

Paper Code No: M28

Question Booklet No.

ENTRANCE EXAMINATION – 2021 – 22

SET – B

040006

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New Delhi

Roll No.

M 2 8 0 4 0 0 6

Signature of Invigilator

Total Marks: 100

Time: 1 Hour 30 Minutes

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, pager 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

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

WRONG METHODS

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

1. If $p(x)$ is a polynomial of degree one and $p(a) = 0$, then a is said to be:
- (A) Zero of $p(x)$ (B) Value of $p(x)$
 (C) Constant of $p(x)$ (D) None of the above
2. Zeroes of $p(x) = x^2 - 27$ are:
- (A) $\pm 9\sqrt{3}$ (B) $\pm 3\sqrt{3}$
 (C) $\pm 7\sqrt{3}$ (D) none of the above
3. If one of the zeroes of cubic polynomial is $x^3 + ax^2 + bx + c$ is -1 , then product of other two zeroes is:
- (A) $b - a - 1$ (B) $b - a + 1$
 (C) $a - b + 1$ (D) $a - b - 1$
4. If a pair of linear equations is consistent, then the lines will be
- (A) parallel (B) always coincident
 (C) intersecting or coincident (D) always intersecting
5. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k is
- (A) $-\frac{5}{4}$ (B) $-\frac{5}{4}$
 (C) $\frac{15}{4}$ (D) $-\frac{3}{2}$

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30x
 (9x3)

6. The product of a rational and irrational number is

- (A) rational (B) irrational
(C) both of above (D) none of above

7. The set $A = \{0, 1, 2, 3, 4, \dots\}$ represents the set of

- (A) whole numbers (B) integers
(C) natural numbers (D) even numbers

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8. Three farmers have 490 kg, 588 kg and 882 kg of wheat respectively. Find the maximum capacity of a bag so that the wheat can be packed in exact number of bags.

- (A) 98 kg (B) 290 kg
(C) 200 kg (D) 350 kg

490
588
882

9. The quadratic equation whose one rational root is $3 + \sqrt{2}$ is

- (a) $x^2 - 7x + 5 = 0$ (b) $x^2 + 7x + 6 = 0$
(c) $x^2 - 7x + 6 = 0$ (d) $x^2 - 6x + 7 = 0$

~~$5x^2 - 7x + 6 = 0$~~

$$\frac{3 + \sqrt{2}}{x} = \frac{5}{1}$$

10. The sum of the roots of the quadratic equation $3x^2 - 9x + 5 = 0$ is

- (A) 3 (B) 6
(C) -3 (D) 2

$$-\frac{b}{a} = -\left(\frac{-9}{3}\right) = 3$$

11. One year ago, a man was 8 times as old as his son. Now his age is equal to the square of his son's age. Their present ages are 48, 48

- ✓ (A) 7 years, 49 years (B) 5 years, 25 years
(C) 1 years, 50 years (D) 6 years, 49 years

12. If x and y are complementary angles, then

- (A) $\sin x = \sin y$ (B) $\tan x = \tan y$
(C) $\cos x = \cos y$ (D) $\sec x = \operatorname{cosec} y$

13. If $\sec A + \tan A = x$, then $\tan A =$

- (A) $\frac{x^2 - 1}{x}$ (B) $\frac{x^2 - 1}{2x}$
(C) $\frac{x^2 + 1}{x}$ (D) $\frac{x^2 + 1}{2x}$

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14. If in $\triangle ABC$, $\angle C = 90^\circ$, then $\sin(A + B) =$

- (A) 0 (B) $1/2$
(C) $12\sqrt{}$ (D) 1

15. The value of $\sin^2 30^\circ - \cos^2 30^\circ$ is

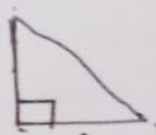
- (A) $-\frac{1}{2}$ (B) $\frac{\sqrt{3}}{2}$
(C) $\frac{3}{2}$ (D) $\frac{2}{3}$

16. In triangle PQR, if $PQ = 6$ cm, $PR = 8$ cm, $QS = 3$ cm, and PS is the bisector of angle QPR, what is the length of SR?

(A) 2 (B) 4
(C) 6 (D) 8

17. A flag pole 18 m high casts a shadow 9.6 m long. Find the distance of the top of the pole from the far end of the shadow.

