ENTRANCE EXAMINATION – 2020

SET A

ROLL NO 9010 6016

Signature of Invigilator

Time: 1 HOUR 30 MINUTES

Total Marks : 100

Instructions to Candidates

1. Do not write your name or put any other mark of identification anywhere in the OMR Response Sheet. IF ANY MARK OF IDENTIFICATIONS IS DISCOVERED ANYWHERE IN OMR RESPONSE SHEET, the OMR sheet will be cancelled, and will not be evaluated.

2. **This Question Booklet contains the cover page and a total of 100 Multiple Choice Questions of 1 mark each**

3. Space for rough work has been provided at the beginning and end. Available space on each page may also be used for rough work.

4. There is negative marking in Multiple Choice Questions. For each wrong answer, 0.25 marks will be deducted.

5. USE/POSSESSION OF ELECTRONIC GADGETS LIKE MOBILE PHONE, iPhone, iPad, page ETC. is strictly PROHIBITED.

6. Candidate should check the serial order of questions at the beginning of the test. If any question is found missing in the serial order, it should be immediately brought to the notice of the Invigilator. No pages should be torn out from this question booklet.

7. Answers must be marked in the OMR response sheet which is provided separately. OMR Response sheet must be handed over to the invigilator before you leave the seat.

8. The OMR response sheet should not be folded or wrinkled. The folded or wrinkled OMR/Response Sheet will not be evaluated.

9. Write your Roll Number in the appropriate space (above) and on the OMR Response Sheet. Any other details, if asked for, should be written only in the space provided.

10. There are four options to each question marked A, B, C and D. Select one of the most appropriate options and fill up the corresponding oval/circle in the OMR Response Sheet provided to you. The correct procedure for filling up the OMR Response Sheet is mentioned below.

CORRECT METHOD
Ⓐ ● Ⓒ Ⓓ

WRONG METHOD

Q1 2.7252525 .... is a ......number.

check

A irrational
B rational
C prime
D integer

Q2 Which of the following is not the last digit of 3^n for n as a positive integer?

A 3
B 9
C 5
D 7

Q3 Which of the following is a linear polynomial?

A $x + \sqrt{5} - \sqrt{3}$
B $\sqrt{2}x^2 - 3x + 4$
C $\sqrt{x} + 5$
D $\sqrt{x} + 2x$

Q4 Which of the following is NOT a polynomial?

A $x^2 + 2x + \sqrt{3}$
B $x + \sqrt{5} - \sqrt{3}$
C $\sqrt{x} + 5$
D $\sqrt{2} x^2 - 3x + 4$

Q5 If α and β are zeroes of (2x+10)(3x+21), then the value of (α+β) is ......

A -12
B 35
C 210
D 5

$$6x^2 + 42x + 30x + 210$$
$$6x^2 + 72x + 210 \qquad -b/a = \frac{-72}{6}$$
$$-\frac{72}{6}$$

Q6 If α and β are zeroes of $x^2 + 8x + 15$, then the value of (αβ) is ......

A 8
B 15
C 5
D 4

Q7 For which of the following polynomial, the sum and product of its zeroes are -4 and -21 respectively?

A $x^2 + 4x - 21$
B $2x^2 + 8x - 21$
C $2x^2 + 4x - 42$
D $2x^2 + 8x + 42$

$$x^2 - (\alpha+\beta)x + \alpha\beta$$
$$x^2 + 4x - 21$$

Q8 If α, β, γ are the roots of $3x^3+9x^2+15x+21=0$, then the value of $(\alpha\beta+\beta\gamma+\gamma\alpha)$ is ......

A   3

B   5

C   7

D   1

Handwritten: $-\frac{b}{a}$ $\alpha+\beta+\gamma = -b/a$

$\alpha\beta\gamma = -d/a$

$\alpha\beta+\beta\alpha+\gamma\alpha = d/a$

Q9 If α, β, γ are the roots of $2x^3+4x+6=0$, then the value of $(\alpha\beta\gamma)$ is ......

A   4

B   6

C   -2

D   -3

Handwritten: $2x^3 + 0x^2 + 4x + 6 = 0$ $\frac{-4}{2}$

Q10 If α, β, γ are the roots of $2x^3+4x+6=0$, then the value of $(\alpha+\beta+\gamma)$ is ......

