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FOR JKSSEE PREPARATION

JKSSEE 2023 Question Paper Class 11

EXAM	YEAR	TYPE
JKSSEE	2023	Question Paper

J&K SAINIK SCHOOL MANASBAL

TEST BOOKLET - XI

Test Booklet No.

ROLL NUMBER

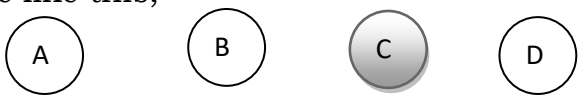
Name of the Candidate:

Signature of the Candidate:

Time: $2\frac{1}{2}$ Hours **Maximum Marks: 280**

GENERAL INSTRUCTIONS FOR CANDIDATE

1. This booklet comprises of Four sections (**32 Pages**) comprising of **140 Questions** with Section **A** - **50** (Mathematics), **B** -**35** (Reasoning), **C** -**30** (Science), **D** -**25** (English). Each Question has **2 Marks** for correct Answer.
2. A separate OMR sheet will be provided to mark the correct answer at the proper place on the OMR sheet.
3. Use only Blue/Black Ball pen to fill your OMR sheet. Use of Pencil is not allowed.
4. For every Question there are four probable answers out of which only one most appropriate / correct. The candidate is required to select the correct answer and darken the bubble against the correct option provided against each Question in the OMR sheet. For example, if your Question no. 10 is C, fill the bubble like this;



5. Overwriting, erasing or cutting on OMR is not allowed. Using of correction fluid/whitener is also not allowed on OMR.
6. Rough work must be done only on this Booklet at the potion specified for the same.
7. The time allowed is 150 minutes.
8. There is no Negative marking.
9. A candidate is eligible for admission if he secures a minimum of **25% marks** in each Section and **40% marks** in aggregate of all the Sections. However, admission will be based on relative merit of candidate followed by medical fitness and verification of requisite documents.

Signature of Invigilator

Signature of Centre Superintendent

SECTION A: MATHEMATICS

(Total Questions - 50 Max Marks – 100)

Q No. 1. The number of prime numbers less than 50 is

a) 13 **b)** 14 **c)** 15 **d)** 16

Q No. 2. 1 is a

a) Prime number **b)** Composite number

c) Both prime and composite **d)** Neither prime nor composite

Q No. 3. Assume that $1056 = 2^5 \times 3^x \times 11^y$. Then $(x, y) =$

a) (1,2) **b)** (1, 1) **c)** (2,1) **d)** (2,2)

Q No. 4. Assume that $1036 = 2^2 \times 5^a \times 7^1 \times 37^1$ and $1036 = 2^b \times 7^c \times 37^1$. Then

a) $a = 0, b = 2, c = 1$ **b)** $a = 1, b = 1, c = 1$

c) $a = 0, b = 1, c = 1$ **d)** $a = 0, b = 2, c = 2$

Q No. 5. The degree of the polynomial $p(x) = 0\,x^3 + 0\,x^2 + 2x + 1$ is

a) 3 **b)** 2 **c)** 1 **d)** 0

Q No. 6. Which of the following is not an irrational number?

a) $\sqrt{2}$ **b)** $\sqrt{3}$ **c)** $\sqrt{4}$ **d)** $\sqrt{5}$

Q No. 7. Let $p(x)$ be a polynomial whose zeros are $1, -2$. Then the zeros of the polynomial $p(x + 1)$ are

a) $1, -2$ **b)** $0, -3$ **c)** $2, -1$ **d)** $2, -2$

Q No. 8. The number of quadratic polynomials having zeros $1, -2$ is

a) One **b)** Two **c)** Three **d)** Infinity

Q No. 9. The degree of zero polynomial is

a) 0 **b)** 1

c) Any positive integer **d)** Not defined

Q No. 10. Let a, b, c be real numbers and let the expression $p(x) = a\,x^2 + b\,x + c$ be a quadratic polynomial. Then which of the following is always true.

a) a and b are always nonzero **b)** Not both a and b are zero

c) a, b and c are always non zero **d)** $a \neq 0$

Q No. 11. Let a, b, c be real numbers and let the expression $ax + by + c = 0$ represents a linear equation. Then which of the following is always correct.

a) a and b are always nonzero **b)** Not both a and b are zero

c) a, b and c are always non zero **d)** $a \neq 0$

Q No. 12. Assume that the straight lines represented by pair of linear equations $x + 3y = 6$ and $2x - \alpha y = 12$ intersect at a unique point. Then which of the following is correct.

a) $\alpha = -6$

b) $\alpha \neq -6$

c) α must be a positive real number

d) α must be a negative real number

Q No. 13. The lines represented by linear equations $x + 3y = 6$ and $2x - 3y = 12$ intersect

a) On $X - axis$ **b)** On $Y - axis$

c) At origin **d)** Nowhere

Q No. 14. Twice the square of a number is two more than three times the number. Then the absolute value (Modulus) of the integral value of the number is

a) 1 **b)** 2 **c)** 3 **d)** 4

Q No. 15. Assume that the roots of the quadratic equation $3x^2 - 2x + \alpha = 0$ are real and equal. Then the value of α is

a) $\frac{1}{3}$ **b)** $\frac{1}{2}$ **c)** 3 **d)** 2

Q No. 16. Assume the graphs of pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ Intersect at origin. Then which of the following is true.

a) $c_1 = c_2 = 1$ **b)** $c_1 \neq c_2$

c) $c_1 = c_2 = 0$ **d)** $a_1b_1 = a_2b_2$

Q No. 17. The number of two digit numbers divisible by 4 is

a) 24 **b)** 22 **c)** 21 **d)** 20

Q No. 18. $1 + 2 + 3 + \cdots + 100 =$

a) 5500 **b)** 5005 **c)** 5050 **d)** 5000

Q No. 19. The sum of first 22 terms of arithmetic progression $8, 3, -2, \ldots$ is

a) -979 **b)** -970 **c)** -991 **d)** -901

Q No. 20. The nth term a_n of an arithmetic progression with first term a and common difference d is $a_n =$

a) $a + nd$ **b)** $a + (n-1)d$

c) $n + ad$ **d)** $n + (a-1)d$

Q No. 21. Let $a =$ Sum of zeros of $x^2 + 7x + 10$ and $b =$ Product of zeros of $x^2 + 7x + 1$. Then $a + b =$

a) 7 **b)** 10 **c)** -6 **d)** -7

Q No. 22. Consider the quadratic polynomial $p(x) = ax^2 + bx + c$. Let $= b^2 - 4ac < 0$. Then the graph of $p(x)$ intersect $X - axis$ at

a) Two points **b)** Exactly at one point

c) No points **d)** Infinite number of points

Q No. 23. Consider the following statements

Statement I: If two triangles have same area, then they must be similar.

