M.M. MEMORIAL PUBLIC SR. SEC. SCHOOL

GLOBAL TALENT SEARCH EXAMINATION # 5

GTSE # 5 (2024)

Pre Nurture & Career Foundation Courses

Time: 3 Hrs.   **Maximum Marks: 600**

Name of the Candidate ………...……………………………………….

Class :- 10th   Reg. No. : GTS/..............................

Examination Centre: ……………………………………………………….......................……………..

Instructions for the candidate :

Please read the following instructions carefully before opening the Question Booklet :

1. This Question Booklet consists of 150 questions. Subject wise Serial Order of the questions is as following :

Question No.		Subject
1 – 20	–	English
21 – 70	–	Mathematics
71 – 90	–	Physics
91 – 110	–	Chemistry
111 – 130	–	Biology
131 – 150	–	Mental Ability

2. Each multiple choice question has four options namely (A), (B), (C) and (D). Out of which only ONE option is correct (except MSQs). Each correct answer earns a credit of **4 marks**. A wrong answer carries a penalty of – 1 mark as negative marking.

3. **Use black or blue ball point pen only on OMR sheet**. Use of pencil is strictly prohibited.

4. Folding, damaging or leaving any identifiable mark on the OMR sheet is strictly prohibited.

5. No Candidate should possess any document other than Admit Card and Photo Identity Card.

6. Candidate may take Question Booklet with him/her only after handling over OMR sheet to invigilating staff.

7. Rough work should be done on the blank space provided on each page of the booklet.

8. For the given 4 alternative, choose only one alternative (expect MSQ's) and dark the selected circle properly as

(A) (B) (C) (D)

Your Hard Work Leads To Strong Foundation

ENGLISH

Question No. 1 to 4 are of Assertion and Reason type questions. Each question consists of two statements namely , Assertion (A) and Reason (R) :

1. Assertion (A) : Imperative sentences are those sentences which are used to express command, order request etc.

Reason (R) : Main features of these sentences are that these don't contain subjects or are implicit.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

2. Assertion (A) : Few / A Few/ The Few all these words signify small number.

Reason (R) : These are used before uncountable nouns.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

3. Assertion (A) : The young seagull was alone on the ledge.

Reason (R) : His family migrated to another continent.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

4. Assertion (A) : Finite verbs are those verbs that agree with the subject and express the mood, tense and number.

Reason (R) : Finite verbs can also act as Noun in the form of present participle.

(A) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).

(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

Q.5 to 8 are Comprehension Type Questions

Read the passage given below and answer the questions that follow :

Most Indian schools fail (5) _____ their students **adequate** playtime and fitness **regime**. Two out of every five school going children (6) _____ have a healthy body mass index (BMI) and 50% of children lack strength. Some schools are adequate lower body found to offer three or more physical education periods per week.

5. (A) ensuring   (B) ensure

(C) insured   (D) None of these

6. (A) didn't   (B) does not

(C) don't   (D) do

7. The word 'Adequate' is _____ .

(A) Adjective   (B) Adverb

(C) Relative Pronoun   (D) None of these

8. Synonymous of 'Regime'

(A) Chaos   (B) Time

(C) Period   (D) Rule

Q.9 to 16 are SCQ's (Single Choice Questions):

9. You _____ very thoughtful. What _____ you _____ about?

(A) looked / was / thinking

(B) look / are / thinking

(C) look / are / think

(D) looking / are / thinking

***********************************ROUGH WORK***************************************

10. You _____ break the body but you _____ break the spirit.

(A) may / can't (B) could / can't

(C) can / might not (D) may / may

11. Change into **passive voice**:

This topic might interest the students.

(A) The students might be interested by this topic.

(B) The students might be interested at this topic.

(C) The students may be interested by that topic.

(D) None of these

12. Name the **poetic device** used in the line, **"on pads of velvet quiet":**

(A) Consonance (B) Assonance

(C) Metaphor (D) Oxymoron

13. When she _____ they _____ and he _____ the house.

(A) had come/quarreled, had left

(B) came/quarreled, left

(C) has come/quarreled, has left

(D) came/had quarreled, was left

14. Select the correct option to complete the narration of the dialogue between Sunita and Neetu.

Sunita : Tomorrow is your birthday, what do you want as a gift?

Neetu : That is a lovely thought but I don't want anything.

Sunita asked Neetu since the next day was her birthday, what _____ as a gift. Neetu replied that that was a lovely thought but _____.

(A) was she wanted, she does not want anything.

(B) she wanted, she did not wanted anything.

(C) she wanted, she did not want anything.

(D) she wants, she wants something.

15. After _____ fourth lesson, English students have _____ break of _____ hour and _____half for _____ dinner.

(A) the, a, a, a, the (B) the, a, x, a, x

(C) a, the, an, a, the (D) the, a, an, a, x

16. _____ house is almost the same as _____ neighbors' house. The only difference in appearance is that _____is grey and _____ is white.

(A) our/ours/ours/theirs

(B) ours/ours/our/their

(C) my/ours/ours/theirs

(D) our/our/ours/theirs

Q.17 to 20 are MSQs (Multiple Selection Questions):

17. Find the **Antonym/s** of underline word.

The captain told the soldiers to **commence** firing.

(A) stop (B) begin

(C) evoke (D) cease

18. Select the **error part/s** from the following options:

I have /(i) many experience /(ii) in handling difficult customers /(iii) but this one is a worst. /(iv)

(A) i (B) ii (C) iii (D) iv

19. Choose the **correct spelled word/s :**

(A) Brigadier (B) Secretary

(C) Fanaticism (D) None of these

20. Identify the **error/s** in the given sentence and supply the correction:

The boys were played in the park when it starts raining.

(A) were - are

(B) played - playing

(C) when - while

(D) starts - started

***********************************ROUGH WORK***************************************

MATHEMATICS

Note: Question 21−30 all are assertion & Reason.

Direction:- Choose one of the correct option given below for following 1−10 Question numbers.

21. Assertion (A): $\sqrt{P}$ is an irrational number, where P is a prime number.

Reason (R): square root of any prime number is an irrational number.

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

22. Assertion (A): Degree of zero polynomial is not defined

Reason (R): Degree of non-zero constant polynomial is 0.

