SST6 Numerical Reasoning

Test 18

Test Code: SST6N18

Student Name: _____ Student ID: _____

PLEASE READ THE INSTRUCTIONS BELOW CAREFULLY:

You may use the back of your answer sheet for your working. This is what you are given at the real exam to use as working paper.

DO NOT WRITE ANYWHERE ELSE ON THE EXAM PAPER

This test asks you to look at ___ material and to answer all the questions on this material.

- This test paper **CANNOT BE TAKEN OUT** of the classroom
- You **MUST GIVE THE TEST PAPER BACK** before you leave the classroom
- You must **WRITE YOUR NAME AND ID** on this page and the answer sheet
- You must **PUT AWAY ALL ELECTRONIC DEVICES** and any other materials that could help you on this exam
- **DO NOT TOUCH OR DRAW ON** the barcode that is on your answer sheet

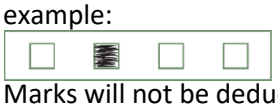
660 Warrigal Road, Malvern East VIC – Phone: 9568 6776

Advice for the test:

- For each question, you are given 4 or 5 possible answers marked A, B, C, D and E. Attempt to find the correct answer, and shade the corresponding bubble on the answer sheet.
- Each question is worth 1 mark, so try not to spend too long on one question – leave it for after you have finished the other questions.
- Check that the question number you are doing on the test paper is the same as the question number that you are shading on the answer sheet.
- There are no marks lost for incorrect answers, so even if you cannot solve a question, shade the box for the answer you think is most correct.

Instructions for the Answer Sheet:

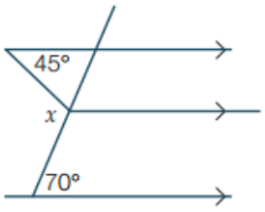
- Use a B or HB pencil.
- Write your name, student ID and test code on the sheet.
- Shade the box which indicates your answer. All answers must be completed like THIS example:



- Marks will not be deducted for incorrect answers.
- No mark will be given if more than ONE answer is completed for any question.
- If you make a mistake, ERASE the incorrect answer – DO NOT cross it out.

1. A fraction has a numerator 3 smaller than its denominator. If adding 3 to both its numerator and denominator, which of the following prediction is correct?
   A. The fraction now becomes 1.
   B. The fraction moves closer to 1.
   C. The fraction is getting smaller.
   D. The fraction remains the same.
   E. None of the above.

2. The value of x in the diagram is



   A. 45 degrees
   B. 75 degrees
   C. 95 degrees
   D. 115 degrees
   E. 145 degrees

3. The sum of z and 7 is divided by 5. When written using algebra it is:
   A. Z+5
   B. $\frac{z}{5}+7$
   C. $z+7\div5$
   D. $\frac{z+7}{5}$
   E. $\frac{7z}{5}$

4. How many zeros are at the end of the following multiplication?

$$10\times11\times12\times13\times\ldots\times19\times20$$

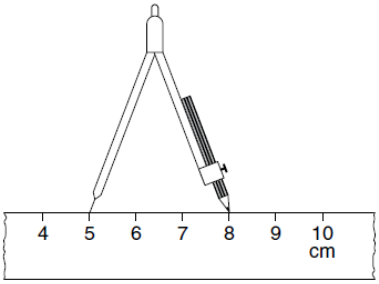
   A. 1
   B. 2
   C. 3
   D. 4
   E. 5

5. $0.125\div0.5=$
   A. 2.5
   B. 0.25
   C. 0.025
   D. 0.0025
   E. 25

6. If a $2 coin is about 2mm thick, then how much money is in a one-kilometre-high stack of $2 coins?
   A. $100 000
   B. $10 000
   C. $1 000
   D. $200 000
   E. 20 000

7. Penny's calculator is broken and the button '0' does not work. In order to calculate 210 + 104, which of the following calculation is not correct or is not working?
   A. 211-1+115-11
   B. 211+115-11+1
   C. 215-5+52x2
   D. 217+115-11-7
   E. 219-9+93+11

8. Vihaan sets the width of his compass as shown. He then uses the compass to draw a circle. What is the diameter of the circle and what is its circumference?