(A) 25.6 (B) 20.4
(C) 23.7 (D) 32.5



$$(18)^2 + (9.6)^2 = x^2$$

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18. A tangent is drawn from a point at a distance of 17 cm of circle $C(0, r)$ of radius 8 cm. The length of its tangent is

(A) 5 cm (B) 9 cm
(C) 15 cm (D) 23 cm



19. The length of a tangent drawn from a point at a distance of 10 cm of circle is 8 cm. The radius of the circle is

(A) 4 cm (B) 5 cm
(C) 6 cm (D) 7 cm



20. From a point P which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR to the circle are drawn. Then the area of the quadrilateral PQOR is

- (A) 60 cm^2 (B) 65 cm^2
(C) 30 cm^2 (D) 32.5 cm^2

21. To draw a pair of tangents to circles which are inclined to each other at an angle of 35° , it is required to draw tangents at the end-points of those two radii of the circle, the angle between which is

- (A) 145° (B) 130°
(C) 135° (D) 90°

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22. To divide a line segment AB in the ratio 4: 7, a ray AX is drawn first such that $\angle BAX$ is an acute angle and then points $A_1 A_2 A_3 \dots$ are located at equal distances on the ray AX and the point B is joined to

- (A) A_4 (B) A_{11}
(C) A_{10} (D) A_7

$$\boxed{16 + x^2 = 64}$$

$$x^2 = \frac{64 - 16}{1}$$

$$\boxed{x = 2}$$

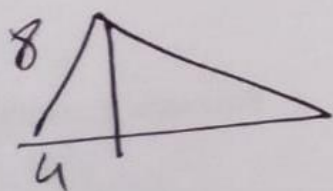
23. The length of altitude of an equilateral triangle of side 8cm is

- (A) $\sqrt{3} \text{ cm}$ (B) $2\sqrt{3} \text{ cm}$
(C) $3\sqrt{3} \text{ cm}$ (D) $4\sqrt{3} \text{ cm}$

$$4^2 + 2^2 = 8^2$$

$$\tan(90^\circ) = \frac{P}{B} = \frac{4}{2} = 2$$

$$\boxed{16 + 4 = 20}$$



[7]

$$4^2 + x^2 = 8^2$$

24. The 21st term of the AP whose first two terms are -3 and 4 is

(A) 17

☒ (B) 137

(C) 143

(D) -143

25. If the numbers $n - 2$, $4n - 1$ and $5n + 2$ are in AP, then the value of n is:

(A) 1

(B) 2

☒ (C) -1

(D) -2

26. The radii of the top and bottom of a bucket of slant height 13 cm are 9 cm and 4 cm respectively. The height of the bucket is

(A) 10 cm

(B) 12 cm

(C) 15 cm

(D) 16 cm

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27. A shuttlecock used for playing badminton has the shape of the combination of

(A) a cylinder and a sphere

(B) a sphere and a cone

(C) a cylinder and a hemisphere

☒ (D) frustum of a cone and a hemisphere

28. The area of the triangle whose vertices are A (1, 2), B (-2, 3) and C (-3, -4) is

(A) 11

(B) 22

(C) 33

(D) 21

29. If the points P (1, 2), B(0, 0) and C(a, b) are collinear, then

☒ (A) $2a = b$

(B) $a = -b$

(C) $a = 2b$

(D) $a = b$

30. The distance of the point (α, β) from the origin is

(A) $\alpha + \beta$


☒ (B) $\alpha^2 + \beta^2$

(C) $|\alpha| + |\beta|$

(D) $\sqrt{\alpha^2 + \beta^2}$

31. The probability of getting a consonant from the word MAHIR is

(A) $\frac{2}{5}$

(B) $\frac{3}{5}$ 

(C) $\frac{4}{5}$

(D) 1

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32. If the probability of an event is P, the probability of its complementary event will be:

(A) $P - 1$

(B) P

☒ (C) $1 - p$

(D) $1 - 1p$

33. A girl calculates that the probability of her winning the first prize in a lottery is 0.08. If 6000 tickets are sold, how many tickets has she bought?

(A) 40

(B) 240

☒ (C) 480

(D) 750

38. A window that is displayed whenever the program requires additional information from you is called a-

- (A) menu bar. (B) filmstrip.
(C) dialog box. (D) None of these

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39. Which statement is valid?

- ← (A) 1 KB = 1024 bytes. (B) 1 MB = 2048 bytes
(C) 1 MB = 1000 kilobytes. (D) 1 KB = 1000 bytes.