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

23. Assertion (A): The pair of equations $ax + 2y = 7$ and $3x + by = 16$ represents parallel lines if ab = 6.

Reason (R): $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ represent parallel lines if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

24. Assertion (A): $x^2 + 5kx + 16 = 0$ has no real roots if $\frac{-8}{5} <$ K $< \frac{8}{5}$

Reason (R): The quadratic equation $ax^2 + bx + c = 0$ (a$\neq$ 0) has two equal roots if $b^2 - 4ac = 0$

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

25. Assertion (A): Common difference of an A.P., Whose n^{th} term is given by $a_n = 4n - 70$ is 4.

Reason (R): d =$a_n - a_{n-1}$

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

26. Assertion (A): In $\Delta ABC, DE$ ∥ BC and AD = $4x - 3$, AE =$8x - 7$, $BD = 3x - 1$ and CE = $5x - 3$, then $x = 5$ units.

Reason (R): If a line is drawn parallel to one side of a triangle to Interest the other two sides is distinct points, the other two sides are divided in the same ratio.

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

*********************************ROUGH WORK*********************************

27. Assertion (A): Points (1,5), (2,3) and (-2,-2) are collinear.

Reason (R): Three points are said to be collinear, when they all lie of same line

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

28. Assertion (A): If θ is an aute angle and $\sin\theta = \cos\theta$, then the value of $\tan^2\theta + 2\sin^2\theta = 2$

Reason (R): If $\cos(40° + x) = \sin 30°$, then the value of x is 20°.

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

29. Assertion (A): The angle between the two tangents drawn from and enternal point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre.

Reason (R): The tangent to a circle is perpendicular to the radius through the point of contact.

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

30. Assertion (A): Volume of cube having length of diagonal $5\sqrt{3}$ cm is $125cm^3$.

Reason (R): For a cube, Diagonal side $\sqrt{3}$, and volume = $(side)^3$

(A) Both (A) and (R) are true and (R) is correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

Comprehensive Type Questions

Direction:- A lighthouse is a tower with a bright light at the top and serves as a navigational did and also warns ships of dangerous areas In the given figure, a man on top of 75m high light house is observing two ships approaching towards its base. observe the figure carefully and answer the following questions.
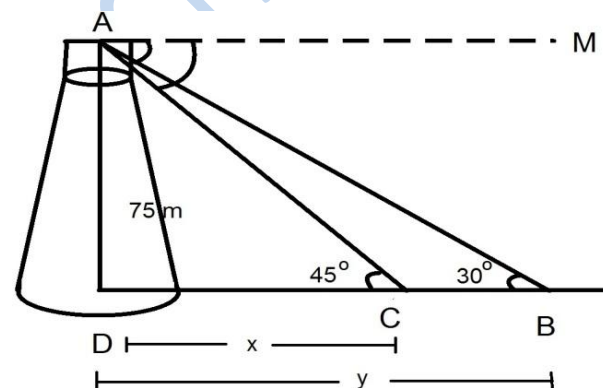
31. ∠MAB = ∠ DBA because they are alternate angle . The statement is?

(A) True   (B) False

(C) Can not say   (D) None of these

32. Find the distance of ship B from the foot of lighthouse

(A) $25\sqrt{3m}$ (B) $75\sqrt{3}m$

(C) $-75\sqrt{3}$m   (D) $-25\sqrt{3}m$

***********************************ROUGH WORK***

33. Find the distance of ship C from the foot of light house.

(A) 25m   (B) −25m

(C) 75m   (D) $-75m$

34. Find the distance between the two ships.

(A) $75(\sqrt{3}-1)$m   (B) $75(\sqrt{3}+1)$m

(C) $75(-\sqrt{3}+1)$m   (D)$-75(\sqrt{3}+1)$m

35. What would have been the distance between the two ships if the ships were on either side of the lighthouse?

(A) $75(\sqrt{3}-1)$m   (B) $75(\sqrt{3}+1)$m

(C) $25(\sqrt{3}-1)$m   (D) $25(\sqrt{3}+1)$m

Single Choice Questions (SCQs)

36. If 2 and −3 are the zeros of the quadratic polynomial x^2+ (a+1) $x+b$, then the value of a+b is:

(A)−5   (B) 0

(C) 6   (D) −6

37. The value for x and y in $\frac{4}{x}+3y=8$ and $\frac{6}{x}-4y=-5$ are:

(A) 2,2   (B) 3,3

(C) 1,1   (D) 4,4

38. For what values of a and b does the following pair of equations have an infinite number of solutions?

$2x+3y=7$

a$(x+y)-b(x-y)=3a+b-2$

(A) 3 and 1   (B) 5 and 1

(C) 4 and 3   (D) 5 and −2

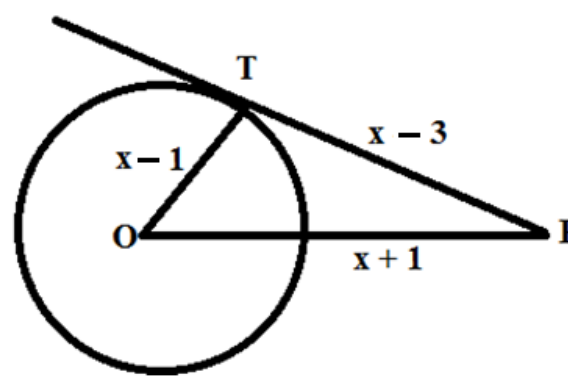**39.** If $\propto$ and β are zeros of the quadratic polynomial $P(x)=ax^2+bx+c$ then $\frac{1}{\propto}+\frac{1}{\beta}-2\propto\beta$ is

(A)$\frac{-ab-2c^2}{ac}$ (B) $\frac{ab+2c^2}{ac}$

(C) $\frac{ab+b^2}{2c}$ (D) $\frac{-c^2+ab}{2ac}$

40. Find the value of x.

(A) 1   (B) 9

(C) 3   (D) 5

41. A natural number, when increased by 12, equals 160 times its reciprocal. The number is:

(A) 8   (B) 6

(C) 4   (D) 2

42. Roots of the quadratic equation $\sqrt{(3x^2-2)}=2x-1$ are:

(A) 3,1   (B) 4,1

(C) 3,2   (D) 2,3

43. Sum of n terms of the series

$\sqrt{2}+\sqrt{8}+\sqrt{18}+\sqrt{32}+$ .... is:

(A) n^2 (B) n(n +1)

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

44. The difference between the sum of first 2n natural number and the sum of first n odd natural numbers is

(A) n^2-n (B) n^2+n

(C) $2n^2-n$ (D) $2n^2+n$

45. 1 +3 + 5 +7 + ... +199 =?