Statement II: If two triangles are similar, then they must have same area.

Then

a) Statement I is correct but Statement II is false

b) Statement I is false but Statement II is correct

c) Both statements are false

d) Both statements are correct

Q No. 24. Assume $\Delta ABC \sim \Delta DEF$ and $AB = 4$cm, $DE = 6$cm, $EF = 9$cm and $FD = 12$cm. Then the perimeter of ΔABC is equal to

a) 18 cm **b)** 16 cm **c)** 14 cm **d)** 20 cm

Q No. 25. Which of the following is not a similarity criterion for two triangles?

a) SSS **b)** AAA

c) SAS **d)** ASA

Q No. 26. Let C be a circle and P, Q be two distinct points on it. Then which of the following is always true

a) Tangents at P and Q never meet.

b) Tangents at P and Q always meet at one point.

c) Tangents at P and Q need not meet.

d) All of the above

Q No. 27. If $\tan A = \frac{4}{3}$, then $2 \sin A \cos A =$

a) $\frac{3}{4}$ **b)** $\frac{9}{10}$ **c)** $\frac{19}{20}$ **d)** $\frac{24}{25}$

Q No. 28. $(1 + \cot x - \operatorname{cosec} x)(1 + \tan x + \sec x) =$

a) 0 **b)** 1 **c)** -1 **d)** 2

Q No. 29. Choose the correct option

a) For all values of θ, $\sin^2 \theta - \cos^2 \theta = -1$

b) For all values of θ, $\sin^2 \theta + \cos^2 \theta = 0$

c) For all values of θ, $\sin \theta < \cos \theta$

d) There exist θ, such that $\sin^2 \theta - \cos^2 \theta = -1$

Q No. 30. $\sec^2 \theta - \tan^2 \theta =$

a) 0 **b)** 1 **c)** -1 **d)** 2

Q No. 31. Suppose we throw a die, what is the probability that a composite number will appear

a) $\frac{1}{3}$ **b)** $\frac{1}{2}$ **c)** 1 **d)** 0

Q No. 32. A card is chosen from a pack of well shuffled pack of 52 cards. Then the probability of card is not a red ace is

a) $\frac{25}{26}$ **b)** $\frac{24}{25}$ **c)** $\frac{23}{26}$ **d)** $\frac{21}{20}$

Q No. 33. Sushil tosses three coins simultaneously, then the probability of at least one head.

a) $\frac{1}{4}$ **b)** $\frac{1}{2}$ **c)** $\frac{1}{8}$ **d)** $\frac{7}{8}$

Q No. 34. Two dice are thrown, then the probability that sum of numbers that appear on the top of the dice is 9 is

a) $\frac{1}{34}$ **b)** $\frac{1}{12}$ **c)** $\frac{1}{9}$ **d)** $\frac{5}{36}$

Q No. 35. The probability that a leap year has 53 Sundays and 53 Mondays is

a) $\frac{1}{7}$ **b)** $\frac{2}{7}$ **c)** $\frac{1}{52}$ **d)** $\frac{1}{50}$

Q No. 36. If for an event E, $P(E) = 0.001$. Then $P(not\ E) =$

a) 0.99 **b)** 0.909 **c)** 0.999 **d)** 0.099

Q No. 37. The probability that a leap year has 52 Sundays is

a) $\frac{1}{7}$ **b)** $\frac{2}{7}$ **c)** $\frac{3}{7}$ **d)** $\frac{5}{7}$

Q No. 38. The distance of a point $(3,6)$ from $X-$axis is

a) 3 **b)** 6 **c)** 2 **d)** 9

Q No. 39. The coordinates of the point which divides the line segment joining the points $A(-1,7)$and $B(4,-3)$ in the ratio $3:2$ is

a) $(2,1)$ **b)** $(1,2)$ **c)** $(3,1)$ **d)** $(1,3)$

Q No. 40. The perimeter of a triangle joining the points (0, 0), (2,0) and (1,1) is

a) 2 units **b)** $2\sqrt{2}$ units

c) $2+2\sqrt{2}$ units **d)** $2+\sqrt{2}$ units

Q No. 41. Consider the following statements

Statement I: Let x be a real number. Then $\sqrt{x^2} = x$.

Statement II: If x and y are real numbers, then $|x-y|$ gives distance between x and y.

Then

a) Statement I is correct but Statement II is false

b) Statement I is false but Statement II is correct.

c) Both statements are false

d) Both statements are correct.

Q No. 42. If $Mode = 2$ and $Mean = 7$. Then $Median =$

a) $\frac{16}{3}$ **b)** $\frac{17}{3}$ **c)** $\frac{14}{3}$ **d)** $\frac{2}{3}$

Q No. 43. The median of the data 9,7,8,14,16,21 is

a) 10 **b)** 11 **c)** 11.5 **d)** 12.3

Q No. 44. In a circle of diameter $42\,cm$, an arc subtends an angle of 30^o at the center. The length of arc is

a) 11 cm **b)** 21 cm **c)** 12 cm **d)** 22 cm

Q No. 45. Suppose circumference of a circle is equal to perimeter of a square. Then $Area(Circle) : Area(Square) =$ (Take $\pi = \frac{22}{7}$)

a) $2:3$ **b)** $10:11$ **c)** $11:10$ **d)** $14:11$

Q No. 46. Area of a Sector of a circle with radius r and angle $\theta =$

a) $\frac{\theta}{360}\pi r^2$ **b)** $\frac{\theta}{360}2\pi r$

c) $\frac{\theta}{360}\pi r$ **d)** None of these

Q No. 47. The approximate area of the sector of a circle with radius $4\,cm$ and of angle 30^o (Take $\pi = 3.14$) is

a) $3.17\,cm^2$ **b)** $4.19\,cm^2$

c) $7.26\,cm^2$ **d)** $9.15\,cm^2$

Q No. 48. The surface area of a sphere of radius r is

a) πr^2 **b)** $4\pi r^2$

c) $2\pi r^2$ **d)** $2\pi r$

Q No. 49. The arithmetic mean of first n odd numbers is

a) $\frac{n}{2}$ **b)** $\frac{n(n+1)}{2}$

c) n **d)** n^2

Q No. 50. The volumes of two spheres are in the ration $64:27$. The ratio of their curved surface area is

