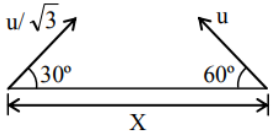# ARJUNA (NEET)

Motion in Plane

DPP-04

1. A river is flowing at the rate of 6 km/h. A swimmer swims across the river with a velocity of 9 km/h w.r.t. water. The resultant velocity of the man will be in (km/h) :
(A) $\sqrt{117}$
(B) $\sqrt{340}$
(C) $\sqrt{17}$
(D) $3\sqrt{40}$

2. A man wishes to swim across a river 0.54 km wide. If he can swim at the rate of 2 km/h in still water and the river flows at the rate of 1 km/h. The angle made by the direction (w.r.t., the flow of the river) along which he should swim so as to reach a point exactly opposite his starting point, should be :
(A) 60°
(B) 120°
(C) 145°
(D) 90°

3. A man is walking on a road with a velocity of 3 km/h when suddenly, it starts raining velocity of rain is 10 km/h in vertically downward direction, relative velocity of the rain with respect to man is :
(A) $\sqrt{13}$ km/hr
(B) $\sqrt{7}$ km/hr
(C) $\sqrt{109}$ km/hr
(D) 13 km/hr

4. Two particles are separated by a horizontal distance x as shown in figure. They are projected as shown in figure with different initial speeds. The time after which the horizontal distance between them becomes zero is :

(A) $\dfrac{x}{u}$
(B) $\dfrac{u}{2x}$
(C) $\dfrac{2u}{x}$
(D) None of these

5. A river 2 km wide is flows at the rate of 2 km/h. A boatman who can row a boat at a speed of 4 km/h in still water, goes a distance of 2 km upstream and then comes back. The time taken by him to complete his journey is
(A) 60 min
(B) 70 min
(C) 80 min
(D) 90 min

6. The velocity of water in a river is 2 kmph, while width is 400 m. A boat is rowed from a point rowing always aiming opposite point at 8 kmph of still water velocity. On reaching the opposite bank the drift obtained is
(A) 93 m
(B) 100.8 m
(C) 112.4 m
(D) 100 m

7. A person can swim in still water at 5 m/s. He moves in a river of velocity 3 m/s, first down the stream and next same distance up the stream. The ratio of times taken are
(A) 1 : 1
(B) 1 : 2
(C) 1 : 4
(D) 4 : 1

8. A man standing on a road hold his umbrella at 30° with the vertical to keep the rain away. He throws the umbrella and starts running at 10 km/hr. He finds that raindrops are hitting hitting his head vertically, the speed of raindrops with respect to the road will be
(A) 10 km/hr
(B) 20 km/hr
(C) 30 km/h
(D) 40 km/hr

9. A man can row a boat with 8 km/hour in still water. If he is crossing a river where the current is 4 km/hour, in what direction should he head the boat to cross the river in shorted time and in what minimum time, he will cross ? (Width of river is 8 km)
(A) 30°, $\dfrac{2}{\sqrt{3}}$ hr
(B) 60°, $\dfrac{2}{\sqrt{3}}$ hr
(C) 90°, 1 hr
(D) 120° and $\dfrac{4}{3}$ hr

10. Two boys are standing at the ends A and B of a ground where AB = a. The boy at B starts running in a direction perpendicular to AB with velocity v_1. The boy at A starts running simultaneously with velocity v and catches the other in a time t, where t is

(A) $\dfrac{a}{\sqrt{v^2 + v_1^2}}$

(B) $\dfrac{a}{v + v_1}$

(C) $\dfrac{a}{v - v_1}$

(D) $\sqrt{\dfrac{a^2}{v^2 - v_1^2}}$

11. A standing man observes rain falling with velocity of 20 m/s at an angle of 30° with the vertical. Find the velocity with which the man should move so that rain appears to fall vertically to him.

(A) 10 m/s

(B) 20 m/s

(C) 30 m/s

(D) $10\sqrt{2}$ m/s

ANSWERS KEY

1. **(A)**
2. **(B)**
3. **(C)**
4. **(A)**
5. **(C)**
6. **(D)**
7. **(C)**
8. **(B)**
9. **(C)**
10. **(D)**
11. **(A)**

Note – If you have any query/issue

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