(A) 9000   (B) 10,000

(C) 11,000   (D) 12,000

46. The distance between the points A(2a,6a) and B(2a +$\sqrt{3}$a, 5a) is:

(A) a   (B) 2a   (C) 3a   (D) 4a

***********************************ROUGH WORK***********************************

47. The fourth vertex D of a parallelogram ABCD whose three vertices A(1,2), B(3,0) and C(7,4) is:

(A) (0,1)   (B) (5,6)   (C) (2,4)   (D) (6,5)

48. If $\sin\theta - \cos\theta = 0$ then value of $(\sin^4\theta + \cos^4\theta)$ is:

(A) 1   (B) $\frac{3}{4}$ (C) $\frac{1}{2}$ (D) $\frac{1}{4}$

49. The value of (sin45°+cos45°) is

(A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{2}$ (C) $\frac{\sqrt{3}}{2}$ (D) 1

50. If x= a $\cos^3\theta$, $y = b\,\sin^3\theta$ then $\left(\frac{x}{a}\right)^{\frac{2}{3}} + \left(\frac{y}{b}\right)^{\frac{2}{3}}$ = ?

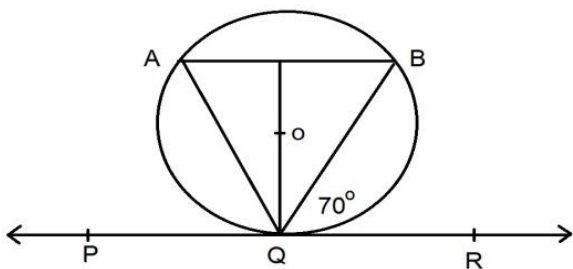(A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{3}{2}$ (D) 1

51. $Cot^4\theta - Cosec^4\theta + Cot^2\theta + Cosec^2\theta$ =?

(A) 0   (B) 1   (C) -1 (D) 2

52. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}$:1 What is the angle of elevation of sum?

(A) 30°   (B) 60°

(C) 45°   (D) None of these

53. In the figure, if PQR is the tangent to a circle at Q whose centre is O. AB is a chord parallel to PR and $\angle BQR = 70°$ then $\angle AQB$ is equal to ?

(A) 20°   (B) 40°   (C) 35°   (D) 45°

54. If the perimeter of a circle is equal to that of a square then the ratio of their areas is:

(A) π: 2   (B) 4: π (C) 1:2   (D) 2: π

55. If the circumference of a circle and perimeter of a square are equal, them

(A) Area of circle = Area of square

(B) Area of circle > Area of square

(C) Area of circle < Area of square

(D) Nothing can be said

56. The value of x and y if

$23x + 35y = 209$

$35x + 23y = 197$ are

(A) 4 and 5   (B) 3 and 4

(C) -3 and 2   (D) 5 and 3

57. If the sum of n terms of an A.P. is $3n^2 + 5n$ then which of its terms is 164.

(A) 26th   (B) 27th

(C) 28th   (D) None of these

58. If 18, a, b, -3 are in A.P. then a + b =

(A) 19   (B) 7   (C) 11   (D) 15

59. The difference between the circumfrance and diameter of a circle is 24cm The radius of the circle is:

(A) 5cm   (B) 5.6cm   (C) 7.2cm   (D) 9.6cm

60. The perimeter (in cm) of a square circumscribing a circle of radius a cm is:

(A) 6a cm   (B) 7a cm   (C) 8a cm   (D) 10a cm

Multiple Selected Questions (MSQs)

61. The roots of the equation $9x^2 - 9(a + b)x + (2a^2 + 5ab + 2b^2) = 0$ are _____

(A) $\frac{-1}{a^2}$ (B) $\frac{2a+b}{3}$ (C) $\frac{a+2b}{3}$ (D) $\frac{2a+2b}{6}$

62. Which of the following is not correct statement?

(A) The value of $\sin\theta$ increases as θ increases.

(B) Maximum value of $\sin\theta$ is -1

(C) $Sin\theta$ is abberivation of $Sin\theta$

(D) $Sin\theta$ means product of sin and θ

63. Which of the following statement is /are not incorrect

(A) Real numbers contains rational number

(B) All integers are rational number.

(C) All integers are real numbers

(D) Every whole number is natural number.

64. If SinA = $\frac{3}{5}$ then value of 2 SinA CosA =

(A) $\frac{24}{25}$ (B) $\frac{12}{25}$ (C) $\frac{24x}{25x}$ (D) $\frac{7}{25}$

************************************ROUGH WORK***

65. Which of the following is/are irrational numbers.

(A) 1.414 (B) 2π (C) 3.14 (D) $\sqrt{101}$

66. Which of the following formulas is/are true.

(A) 3 Median = Mode + 2Mean

(B) 2 Median = Mode +3Mean

(C) Mode = 3Median− 2 Mean

(D) 3 Mode + Mean = 3 Median + Mean

67. What is value of a when the distance between the points (3, a) and (4, 1) is $\sqrt{10}$.

(A) 4 (B) 2 (C) - 2 (D) 5

68. The value of x in $2\left(\frac{2x+3}{x-3}\right) - 25\left(\frac{x-3}{2x+3}\right) = 5$, $x \neq 3, \frac{-3}{2}$

(A) 5 (B) 1 (C) 6 (D) -5

69. Which of the following is/are true.

(A) The value of probability lies in the internal

O < P(E) < 1

(B) The value of probability lies in the internal

O$\leq P(E) \leq$1

(C) The value of probability of sure event is $\frac{1}{2}$.

(D) The probability of an impossible event is 0.

70. A circle is inscribed in a square of side 2.5 cm. Another circle is circumscribing this square. The ratio of areas of outer circle and inner circle.

(A) 1 : $\sqrt{2}$ (B) 2 : 1 (C) $2\pi : \pi$ (D) $\sqrt{3}$: 1

PHYSICS

Assertion/Reason questions

Directions:- The questions from 71 to 74 below consist of an assertion and a Reason. Use the following key to choose the appropriate answer.

(A) Both A and R are True and R is the correct explanation of A.

(B) Both A & R are true but R is not the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

71. Assertion (A):- The magnitude of the magnetic field at a point on the axis of a current carrying solenoid is inversely proportional to the current flowing through solenoid

Reason (R):- The magnitude of the magnetic field at a point on axis of solenoid is directly proportional to no. of turns per unit length of solenoid.