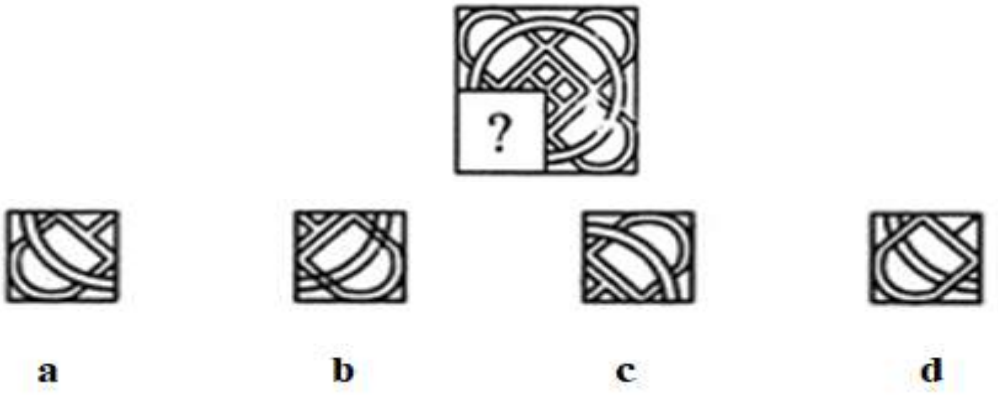
a) $4:3$ **b)** $16:9$ **c)** $32:27$ **d)** $8:9$

SECTION B: INTELLIGENCE / REASONING

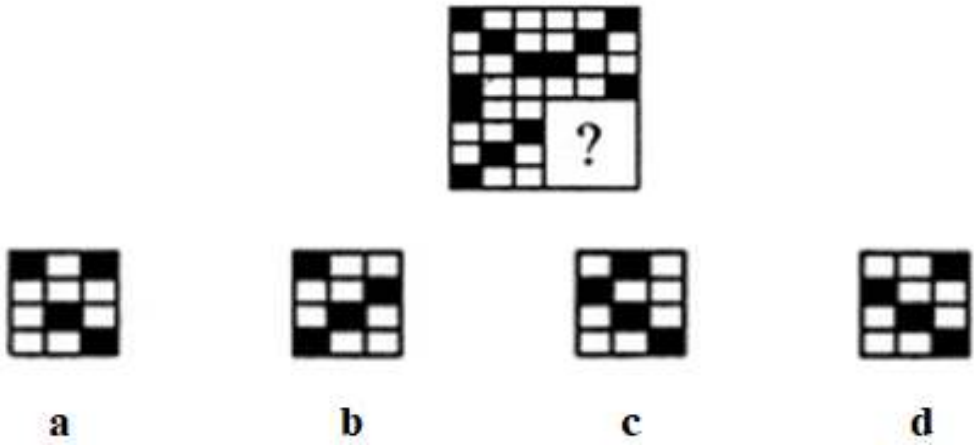
(Total Question – 35 Max Marks – 70)

Directions: In each of the questions **(Q No. 51 to Q No. 53)**, select a figure from amongst the four alternatives, which when placed in the blank space of figure **(?)** would complete the pattern.

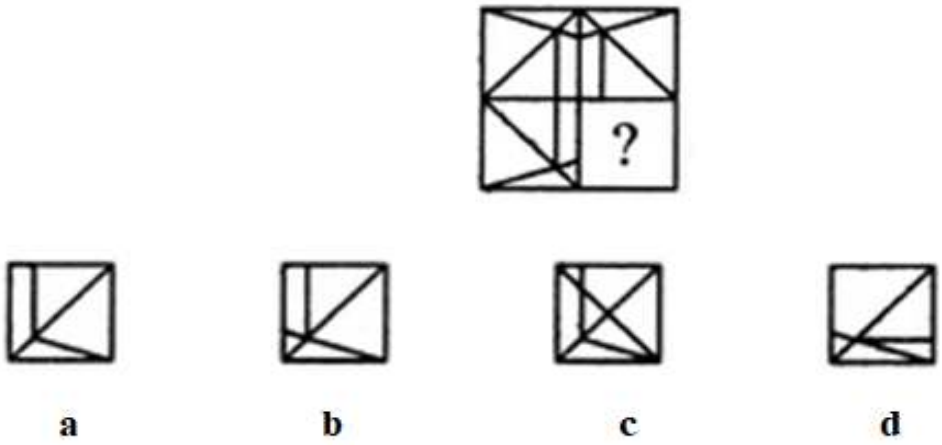
Q No. 51. Identify the figure that completes the pattern.



Q No. 52. Identify the figure that completes the pattern.



Q No. 53. Identify the figure that completes the pattern.



Directions: (Q No. 54 to Q No. 56), Choose the correct alternative that will continue the same pattern and replace the question mark/s (?) in the given series.

Q No. 54. 3, 4, 7, 7, 13, 13, 21, 22, 31, 34, ?

a) 42 **b)** 43 **c)** 51 **d)** 52

Q No. 55. 1, 10, ?, 100, 1001, 1000, 10001

a) 101 **b)** 110 **c)** 111 **d)** None of these

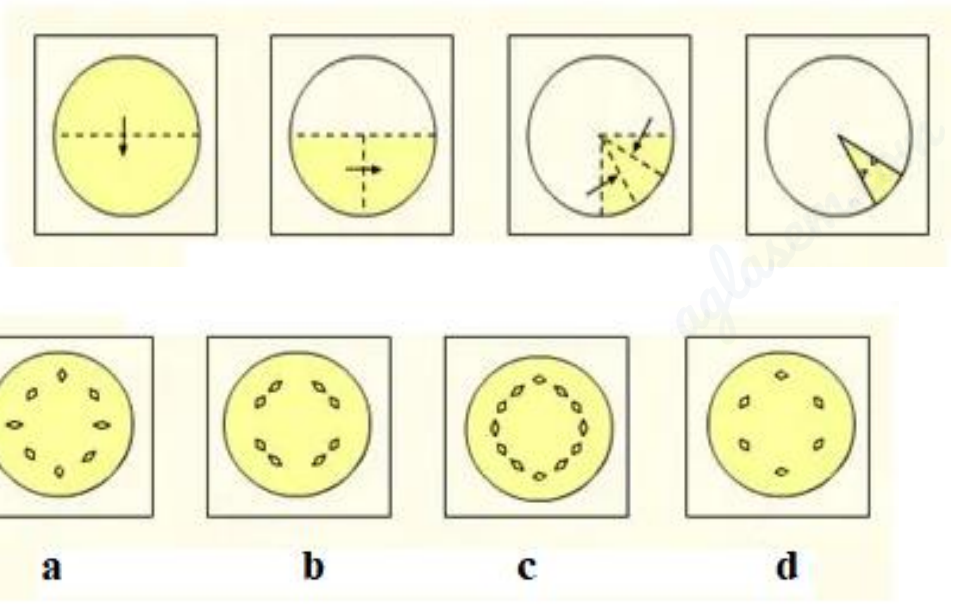
Q No. 56. 20, 20, 19, 16, 17, 13, 14, 11, ?, ?

