt{\sin x + y}$ then $\frac{dy}{dx} =$

1. $\frac{\cos x}{y-1}$

2. $\frac{\cos y}{x-1}$

3. $\frac{\cos x}{2y-1}$

4. $\frac{\cos y}{2x-1}$

114. If there is an error 0.01 cm. in the measurement of the radius 10 cm of a cylinder of fixed height 20 cm. then error in the volume is

1. **4π cubic cm**

2. 2.5π cubic cm

3. 0.06 cubic cm

4. 0.6 cubic cm

115. If θ is the angle between the curves $y = x^2$, $x = y^2$ at (1, 1) then $\tan \theta =$

1. 3

2. $\frac{3}{4}$

3. $\frac{3}{5}$

4. $\frac{5}{14}$

116. If the product of two positive numbers is 400 then the minimum value of their sum is

1. 8
2. 12
3. 32
4. **40**

117. $\int \frac{x^{24}}{x^{10}+1} dx =$

1. $\frac{1}{5} \left[\frac{x^{15}}{3} - x^5 - \tan^{-1}(x^5) \right]$
2. $\frac{1}{5} \left[\frac{x^{15}}{3} - x^5 + \tan^{-1}(x^5) \right] + c$
3. $\frac{1}{5} \left[\frac{x^{15}}{3} - x^5 + \sin^{-1}(x^5) \right] + c$
4. $\frac{1}{5} \left[\frac{x^{15}}{3} + x^5 + \cos^{-1}(x^5) \right] + c$

118. $\int e^x \left(\frac{1+\sin x}{1+\cos x} \right) dx =$

1. **$e^x \tan x / 2 + c$**
2. $e^x \sec x / 2 + c$
3. $2e^x \tan x / 2 + c$
4. $2e^x \sec x / 2 + c$

119. $\int_0^{\pi/2} \frac{1}{1 + \cot x} dx =$

1. $\frac{\pi}{8}$

2. $\frac{\pi}{4}$

3. $\pi \log_2$

4. $\frac{\pi}{2}$

120. The area bounded by the curve $y = x^2$ and the lines $y = x + 2$, $x = -1$, $x = 2$ is

1. $\frac{9}{2}$

2. $\frac{8}{3}$

3. $\frac{1}{2}$

4. $\frac{1}{3}$

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Methodology

121. The 'Mathematical statement' whose truth hood is self evident is known as

1. Intuition
2. **Postulate**
3. Induction
4. Deduction

122. The Numerals 0, 1, 2, 3, 9 are base for this number system

1. Indo-American system
2. **Hindu-Arabic system**
3. Hindu-Islamic system
4. Hindu-Roman system

123. Pythagoras, the ancient Greek Mathematician, is reported to have constructed a polygon, equivalent to a given

1. Circle
2. Ellipse
3. **Polygon**
4. Triangle

124. One of the following Ancient Indian Mathematician is reported to have stated the Pythagoras theorem thus.

‘The square of bhuja plus square of koti is the square of Karna’.

1. Brahma Gupta
2. Mahaveer
3. Sreedhara
4. **Aryabhata**

125. The Evaluation that will be taken up so as forecast future performances in the specified learning area is known as

1. Performance Evaluation
2. Futuristic Evaluation
3. Proficiency Evaluation
4. **Prognostic Evaluation**

126. It is correct to say that mathematics is the mirror of civilization. This means that, the mathematics subject has

1. Vocational value
2. **Cultural value**
3. Professional value
4. Utilitarian value

127. An instructional objective has to be stated in such a way that it invariably contains

1. behaviour part only
2. content part only
3. behaviour part or content part
4. **both behaviour part and content part in terms of student behaviour modification**

128. In the cognitive domain of educational objectives, the knowledge objective is at the lower level and forms the basis for all higher level objectives. The second objective from top to bottom of cognitive domain is

1. Comprehension
2. Application
3. **Synthesis**
4. Analysis

129. While teaching the mathematics, whole of the external world may be brought into the classroom by using

1. Slide projector
2. **Educational television**
3. Visual symbols
4. Still pictures

130. Talented children in mathematics may be identified by

1. **Gathering opinion of present and former teacher**
2. Taking interview of parents or guardian
3. Consulting siblings and other family members
4. Correcting view of friends and peer groups

131. In this step of Herbart, the actual teaching takes place and gradually builds the new concepts

1. Recapitulation stage
2. Preparation stage
3. **Presentation stage**
4. Motivation stage

132. Besides curricular activities, the annual plan gives the details of
1. Co-educational activities
 2. Co-teacher's activities
 3. **Co-curricular activities**
 4. Extra-student activities
133. The International Mathematic Olympiad is a
1. **Individual competition**
 2. Continental competition
 3. Intra continental competition
 4. International competition
134. The method which proceeds from particular cases to general cases is known as
1. Heuristic method
 2. Analytic method
 3. **Inductive method**
 4. Synthetic method
135. The line of reasoning that can be found in synthetic method may be stated thus
1. **If A is true, then B is true**
 2. If A is true, then B is not true
 3. If A is not true, then B is true
 4. If A is true, B is true, C is not true