72. Assertion (A): The focal length of the convex mirror will increase if the mirror is placed in water

Reason (R):- The focal length of a convex mirror of Radius R is equal to $f = \frac{R}{2}$ (for Rays near to principal axis)

73. Assertion (A): Human eye has the ability to form sharp images of objects at different position from the eye on the retina of the eye.

Reason (R): Eye lens is of convex lens of fixed focal length.

74. Assertion (A): Atmospheric refraction of light leads to twinkling of stars.

Reason (R): The refractive index of atmospheric air decrease progressively as we go higher and higher.

Comprehension Type Questions (Q.75 to Q.78)

Paragraph - I : Given information is about the magnetic field due to a current in a long solenoid, where we refer solenoid, as a coil of many circular turns wrapped closely in the shape of a cylinder
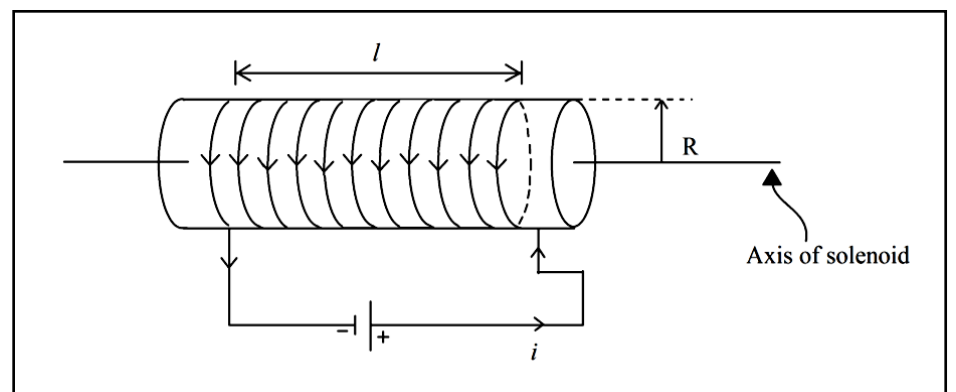
It can also be stated that magnetic field inside a long solenoid is directly proportional to current flowing in the wire and the number of turns wrapped per unit length of solenoid.

***********************************ROUGH WORK***********************************

75. Find the Ratio of Magnitudes of the magnetic Induction (or field) for a solenoid at its axis when current in the coil is quadrupled and keeping other parameters as constant. ($B_1 : B_2 = ?$)

(A) 1 : 2   (B) 2 : 1

(C) 1 : 4   (D) 4 : 1

76. Find the Ratio of magnitudes of the magnetic Induction (or field) for a solenoid at its axis when number of turns per unit length increases from 2022 to 2023. ($B_1 : B_2$)

(A) $(2022)^2 : (2023)^2$

(B) 2023 : 2022

(C) $(2022) : (2023)$

(D) $(2023)^2 : 2022$

Paragraph - II : Study the two electric circuits I and II. The electric circuit I is labelled as series combination and electric circuit II is labelled as parallel combination.

(i)   **(ii)**
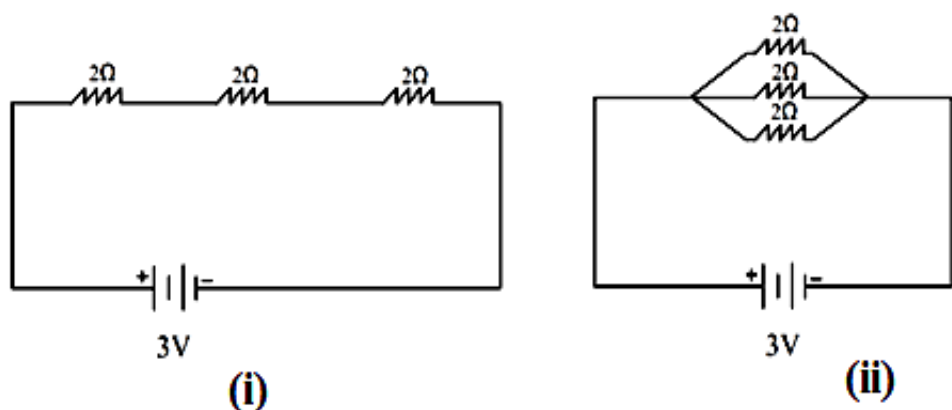
77. What is the ratio of the resistance of circuit (I) to the resistance of circuit (II)?

(A) 6   (B) 5   (C) 3   (D) 9

78. Calculate the sum of current in each middle resistor of circuit (ii) and (i).

(A) 1.89 A   (B) 2.5 A

(C) 1.5 A   (D) 4.5 A

Single Choice Questions (SCQs)

79. Match the following

List I	List II
(i) Dark muscular diaphragm which controls the size of pupil	(p) Myopia
(ii) Regulates & control the amount of light entering the eye.	(q) Near point of eye
(iii) Minimum distance at which objects can be seen distinctly without any strain	(r) Iris
(iv) A person can see nearby objects clearly but cannot see distinct objects distinctly	(s) Pupil
	(t) Cornea
	(u) Least distance of distinct vision

(A) (i) → s (ii) → r (iii) → q (iv) → p

(B) (i) → r (ii) → s,t (iii) → q, u (iv) → p

(C) (i) → r (ii) → s (iii) → q, t (iv) → s

(D) (i) → r (ii) → s (iii) → q, u (iv) → p

80. Statement I: Scattering of light by the colloidal particles give rise to Tyndall effect

Statement II: Earth's atmosphere is Homogeneous mixture of minute particles (Smoke, tiny water droplet, suspended particles of dust and molecules of air), when a beam of light strikes such particles then above phenomenon is observed.

