HIGH SCHOOL SCHOLARSHIP EXAMINATION
FEBRUARY 2009

Seat No.

QUESTION PAPER CODE NO.

0	5	2	2

MATHEMATICS (ENGLISH)

TOTAL MARKS : 100 **TIME : 13.00 to 14.00**

Please read the following instructions carefully before solving the question paper.

N.B. — (1) This question paper contains **50** questions carrying **2** marks each.
(2) All questions are *compulsory.*
(3) A separate answer-sheet is provided. Every question has four alternatives numbered 1, 2, 3, 4. Out of these, only one choice of answer is correct. This correct alternative number should be written in the block provided in the answer-sheet, next to the corresponding question number, *e.g.* **4**.
(4) The correct alternative should be written in English number only. Answers in any other language will not be considered.
(5) As far as possible avoid cancellations and overwriting. Answers written in this way will not be considered.
(6) Answers should be written in blue and black ink pen or ball point pen. Answers written in pencil or red or any other coloured ink will not be checked.
(7) While correcting the answer, cancel the wrong answer number by drawing three lines across it as shown **3**. The corrected answer number should be written next to the cancelled block, to look like **3** 2.
(8) The correction can be done only once for each question.
(9) In one subject maximum five corrections will be considered. More than five corrections will not be given marks.
(10) Time period for the exam is limited hence do not spend much time on any question. If you find any *one* question difficult, go to the next question and unsolved question can be tried again at the end if time permits.
(11) Blank space for rough work is provided overleaf and at the bottom of each page of the question paper. Rough work is to be done in this space only.
(12) After reading carefully the sample questions, write the alternative in a form as **1, 2, 3** or **4** by selecting the correct answer.

Sample question—**(1)** If Aditya secured 90 marks out of 150 in mathematics, then what are his percent marks ?
(1) 50% (2) 60% (3) 75% (4) 90%

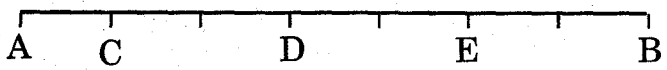
Explanation—Four alternative answers are provided under the above question. Out of these 60% is the correct answer. This correct answer has Serial No. (2). Hence you have to write digit 2 in English in the column against this question number in the answer-sheet in the box provided.

Sample question—**(2)** $a^0 \times b^0 + (a + b)^0 =$ .....
(1) 3 (2) 4 (3) 6 (4) 2

Explanation— Four alternative answers are provided out of which 2 is the correct answer. This correct answer has the Serial No. 4. Hence you have to write 4 in the answer sheet in the box provided this question number.

Now you are asked to write the answers to the questions on the separate answer-sheet provided.

1. The segment given below is divided into equal parts. Observe the figure carefully and answer the question given by choosing the correct alternative. l (AB) = 1 unit.



$l(DE) - l(CB) + l(AE) = ...(?)$

(1) $\frac{1}{7}$ unit (2) $-\frac{9}{7}$ unit

(3) 7 units (4) $\frac{9}{7}$ units

2. Two cubical boxes of side 4 m each are stuck to each other along their surface to form a box. Find the total surface area of this box formed.

(1) 128 sq.m (2) 160 sq. m

(3) 192 sq. m (4) 96 sq. m

3. $\frac{0.36 \times 0.27 \times 0.01}{0.06 \times 0.03 \times 0.1} = ...(?)$

(1) 5.4 (2) 5.04

(3) 54 (4) 540

4. $(-1.07)^2$ =.....(?)

(1) –1.1449 (2) 1.1449

(3) 1.4149 (4) –1.4149

5. Saloni read $\frac{4}{9}$th part of a book on Monday, $\frac{2}{9}$th part on Tuesday and the remaining 51 pages on Wednesday. How many times did she read the pages on Wednesday to that of Monday ?

(1) $\frac{2}{3}$ (2) $\frac{3}{2}$

(3) $\frac{4}{3}$ (4) $\frac{3}{4}$

6. Which of the following are the factors of the expression $5 - 10y - y + 2y^2$?

(1) $(1 - 2y)(5 - y)$ (2) $(1 - 2y)(1 + 2y)$

(3) $(5 - y)^2$ (4) $(5 + y)(1 - 2y)$

7. $2\frac{1}{2}\%$ of 5 lit = ...(?)