136. In Heuristic method the pupil will be kept in the place of
1. **a discoverer**
 2. a teacher
 3. a doctor
 4. an engineer
137. 'A project is a problematic act, carried to completion in its most natural setting' – defined by
1. Dr. Kil Patrick
 2. **J.A. Stevenson**
 3. J.A. Johnson
 4. Ballord
138. In defining the curriculum, 'Cunningham' compared the role of the teacher to that of
1. **an artist**
 2. an artisan
 3. a dancer
 4. a painter
139. The English word 'Curriculum' was derived from the Latin word 'Currere' which means that 'the curriculum' is comparable to
1. Course to travel
 2. Path to study
 3. Track to run
 4. **Course to run**

140. One of the following ancient civilizations are believed to have used the sexagesimal numeral system
1. Sumerians
 2. **Babylonians**
 3. Mongolians
 4. Egyptians
141. In his book, 'Aryabhateeyam', Aryabhata, the famous Indian, ancient mathematician, is reported to have given the formula to find the sum of
1. First 'n' natural numbers
 2. First 'n' even natural numbers
 3. First 'n' odd natural numbers
 4. **Squares of first 'n' natural numbers**
142. 'A smallest number which can be expressed as a sum of cubes of two natural numbers in two different ways' is known as
1. RangaRajan number
 2. Ranganadhan number
 3. **Ramanujan number**
 4. Srinivasan number
143. The main purpose of Formative Evaluation is to provide feedback to
1. Parents and the teachers
 2. Teachers and the Government
 3. **Students and the teacher**
 4. Government and the parents

144. In a multiple choice test item, the stem can be in the form of a
1. **a question or incomplete statement**
 2. a complex or complicated statement
 3. a distracter or a false indirect statement
 4. Ambiguous and complete statement
145. There are many interesting puzzles, riddles and designs which serve not only as source of knowledge, but also sources of pleasure and happiness. They indicate that mathematics has
1. **Aesthetic value**
 2. Intellectual value
 3. Symmetrical value
 4. Disciplinary value
146. While stating an instructional objective, care should be taken that it should contain only one
1. **Action verb**
 2. Auxiliary verb
 3. Finite verb
 4. Transitive verb
147. In educational taxonomy, proposed by Bloom and his associates, there is an hierarchy in difficulty and sophistication. Each objective of a particular level, consists of every objective of
1. **Lower level**
 2. Upper level
 3. Dorsal level
 4. Front level

148. Identify the specification of instructional objective from the following

1. The pupil develops the understanding of mathematical formula
2. The pupil applies the knowledge of mathematics in new and unfamiliar situation
3. **The pupil recalls the definition of co-prime**
4. The pupil develops interest in study of mathematics

149. In the cone of learning experiences, as we move from the bottom to top the following quality of experiences increases

1. Concreteness
2. **Abstractness**
3. Exactness
4. Vagueness

150. The annual plan depicts the year long activities that are likely to be taken up by the mathematics teacher on

1. Permanent basis
2. Textbook basis
3. **Yearly basis**
4. Syllabus basis

151. According to the steps recommended by Herbart, great educationist, for daily lesson plan, the 'preparation' steps is meant to test the
1. Knowledge of previous lessons
 2. Knowledge of previous classes
 3. **Previous relevant knowledge of pupils**
 4. Readiness of the pupil
152. Through mathematics club activities, such as debates, discussions etc, the special needs of the following types of pupils may be met
1. Meditates
 2. Imbeciles
 3. **Gifted children**
 4. Morons
153. In teaching mathematics 'accuracy' in stating the results may be ensured by
1. Providing time frame to every problem
 2. Providing insufficient practice
 3. Use of short cut methods
 4. **Copying all figures correctly**
154. The formula derived, the principle constructed by inductive method, will be extended to new situations by
1. Heuristic method
 2. Project method
 3. **Deductive method**
 4. Analytic method

155. Which of the following methods is 'complementary' to Analysis
1. Heuristic method
 2. **Synthetic method**
 3. Deductive method
 4. Inductive method
156. Which of the following methods of teaching is considered as experimental part of Inductive method
1. Analytic method
 2. Project method
 3. **Laboratory method**
 4. Problem solving method
157. The last step of project method of teaching is
1. Sensing the problem
 2. **Recording**
 3. Providing a problem situation
 4. Sensing the temporary solution
158. If a topic, selected for study is useful either to 'succeed in life' or to 'prepare for higher studies' then the topic is said to have
1. Cultural value
 2. Professional value
 3. **Preparatory value**
 4. Vocational value

159. “The sets, the relations and functions are arranged in a sequential order because knowledge of fundamental concepts of set theory is necessary for learning the next topics.” – this type of arrangement of topics is known as

1. Concentric approach
2. Psychological approach
3. **Logical approach**
4. Topical approach

160. The percentages, simple interest, compound interest were selected and placed in the school syllabus, in the same class. This was done so as to meet the principle of

1. Disciplinary value
2. **Utilitarian value**
3. Cultural value
4. Vocational value