(A) Statement I is correct and Statement II is correct and statement II is also correct explanation of I

(B) Statement I is correct and Statement II is correct and Statement II is not the correct explanation of I

(C) Statement I is True and Statement II is False

(D) Statement I is False and Statement II is True

********************************ROUGH WORK********************************

81. Match the following

List I	List II
(i) Plug Key (open)	(p) ——⌇⌇⌇↗——
(ii) Rheostat	(q) ——+(A)— I
(iii) Ammeter	(r) ——⌇⌇⌇——
(iv) Voltmeter	(s) ——⌇⌇⌇——
(v) Resister	(t) ——+(V)—← I
	(u) ——⎝⎠⎝⎠⎝⎠——
	(v) ——+(A)— ——
	(w) ——+(V)— ——
	(x) ——( )——
	(y) ——(•)——

(A) i → y, ii → s, iii → v, iv → t, v → s
(B) i → x, ii → r, iii → q, iv → t, v → s
(C) i → x, ii → p, r, iii → v, iv → w, v → s
(D) i → x, ii → p,r, iii → q, v, iv → t,w, v → s

82. Choose the correct order of Resistivities of different materials.

(A) Nichrome>Tungsten>Nickel>Aluminium>Copper
(B) Nichrome>Nickel>Tungsten>Aluminium>Copper
(C) Nichrome>Copper>Tungsten>Nickel>Aluminium
(D) Nichrome>Tungsten>Nickel>Copper>Aluminium

83. Which of the following quantities remains the same when light goes from one medium to another medium?

(A) Speed   (B) Frequency
(C) Wavelength   (D) Intensity

84. Light travels from air into glass of refractive index 1.5. The time taken by the light travel through a piece of glass of 50 cm thickness is:

(A) 2.25 sec   (B) 2.25×10^{-7} sec
(C) 2.25×10^{-8} sec   (D) 2.5×10^{-9} sec

85. A student conduct an experiment by using a convex lens. He places the object at a distance of 60 cm in front of the lens and observes that the image is formed at a distance of 30 cm behind the lens. What is the power of the lens.

(A) 0.005 dioptre   (B) 0.05 dioptre
(C) 5 dioptre   (D) 50 dioptre

86. Choose the incorrect statement

(A) Flemings right – hand rule is a simple rule to know the direction of induced current.
(B) The right – hand thumb rule is used to find the direction of magnetic fields due to current carrying conductors.
(C) The difference between the direct and alternating currents is that the current always flows in one direction, whereas the alternating current reverses its direction periodically.
(D) In India, the AC changes direction after every $\frac{1}{50}$ second

Multiple Select Questions (MSQs)

87. A convex mirror used for Rear – view on an automobile has a curvature of $\left(\frac{1}{3}\right)$m. If a Bus is located at 5 m from the mirror then choose the correct options.

(A) Radius of Curvature = 3m
(B) Focal length = 1.5 m
(C) Image is 1.15m at the back of mirror
(D) Nature of image formed is virtual, erect and larger in size by a factor of 0.23

88. Which of the following statements is/are True.

(A) Mirror formula can be expressed as $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$
(B) Mirror formula can be expressed as $\frac{1}{V} - \frac{1}{u} = \frac{1}{f}$
(C) Magnification of the mirror (m) is equal to the ratio of Height of Image (h') to the height of object (h) and mathematically it is
$m = \frac{h'}{h} = \frac{-v}{u} = -\left(\frac{Image\ distance}{Object\ distance}\right)$
(D) Magnification of the lens (m) is equal to the ratio of height of object (h) to the height of image (h') and mathematically it is
$m = \frac{h}{h'} = \frac{v}{u} = \frac{Image\ distance}{Object\ distance}$

*********************************ROUGH WORK*********************************

89. Choose the correct Statements regarding Galvanometer

(A) Galvanometer is an instrument that can detect the presence of Electromotive force in the circuit

(B) Galvanometer is an instrument that can detect the presence of current in a circuit.

(C) Galvanometer Zero Mark is in the left side and pointer deflects only from left to Right

(D) Galvanometer zero mark is in the middle & pointer has tendency to deflect either to the left or right of the zero mark depending on the direction of current.

90. Choose the correct options

(A) A Generator converts the mechanical energy into electrical energy and work on the basis of electromagnetic Induction

(B) For domestic purpose, the electric power lines carry DC electric power of 220 V

(C) For domestic purpose, in our houses we receive AC electric power of 220 V with a frequency of 50 HZ.

(D) In supply Red insulation is live wire, Black is neutral wire and the potential difference between the two is 220 V and earth wire has a Green insulation.

CHEMISTRY

Assertion/Reason questions

Directions:- The questions from 91 to 94 below consist of an assertion and a Reason. Use the following key to choose the appropriate answer.

(A) Both A and R are True and R is the correct explanation of A.

(B) Both A & R are true but R is not the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

91. Assertion (A) :- Acetic acid (CH_3COOH) is monobasic:
Reason (R) :- Acetic acid has only one replaceable hydrogen atom present which it releases in aqueous solution as [H^+]

92. Assertion (A) :- 24 carat gold is regarded as completely pure gold.
Reason (R) :- 24 carat gold can be used for making ornaments

93. Assertion (A):- Pungent smelling gas is produced when sulphur burns in air.
Reason(R):- Sulphur trioxide is formed on reaction of sulphur with oxygen.

94. Assertion (A):- In electrolysis of water, the volume of hydrogen liberated is twice the volume of oxygen formed.
Reason (R):- Water (H_2O) has hydrogen & Oxygen in the ratio of 1 : 2 by volume.

Comprehension type questions:- (Q.95 – Q.98)

Direction :- The questions from 95 to 98 have to be answered from the following paragraph.

The earlier concept of oxidation and reduction is based on the addition or removal of oxygen or hydrogen elements so, in terms of oxygen and hydrogen, oxidation is addition of oxygen to a substance and removal of hydrogen from a substance. On the other hand, reduction is addition of hydrogen to a substance and removal of oxygen from a substance. The substance which gives oxygen to another substance or removes hydrogen from another substance in an oxidation reaction is known as oxidising agent, while the substance which gives hydrogen to another substance or removes oxygen from another substance in a reduction reaction is a known as reducing reaction is known as reducing agent

95. A redox reaction is one in which:-

(A) both the substances are reduced

(B) both the substances are oxidised

(C) an acid is neutrilised by the base

(D) One substance is oxidised while the other is reduced

*************************************ROUGH WORK*************************************

96. In the reaction, $H_2S + Cl_2 \rightarrow S + 2\,HCl$

(A) H_2S is the reducing agent

(B) HCl is the oxidising agent

(C) H_2S is the oxidising agent

(D) Cl_2 is the reducing agent

97. Which of the following processes does not involve either oxidation or reduction?

(A) Formation of slaked lime from quicklime

(B) Heating mercuric oxide

(C) Formation of manganese chloride from manganese oxide

(D) Formation of Zinc from zinc blends

98. $Mg + CuO \rightarrow MgO + Cu$

Which of the following is wrong relating to the above reaction?