a) 10, 10 **b)** 10, 11 **c)** 13, 14 **d)** 13, 16

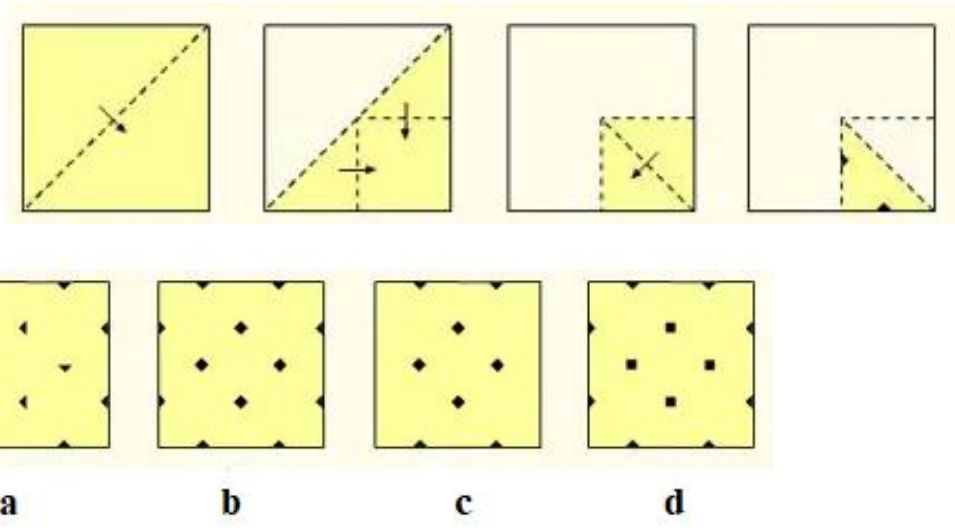
Q No. 57. Vimla starts for office every day at 9 am and reaches exactly on time if she drives at her usual speed of 40 km/hr. She is late by 6 minutes if she drives at 35 km/hr. One day, she covers two-thirds of her distance to office in one-thirds of her usual time to reach office, and then stops for 8 minutes. The speed, in km/hr, at which she should drive the remaining distance to reach office exactly on time is:

a) 27 **b)** 28 **c)** 29 **c)** 26

Q No. 58. A circular sheet of paper has been folded and punched as shown below. How will it appear when opened?



Q No. 59. A square sheet of paper has been folded and punched as shown below. How will it appear when opened?



Directions: In the given questions **(Q No. 60 and Q No. 61)**, the day of a particular date is already given and you are required to find out the day on the following date based on the former information given to you.

Q No. 60. On 8th November 2006, Wednesday falls. Find out what was the day of the week on 8th January 2009.

a) Thursday **b)** Saturday **c)** Sunday **d)** Monday

Q No. 61. On 8th February 2005, it was Tuesday. Find out the day of the week on the 8th February 2004.

a) Sunday **b)** Monday **c)** Tuesday **d)** Wednesday

Direction: In the below questions **(Q No. 62 and Q No. 63)**, you are given the various information and you need to find the angle of the clock with respect to minute hand, hour hand, or second hand.

Q No. 62. Suppose a clock started at noon. When the minute hand is 10 past 5 than the hour hand has turned through

a) 140° **b)** 155° **c)** 160° **d)** 170°

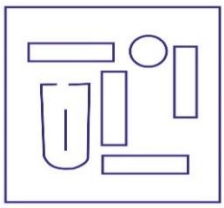
Q No. 63. Find the time between 2 and 3 o'clock when the hands of a clock will be together.

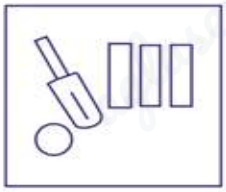
a) 10 9/11 minutes **b)** 10 10/11 minutes

c) 8 minutes **d)** 10 6/11 minutes

Q No. 64. From the given answer figures select the one in which the question figure is hidden/embedded in the same direction.

Question Figure





a



b



c



d

Q No. 65. In a certain code language, OPERATION is written as NODQBUJPO. How is SNVISBLE written in that code?

a) JOWJTJCMF **b)** JOWJTHAKD

c) HMUHTJCMF **d)** HMUHTHAKD

Q No. 66. If in a certain code, BAT = 23 and CAT = 24, then how will you code BALL?

a) 27 **b)** 28 **c)** 32 **d)** 120

Q No. 67. Study the following letters and their corresponding digit codes followed by certain conditions of coding and answer the question given below them by finding out which of the digit combinations given in (a), (b), (c) and (d) is the coded form of the letter - group given.

Letter	P	N	A	J	I	R	E	B	U	K
Code	5	3	9	1	4	6	2	7	0	8

Conditions:

(1) IF both the first and the last letters in the group are vowels, both should be coded as $.

(2) If both the first and the last letters in the group are consonant, both should be coded as #.

a) RBUKAE # 70892 **b)** 670892

c) 670982 **d)** 607892

Q No. 68. If "cook" is called 'butler", "butler" is called "manager? 'manager' is called 'teacher, 'teacher' is called 'clerk' and 'clerk' is called 'principal who will teach in a class?

a) Cook **b)** Butler **c)** Manager **d)** Clerk

Q No. 69. In a below mentioned question, a word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in the two given matrices. The columns and rows of Matrix *I*st are numbered from 0 to 4 and those of Matrix *II*nd from 5 to 9. A letter from these matrices can be represented first by its row and then the column number e.g., in the matrices for questions 1 to 4, M can be represented by 14, 21, etc; 0 can be represented by 20, 32, etc. Similarly, you have to identify the correct set for the word given in each question.