40. One of the methods for determining mode is

- (A) $\text{Mode} = 2 \text{ Median} - 3 \text{ Mean}$
(B) $\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$
(C) $\text{Mode} = 2 \text{ Mean} - 3 \text{ Median}$
(D) $\text{Mode} = 3 \text{ Mean} - 2 \text{ Median}$

41. For the following distribution

C.I.	0-5	6-11	12-17	18-23	24-29
f	26	20	30	16	22

The upper limit of the median class is

- (A) 18.5 (B) 18
(C) 17.5 (D) 17

42. If θ is the angle in degrees of a sector of a circle of radius V , then area of the sector is

(A) $\frac{\pi r^2 \theta}{180}$

(B) $\frac{\pi r^2 \theta}{360}$

(C) $\frac{\pi r \theta}{180}$

(D) $\frac{\pi r \theta}{360}$

43. The area of the sector of a circle with radius 6 cm and of angle 60° is

(A) 9.42 cm^2

(B) 37.68 cm^2

(C) 18.84 cm^2

(D) 19.84 cm^2

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44. The pair of equation $x = -4$ and $y = -5$ graphically represents lines which are

(A) intersecting at $(-5, -4)$

(B) intersecting at $(-4, -5)$

(C) intersecting at $(5, 4)$

(D) intersecting at $(4, 5)$

45. If $x = a$, $y = b$ is the solution of the equations $x + y = 5$ and $2x - 3y = 4$, then the values of a and b are respectively

(A) $6, -1$

(B) $2, 3$

(C) $1, 4$

(D) $19/5, 6/5$

46. Which among the options is one of the factors of $x^2 + x/6 + 1/6$

(A) $3x + 1$

(B) $2x + 1$

(C) $x - (1/5)$

(D) $x - (1/2)$

47. Which of the following is input as well as output device?
(A) Monitor (B) Keyboard
(C) Mouse (D) Storage Device
48. Which type of program acts as an intermediary between a user of a computer and the computer hardware?
(A) Operating system (B) User thread
(C) Super user thread (D) Application program
49. Which one of the following software applications would be the most appropriate for performing numerical and statistical calculations?
(A) Database (B) Document processor
(C) Graphics package (D) Spreadsheet
50. Express 98 as a product of its primes
(A) $2^2 \times 7$ (B) $2^2 \times 7^2$
(C) 2×7^2 (D) $2^3 \times 7$
51. The sum of first n odd natural numbers is
(A) $2n^2$ (B) $2n + 1$
(C) $2n - 1$ (D) n^2

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52. The ratio of the volumes of two spheres is 8:27. If r and R are the radii of spheres respectively, then $(R - r) : r$ is:

(A) 1:2

(B) 1:3

(C) 2:3

(D) 4:9

53. A number when divided by 60 gives 35 as quotient and leaves 81 as remainder. What is the number?

(A) 2121

(B) 4151

(C) 2181

(D) 3171

54. When a number is divided by 3 it leaves remainder as 5. What will be the remainder when $3n + 3$ are divided by 3?

(A) 0

(B) 3

(C) 9

(D) 6

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55. The probability that it will rain tomorrow is 0.85. What is the probability that it will not rain tomorrow

(A) 0.25

(B) 0.145

(C) $\frac{3}{20}$

(D) None of these

1 -

56. If a, p are the roots of the equation $(x - a)(x - b) + c = 0$, then the roots of the equation $(x - a)(x - P) = c$ are

(A) a, b

(B) a, c

(C) b, c

(D) none of these

57. This is the book I have ever read.

(A) interesting

(B) more interesting

(C) most interesting

(D) None

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58. She said to him, "Where are you living"?

(A) She said to him where he lived.

(B) She asked him where he was living.

(C) She asked me where I am living.

(D) She asked him where he was lived.

59. Choose the correct spelling:

(A) Amatuer

(B) Amature

(C) Amateur

(D) Ameteur

60. There was no longer room for the car after we moved the patio furniture into the garage, so I had to park on the street.

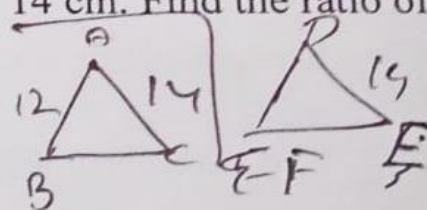
- (A) Simple Sentence (B) Compound Sentence
(C) Complex Sentence (D) Compound-Complex Sentence

61. A sentence has been given in Active/Passive voice. Out of the four alternatives suggested below, select the one which best expresses the same sentence in Passive/Active voice. One should not give unsolicited advice.

- (A) Unsolicited advice is not to be given.
(B) Unsolicited advice can't be given.
(C) Unsolicited advice may not be given.
(D) Unsolicited advice should not be given.