(A) CuO gets reduced

(B) Mg gets oxidised

(C) CuO gets oxidised

(D) It is a redox reaction

Single Choice Questions (Q.99 to Q.106)

99. Tertiary butane gets oxidised with oxidising agents like alkaline $KMnO_4$ to :-

(a) Isobutane

(b) Ter-butyl alcohol

(c) Secondary Propyl alcohol

(d) All of above

100. Identify the Incorrect one.

(A) Metal oxdes are basic in nature

(B) Some metal oxides, such as aluminium oxide, Zinc oxide etc show both acidic as well as basic behaviour.

(C) Metal oxides which react with both acids as well as bases to produce salts and water are known as amphoteric oxides

(D) Non –metallic oxides are also called amphoteric oxides.

101. On heating, Baking soda, what will form

(A) K_2CO_3 (B) $KHCO_3$

(C) $NaHCO_3$ (D) Na_2CO_3

102. What happens when a solution of an acid is mixed with a solution of a base in a test tube ?

(i) The temperature of the solution increases.

(ii) The temperature of the solution decreases.

(iii) The temperature of the solution remains the same

(iv) Salt formation takes place.

(A) (i) only   (B) (i) and (iii)

(C) (ii) and (iii)   (D) (i) and (iv)

103. In an attempt to demonstrate electrical conductivity through an electrolyte set –up is given which among the following statements (s) is (are) correct?
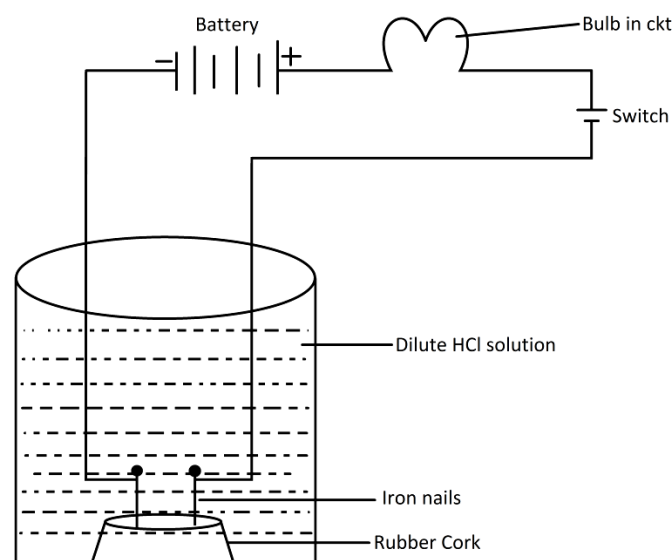
(A) Bulb will not glow because electrolyte is not acidic

(B) Bulb will glow because HCl is a strong acid and furnishes iron for conduction

(C) Bulb will not glow because circuit is incomplete

(D) Bulb will not glow because it depends upon the type of electrolytic solution.

104. Which of the following alloys contains a non – metal as one of its constituents?

(A) brass   (B) amalgam

(C) steel   (D) bronze

105. The reason for different behaviour (floating) of Mg in dilute HCl is due to:-

(A) Mg is lighter element than dilute HCl

(B) Mg reacts with dilute HCl to produce H_2 gas which help in floating

(C) Mg reacts with dilute HCl to produce N_2 gas which help in floating

(D) Mg reacts with dilute HCl to produce CO_2 gas which help in floating

ROUGH WORK

106. The chemical reaction between a piece of copper and nitric acid is given by the chemical equations,

$Cu + HNO_3 \rightarrow Cu(NO_3)_2 + H_2$

$H_2 + HNO_3 \rightarrow H_2O + NO_2$

What can be inferred from the chemical equation?
(A) Copper causes the oxidation of HNO_3 to form NO_2.
(B) Hydrogen gas gets oxidised by HNO_3 to form water.
(C) Gas reacts with oxygen in the air to form water
(D) Nitrate reacts with hydrogen to form NO_2 and H_2O

Multiple selection question:- (Q.107 to Q.110)

107. Barium chloride on reacting with ammonium sulphate forms barium sulphate and ammonium chloride. Which of the following correctly represents the type of the reaction involved?
(A) Displacement reaction
(B) Precipitation reaction
(C) Combination reaction
(D) Double displacement reaction

108. Which of the following statements about the given reaction are correct?

$3 Fe_{(s)} + 4H_2O_{(g)} \rightarrow Fe_3O_{4(s)} + 4H_{2(g)}$

(A) Iron metal is getting oxidised
(B) water is getting reduced
(C) Water is acting as reducing agent
(D) water is acting as oxidising agent

109. Which of the following are not ionic compounds ?
 (A) KCl   (B) HCl   (C) CCl_4 (D) NaCl

110. Select the correct statements.
(A) CO is neutral while CO_2 is acidic
(B) Both CO and CO_2 support combustion
(C) CO is more poisonous and harmful and harmful than CO_2
(D) Solid CO_2 is known as dry ice

BIOLOGY

Assertion/Reason questions (Q.111 to Q.114)

Directions:- The questions from 111 to 114 below consist of an assertion and a Reason. Use the following key to choose the appropriate answer.

(A) Both A and R are True and R is the correct explanation of A.

(B) Both A & R are true but R is not the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

111. Assertion (A) :- Law of independent assortment can be proved only through monohybrid cross

Reason (R) :- In a dihybrid cross beside the parent combination of traits, two new recombinants are formed.

112. Assertion (A) :- In reflex action the response to a stimulus is almost immediate

Reason (R) :- The impulse from motor neuron is directly transferred to sensory neuron through a relay neuron.

113. Assertion (A) :- Epiglottis is a safety valve over uvula.

Reason (R) :- Larynx is closed during swallowing of food.

114. Assertion (A) :- Hydra use specialised cell to perform regeneration

Reason (R) :- Regeneration is equivalent to reproduction in most of organism.

***********************************ROUGH WORK***************************************

Comprehension type questions (Q.115 to Q.118)

Direction :- The questions from 115 to 118 have to be answered from the following paragraph.