Matrix – I

	0	1	2	3	4
0	A	E	S	T	H
1	T	H	A	E	S
2	E	S	T	H	A
3	H	A	E	S	T
4	S	T	H	A	E

Matrix II

	5	6	7	8	9
5	P	O	R	K	L
6	K	L	P	O	R
7	O	R	K	L	P
8	L	P	O	R	K
9	R	K	L	P	O

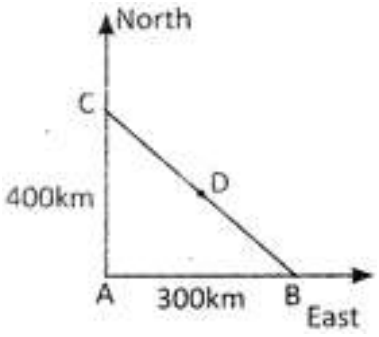
a) EAST 44, 32, 21, 03 **b)** 32, 31, 02, 04

c) 20, 43, 33, 11 **d)** 13, 12, 14, 10

Q No. 70. Meena walks 14 meters towards West, then turns to her right and walks 14 meters and then turns to her left and walks 10 meters. Again turning to her left, she walks 14 meters. What is the shortest distance between her starting point and the present position?

a) 10 **b)** 24 **c)** 28 **d)** 38

Q No. 71. In the given figure, B is 300 km Eastward of A and C is 400 km North of A. D is exactly in the middle of C and B, the distance between C and D is:



a) 250km **b)** 300km **c)** 2502√km **d)** 350km

Q No. 72. Study the following Information carefully and answer the question:

(i) Six children B/ D/ C, M, J and K are split into two groups of three each and are made to stand in two rows in such a way that a child in one row is exactly facing a child in the other row.

(ii) M is not at the ends of any row and is to the right of J, who is facing C. K is to the left of D, who is facing M.

Which of the following groups of children is in the same row?

a) BDC **b)** BMD **c)** MJK **d)** None of these

Q No. 73. Read the following information carefully and answer the questions given below:

(i) 'P # Q' means 'P is the father of Q'.

(ii) 'P + Q' means 'P is the mother of Q'.

(iii) 'P - Q' means 'P is the brother of Q'.

(iv) 'P % Q' means 'P is the sister of Q'.

If A + B - C % D # E, then A is D's

a) Father **b)** Sister

c) Grandfather **d)** Grandmother

Q No. 74. A number series is given, after the series, bellow it in the next line, a number is given and is followed by (a), (b), (c), (d), (e). You have to complete the series starting with the given number, following the pattern of the given series.

2, 9, 57, 337, 1681 3, (a) (b) (c) (d) (e)

Which number will come in place of (e)?

a) 32416 **b)** 4231

c) 13441 **d)** 6392

Q No. 75. Find the number of ways of selecting 4 letters from the word EXAMINATION.

a) 136 **b)** 126 **c)** 252 **d)** 525

Q No. 76. There are two statements followed by two conclusions numbered **I** and **II**. You have to consider the two statements to be true, even if they seen to be at variance at the commonly known facts. You have to decide which of the given conclusions definitely follows from the given statements.

You are to give your answer as: **(a)** if only I follows; **(b)** if only conclusion II follows; **(c)** if either I or II follows; **(d)** if neither I nor II.

Statement:

All boys are mothers.

All mothers are fathers.

Conclusions:

I. All mother are boys.

II. All boys are fathers.

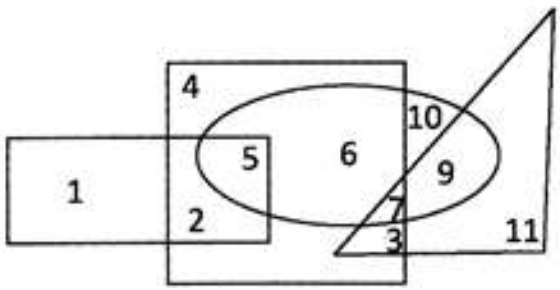
a) If only I follows

b) If only conclusion II follows

c) If either I or II follows

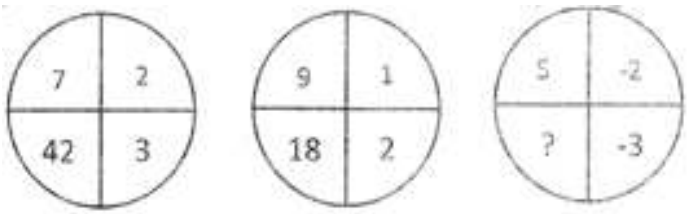
d) If neither I nor II follows

Q No. 77. Which number is in the square, ellipse and triangle?



a) 1 **b)** 5 **c)** 6 **d)** 7

Q No. 78. Find the missing number.



a) -30 **b)** 13 **c)** 18 **d)** 30

Q No. 79. Find the odd man out.

a) ACDF **b)** FGKL **c)** HIVW **d)** TUOP

Q No. 80. A statement is given followed by two conclusions numbered **I** and **II**. You have to decide which alternative among the given options follow from the given statement.

Statements: The eligibility for admission to the course is minimum second class Master's degree. However, the candidates who have appeared for the final year examination of Master's degree can also apply.

Conclusions: I. All candidates who are yet to get their Master's degree will be there in the list of selected candidates.

II. All candidates having obtained second class Master's degree will be there in the list of selected candidates.

a) Only conclusion I follows **b)** Only conclusion II follows

c) Either I or II follows **d)** Neither I nor II follows

Q No. 81. Read the following statements carefully and answer the question based on it.

In a group of five persons A, B, C, D and E.

(i)	A and C are Intelligent in English and Reasoning.
(ii)	B and C are Intelligent in English and General Awareness.
(iii)	E and D are Intelligent in Arithmetic and Interview.
(iv)	E is intelligent in Interview. Reasoning and Arithmetic.
(v)	B and D are intelligent in Arithmetic and General Awareness?

Who is intelligent in English, Arithmetic and General Awareness?

a) A **b)** B **c)** C **d)** D

Q No. 82. The two expression on either side of the sign (=) will have the same value if two terms on either side or on the same side are interchanged. The correct terms to be inter-changed have been given as one of the four alternatives under each expressions. Find the correct alternative. Select the correct set of symbols which will fit in the given equation 5 0 3 5 = 20.

a) ×, ×, ×| **b)** −, +, ×| **c)** ×, +, ×| **d)** +, −, ×|

Q No. 83. Five words are given. Which of them will come at the third position if all of them are arranged alphabetically as in a dictionary?