A   2

B   4

C   -3

D   0

Handwritten: $2x^3 + 0x^2 + 4x + 6 = 0$ $\frac{-0}{2} = 0$

Q11 The cost of 3 bananas and 5 mangos is Rs. 50. If cost of 3 mangos and one banana is Rs. 26, then what is the cost of a mango?

A   Rs. 10

B   Rs. 5

C   Rs. 7

D   Rs. 13

Handwritten: $3x+5y=50$; $3x+y=26 \times 3$; $4y=24$; $y=6$; $3x+5y=50$, $x=0$; $2+3y=26 \times 3$; $3x+5y=50$; $3x+y=26$; $-4y=-20$; $y=7$

Q12 For what value of k, the system of equations $x+3y=7$, $2x+ky+14=0$ has no solution?

A   6

B   4

C   2

D   1

Handwritten: $\frac{1}{2} = \frac{3}{k} = \frac{-7}{14} = -\frac{1}{2}$; $(k=2\cdot6)$; $k=6$

Q13 For what value of k, the system of equations $x+3y=7$, $kx+6y-14=0$ has infinite number of solutions?

A   1

B   2

C   3

D   4

Handwritten: $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$; $\frac{1}{k} = \frac{1}{2}$; $\frac{1}{k} = \frac{3}{6} = \frac{-7}{-14}$

Q14 Let sum of two numbers is 8 and difference between them is 2. Which of the following is the product of these numbers?

A   5

B   10

C   15

D   20

Handwritten: $x+y=8$; $x-y=2$; $y=3$; $2x=10$; $x=5$

Q15 The sum of digits of a two digit number is 7. The number obtained by interchanging the digits exceeds the given number by 27. The number is ....

A   34
B   43
C   16
D   25

Handwritten work: $x+y=7$ $2+y\ 27$ $y+10x=27$
$(y+x+2+2=0)$ ...

Q16 Present age of a woman is 8 years more than double of age of her daughter. If present age of daughter is 12 years, then present age of mom is............years.

A   30
B   25
C   32
D   33

Handwritten: $|w|$ $(1)D+6$

Q17 Which of the following is the solution of the following system of equations:

$$\frac{2}{x}+\frac{3}{y}=2$$

$$\frac{4}{x}-\frac{4}{y}=-1$$

A   x = 4, y = 2
B   x = 2, y = 2
C   x = 2, y = 4
D   x = 4, y = 4

Handwritten work: $2u+3v=2 \times 2$ $4u+6v=4$
$4u-4v=-1$ $4u-4v=-1$
$2u+3=2$ $10v=5$
$2u=2-3$ $v=\frac12$
$2u=\frac12$ $u=\frac12$ ...

Q18 The product of two consecutive positive integers is 210. The sum of these integers is ....

A   27
B   29
C   31
D   35

Handwritten work: $x(x+1)=210$ $x^2+x+210=0$
$x^2+x+210=0$ ... $-1\pm\sqrt{1+840}$ ...
27×28 ...

Q19 The area of a rectangle is 105 m². The length of the rectangle is one more than twice of its breadth. The breadth of rectangle is ....

A   7 m
B   15 m
C   20 m
D   25 m

Handwritten work: $l\times b=105$ $2b\times b=105$ $l=2b$
$l=1+2b$
$b+2b^2-105=0$
$-2\pm\sqrt{4+420}$ ...

Q20 Which of the following series is NOT in AP?

A   2, 4, 8, 10, ...
B   2, 5/2, 3, 7/2, ...
C   0.2, 0.22, 0.24, 0.26, ...
D   15, 10, 5, 0, ...

Q21 Which of the following series is in AP?

A   2, 4, 8, 10, ...
B   2, 5/2, 3, 7/2, ...
C   0.2, 0.22, 0.222, 0.2222, ...
D   15, 10, 5, 10, ...

Handwritten work: $\frac{-1\pm\sqrt{1+840}}{4}$ ... $b+2b^2=105$ $2b^2+b-105=0$ ...

Q22 If the 3rd and 9th terms of an AP are 4 and -8 respectively, which term of this AP is zero?

A 6th term

B 7th term

C 8th term

D 5th term

Q23 Let the 17th term of an AP exceeds its 10th term by 7. Which of the following is the common difference of this AP?