Our body needs to remove the wastes that build up from cell activities and from digestion. If these wastes are not removed, then our cells can stop working, then our cells can stop working and we can get very sick. The organs of excretory system consists of a pair of kidneys, a pair of ureters, a urinary bladder and a urethera. Each kidney is made up of nearly one million complex tubular structures called nephrons. The formation of urine involves various processes that takes place in the different parts of the nephrons. Each nephron consist of a cup – shaped upper end called Bowman's capsule containing a bunch of capillaries called glomerulus. Bowman's capsule leads to tubular structure proximal convoluted tubule, loop of Henle and distal convoluted tubule. Which ultimately joins the collecting tubule.

115. The outline of principal events of urination is given below in random order.
   (i) Stretch receptors on the wall of urinary bladder send signals to the CNS.
   (ii) The bladder fills with urine & become distended.
   (iii) Micturition
   (iv) CNS passes on motor messages to initiate the contraction of smooth muscles of bladder and simultaneous relaxation of urethral sphincter.

   The correct sequences of the events is :-
   (A) (i) → (ii) → (iii) → (iv)   (B) (iv)→ (iii) →(ii) →(i)
   (C) (ii) →(i) →(iv) →(iii)   (D) (iii) →(ii) →(i) →(iv)

116. Correct sequence of urine formation is :-
   (A) Ultrafiltration, reabsorption, secretion and osmosis
   (B) Secretion, osmosis, ultrafiltration, reabsorption
   (C) only filtration and absorption
   (D) only osmosis and secretion

117. The following substances are the excretory products in animals. Choose the least toxic form.
   (A) Urea   (B) Uric acid
   (C) Ammonia   (D) Carbondioxide

118. Glomerular filtrate is first collected by:-
   (A) Distal convoluted tubule
   (B) Proximal convoluted tubule
   (C) Bowman's capsule
   (D) Loop of Haule

Single choice questions:- (Q.119 to Q.126)

119. A case of bio – magnification was being studied. A laboratory received equal quantities of three sample A, B, Z.
   The level of pesticides found in these sample are as follow: A – 1 mg, B – 0.2 mg, Z – 3 mg
   The sample A, B and Z respectively could be
   (A) Grass, Grasshopper and adipose tissue of birds.
   (B) Grasshopper, Grass and adipose tissue of birds.
   (C) Grass, Adipose tissue of birds and grasshopper.
   (D) Adipose tissue of bird, grasshoppers and grass.

120. From a single ear of corn, a farmer planted 200 kernel which produced 140 tall and 40 short plants. The genotype of these offsprings are most likely
   (A) TT, Tt and tt   (B) TT & tt
   (C) TT and Tt   (D) Tt and tt

121. In a neuron conversion of chemical signal to a electrical signal occurs at
   (A) Cell body
   (B) Axonal end
   (C) Dendritic end
   (D) Axon

122. After pollination, the growth of pollen tube on stigma towards ovule is due to :-
   (A) Phototropism
   (B) Chemotropism
   (C) Hydrotropism
   (D) Geotropism

***************************************ROUGH WORK***************************************

123. Which of the following statements is/are not correct?

(A) Bronchus is divided into bronchioles

(B) The opening leading to the larynx is called glottis

(C) During inhalation, ribs move inward and diaphragm is raised

(D) Oxygen has more affinity with haemoglobin than CO_2

124. Which one is a possible progeny in F2 generation of pure bred tall plant with round seed and short plant with wrinkled seeds?

(A) Tall plant with round seeds

(B) Tall plant with wrinkled seeds

(C) Short plant with round seed

(D) All of the above

125. Antidiuretic hormone [ADH]

(A) increase water reabsorption

(B) increase water release

(C) increase Na^+ reabsorption

(D) decreases urea synthesis

126. Amount of blood corpuscles is changed in dengue fever. One of the common symptoms observed in people infected with dengue fever is

(A) significant decrease in RBC count

(B) significant decrease in WBC count

(C) significant decrease in platelets count

(D) significant increase in platelets count

Multiple selection questions:- (Q.127 to Q.130)

127. Which of the following statement is true about heart

(A) Left atrium receives oxygenated blood from different parts of body while right atrium receive deoxygenated blood from lungs.

(B) Left Ventricle pump Oxygenated blood to different body parts while right ventricle pump deoxygenated blood to lungs

(C) Valve ensure that blood flow backward when the atria or ventricle contract.

(D) Tricuspid valve is present between right atria and right ventricle

128. Choose the correct statement

(A) Gustatory receptor detect taste while olfactory receptors detect smell.

(B) A dihybrid plant TtRr on self pollination produce 100 seed having genotype TtRr out of 400 offspring

(C) Amoeba reproduce through binary as well as multiple fission.

(D) The communication between the central nervous system and other parts of body is facilitated by peripheral nervous system consist of cranial nerves only

*************************************ROUGH WORK*************************************

129. The correct statements with reference to single celled organism are

(A) Unicellular organisms respire and reproduce.

(B) Simple diffusion is sufficient to meet the requirement of exchange of gases.

(C) Specialised tissue perform different function in these organism.

(D) All unicellular organism move by cilia

130. Select the correct statement

(A) Reproduction is linked to the stability of population of species

(B) Ozone at higher level of atmosphere is a product of UV radiation acting on O_2 (Oxygen) molecule.

(C) The normal diastolic pressure is about 120 mm of Hg and systolic pressure is 80 mm of Hg

(D) The child is born as result of rhythmic contractions of muscles in uterus during delivery of child.

MENTAL ABILITY

131. Find the missing terms in the given series.

1, 12, 3, 11, 7, 9, 15, 6, ?, ?

(A) 20, 5   (B) 31, 2

(C) 18, 6   (D) 18, 16

132. 2Z5, 7Y7, 14X9, 23W11, 34V13, ?

(A) 27U24   (B) 47U15

(C) 45U15   (D) 47V14

133. If 'ZORPIA' is to 'AZIOPR', then 'TROUPE' is to _____.

(A) PETROL   (B) EUROPE

(C) ETPRUO   (D) REPORT

Direction: In each of the following questions, choose the one which is different from the others.