a) Sack **b)** Shame

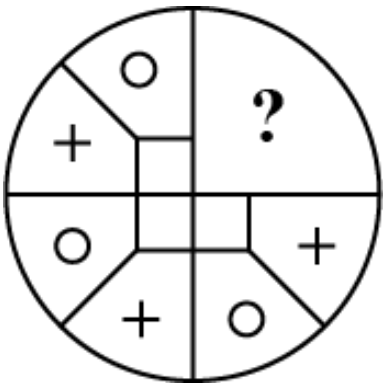
c) Sick **d)** Show

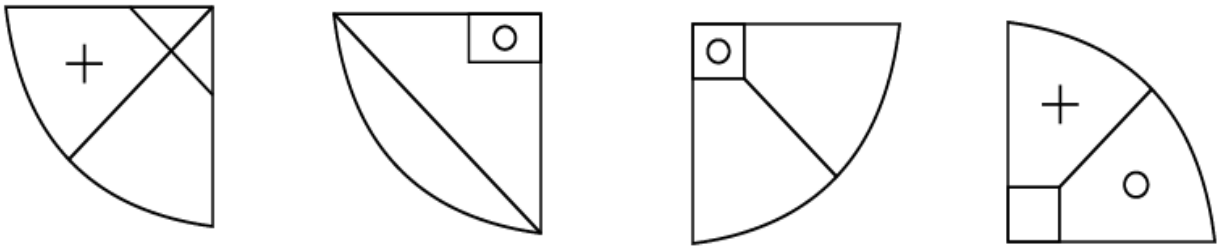
Q No. 84. Four words have been given of which three are alike in same way and one is different, choose out the ODD one.

a) Treachery **b)** Morbid

c) Deceit **d)** Swindle

Q No. 85. The following problem is based on pattern completion test. A figure is given whose one part/quarter is missing or left blank with some choices, you are required to select the best choice which completes the figure.





a b c d

SECTION C: SCIENCE

(Total Question – 30 Max Marks – 60)

Directions (Q No. 86 and Q No. 87): Read the passage and answer the Questions.

Marble's popularity began in ancient Rome and Greece, where white and off-white marble were used to construct a variety of structures, from hand-held sculptures to massive pillars and buildings.

Q No. 86. The substance not likely to contain $CaCO_3$ is:

a) Dolomite **b)** A marble statue

c) Calcined gypsum **d)** Sea shells

Q No. 87. Calcium Oxide can be reduced to Calcium, by heating with Sodium metal. Which compound would act as an oxidizing agent in the above process?

a) Sodium **b)** Sodium Oxide

c) Calcium **d)** Calcium Oxide

Directions (Q No. 88 and Q No. 89): The pH values of many common liquids are given in the table below. Study the below table and answer the following questions.

Substance	pH
Battery acid	<1.0
Stomach acid	2.0
Lemon acid	2.4
Cola	2.5
Apple juice	3.5
Black coffee	5.0
Acid rain	5.6
Milk	6.5
Distilled water	7.0
Human saliva	7.5
Sea water	8.0
Soap	9.0-10.0
Milk of magnesia	10.5
Ammonia	11.5
Bleach	12.5

Q No. 88. Which of these is valid conclusion that can be drawn from the table.

a) Many common food items are quite acidic in nature

b) Our stomach contains a liquid which is a weak acid

c) Sea water is neither acidic nor basic. It is neutral

d) Acid rain, in spite of its name, is basic in nature

Q No. 89. Amit has black coffee with milk. Which of the following is most likely to be true about the pH of the mixture?

a) It will be less than that of black coffee

b) It will be more than that of distilled water

c) It will be more than that of acid rain

d) It will be less than that of apple juice

Directions (Q No. 90 and Q No. 91): A student took four metals P, Q, R and S and carried out different experiments to study the properties of metals. Some of the observations were:

- All metals could not be cut with knife except metal R.
- Metal P combined with oxygen to form an oxide M_2O_3 which reacted with both acids and bases.
- Reaction with water.

  P – Did not react either with cold or hot water but reacted with steam.

  Q – Reacted with hot water and the metal started floating.

  R – Reaction violently with cold water.

  S – Did not react with water at all.

  Based on the above observations answer the following:

Q No. 90. Out of the given metals, the one which needs to be stored using kerosene is:

a) P **b)** R **c)** S **d)** Q

Q No. 91. The increasing order of the reactivity of the four metals is:

a) P<Q<R<S **b)** S<R<Q<P

c) S<P<Q<R **d)** P<R<Q<S

Q No. 92. When sodium hydrogen carbonate is added to ethanoic acid a gas evolves. Consider the following statements about the gas evolved.

a) It turns lime water milky

b) It is evolved with a brisk effervescence

c) It has a smell of burning Sulphur

d) It is also a by-product of respiration

The correct statement are:

a) a and b only **b)** b and d only

c) a, c and d **d)** a, b and d

Q No. 93. While studying the saponification reaction, what do you observe when you mix an equal amount of colourless vegetable oil and 20% aqueous solution of NaOH in a beaker?

a) The colour of the mixture has become dark brown

b) A brisk effervescence is taking place in the beaker

c) The outer surface of the beaker has become hot

d) The outer surface of the beaker has become cold

Q No. 94. All living cells require energy for various activities. This energy is available by the breakdown of simple carbohydrates either using oxygen or without using oxygen.

The characteristic process observed in anaerobic respiration are:

(i) Presence of oxygen

(ii) Release of Carbon dioxide

(iii) Release of energy

(iv) Release of lactic acid

a) (i), (ii) only **b)** (i), (ii), (iii) only

c) (ii), (iii), (iv) only **d)** (iv) only

Q No. 95. In a person, the tubule part of the nephron is not functioning at all. What will its effect be on urine formation?

a) The urine will not be formed

b) Quality and quantity of urine is unaffected

c) Urine is more concentrated

d) Urine is more diluted

Q No. 96. Refer to Table A showing the blood report of the levels of glucose of patient's X and Y. Infer the disease which can be diagnosed from the given data.

Table A: Blood report of patient X and Y

Time of Check	Blood Glucose ranges (mg/dL)	
	Patient X	**Patient Y**
Before breakfast (Fasting)	<100	70-130
Before Lunch, supper and snack	<110	70-130
Two hours after meals	<140	<180
Bedtime	<120	90-150

a) Diabetes **b)** Goiter

c) Marasmus **d)** Acromegaly

Q No. 97. Refer to the Table B and suggest the value of the mean blood glucose level beyond which doctors' advice is necessary.

Table B: Blood Glucose chart

	Mean Blood Glucose Level (mg/dL)
Doctors' advice needed	380
	350
	315
	280
	250
	215
Good	180
	150
Excellent	115
	80
	50

a) 180 mg/dL **b)** 115 mg/dL

c) 50 mg/dL **d)** 80 mg/dL

Q No. 98. A student while observing an embryo of a gram seed listed various parts of the embryo as listed below: Testa, Micropyle, Cotyledon, Tegmen, Plumule, Radicle.

