PHYSICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 8

Total Marks : 32

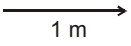
Max. Time : 33 min.

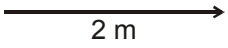
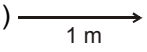
Topic : Mathematical Tools

Type of Questions		M.M., Min.
Single choice Objective ('–1' negative marking) Q.1 to Q.5	(3 marks, 3 min.)	[15, 15]
Multiple choice objective ('–1' negative marking) Q.6	(4 marks, 4 min.)	[4, 4]
Subjective Questions ('–1' negative marking) Q.7	(4 marks, 5 min.)	[4, 5]
Comprehension ('–1' negative marking) Q.8 to Q.10	(3 marks, 3 min.)	[9, 9]

1. If $\vec{A}$ is $2\hat{i}+9\hat{j}+4\hat{k}$, then $4\vec{A}$ will be :

(A) $8\hat{i}+16\hat{j}+36\hat{k}$ (B) $8\hat{i}+36\hat{k}+16\hat{j}$ (C) $8\hat{i}+9\hat{j}+16\hat{k}$ (D) $8\hat{i}+36\hat{j}+16\hat{k}$

2. Which of the following vector is equal as that of  1 m

(A)  1 m (B)  2 m (C)  1 m (D)  1 m

3. The point for the curve, $y = xe^x$,

(A) x = - 1 is minima (B) x = 0 is minima (C) x = - 1 is maxima (D) x = 0 is maxima

4. The function $x^5 - 5x^4 + 5x^3 - 10$ has a maxima, when x =

(A) 3 (B) 2 (C) 1 (D) 0

5. The unit vector along $\vec{A} = 2\hat{i}+3\hat{j}$ is :

(A) $2\hat{i}+3\hat{j}$ (B) $\frac{2\hat{i}+3\hat{j}}{2}$ (C) $\frac{2\hat{i}+3\hat{j}}{3}$ (D) $\frac{2\hat{i}+3\hat{j}}{\sqrt{13}}$

6. Which of the following represents a vector ?

(A) (B) (C) $\overleftarrow{A}$ (D) $\vec{A}$ (E) $\hat{A}$

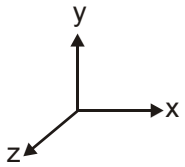
7. The x-component of a certain vector in x-y-plane is 2 units and y-component is + $2\sqrt{3}$ units. What is the magnitude of the vector.

COMPREHENSION

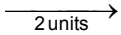
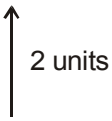
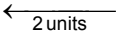
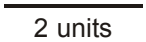
Position vector $\vec{A}$ is $2\hat{i}$

Position vector $\vec{B}$ is $3\hat{j}$

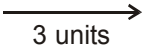
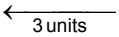
$\hat{i},\hat{j},\hat{k}$ are along the shown x,y and z axes :



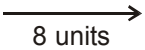
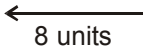
8. Geometrical representation of $\vec{A}$ is

(A)  2 units (B)  2 units (C)  2 units (D)  2 units

9. Geometrical representation of $\vec{B}$ is :

(A)  3 units (B)  3 units (C)  3 units (D)  3 units

10. $-4\vec{A}$ can be represented as

(A)  8 units (B)  8 units (C) $\vec{A}$ (D) $\vec{A}$

Answers Key

DPP NO. - 8

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

Hint & Solutions

DPP NO. - 8

1. $\vec{A} = 2\hat{i} + 9\hat{j} + 4\hat{k}$

$4\vec{A} = 8\hat{i} + 36\hat{j} + 16\hat{k}$

2. $\xrightarrow[1\text{ m}]{}$ magnitude & direction must be same.

3. $\frac{dy}{dx} = x.e^x + e^x = (x + 1)\, e^x = 0$; $x = -1$;

$\frac{d^2y}{dx^2} > 0$ for $x = -1$

4. $\frac{dy}{dx} = \frac{d}{dx}(x^5 - 5x^4 + 5x^3 - 10) = 5x^4 - 20x^3 + 15x^2$

$= 0$; $x = 3, 0, 1$

$\frac{d^2y}{dx^2} < 0$ at $x = 1$

5. $\vec{A} = 2\hat{i} + 3\hat{j}$

$\vec{A} = \frac{2\hat{i} + 3\hat{j}}{\sqrt{4+9}} = \frac{2\hat{i} + 3\hat{j}}{\sqrt{13}}$

6*. (B) $\longrightarrow$ (D) $\vec{A}$

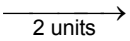
7. $A_x = 2$

$A_y = 2\sqrt{3}$

$A = \sqrt{A_x^2 + A_y^2}$

$= \sqrt{4+12} = 4$

8. $\vec{A} = 2\hat{i}$



9. $\vec{B} = 3\,j$

10. $-4\vec{A} = -8i$