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62. If $\triangle ABC \sim \triangle DEF$ such that $AB = 12$ cm and $DE = 14$ cm. Find the ratio of area of $\triangle ABC$ and $\triangle DEF$.



- (A) 49/9 (B) 36/49
(C) 49/16 (D) 25/49

63. The binary system uses powers of

- (A) 2 (B) 10
(C) 8 (D) 16

64. The radian of a number system
 (A) is variable
 (B) has nothing to do with digit position value
 (C) Equals the Number of its distinct Counting digits
 (D) Is always an even number
65. The brain of any computer system is.....
 (A) CPU (B) ALU
 (C) Memory (D) Control Unit
66. Fifth Generation of computer was based on which technology?
 (A) VVLSI (B) System Knowledge
 (C) Artificial Intelligence (D) Programming
67. Junk e-mail is also called **SSF JAMIA MILLIA ISLAMIA New Delhi**
 (A) spam (B) spoof
 (C) sniffer script (D) None of above
68. The first company to mass market a microcomputer as a personal computer was
 (A) IBM (B) Super UNIVAC
 (C) Radio Shaks (D) Hewlett-Packard
69. Which of the following is not internet browser?
 (A) UC (B) Chrome
 (C) Mozilla (D) Lotus

70. Which is not the example of special purpose computer?
(A) Multimedia computer (B) Word Processor
(C) Automatic Aircraft Landing (D) All of the above

71. The mRNA codon of valine is
(A) GUC (B) UGG
(C) CCA (D) TTG

72. How many RNA polymerases are present in a bacterial system?
(A) 4 (B) 2
(C) 1 (D) 3

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73. Which of the following processes does not occur in prokaryotes?
(A) Transcription (B) Splicing
(C) Translation (D) Replication

74. Which of the following is not part of the RNA polymerase core enzyme?
(A) α (B) β
(C) ω (D) σ

75. Four types of σ factors are known of them which one is heat stable?
(A) σ^{70} (B) σ^{32}
(C) σ^{54} (D) σ^{28}

76. Which of the following enzyme has a unique ability to introduce positive and negative supercoiling of the DNA and it is the target for antibacterial agents such as ciprofloxacin/quinolones?

- (A) DnaA protein (B) DNA helicase
(C) DNA gyrase (D) DNA polymerase

77. The coding sequences found in split genes are called

- (A) Operons (B) introns
(C) exons (D) cistrons

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78. The percentage of human genome which encodes proteins is approximately

- (A) Less than 2% (B) 5%
(C) 25% (D) 99%

79. Which biomolecule is distributed more widely in a cell?

- (A) Chloroplast (B) RNA
(C) DNA (D) Spaherosomes

80. The fastest enzyme is

- (A) DNA gyrase (B) Pepsin
(C) DNA polymerase (D) Carbonic anhydrase

81. IF '+' stands for '-', '-' stands for 'x', 'x' stands for '÷' and '÷' stands for '+' then what is the value of $56 \times 7 \div 13 - 11 + 15 - 8 \div 2 - 7$?

- (A) 30
(B) 45
(C) 60
(D) 90

82. QPO, NML, KJI, _____, EDC

- (A) HGF
(B) CAB
(C) JKM
(D) GHD

83. A is son of C while C and Q are the sisters to one another. Z is the mother of Q. If P is the son of Z, Which one of the following statements is correct?

- (A) Q is the grandfather of A
(B) P is the maternal uncle of A
(C) P is the cousin of A
(D) Z is the brother of C

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84. Find the one which does not belong to that group?

- (A) 27
(B) 37
(C) 47
(D) 67

85. Which of the following are the major functions of Carbohydrates?

- (A) Storage
(B) Structural framework
(C) Transport Materials
(D) Both Storage and structural framework

86. Which of the following is the smallest carbohydrate - triose?
- (A) Ribose (B) Glucose
(C) Glyceraldehyde (D) Dihydroxyacetone
87. Which of the following cell organelles regulates the entry and exit of molecules to and from the cell?
- (A) Lysosomes (B) Golgi bodies
(C) Cell membrane (D) Mitochondria
88. Which of the following cell organelles is present in plant cells and absent in animal cells?
- (A) Nucleus (B) Chloroplast
(C) Vacuole (D) Cytoplasm
89. What causes mutation?
- (A) Excess of DNA replication (B) Exposure to chemicals
(C) Radioactive rays (D) Both A and B
90. Ten new television shows appeared during the month of September. Five of the shows were sitcoms, three were hour-long dramas, and two were news-magazine shows. By January, only seven of these new shows were still on the air. Five of the shows that remained were sitcoms
- (A) Only one of the news-magazine shows remained on the air
(B) Only one of the hour-long dramas remained on the air
(C) At least one of the shows that was cancelled was an hour-long drama
(D) Television viewers prefer sitcoms over hour-long dramas

