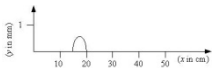
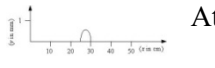
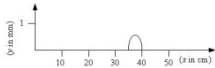
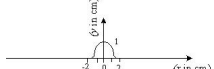
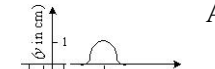
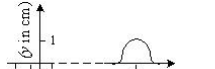
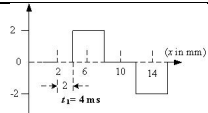
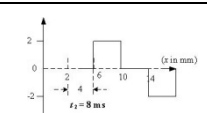
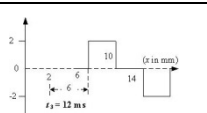


Wave and Motion : Waves in Strings – Subjective Questions (Typical)

Answers Only

A-01	(-) 2 m
A-02	(a) L, L, T (b) $\frac{a}{T}$ (c) Negative direction (d) $x = -a$ and $x = -2a$
A-03	At $t = 1$ s  At $t = 2$ s  At $t = 3$ s 
A-04	At $t = 0$ s,  At $t = 1$ s,  At $t = 2$ s, 
A-05	$f(x, t) = A \sin\left(\frac{t}{T} - \frac{x}{vT}\right)$
A-06	(a) L, L (b) $f(x, t) = A \sin\left(\frac{x-vt}{a}\right)$
A-07	$f(x, t) = A \sin\left(\frac{x - v(t - t_0)}{a}\right)$
A-08	(a) Negative x -direction (b) 10 m/s, 20 cm, 50 Hz (c) 0.10 mm, 3.14 cm/s
A-09	(a) $y = (0.20 \text{ cm}) \sin[(\pi \text{ cm}^{-1})x - (2\pi \times 10^3 \text{ s}^{-1})t]$ (b) Zero, 4π m/s (c) No
A-10	(a) 20 ms, 4.0 cm (b) Zero (c) Zero (d) 9.7 cm/s, 18 cm/s, 25 cm/s
A-11	50 Hz, 4.0 cm, 2.0 m/s
A-12	(a) 1.0 cm (b) 4 cm (c) 1.6 cm^{-1} (d) 5 Hz
A-13	(a) 20 cm (b) -1.5 mm
A-14	32 m/s
A-15	(a) 0.02 s (b)
A-16	(a) 2 s (b) 3s (c) 2×10^{-3} N
A-17	0.25
A-18	0.11 N
A-19	(a) 30 m/s, 30 cm (b) $y = (1.0 \text{ cm}) \cos\left[\frac{x}{30 \text{ cm}} - \frac{t}{0.01 \text{ s}}\right]$ (c) -5.4 m/s, 2.0 km/s^2 .
A-20	0.05 s
A-21	80 m/s and 63 m/s

A-22	0.02 s
A-23	50 m/s
A-24	3.7 m/s ²
A-25	v
A-26	(a) \sqrt{gx} (b) $\sqrt{\frac{4L}{g}}$ (c) At a distance $\frac{L}{3}$ from the bottom
A-27	At $t = 100$ ms at $x = 2.0$ m
A-28	49 mW
A-29	(a) 0.47 W (b) 9.4 mJ
A-30	(a) 70 m/s, 16 cm (b) 1.4 m/s, 3.8 km/s (c) 0.67 W
A-31	$4\sqrt{2}$ mm
A-32	(i)  (ii)  (iii) 
A-33	(a) 3π (b) 4π (c) Zero, 4.0 mm
A-34	30 Hz
A-35	1.00 g/m
A-36	250 Hz, 40 cm
A-37	1480 N
A-38	384 m/s
A-39	70 Hz
A-40	164 N
A-41	(a) 80 Hz (b) 25 cm
A-42	8.0 cm
A-43	(a) 50 cm (b) $(0.5 \text{ cm}) \sin[(0.06\pi \text{ cm}^{-1})x] \times \cos[(1320\pi \text{ s}^{-1})t]$
A-44	26.7 cm, 23.8 cm, 22.4 cm, and 20.0 cm
A-45	70
A-46	(a) 30 Hz (b) 3 rd , 5 th and 7 th (c) 2 nd , 4 th and 6 th (d) 48 m/s
A-47	2:3
A-48	5 cm from the left end
A-49	180 Hz
A-50	(a) $2L$, $\frac{\pi}{L}$ (b) $y = A \sin\left(\frac{\pi x}{L}\right) \times \sin(2\pi vt)$

A-51	(a) 2 m, 100 Hz (b) $(0.5 \text{ cm}) \sin[(\pi \text{ m}^{-1})x] \times \cos[(200\pi \text{ s}^{-1})t]$
A-52	(a) 300 Hz (b) 0, 10 cm, 20 cm, 30 cm (c) 30 cm (d) 20 cm. 60 m/s
A-53	10 cm
A-54	$1.98 \times 10^{11} \text{ N/m}^2$
A-55	$5.8 \times 10^3 \text{ kg/m}^3$
A-56	(a) 10 Hz, 30 Hz, 50 Hz (b) 8.00 m, 2.67 m, 1.60 m
A-57	240 Hz
A-58	5
A-59	5
A-60	$y = 0.1 \sin \left[30t \pm \frac{3}{2}x \pm \varphi \right]$