   A. Diameter = 8cm, Circumference = 8π cm
   B. Diameter = 6cm, Circumference = 6π cm
   C. Diameter = 5cm, Circumference = 5π cm
   D. Diameter = 3cm, Circumference = 6π cm
   E. Diameter = 3cm, Circumference = 12π cm

9. How many four-digit numbers that begin with the digit 1 have two identical digits, including 1? Examples of such numbers are 1004, 1153, 1566…
   A. 196
   B. 212
   C. 216
   D. 397
   E. 432

Questions 10 and 11 are based on the following information:

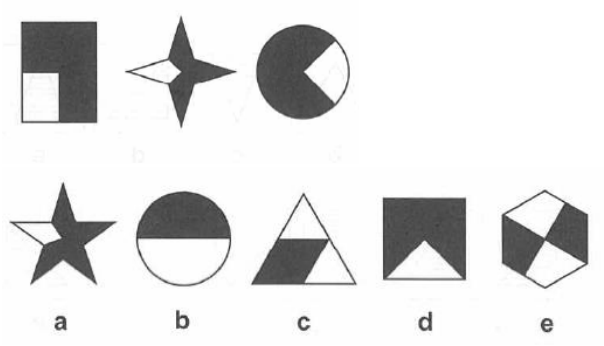
A 6-sided die is rolled 10 times and the following numbers come up: 6, 6, 1, 4, 3, 2, 4, 5, 6, 2.

10. What is the experimental probability of getting an even number?
    A. 1/2
    B. 7/10
    C. 6/10
    D. 5/10
    E. 2/10

11. What is the theoretical probability of getting an even number if the die is fair?
    A. 7/10
    B. 3/10
    C. 1/2
    D. 6/10
    E. None of the above

12. A fair coin is tossed. How many times would you expect it to show heads in 5300 trials?
    A. 1300
    B. 2500
    C. 2550
    D. 2650
    E. 2750

13. There are three figures that are like each other in some way. Find which of the five figures on the second row is most like the three figures on the above.



    A. A
    B. B
    C. C
    D. D
    E. E

14. Which inequality shows the statement below?
    X is 10 or less and more than -1
    A. $-1 < X \leq 10$
    B. $-1 < X < 10$
    C. $-1 > X \leq 10$
    D. $-1 > X < 10 = 10$
    E. $-1 > X \geq 10$

15. Which of the following is correct?
    ① $1 < \sqrt{7} < 2$
    ② $3 < \sqrt{10} < 4$
    ③ $8 < \sqrt{53} < 9$
    ④ $8 < \sqrt{76} < 9$
    ⑤ $12 < \sqrt{150} < 13$

    A. ①②④
    B. ① ③ ⑤
    C. ③ ④
    D. ② ④ ⑤
    E. ② ③ ⑤

16. $2^3 = 8$
    $2^2 = 4$
    $2^1 = 2$
    $2^0 = @$
    $2^{-1} = \#$
    $2^{-2} = \%$
    Given the pattern, find the values of @, # and %.

    A. $@ = 0, \quad \# = 0.2, \quad \% = 0.02$
    B. $@ = 0, \quad \# = -2, \quad \% = -4$
    C. $@ = 1, \quad \# = -2, \quad \% = -4$
    D. $@ = 1, \quad \# = 1/2, \quad \% = 1/4$
    E. None of the above

17. Based on Question 16, $2^{-5} =$?
    A. – 32
    B. – 10
    C. 32
    D. $\frac{1}{10}$
    E. $\frac{1}{32}$

18. Callum travels from town X to town Y at a constant speed of 120km/h. Upon reaching town Y, he immediately heads back to town X. On his return trip to town X, he spends half the time travelling 20km/h and half the time travelling 60km/h. What is Callum's average speed, for the entire roundtrip?
    A. 48km/h
    B. 60km/h
    C. $66\frac{2}{3}$ km/h
    D. 72km/h
    E. 80km/h

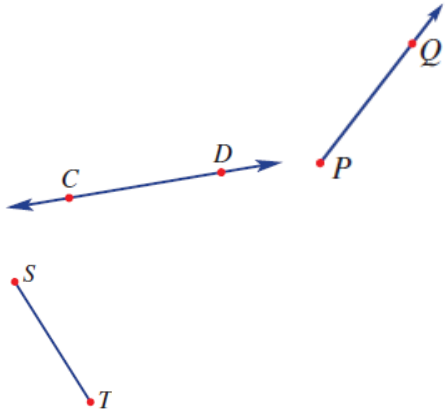
19. Olivia starts at 2637 and counts backwards by eights. She stops counting when she reaches a number less than 10. What is her final number?
    A. 1
    B. 2
    C. 5
    D. 8
    E. 9

20. Which of the following calculation does not give a result of -20?
    A. 0-20
    B. -10-10
    C. -30+10
    D. -10x2
    E. (-4)x(-5)