(1) 125 ml (2) 1250 ml

(3) 525 ml (4) 750 ml

8. A circle with centre O has a chord AB = 9 cm. M is midpoint of the chord and seg OM $\perp$ seg AB. If $l(\text{OM}) = 6$ cm, then what is the length of the biggest chord of given circle ?

(1) 9 cm (2) 7.5 cm

(3) 11 cm (4) 15 cm

9. What is the sum of the additive inverse of $\frac{5}{3}$ and the multiplicative inverse of $\frac{3}{5}$?

(1) 0 (2) $\frac{10}{3}$

(3) $-\frac{5}{3}$ (4) $\frac{3}{5}$

10. If the measures of the angles of a quadrilateral are $(3x + 15)°$, $(x + 20)°$, $(2x + 30)°$ and $(3x - 20)°$, then find the difference between the greatest and the smallest angle of the given quadrilateral.

(1) 65° (2) 55°

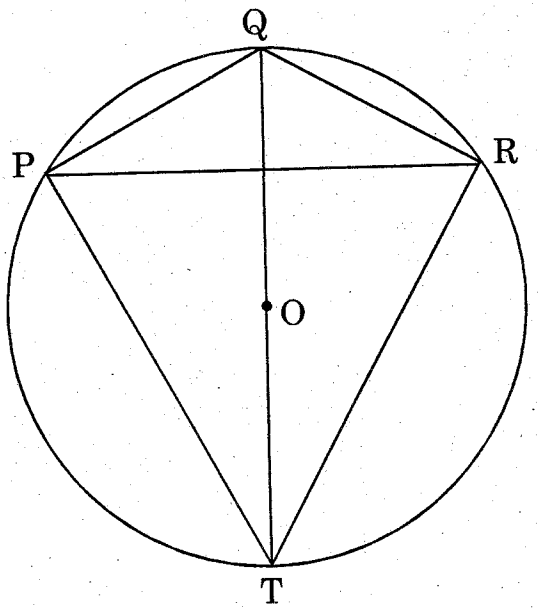
(3) 120° (4) 85°

11. If $x = 3z + 4$; $y = x - 4$ and $z = 1.5$, then find the value of $2x + 3y - 2z$.

(1) 33.5 (2) 27.5

(3) 6.5 (4) 7.5

12. Observe the figure given below and hence find the false statement. (O is the centre of the given circle).



(1) $\angle$ PTQ $\cong \angle$ PRQ (2) $\angle$ QPT $\cong \angle$ QRT

(3) $\angle$ PQR $\cong \angle$ PTR (4) $\angle$ RTQ $\cong \angle$ RPQ

13. 12 workers can complete a piece of work in 10 days. If number of workers are reduced to $\frac{1}{3}$rd of the original number, then how many more days would be required to complete the same work ?

(1) 3 (2) 5

(3) 15 (4) 20

14. 40 m × 35 m rectangular garden has a road of width 2.5 m around it from inside. Find the area of the garden within.

(1) 625 sq. m (2) 1400 sq. m

(3) 1050 sq. m (4) 1800 sq. m

15. Which of the following options has the minimum sum of the place values of 2 and 3 ?

(1) 2.341 (2) 2.431

(3) 2.413 (4) 3.241

16. How many litres of milk will be given to 120 girls in a hostel, from 15th September to 20th October, if each girl in the hostel is given 250 ml of milk per day ?

(1) 1080 litres (2) 1050 litres

(3) 1110 litres (4) 1810 litres

17. The average age of Mahesh and Deepak is 13 yrs. and that of Deepak and Aarati is 20 yrs. If sum of ages of Aarati and Mahesh is 36 yrs, then what is Aarati's age ?

(1) 13 yrs. (2) 18 yrs.

(3) 20 yrs. (4) 25 yrs.