A 1

B 2

C -1

D -2

Q24 Two APs have the same common difference and the difference between their 11th terms is 75. Which of the following is the difference between their 101st terms?

A 750

B 700

C 75

D 70

Q25 Let the sum of the first 15 terms of an AP is 390 and its first term is 5. Which of the following is the difference between the 6th and 5th terms of this AP?

A 3

B 4

C 5

D 6

Q26 How many terms of the AP 9, 17, 25, ... must be taken which gives a sum of 636?

A 10

B 11

C 12

D 13

Q27 A sum of Rs. 700 is to be used to give cash prizes to seven students of a school for their overall academic performance. Let each price is Rs. 20 less than its preceding prize. Which of the following is the difference between first and last prizes?

A Rs. 100

B Rs. 110

C Rs. 120

D Rs. 130

Q28 Which of the following term of the AP 121, 117, 113, ... is its first negative term?

A 32th term

B 31th term

C 30th term

D 29th term

Q29 Let ΔABC and ΔDEF are similar triangles and their areas are 64 cm² and 121 cm² respectively. If EF = 11 cm, then BC is equal to .... cm.

A 5
B 6
C 7
D 8

$\frac{8}{11}$

Q30 Let ΔABC is an isosceles triangle with right angle at C. Which of the following identity is True?

A $AB^2 = 4AC^2$
B $AB^2 = 2AC^2$
C $AC^2 = 2AB^2$
D $AC^2 = 4AB^2$

$AB^2 = AC^2 + BC^2$
$AB^2 = AC^2 \cdot \frac{h}{6^o}$ $AB = AC$
$\frac{AB}{\mu}$

Q31 Let in ΔABC, AB = 6√3 cm, BC = 6 cm, and AC = 12 cm. Which of the following is the value of the angle B?

A 60⁰
B 30⁰
C 45⁰
D 90⁰
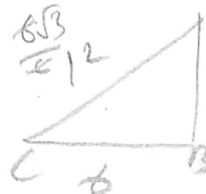
$\tan\theta = \frac{6\sqrt{3}}{6} = \sqrt{3}$

$x^2+y^2 - 4x + 3 = 4 + y^2 + 4x$
$36\sqrt{9} + 36$ $6x^2 - 54$
$108 + 3$

Q32 Which of the following point on the x axis is equidistant from point (2, -5) and (-2, 9)?

A (-7, 0)
B (7, 0)
C (5, 0)
D (-5, 0)

$(x,-1)\ (x,0)\ (-2,9)$

$\sqrt{(2-x)^2 + 25} = \sqrt{(-2-x)^2 + 81}$

Q33 For which of the following value of the y the distance between P(10, y) and Q(2, -3) is 10 unit?

A 5
B -5
C -9
D 9

$\dfrac{-6 \pm \sqrt{36 + 1\cdot8}}{}$

$\dfrac{-6 \pm \sqrt{144}}{2}$ $\dfrac{(2\pm)}{-6\pm12}{2}$

$PQ = \sqrt{\ldots}$ $-9,3$

$(-3-y)^2 + 64 = 100$
$9 + y^2 + 6y = 36$
$y^2 + 6y - 27 = 0$

Q34 Which of the following point divides the line joining of points P(-1, 7) and (4, -3) in the ratio 2:3?

A (1, 3)
B (-1, 3)
C (1, -3)
D (-1, -3)

$y = \dfrac{m_2 y_1 + m_1 y_2}{m+n}$ $x = \dfrac{m_1 x_2 + n x_1}{m+n}$ $m = 2, n = 3$

$= \dfrac{2 \times (-3) + 3 \times 7}{5}$ $\dfrac{-6+21}{5} \Rightarrow \dfrac{15}{5} = 1$ $\dfrac{2 \times 4 + 3 \times (-1)}{5}$ $\dfrac{8-3}{5} = 1$

Q35 Which of the following is the area of the triangle form by the points A(5, 2), B(4, 7), and C(7, -4)?

A 1 square units
B 2 square units
C 3 square units
D 4 square units

$\frac{1}{2} x_1(y_2-y_3) + x_2(y_3-y_1) + x_3(y_1-y_2)$

$5(8) + 4(6) + 7(-3)$

$\frac{1}{2}(40 + 24 - 35)$

$\begin{vmatrix} 2 & 2 & 1 \\ 4 & 7 & 1 \\ 7 & -4 & 1 \end{vmatrix}$

$25-1$

Q36 The value of $\cos 30^\circ$ is equal to...........