21. The hit movie 'Lockdown Stage 4.0' runs for $1\frac{3}{4}$ hours. A local cinema in Melbourne plans to screen it back to back. The first screening will start at 1:30pm and the last screening must finish by 23:00 pm. How many times can the movie be screened within this time period?
    A. 3 complete screenings
    B. 4 complete screenings
    C. 5 complete screenings
    D. 6 complete screenings
    E. 7 complete screenings

22. Convert 3.5m/s into _____km/h
    A. 126km/h
    B. 12.6km/h
    C. 210km/h
    D. 21km/h
    E. 2.5km/h

23. Name the following:



    A. Line CD, Ray PQ, Segment ST
    B. Ray CD, Line PQ, Segment ST
    C. Segment CD, Ray PQ, Line ST
    D. Line CD, Segment PQ, Ray ST
    E. Ray CD, Ray PQ, Segment ST

24. Mr. Andreas and Mrs. Andreas are going to buy a new furniture set for their living room. They want to buy a couch, a coffee table, and a recliner. They have narrowed it down so that they are choosing between 4 couches, 5 coffee tables, and 9 recliners. How many different furniture combinations are possible?
    A. 18
    B. 20
    C. 5!
    D. 180
    E. 459

25. Kate worked part-time at a library. Her hours for three days she worked one week were: $1\frac{2}{3}$, $4\frac{2}{5}$, $3\frac{1}{2}$. Find how much time she worked for the week.
    A. 8 hours and 24 minutes
    B. 8 hours and 50 minutes
    C. 9 hours and 15 minutes
    D. 9 hours and 34 minutes
    E. 10 hours and 7 minutes

26. If $\frac{@}{16}$ lies between $\frac{1}{4}$ and $\frac{3}{8}$, and @ is a whole number, then @ equals:
    A. 5
    B. 6
    C. 7
    D. 8
    E. 10

27. In a video game, Yiruka scored 30% fewer points than Val. Val scored 1060 points. How many points did Yiruka score?
    A. 318
    B. 742
    C. 816
    D. 1030
    E. 1378

28. If the range for the data set below is 23, which number could h be?
    29, 31, 12, 12, h, 13, 10
    A. 7
    B. 8
    C. 9
    D. 10
    E. None of the above

29. Matthew scored a 65%, 80%, 85% and 100% on his first for math quizzes. His mother promises that if he reaches an average score of 85%, he can watch the hit movie *Friendships during Lockdown* with his friends in a local cinema. What score will Matthew have to earn on his fifth quiz to go to watch the movie?
    A. 89%
    B. 90%
    C. 93%
    D. 95%
    E. 98%

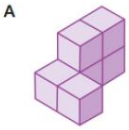
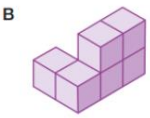
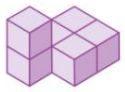
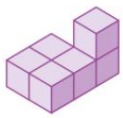
30. Find the value of a in $\frac{1}{1+\frac{1}{2+\frac{1}{a+\frac{1}{2}}}} = \frac{16}{23}$
    A. $\frac{5}{13}$
    B. 1
    C. 2
    D. $2+\frac{1}{2}$
    E. 3

31. Suppose that inflation is recorded as 5% in 2018 and that a loaf of bread costs $2.0 at the end of 2017. If the price of the bread increased with inflation, what was the price of the loaf at the end of 2018?
    A. $1.8
    B. $2.05
    C. $2.1
    D. $2.5
    E. $3.2

32. Choose the correct algebraic notation for the following rule
    Subtract 6 from z, then divide by 7 to get w
    A. $w = z - 6 \div 7$
    B. $w = \frac{z-6}{7}$
    C. $w = 6 - z \div 7$
    D. $(w - 6) \div 7 = z$
    E. $w = 6 - z \div 7$

33. Find the size of the angle of rotation required to produce an identical image respectively for the following two shapes.
    (a) 
    (b) 
    A. 90 degrees, 90 degrees
    B. 180 degrees, 90 degrees
    C. 180 degrees, 72 degrees
    D. 270 degrees, 180 degrees
    E. 270 degrees, 360 degrees

34. Ryan took a taxi home from the airport. The tax fare was $2.10 per mile, and he gave the driver a tip of $5. Ryan paid a total of $36.50. Find the distance in miles between the airport and Ryan's home.
    A. 10
    B. 12
    C. 15
    D. 18
    E. 20

35. Which of the shapes below is not a rotation of the one shown on the right?
    
    A 
    B 
    C 
    D 
    A. A
    B. B
    C. C
    D. D
    E. None of the above