On examining the list, the teacher commented that only three parts are correct. Select these three correct parts:

a) Cotyledon, Testa, Plumule

b) Cotyledon, Plumule, Radicle

c) Cotyledon, Tegmen, Radicle

d) Cotyledon, Micropyle, Plumule

Q No. 99. Which among the following is not the function of testes at puberty?

(i) Formation of germ cells

(ii) Secretion of testosterone

(iii) Development of placenta

(iv) Secretion of estrogen

a) (i) and (ii) **b)** (ii) and (iii)

c) (iii) and (iv) **d)** (i) and (iv)

Q No. 100. Study the given cross showing self-pollination in F_1.

RRYY	x	rryy	Parents
(Round Yellow)		(Wrinkled Green)	
RrYy	x	RrYy	F1 generation
(Round Yellow)		(Round Yellow)	

The combination of characters in the F_2 progeny are:

a) Round Yellow : Round Green : Wrinkled Yellow : Wrinkled Green

b) Round Green : Round Yellow : Wrinkled Yellow : Wrinkled Green

c) Round Yellow : Round Green : Wrinkled Green : Wrinkled Yellow

d) Round Green : Round Yellow : Wrinkled Yellow : Wrinkled Green

Q No. 101. A Mendelian experiment consists of breeding tall pea plants bearing white flowers. The progeny all bore violet flowers, but the genetic make-up of the tall parent cod depicted as:

a) TTWW **b)** TTww

c) TtWW **d)** TtWw

Q No. 102. A converging lens forms a three times magnified image of an object, which can be take on a screen. If the focal length of the lens is 30cm, then the distance of the object from the lens is:

a) -55 cm **b)** -50 cm **c)** -45 cm **d)** -40 cm

Directions (Q No. 103 and Q No. 104): Case based Questions.

A compound microscope is an instrument which consists of two lenses L_1 and L_2. The lens L_1 called objective, forms a real, inverted and magnified image of the given object. This serves as the object for the second lens L_2; the eye piece. The eye piece functions like a simple microscope or magnifier. It produces the final image, which is inverted with respect to the original object, enlarged and virtual.

Q No. 103. What is the value and sign of magnification (according to the new Cartesian sign convention) of the image formed by L_2?

a) Value = Less than 1 and Sign = Positive

b) Value = More than 1 and Sign = Positive

c) Value = Less than 1 and Sign = Negative

d) Value = More than 1 and Sign = Negative

Q No. 104. If power of the eye piece (L2) is 5 diopters and it forms an image at a distance of 80 cm from its optical center, at what distance should the object be?

a) 12 cm **b)** 16 cm **c)** 18 cm **d)** 20 cm

Q No. 105. A person cannot see distinctly objects kept beyond 2 cm. This defect can be corrected by using a lens of power.

a) +0.5 D **b)** -0.5 D **c)** +0.2 D **d)** -0.2 D

Q No. 106. Which of the following phenomena of light are involved in the formation of a rainbow?

a) Reflection, refraction and dispersion

b) Refraction, dispersion and total internal reflection

c) Refraction, dispersion and internal reflection

d) Dispersion, scattering and total internal reflection

Q No. 107. In an experiment to trace the path of a ray of light through a triangular glass prism, a student would observe that the emergence ray:

a) Is parallel to the incident ray

b) Is along the same direction of incident ray

c) gets deviated and bends towards the thinner part of the prism

d) Gets deviated and bends towards the thicker part (base) of the prism

Q No. 108. A cylindrical conductor of length *'l'* and uniform area of cross section 'A' has resistance 'R'. The area of cross section of another conductor of same material and same resistance but of length *'2l'* is:

a) A/2 **b)** 3A/2 **c)** 2A **d)** 3A

Q No. 109. Two bulbs of 100 W and 40 W are connected in series. The current through the 100 W bulb is 1A. The current through the 40 W bulb will be:

a) 0.4 A **b)** 0.6 A **c)** 0.8 A **d)** 1A

Q No. 110. In an electric circuit three incandescent bulbs A, B and C of rating 40 W, 60 W and 100 W, respectively are connected in parallel to an electric source. Which of the following is likely to happen regarding their brightness?

a) Brightness of all the bulbs will be the same

b) Brightness of bulb A will be the maximum

c) Brightness of bulb B will be more than that of A

d) Brightness of bulb C will be less than that of B

Q No. 111. Which of the following pattern correctly describes the magnetic field around a long straight wire carrying current?

a) Straight lines perpendicular to the wire

b) Straight lines parallel to the wire

c) Radial lines originating from the wire

d) Concentric circles centered around the wire

Q No. 112. Choose the incorrect statement from the following regarding magnetic lines of field:

a) The direction of magnetic field at a point is taken to be the direction in which the north pole of a magnetic compass needle points

b) Magnetic field lines are closed curves

c) If magnetic field lines are parallel and equidistant, they represent zero field strength

d) Relative strength of magnetic field is shown by the degree of closeness of the field lines

Q No. 113. For a current in a long straight solenoid N-pole and S-pole are created at the two ends. Among the following statements, the incorrect statement is:

a) The field lines inside the solenoid are in the form of straight lines which indicates that the magnetic field is the same at all points inside the solenoid

b) The strong magnetic field produced inside the solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the coil

c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet

d) The N-Pole and S-Pole exchange position when the direction of current through the solenoid is reversed

Directions (Q No. 114 and Q No. 115): Read the following and answer the questions given below.

The Table shows some organisms and their food sources in an ecosystem.

Organism	**Food Source**
Frog	Cricket, Grasshopper
Cricket	Grass
Snake	Frog, Shrew
Grasshopper	Grass
Eagle	Snake, Shrew

Q No. 114. A snake eats a frog. What percentage of energy of the frog is transferred to the snake?

a) 1 % **b)** 2 % **c)** 10 % **d)** 90 %

Q No. 115. Which organism has the largest biomass in the ecosystem?

a) Grass **b)** Snake **c)** Eagle **d)** Grasshopper

SECTION D: ENGLISH

(Total Question – 25 Max Marks – 50)

Directions: Q No. 116 to Q No. 125.

Read the following passage and answer the questions based on the passage.

In their darker moments, climatologists talk about their own "nightmare scenario". This is one where global warming has brought about such significant climatic changes that ocean currents change direction. One scene from the nightmare has the Gulf Stream moving south or even going into reverse, making winter in London look and feel like a St Petersburg January.

The ocean is a great moderating influence on the planet, soaking up the heat around the tropics and depositing it in the cooler polar regions. Yet scientists know surprisingly little about how the sea does this – they estimate that the North Atlantic alone moves energy equivalent to the output of several hundred million power stations.