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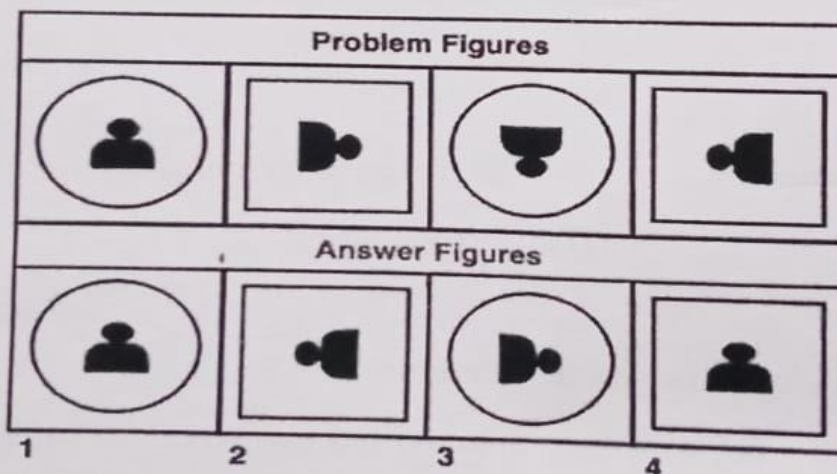
91. Look at this series: 53, 53, 40, 40, 27, 27... What number should come next?
- (A) 12
- (B) 14
- (C) 27
- (D) 53

92. The process of reasoning from a premise or premises to a conclusion based on those premises is known as.

- (A) Extended reasoning
- (B) Subordinate premise
- (C) Dialectic
- (D) Inference

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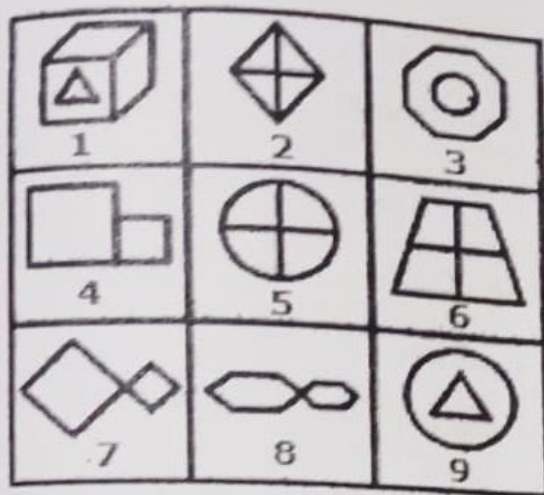
93. The following question consists of some Problem Figures followed by other figures marked 1, 2, 3, 4 called the Answer Figures.



Find out the correct answer figure that should come next in the sequence of problem figures.

- (A) 1
- (B) 2
- (C) 3
- (D) 4

94. Group the given figures into three classes using each figure only once.



- (A) 1, 3, 9; 2, 5, 6; 4, 7, 8
(B) 1, 3, 9; 2, 7, 8; 4, 5, 6
(C) 1, 2, 4; 3, 5, 7; 6, 8, 9
(D) 1, 3, 6; 2, 4, 8; 5, 7, 9

95. Choose the alternative which is closely resembles the mirror image of the given combination.

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(1) EVITCEFFE

(3) EVITCEFFE

(2) EVITCEFFE

(4) EVITCEFFE

- (A) 2
(B) 1
(C) 3
(D) 4

96. She can't run anymore, she is _____ tired.

- (A) too
(B) so
(C) such
(D) so such

97. Kindly ask him to play the piano, he is a _____ pianist.

(A) fragile

(B) virtuoso

(C) voracious

(D) vulnerable

98. The word best express the meaning of BEMOAN

(A) Lament

(B) Soothe

(C) Denounce

(D) Loathe

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99. He looks upset; I think he took the criticism _____ heart.

(A) to

(B) about

(C) in

(D) of

100. Which tense is used to express an action that began in the past before some point and continued up to that point?

(A) Past indefinite tense

(B) Past perfect tense

(C) Past perfect continuous tense

(D) Past continuous tense