18. What is the ratio of $5\frac{1}{4}$ hrs. to 1080 seconds ?

(1) 2 : 35 (2) 34 : 2

(3) 35 : 2 (4) 2 : 34

19. Find the volume of a cuboid, whose length is $(3a + 2b)$ units and its breadth and height is $(3a - 2b)$ units each.

(1) $27a^3 - 18a^2b - 12ab^2 + 8b^3$ cubic units

(2) $9a^2 - 4b^2$ cubic units

(3) $27a^3 + 18a^2b - 12ab^2 + 8b^3$ cubic units

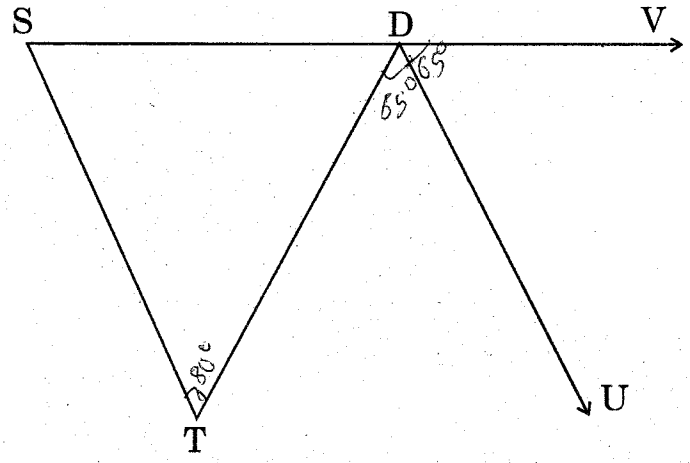
(4) $27a^3 - 18a^2b + 12ab^2 + 8b^3$ cubic units

20. What is the difference between the sum of twin prime numbers between 20 to 40 and the sum of twin prime numbers between 70 to 90 ?

(1) 10 (2) 60

(3) 84 (4) 144

21. In the figure given below $m\angle$ T = 80°, $m\angle$ UDT = 65°, Ray DU is bisector of $\angle$ TDV, then what types of triangle is ΔSTD ?



(1) Equilateral triangle (2) Isosceles triangle

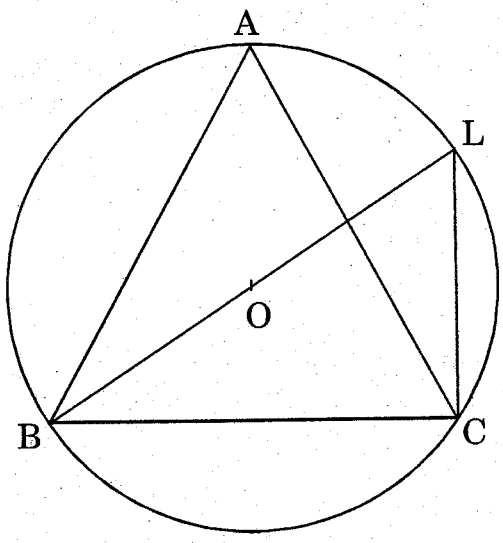
(3) Scalene triangle (4) Right-angled triangle

22. Population of Morgaon increases by 10% per year. If the population of this year is 2420, then what was the population of Morgaon, 2 years before ?

(1) 3000 (2) 2178

(3) 2000 (4) 1936

23. In the figure given below, 'O' is the centre of the circle.
If chord AB ≅ Chord AC ≅ Chord BC, then $m \angle$ LBC = ?



(1) 60° (2) 45°

(3) 65° (4) 30°

24. A cube of side 12 cm is melted to form three smaller cubes. If sides of first two smaller cubes formed are 6 cm and 8 cm respectively, then find the side of third smaller cube.

(1) 4 cm (2) 6 cm

(3) 10 cm (4) 7 cm

25. If square root of a number is 8, then find the square of the cube root of the same number.

(1) 4
(2) 64
(3) 16
(4) 2

26. How many times is the LCM of 150 and 350, to that of its G.C.D. ?

(1) 12
(2) 21
(3) 7
(4) 35

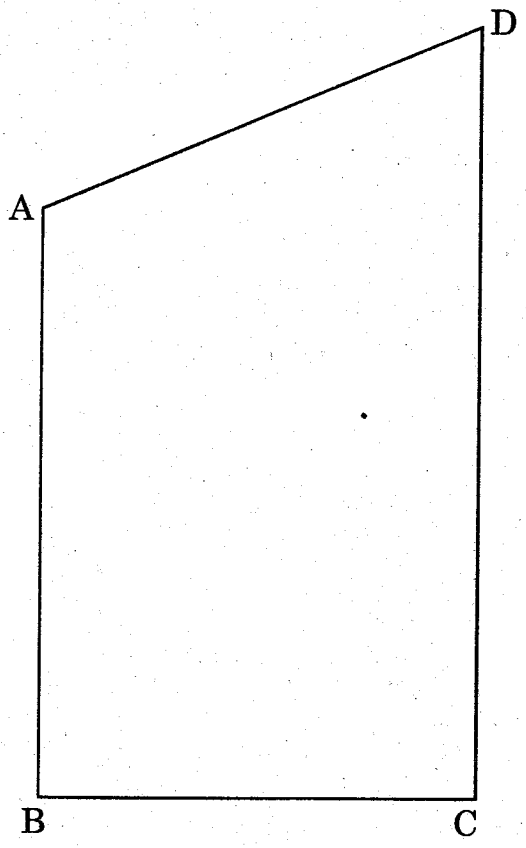
27. The lengths of the sides of some figures are given in the options below. Find which of them will not form a triangle.