Last year oceanographers began their biggest international research initiative to learn more about ocean circulation. The first results from the World Ocean Circulation Experiment demonstrate just how complex the movement of seawater can be. They have also given scientists a glimpse of the amount of heat being exchanged between the oceans and the atmosphere. As part of the experiment, researchers are monitoring the speed and direction of ocean currents, water temperature and salinity.

Research ships taking part will gather detailed measurements at 24,000 points or "stations" along carefully designated trans-ocean routes. This undertaking dwarfs the 8,000 hydrographic stations created in the past hundred years of ocean surveying. A fleet of ships, buoys, seabed sensors and satellites will collect so much data that Britain, one of the 40 countries taking part, has opened a research institute, the James Rennell Centre for Ocean Circulation in Southampton, to process them.

One of the justifications for the experiment, says John Woods, director of marine and atmospheric sciences at the Natural Environment Research Council, is that the oceans hold the key to understanding long-term changes in the global climate. The Earth has two "envelopes" - the ocean, consisting of slowly circulating water, and the atmosphere, made of fast-moving air. Far from being independent, they interact, one modifying the other until a balance is reached between them. The

present balance came about at the end of the last Ice Age, about 10,000 years ago. Scientists hope that knowing more about the ocean's "weather patterns" will help them predict climate changes.

Knowing how heat is moved around the ocean is crucial to such long-term forecasting. The top three metres of the ocean store more heat than all of the atmosphere. Some of the heat can be transported downward between 30 metres and several thousand metres. The deeper it goes, the longer it stays out of the atmosphere. Water heated in the equatorial region flows in shallow currents north or south towards the poles, releasing its heat to the air and, as it becomes colder and denser, sinks to the sea floor, forming deep, cold currents that flow back to the equator.

Q No. 116. Some climatologists are of the opinion that global warming could

a) Change in wind direction in the polar regions.

b) Modify ocean currents.

c) Warm the oceans

d) Increase wind speeds.

Q No. 117. What results have already been confirmed by scientists?

a) Heat is stocked at great depths.

b) The last Ice Age ended about 10,000 years ago.

c) The complexity of ocean currents.

d) Gulf Stream currents are situated in the surface layer of water.

Q No. 118. Where is most of the heat stored?

a) Around equator.

b) In the atmosphere.

c) Along the sea bed.

d) In the top layers of the ocean.

Q No. 119. As per the findings the atmosphere and the ocean

a) Have an independent influence on the climate

b) Interact and create a global climatic balance.

c) Have a little effect on the climate.

d) Will stop functioning in the coming years due to climate change

Q No. 120. Why are the researchers monitoring the speed and direction of ocean currents, water temperature and salinity?

a) To learn about ocean circulation

b) To calculate the heat of the ocean

c) To measure the speed of the ocean currents

d) None of the Above

Q No. 121. Which word is closely related to the phrasal verb 'soaking up" used in the above passage?

a) Absorb **b)** Swallow

c) Sip **d)** Evaporate

Q No. 122. What does the sentence, "The ocean is a great moderating influence on the planet...", refer to in the passage?

a) The ocean is Earth's vast water reservoir.

b) The ocean currents help in the movement of the earth.

c) The ocean balances the temperature of the earth.

d) The ocean moderates the winds.

Q No. 123. In the sentence "... the oceans hold the key to understanding long-term changes in the global climate", what does the idiom "**hold the key**" mean?

a) The potential to make a change

b) A way forward.

c) The place through which one has to go.

d) To make it possible to explain.

Q No. 124. Which word is closely related to the word **"envelopes"** as used in the sentence 'The Earth has two "envelopes"'?

a) Coverings **b)** Encasements

c) Coatings **d)** Casings

Q No. 125. In the sentence, "The present balance came about at the end of the last Ice Age..." what does the phrasal verb **"came about"** mean?

a) To start **b)** To happen

c) To end **d)** To follow

Directions: Q No. Q No. 126 to Q No. 140. Grammar, Vocabulary & Punctuation

Q No. 126. Sharif has decided against ..... a new house. (Fill in the blank with the appropriate word)

a) To buy **b)** Buying

c) For buying **d)** Buy

Q No. 127. I don't like people smoking on the streets. I think it .....be banned in public places. (Fill with the appropriate modal)

a) Can **b)** Shall

c) Should **d)** Will

Q No. 128. This factory produces some of ..... mobile phones in the world.

a) best **b)** very best

c) the most best **d)** the best

Q No. 129. Which phrasal verb can be used instead of the word **EXTINGUISH** in the sentence, "Extinguish the fire"?

a) Put out **b)** Put off

c) Put down **d)** Put away

Q No. 130. Choose the correct spelling.

a) Diarrhoea **b)** Diarrheoa

c) Dairrheoa **d)** Dairrhoea

Q No. 131. A person who is interviewed is called?

a) Interwiee **b)** Interviewer

c) Interviewee **d)** Interviee

Q No. 132. You have to buy a paper ream, a pencil box, an inkpot, and a dozen of drawing sheets. So you are going to a ..... shop.

a) book **b)** stationery

c) paper **d)** stationary

Q No. 133. Which of the following sentence is correctly punctuated?

a) These findings we would suggest cast doubt upon his hypothesis

b) These findings we would suggest, cast doubt upon his hypothesis

c) These findings, we would suggest, cast doubt, upon his hypothesis

d) These findings, we would suggest, cast doubt upon his hypothesis

Q No. 134. Women in teaching..... are paid less. (Choose the most appropriate word to fill in the blank)

a) Job **b)** profession

c) employment **d)** occupation

Q No. 135. Which of the following singular noun is incorrectly paired with its plural?

a) Goose-geese **b)** Loaf-loaves

c) Index-indexes **d)** hoof-hooves

Q No. 136. I am going to ..... to your parents about your exam results.

a) Call **b)** Talk

c) Discuss **d)** Ask

Q No. 137. A person who comes to a country to settle there is called?

a) Immigrant **b)** Traveler

c) Tenant **d)** Emigrant

Q No. 138. Which of the following sentence is correctly punctuated?

a) Yes, said Junaid, I will do your work.

b) Yes, said Junaid, "I will do your work."

c) "Yes said", Junaid, "I will do your work."

d) "Yes, "said," Junaid, "I will do your work."

Q No. 139. Aisha ..... to school every day. (Fill in the blank with the appropriate verb)

a) walk **b)** have walked

c) walks **d)** None of the above

Q No. 140. The Jury ..... divided in their opinion.

a) were **b)** was

c) Both A & B **d)** None of the above

S P A C E F O R R O U G H

SPACE FOR ROUGH

S P A C E F O R R O U G H