A   1/2

B $\dfrac{\sqrt{3}}{2}$

C $\sqrt{3}$

D   1

Q37 The value of $\cos 30^\circ - \sin 30^\circ$ is equal to...........

A $\dfrac{\sqrt{3}-1}{2}$ $\dfrac{\sqrt{3}}{2} - \dfrac{1}{2}$

B $\dfrac{\sqrt{3}+1}{2}$

C $\dfrac{1-\sqrt{3}}{2}$ $\dfrac{\sqrt{3}-1}{2}$

D $\dfrac{\sqrt{3}}{2}$

Q38 The value of $\cos 30^\circ \cos 60^\circ \cos 90^\circ \cos 120^\circ$ is equal to ....

A   1 $\dfrac{\sqrt{3}}{2} \times \dfrac{1}{2} \times 0 \times \dfrac{-1}{2}$

B   -1

C   Zero

D   1/2

Q39 If $\tan\theta = 1$, then $\dfrac{2\sin\theta + \cos\theta}{2\sin\theta - \cos\theta}$ is equal to .... $\dfrac{2\tan\theta + 1}{2\tan\theta - 1}$

A   1 $2 \times \dfrac{1}{\sqrt{2}} + \dfrac{1}{\sqrt{2}}$ $\dfrac{2+1}{2-1} = \dfrac{3}{1}$

B   2 $\overline{2 \times \dfrac{1}{\sqrt{2}} - }$

C   3

D   4

Q40 The value of $3\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$ is equal to ....

A   2 $3 + \dfrac{3}{4} - \dfrac{3}{4}$

B   3

C   4

D   5

Q41 If $3\sin\theta + 4\cos\theta = 5$, then value of $\sin\theta$ is equal to ....

A   5/7 $\dfrac{3\tan\theta + 1}{5}$ $3\sin\theta =$ 3

B   3/5

C   1/3 $-\sqrt{5} \quad -5 \le () \le 5$

D   1

$3\times 1 + 4\times\dfrac{1}{}$

$3+4$

$3\times\dfrac{3}{5} + 4\times\dfrac{4}{5} = 3$

$9+\dots$

Q42 The line segment joining the mid points of adjacent sides of a square form a ....

A rectangle
B square
C parallelogram
D rhombus
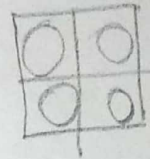
Q43 The line segments joining the midpoints of adjacent sides of a rectangle form a ....

A rectangle
B square
C parallelogram
D rhombus
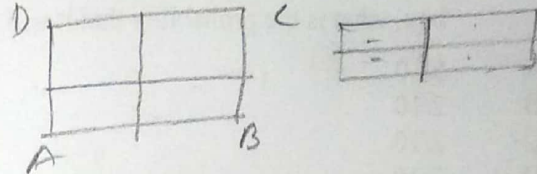
Q44 Let the radii of two circles are 10 cm and 5 cm respectively. Which of the following is the radius of a circle whose circumference is equal to sum of the circumferences of these two circles?

A 12 cm
B 13 cm
C 14 cm
D 15 cm

$r_1 = 10 \qquad r_2 = 5$

$2\pi R = 2\pi (r_1 + r_2)$

$R = 15$

Q45 On increase of the radius of a circle by 10%, which of the following is the change in its area?

A 10% increase
B 20% increase
C 21% increase
D 22% increase

$A = \pi R^2$

$\left(\frac{\Delta A}{A} \times 100\right) = A\% = 2 R\% = 2 \times 10$

Q46 The length of a rectangle is 5 cm more than its breadth. If the perimeter of the rectangle is 30 cm, then its area is ....

A 50 cm²
B 150 cm²
C 100 cm²
D 60 cm²

$L = 5 b \qquad L = 5+b$

$2(l+b) = 30$

$l + b = 15$

$5b + b = 15$

$6b = 15$

$b = \frac{5}{2} \qquad l = \frac{25}{2}$

$\frac{25 \times 5}{2} = \frac{125}{4}$

Q47 The length of a rectangle is increases by 20% and its breadth is decreases by 10%. What is the change in its area?