134. (A) 8 – 33   (B) 12 – 37

(C) 9 – 28   (D) 15 – 46

135. (A) MN : 17   (B) PQ : 33

(C) CD : 7   (D) HI : 17

136. If HOTEL = 55, then BORE = ?

(A) 40   (B) 35

(C) 55   (D) 60

137. If 2 Δ 3 = 8.5, 4 Δ 9 = 42.5, 8 Δ 6 = 55, then 18 Δ 37 = ?

(A) 61   (B) 93.5

(C) 693.5   (D) 642

Direction: Study the following information carefully to answer the questions that follow:

Aditya Mishra has three children : Urmila, Raghu and Sumit. Sumit is married to Roma, the eldest daughter of Mr and Mrs Sahoo. The Sahoo's married their youngest daughter Sneha to the eldest son of Mr and Mrs Sharma and they had two children Sandeep Shefali. Sahoo have two other children, Rohit and Nishu, each elder to Sneha. Sohan and Arun are sons of Sumit and Roma Latika is the daughter of Sandeep.

138. How is Mrs Sahoo related to Sumit?

(A) Aunt   (B) Mother – in – law

(C) Mother   (D) Sister – in – law

139. What is the surname of Sohan?

(A) Sharma

(B) Sahoo

(C) Mishra

(D) Can't be determined

140. What is the surname of Latika?

(A) Sharma   (B) Sahoo

(C) Mishra   (D) Either (A) or (B)

Direction: Study the following information to answer the given questions:

Q, R, S, T, U and V are seated in a straight line facing North. S is second to the right of T and T is second to the right of Q, R is to the left of Q and is second to the left of V.

141. Who is sitting at extreme left end?

(A) Q   (B) R   (C) V   (D) S

142. How many persons are sitting between Q and U?

(A) 1   (B) 0   (C) 2   (D) 3

ROUGH WORK

Direction : A word arrangement machine, when given an input line of words, rearrange in every step following a certain rule. Following is an illustration of an input of words and various steps or rearrangement.

Input	:	**gone are take enough brought station**
Step I	:	are brought gone take enough station
Step II	:	are brought enough gone take station
Step III	:	are brought enough gone station take
Step IV	:	are brought enough gone station take

And Step IV is the last step for this input.

143. Input : car on star quick demand fat

What will be the third step for this input?

(A) star quick car demand on fat

(B) car demand on quick star

(C) star car demand quick on fat

(D) star car quick on demand fat

144. Arrange the given words as they occur in the dictionary and select the correct option.

1. Ambitious   2. Ambiguous   3. Ambiguity

4. Animation   5. Animals

(A) 3, 2, 4, 1, 5   (B) 3, 2, 5, 4, 1

(C) 3, 2, 1, 5, 4   (D) 3, 2, 4, 5, 1

145. Amit is ranked 11th from the top and Ravi is ranked 14th from the bottom in a class of 35 students. How many students are there between Amit and Ravi?
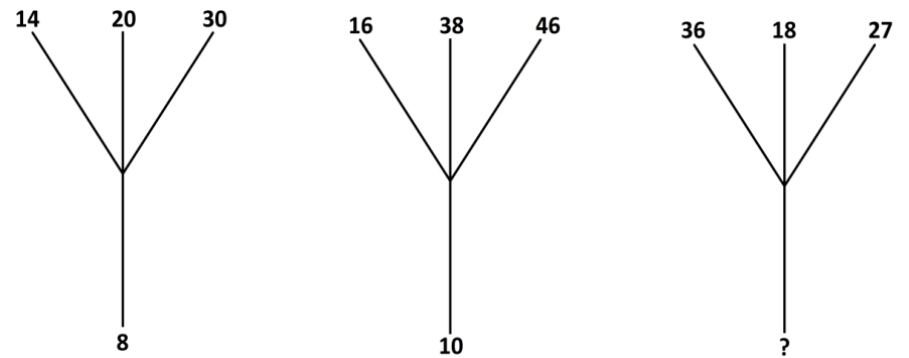
(A) 10   (B) 9   (C) 6   (D) 7

146. If '+' means 'divided by', '-' means, 'X', 'X' means 'minus' and '/' means 'multiplied by', then what will be the value of the following expression?
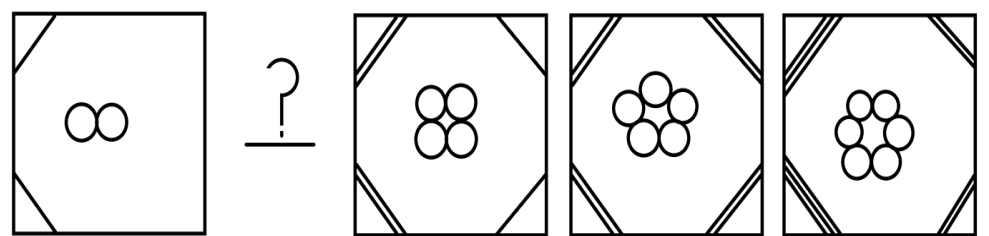
$$[\{(17 \times 2) - (4/2)\} + (23 - 6)]/0$$

(A) Infinite   (B) 0

(C) 118   (D) 219

147. Find the missing number from the options which will replace the question mark (?) in the given patterns.

14   20   30   16   38   46   36   18   27

8   10   ?

(A) 18   (B) 12

(C) 9   (D) 6

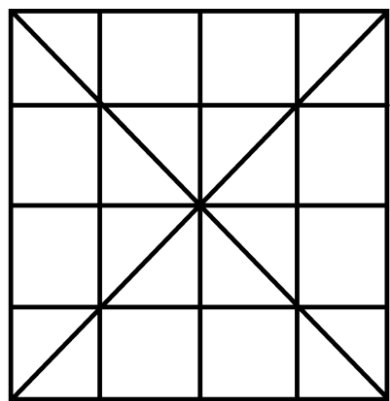**148.** Choose one figure from the options that can replace the question mark (?) to form a series.

(A)

(B)

(C)

(D)

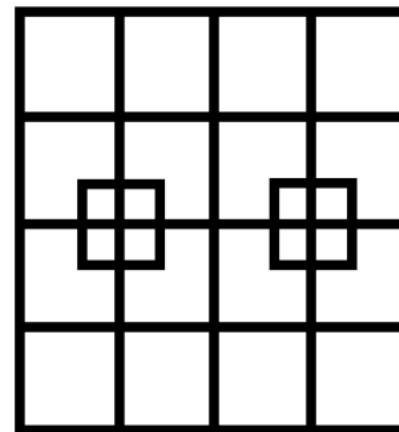***********************************ROUGH WORK***********************************

149. Find the number of triangles in the given figures.

(A) 36 (B) 40

(C) 48 (D) 50

150. Find the number of squares in the given figure.

(A) 28 (B) 40

(C) 39 (D) None of these

**************************************ROUGH WORK***************************************