

## JEE MAIN WAVES — STANDING WAVES AND NORMAL MODES (STRINGS, ORGAN PIPES) — PYQS

**Max. Marks: 16**
**Questions: 4**

### Section A (MCQ) — 4 questions

- Q.1** The fifth harmonic of a closed organ pipe is found to be in unison with the first harmonic of an open pipe. The ratio of lengths of closed pipe to that of the open pipe is  $5/x$ . The value of  $x$  is \_\_\_\_\_

[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) 3      (2) 2      (3) 4      (4) 1

Scan or tap for the  
full solution



- Q.2** In an open organ pipe  $v_3$  and  $v_6$  are 3<sup>rd</sup> and 6<sup>th</sup> harmonic frequencies, respectively. If  $v_6 - v_3 = 2200$  Hz then length of the pipe is \_\_\_\_\_ mm.

(Take velocity of sound in air is 330 m/s.)

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 200      (2) 225      (3) 275      (4) 250

Scan or tap for the  
full solution



- Q.3** In an experiment with a closed organ pipe, it is filled with water by  $\left(\frac{1}{5}\right)$ th of its volume. The frequency of the fundamental note will change by

[JEE Main 2025 (Online) 4th April Morning Shift]

- (1) 20%      (2) 25%      (3) -20%      (4) -25%

Scan or tap for the  
full solution



- Q.4** In the resonance experiment, two air columns (closed at one end) of 100 cm and 120 cm long, give 15 beats per second when each one is sounding in the respective fundamental modes. The velocity of sound in the air column is:

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 370 m/s    (2) 340 m/s    (3) 335 m/s    (4) 360 m/s

Scan or tap for the  
full solution



### ANSWER KEY

| Ques. | 1 | 2 | 3 | 4 |  |  |  |  |  |  |  |  |  |  |
|-------|---|---|---|---|--|--|--|--|--|--|--|--|--|--|
| Ans.  | 2 | 2 | 2 | 4 |  |  |  |  |  |  |  |  |  |  |