(1) 2 cm, 2.5 cm, 3.5 cm
(2) 3.2 cm, 2 cm, 2.5 cm
(3) 3.3 cm, 6.5 cm, 3.1 cm
(4) 4.5 cm, 5.7 cm, 5.2 cm

28. Average weights of 40 sacks kept in a godown is 32 kg. If two new sacks of equal weights are kept in the godown, then the average of all the sacks increases by 0.5 kg. Find the weight in kilograms, of each sack, which was kept later.

(1) 42.5
(2) 42
(3) 85
(4) 84.2

29. In the figure given below, seg AB || seg CD. $m \angle C = 90°$. If $l(AB) = 50$ cm, $l(CD) = 55$ cm, $l(BC) = 12$ cm, then find the perimeter of the given figure in cm.



(1) 154
(2) 130
(3) 142
(4) 118

30. If the area of a square is 1156 sq. cm, then find its perimeter.

(1) 136 cm (2) 36 cm

(3) 34 cm (4) 144 cm

31. Perimeter of an isosceles triangle is 48 cm. If the length of the congruent sides of triangle is half the length of the non-congruent side, then find the length of the congruent sides.

(1) 6 cm (2) 24 cm

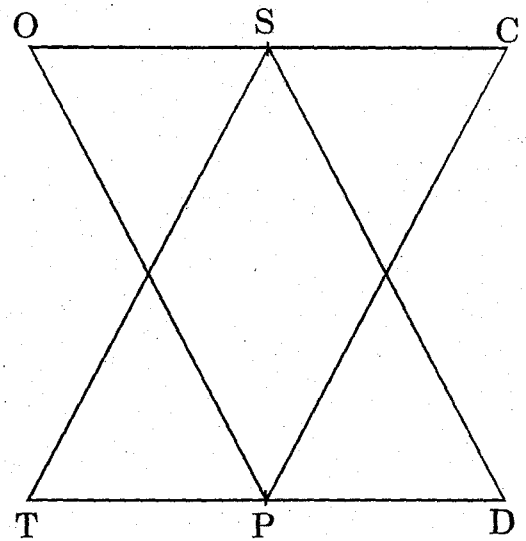
(3) 10 cm (4) 12 cm

32. * 3 * 4 is a four-digit number which is completely divisible by 12. If the same digit appears in the place of *, then find that digit.

(1) 1 (2) 2

(3) 5 (4) 4

33. In the figure given below, if ΔSTD and ΔPCO are congruent for the one to one correspondence, STD $\leftrightarrow$ PCO between their vertices, then which of the pair of angles given below are not in correspondence with each other ?



(1) $\angle$ TSD and $\angle$ CPO (2) $\angle$ TDS and $\angle$ COP

(3) $\angle$ DTS and $\angle$ OCP (4) $\angle$ SDT and $\angle$ PCO

34. If the ratio of the complementary angle to that of the supplementary angle of the given angle is 1 : 10, then find the ratio of the given angle with its supplementary angle.

(1) 4 : 5 (2) 1 : 8

(3) 8 : 1 (4) 5 : 4

35. $\frac{5}{7} + \frac{3}{7} \times \frac{14}{24} = x$, then x = ?

(1) $\frac{2}{3}$ (2) $\frac{47}{56}$

(3) $\frac{54}{58}$ (4) $\frac{27}{28}$

36. $4\frac{3}{4}$ centimeter = ...decameter.

(1) 47.5×10^{-5}

(2) 475×10^{-7}

(3) 47.5×10^{-4}

(4) 0.475×10^{5}

37. A shopkeeper earns a profit of 15% on selling a radio, whereas if it is sold for Rs. 360 less, he suffers a loss of 15%, then what is the cost price of the radio for the shopkeeper ?