A 8% increase
B 10% increase
C 20% increase
D 2% decrease

$l = 5+b$

$2(l+b) = 30 \quad 20\% \quad \int l = 15$

$l + b = 15 \quad A = l \times b$

$5+b = 15$

$b = 10 \qquad A = l \times b$

$20 \times (10-1)$

$10\% \quad l = 5+b$

$l = 5+5 = \frac{15}{2} = \frac{15}{2}$

Q48 On increasing the side of a square by 10%, what is the change in its area?

A 21% increase
B 22% increase
C 23% increase
D 24% increase

$A = l^2$

$A = S^2$

$= 2 \times S$

$2 \times 10 \times (20)$

$l = 5b$

$l = 5 \times 5 = \frac{25}{2}$

$2(l+b) = 30$

$l + b = 15$

$5b + b = 15$

$6b = 15$

$b = 8\frac{5}{2}$

Q49 One card is drawn at random from a well-shuffled deck of 52 cards. What is the probability of getting an ace?

A 1/3
B 1/6
C 1/2
D 1

Q50 A box contains 5 blue, 2 white, and 3 red marbles. If a marble is drawn at random from the box, what is the probability that it will red?

A 5/10
B 2/10
C 3/10
D 7/10

Q51 The Boolean expression x(x+y) is equivalent to ...

A y
B x'
C x
D y'

Q52 The Boolean expression (x.y')' is equivalent to ....

A x' + y'
B x' + y
C x + y'
D x + y

Q53 Which of the following is a combinational circuit?

A Flip Flop
B Counter
C Register
D Multiplexor

Q54 Which of the following is a sequential circuit?

A Counter
B Multiplexor
C Decoder
D Encoder

Q55 Which of the following is NOT a self complementary coding scheme?

A 2421
B Excess-3
C BCD
D 84-2-1

Q56 Joystick is a ....device.
A Input
B Output
C I/O
D Memory

Q57 Which of the following is an output device?
A Keyboard
B Mouse
C Projector
D Trackball

Q58 Opera is a ....
A Operating System
B Web browser
C Search Engine
D Compiler

Q59 Which of the following is a Web browser?
A Safari
B ARX
C BullGuard } ANS
D McAfee

Q60 Which of the following is an operating system?
A Opera
B Safari
C K42
D BullGuard

Q61 Which of the following is a search engine?
A Safari
B Bing
C Safari
D K42

Q62 Which of the following is an object oriented programming language?
A C
B COBOL
C FORTRAN
D Python

Q63 Which of the following is an interpreted programming language?
A C
B Python
C C++
D Pascal

Q64 One Nibble is equal to ...... bits.

A 2

B 4

C 6

D 8

Q65 Which of the following is decimal number equivalent to octal number $(13)_8$?

A 10

B 11

C 12

D 13

$1 \times 8^1 + 3 \times 8^0$

$8 + 3 = 11$

Q66 Which of the following is decimal number equivalent to a number of radix 5 $(22)_5$?

A 10

B 11

C 12

D 13

22

$2 \times 5^1 + 2 \times 5^0$

$10 + 2$

Q67 An ...... is an intranet that is accessible to some people from outside the company.

A Internet

B extranet

C LAN

D Local-intranet

Q68 Which of the following is a Database Management System (DBMS)?

A Bing

B Ingres

C Baidu

D Safari

Q69 Which of the following is a Germany-based multinational software company?

A Oracle

B Adobe

C SAP

D HCL

Q70 Which data structure is used to implement a recursive function?

A Stack

B Queue

C Binary Tree

D AVL Tree

Q71 Which of the following is the next term of the series: ABZ, BCY, CDX, ...?

A DDW

B DEW

C DFW

D DEV

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

Q72 Which of the following is the next term of the series: CAC, DZD, EYE, ...?

A FXF
B FYF
C FYG
D FXG

Q73 Which of the following is the next number in the series: 1, 2, 4, 7, ...?

A 9
B 10
C 11
D 12

Q74 Which of the following is the next number in the series: 1, 4, 9, 16, ...?

A 24
B 25
C 26
D 27

Q75 Which of the following is the next term of the series: B_1CD, C_4DE, D_9EF, $E_{16}FG$, ...?