36. How many cubes are there in this solid?

A. 7
B. 8
C. 9
D. 10
E. 11

37. Given that $a^2 - b^2 = (a + b)(a - b)$, evaluate:

$$\left(1 - \frac{1}{2^2}\right)\left(1 - \frac{1}{3^2}\right)\left(1 - \frac{1}{4^2}\right) \ldots \left(1 - \frac{1}{100^2}\right)$$

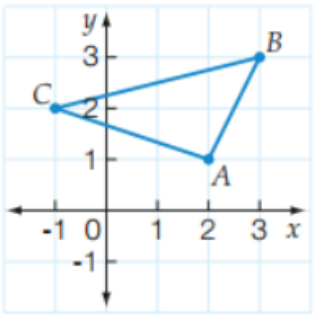
A. $\frac{1}{50}$
B. $\frac{199}{10000}$
C. $\frac{101}{200}$
D. $\frac{101}{2}$
E. $\frac{1999}{10000}$

38. Find the sum of

$$\frac{1}{1\times2} + \frac{1}{2\times3} + \frac{1}{3\times4} + \frac{1}{4\times5} + \frac{1}{5\times6} \ldots + \frac{1}{99\times100}$$

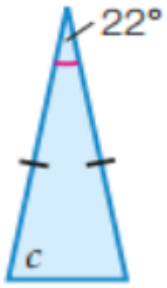
A. $\frac{1975}{9900}$
B. $\frac{4501}{9900}$
C. $1\frac{1}{99}$
D. $\frac{99}{100}$
E. $\frac{1}{2}$

39. Reflect the following triangle in the x-axis and write the coordinates of the reflected vertices.



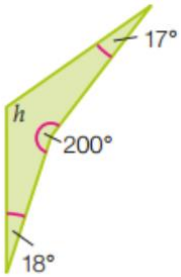
A. $A'(2, -1)$ $B'(3, -3)$ $C(-1, -2)$
B. $A'(-2, 1)$ $B'(-3, 3)$ $C(1, 2)$
C. $A'(-2, -1)$ $B'(-3, -3)$ $C(1, -2)$
D. $A'(2, 1)$ $B'(3, 3)$ $C(-1, 2)$
E. $A'(0, -1)$ $B'(3, 0)$ $C(-1, -2)$

40. Find the size of the unknown angle in the following triangle.



A. 158 degrees
B. 120 degrees
C. 90 degrees
D. 79 degrees
E. 60 degrees

41. Find the size of the unknown angle in the following triangle.



A. 120 degrees
B. 125 degrees
C. 130 degrees
D. 135 degrees
E. 180 degrees

42. $800 \div 5 \times 4$ is the same as
A. $800 \div 20$
B. 40
C. $5 \times 4 \div 800$
D. $800 \times 4 \div 5$
E. None of the above

43. Which of the following is correct?
A. $\sqrt{1^2 + 2^2} = 1 + 2$
B. The square root of 12100 is 110.
C. The first three multiples of 3 is 6, 9, 12.
D. 1 is the smallest prime number.
E. The length and width of a rectangle can never be the same.

44. Find the next number in the sequence.
6, 12, 20, 30, ?
A. 36
B. 40
C. 42
D. 50
E. 54

45. Sarah rounded a number to 1 decimal place and got 101.5. Which of the following cannot be the number?
A. 101.4460
B. 101.4987
C. 101.5003
D. 101.5495
E. 101.53776

46. Find the missing values in the table.

Input	4	5	6	#	$	%
output	19	23	@	39	47	403

A. @=31, #=8, $=10, %=100
B. @=27, #=8, $=11, %=101
C. @=27, #=9, $=11, %=100
D. @=31, #=9, $=10, %=101
E. @=35, #=11, $=12, %=101

47. There is enough ice on Earth to fill a cube of side length 300km. Find the approximate volume of ice on Earth.
A. $6 \times 10^4 km^2$
B. $6 \times 10^6 km^3$
C. $9 \times 10^4 km^2$
D. $9 \times 10^6 km^3$
E. $12 \times 10^6 km^3$

48. At a family reunion, each of Sana's aunts and uncles is getting photographed once. The aunts are taking pictures in groups of 5 and the uncles are taking pictures in groups of 10. If Sana has the same total number of aunts and uncles, what is the minimum number of aunts that Sana must have?
A. 5
B. 10
C. 15
D. 20
E. 50

49. 20 people at a party shook hands with each other. Each person only shakes each other person's hand once. How many handshakes were there altogether?
A. 20
B. 40
C. 190
D. 200
E. 400

50. During a party, mathematicians shake hands with each other and each individual only shakes each other person's hand once. Altogether there are 45 handshakes, so how many mathematicians are there?
A. 9
B. 10
C. 11
D. 15
E. 21