CLASS 8 · MATHEMATICS

Power Play

Sample paper · 15 questions · 22 marks

10 objective questions × 1 mark. Five written-response questions: 12 marks. Write your working where needed. Suggested time: 45 minutes. Answers and marking guidance follow the questions.

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Section A · Objective questions (10 marks)

1. What is the value of 2 to the power 5?

A. 32

B. 10

C. 25

D. 64

2. Using the laws of exponents, 3 to the power 4 multiplied by 3 to the power 2 equals:

A. 9 to the power 6

B. 3 to the power 8

C. 3 to the power 6

D. 3 to the power 2

3. Using the laws of exponents, 7 to the power 8 divided by 7 to the power 5 equals:

A. 7 to the power 13

B. 7 to the power 2

C. 7 to the power 40

D. 7 to the power 3

4. (2 to the power 3) to the power 2 equals:

A. 8 to the power 9

B. 2 to the power 6

C. 2 to the power 9

D. 2 to the power 5

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5. What is the value of 5 to the power 0?

A. 50

B. 1

C. 0

D. 5

6. 3 to the power -2 equals:

A. 1/9

B. -9

C. 1/6

D. -6

7. 34,000 written in scientific (standard) notation is:

A. 3.4 x 10 to the power 3

B. 34 x 10 to the power 3

C. 0.34 x 10 to the power 5

D. 3.4 x 10 to the power 4

8. Which of these is the largest number?

A. 4 squared

B. 5 squared

C. 2 to the power 5

D. 3 cubed

9. 0.0007 written in scientific (standard) notation is:

A. 7 x 10 to the power -4

B. 7 x 10 to the power -3

C. 7 x 10 to the power 4

D. 0.7 x 10 to the power -3

10. A sheet of paper 0.1 mm thick is folded 5 times, doubling its thickness each fold. Its new thickness is:

A. 0.5 mm

B. 3.2 mm

C. 1.6 mm

D. 6.4 mm

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Section B · Written responses (12 marks)

Attempt all five. Use a separate sheet if you need more space. The marks for each question are shown.

11. Simplify (2 to the power 4 x 2 to the power 3) divided by 2 to the power 5, giving your answer as a whole number. [2 marks]

12. Write 0.00056 in scientific (standard) notation and explain how you chose the exponent. [2 marks]

13. Using the division law of exponents, explain why any non-zero number raised to the power 0 equals 1. [2 marks]

14. Which is greater: 2 to the power 10 or 10 squared? By roughly how many times? Show your working. [3 marks]

15. A single bacterium doubles every hour. Starting with 1 bacterium at 9:00 AM, how many bacteria are there at 12:00 noon? Express the count both as a power of 2 and as a number. [3 marks]

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Answers & marking guidance

Use these after attempting the paper. Accept equivalent correct reasoning and sensible units. These are Evater model answers, not an official marking scheme.

Section A · 1 mark each

1. A — 2 to the power 5 = 2 x 2 x 2 x 2 x 2 = 32.

2. C — When multiplying powers with the same base, add the exponents: 4 + 2 = 6.

3. D — When dividing powers with the same base, subtract the exponents: 8 - 5 = 3.

4. B — When a power is raised to another power, multiply the exponents: 3 x 2 = 6. (The value is 64.)

5. B — Any non-zero number raised to the power 0 equals 1.

6. A — A negative exponent means a reciprocal: 3 to the power -2 = 1 / (3 squared) = 1/9.

7. D — 34,000 = 3.4 x 10,000 = 3.4 x 10 to the power 4, with the factor between 1 and 10.

8. C — 2 to the power 5 = 32, while 3 cubed = 27, 4 squared = 16 and 5 squared = 25.

9. A — The decimal point moves 4 places to the right to give 7, so 0.0007 = 7 x 10 to the power -4.

10. B — After 5 folds the thickness is 0.1 x 2 to the power 5 = 0.1 x 32 = 3.2 mm.

Section B · Model answers

11. 2 to the power (4 + 3 - 5) = 2 to the power 2 = 4.

Marking: 1 mark for correctly adding and subtracting exponents; 1 mark for the value 4.

12. 0.00056 = 5.6 x 10 to the power -4. The decimal point moves 4 places to the right to reach 5.6, so the power of 10 is -4.

Marking: 1 mark for 5.6 as the coefficient; 1 mark for the exponent -4 with a correct reason.

13. For a non-zero a, a to the power m divided by a to the power m = a to the power (m - m) = a to the power 0. But any non-zero number divided by itself is 1, so a to the power 0 = 1.

Marking: 1 mark for using a to the power m / a to the power m; 1 mark for concluding a to the power 0 = 1.

14. 2 to the power 10 = 1024 and 10 squared = 100. 1024 > 100, so 2 to the power 10 is greater; it is about 10 times as large (1024 / 100 = 10.24).

Marking: 1 mark for evaluating 2 to the power 10 = 1024; 1 mark for 10 squared = 100; 1 mark for the comparison with a sensible 'how many times'.

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15. At 10:00 there are 2, at 11:00 there are 4, and at 12:00 there are 8. That is 2 to the power 3 = 8 bacteria after 3 hours.

Marking: 1 mark for the doubling pattern per hour; 1 mark for recognising 3 hours gives 2 to the power 3; 1 mark for the value 8.

Topic references

NCERT Class 8 Mathematics, Ganita Prakash, Chapter 2: Power Play.

https://ncert.nic.in/textbook/pdf/hegp102.pdf

Concept reference only. Questions and model answers are original Evater practice material, not an official NCERT paper.

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