A $F_{25}GI$
B $F_{16}GH$
C $E_{25}GH$
D $F_{25}GH$

Q76 Which of the following is the next term of the series: Z_1A, YB_2, X_1C, WD_2, ...?

A V_1E
B V_1G
C W_1E
D VE_2

Q77 Which of the following is the code of CAT in a coding scheme in which BAT is coded as 2120'

A 2121
B 2130
C 2220
D 3120

Q78 Which of the following is the code of CD in a coding scheme in which CAT is coded as 24?

A 7
B 23
C 10
D 8

Q79 *Potato* is related to *Vegetable* in the same way as *Gram* is related to ....?

A Vitamins
B Food
C Pulses
D Fruits

Q80 Milk is related to *Goat* in the same way as *egg* is related to ....

A   Cow
B   Bread
C   Food
D   Hen

Q81 Which of the following is the code of the JMI in a coding scheme in which CAT is coded to SAD?

A   IMJ
B   IMK
C   HMK
D   JMK

Q82 Which of the following is the code of the DIG in a coding scheme in which BAD is coded to DAB?

A   CIG
B   GID
C   FID
D   CID

Q83 Which of the following is the code of the BAT in a coding scheme in which CAT is coded to ACT?

A   CAT
B   TAB
C   ABT
D   ACT

Q84 If XY mean 2, CAT mean 3, PGDCA mean 5, then BAT is ....

A   2
B   3
C   4
D   5

Q85 If AB mean 3, BC mean 5, BD mean 6, then CAB is ....

A   3
B   4
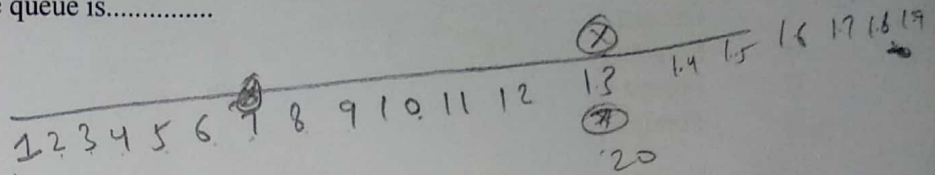C   5
D   6

Q86 If CD mean 34, AC mean 13, BE mean 25, DA mean 41, then BA is ....

A   21
B   22
C   23
D   24

Q87 Let X is standing at 13th position in a queue and is at 7th position from end of queue. The number of persons in the queue is..............

A   18
B   19
C   20
D   21

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

20

Q88 If X is half of Y and Y is double of Z then ....

A   X = 2Z
B   X = Z/2
C   X = 3Z
D   X = Z

$X = \frac{Y}{2}$ $X = Z$

$Y = 2Z$

Q89 Which of the following is an odd figure?

A   ⬡

B   ☐

C   ―

D   △

Q90 Asif introduces Sidra as the sister of the only son of his father's wife. How is Sidra related to Asif's mother?

A → S

A   Daughter
B   Sister
C   Mother
D   Niece

Q91 Which of the following word is most nearly the same in meaning as the word ARDUOUS?

A   Difficult
B   Pleasurable
C   Easy
D   Different

Q92 Which of the following word is most nearly the same in meaning as the word CANNY?

A   Silly
B   Foolish
C   Clever
D   Handsome

Q93 Which of the following is correctly spelt word?

A   Forcast
B   Forcaust
C   Forecast
D   Forecaste

Scanned with CamScanner

Q94 Which of the following is correctly spelt word?

A Fariegn

B Forgein   *foreign*

C Foregn

D Foreign

Q95 Which of the following word is most nearly the opposite in meaning as the word CERTAINLY?

A Possibly

B Surly

C Definitely

D Clearly

Q96 Which of the following word is most nearly the opposite in meaning as the word ARTIFICIAL?

A Solid

B Pure

C Unnatural

D Natural

Q97 I saw a .... of cow in the field.

A herd

B group

C swarm

D flock

Q98 During festivals the shops are .... of people.

A full

B busy

C crowded

D occupied

Q99 Handsome is a ....

A Noun

B Pronoun

C Adjective

D Adverb

Q100 Which of the following is an adverb in the sentence "the house was spotlessly clean"?

A spotlessly

B house

C clean

D was