(1) 1,380 (2) 1,560

(3) 820 (4) 1,200

38. If x is directly proportional to y, then which number will replace '?' ?

x	$\frac{2}{5}$	?
y	$\frac{3}{5}$	$\frac{1}{2}$

(1) $\frac{1}{3}$ (2) $\frac{1}{4}$

(3) $\frac{2}{3}$ (4) $\frac{3}{4}$

39. After selling a fan for Rs. 720, the profit earned is $\frac{1}{5}$ of its cost price. Hence find the cost price of one fan.

(1) Rs. 480 (2) Rs. 576

(3) Rs. 540 (4) Rs. 600

40. If the diagonal of a rectangle ABCD is 61 units and its breadth is 11 units, then find the area of the $\square$ ABCD.

(1) 60 sq. units (2) 660 sq. units

(3) 600 sq. units (4) 671 sq. units

41. Amongst the following options, which plan would be economic for the housing loan ?

(1) A principal of Rs. 250 for $1\frac{1}{2}$ years give interest of Rs. 60

(2) A principal of Rs. 700 for 2 years give interest of Rs. 133

(3) A principal of Rs. 70 for 5 years give interest of Rs. 28

(4) A principal of Rs. 500 for 2 years give interest of Rs. 74

42. If the diagonals of a rhombus are 24 cm and 32 cm each, then find its perimeter.

(1) 20 cm (2) 72 cm

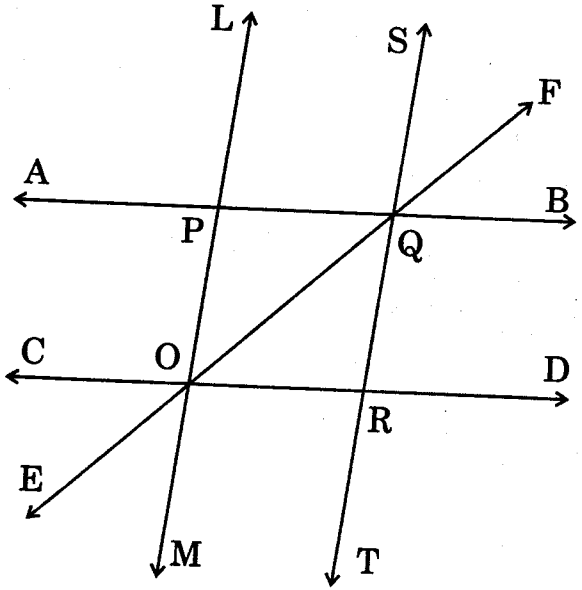
(3) 96 cm (4) 80 cm

43. If a principal amounts to Rs. 3,550 in 4 years at a rate of $10\frac{1}{2}$ pcpa, then what is the principal ?

(1) Rs. 2,400 (2) Rs. 2,800

(3) Rs. 2,500 (4) Rs. 3,000

44. Line AB, line CD, line LM, line ST and line EF intersect each other at distinct points as shown in figure below. Find the number of pairs of opposite rays formed.



(1) 12

(2) 10

(3) 5

(4) 8

45. $\left[(16)^2\right]^4 = \left[(4)^{\boxed{x}}\right]^4$, then x = ?

(1) 2

(2) 4

(3) 6

(4) 8

46. Which of the following is the factor of $81n^4 - 625$?

(1) $(9n^2 + 25)(9n^2 + 25)$ (2) $(9n^2 + 25)(3n^2 - 5)(3n^2 + 5)$

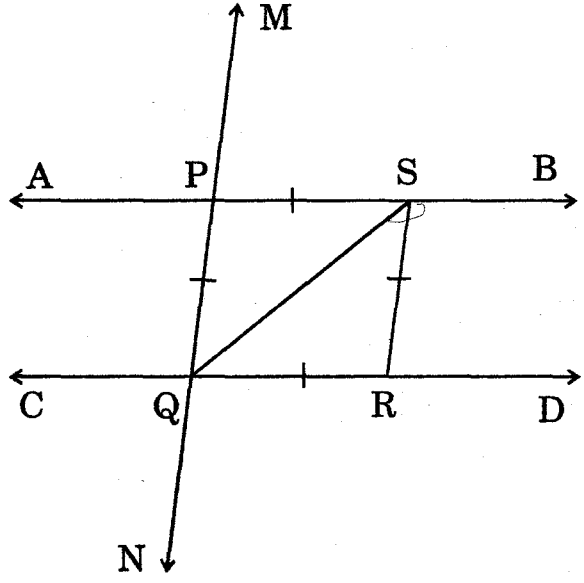
(3) $(9n^2 + 25)(3n + 5)(3n - 5)$ (4) $(9n^2 - 25)(9n^2 - 25)$

47. $\frac{81^2 \times 27^2}{9^3 \times 3^5} = 3^x$, then x = ?

(1) 1 (2) 2

(3) 3 (4) 4

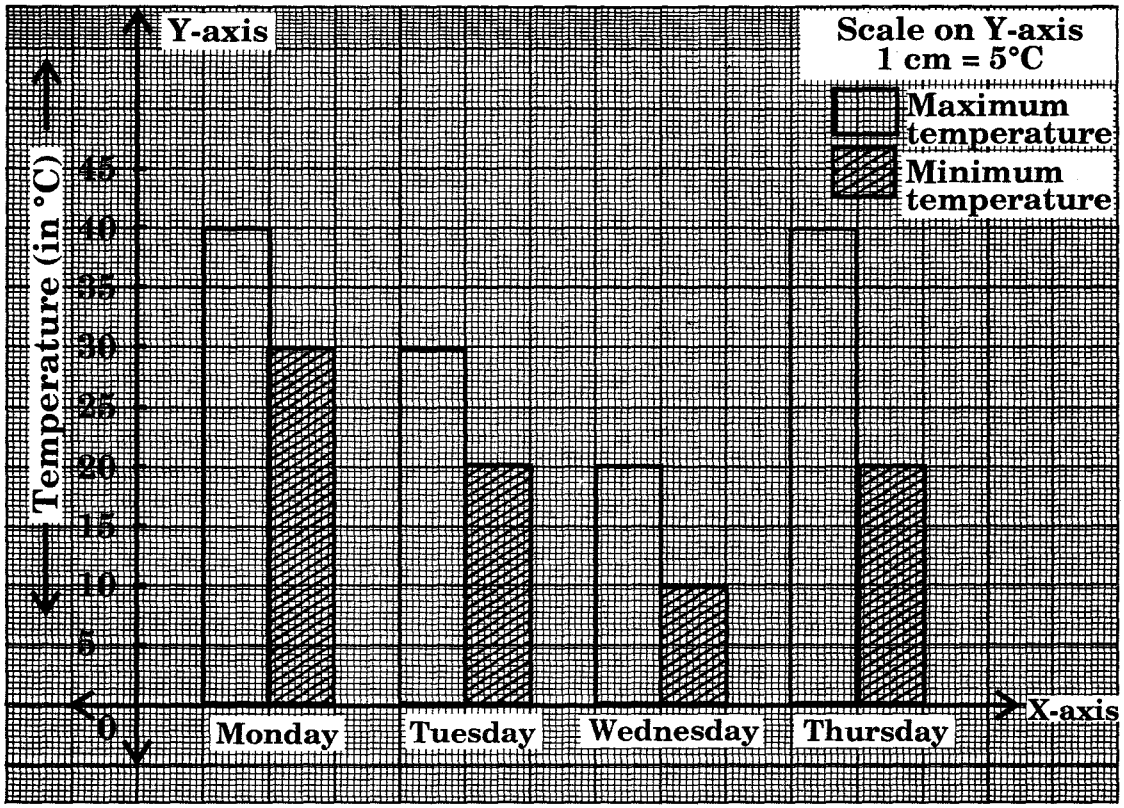
48. In the figure given below, line AB $\parallel$ line CD, $m \angle$ DQN = 120°. If seg QS is the diagonal of the $\square$ PQRS, then $m \angle$ BSQ = ?



(1) 120° (2) 60°

(3) 115° (4) 150°

49 & 50. *Note* : Observe the graph and answer the questions.:



49. What is the ratio of the maximum temperature to the minimum temperature for Monday ?

(1) 4 : 3 (2) 7 : 5

(3) 3 : 4 (4) 1 : 2

50. On which two days is the ratio of maximum temperature to that of minimum temperature the same ?

(1) Monday and Thursday

(2) Tuesday and Wednesday

(3) Tuesday and Monday

(4) Thursday and Wednesday