(A) \angle BOA = 90°

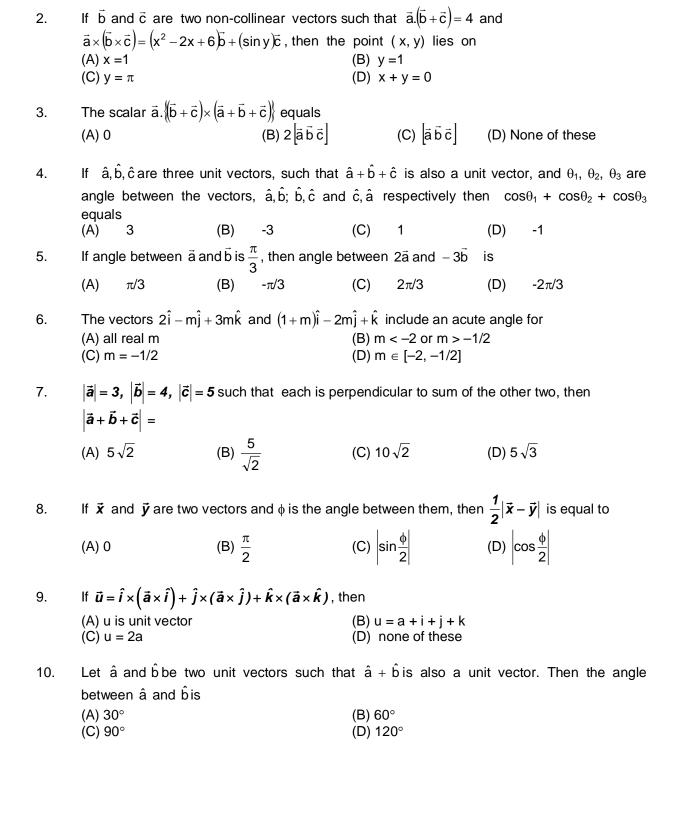
(C) ∠BOA < 90°

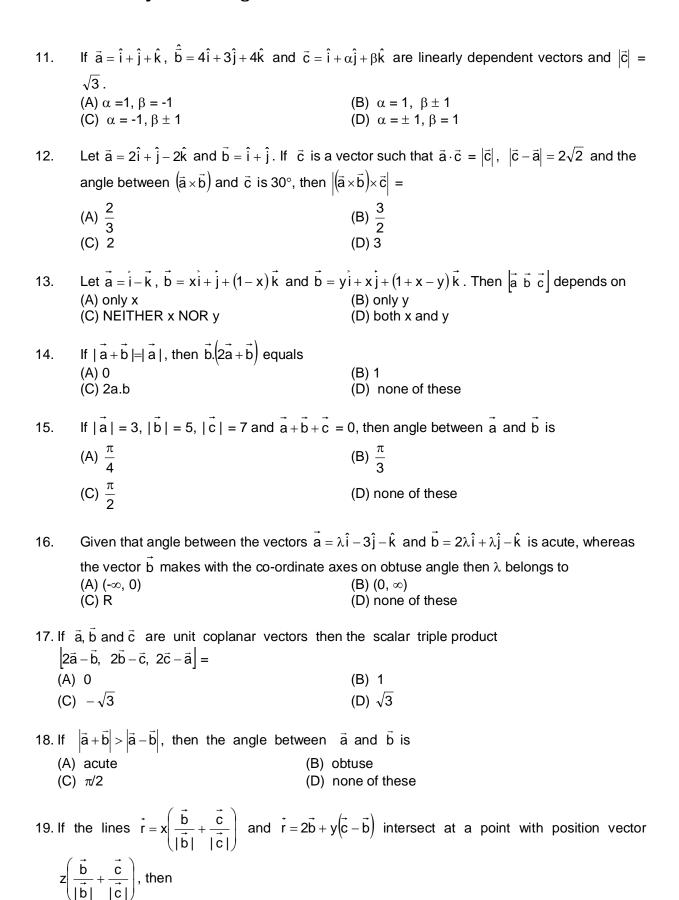
1.

VECTOR LEVEL-I

(B) ∠BOA > 90°(D) 60° ≤ ∠BOA ≤ 90°

 \overrightarrow{OA} and \overrightarrow{OB} are two vectors such that $|\overrightarrow{OA} + \overrightarrow{OB}| = |\overrightarrow{OA} + 2\overrightarrow{OB}|$. Then





(A) z is the AM between $|\vec{b}|$ and $|\vec{c}|$ (B) z is the GM between $|\vec{b}|$ & $|\vec{c}|$

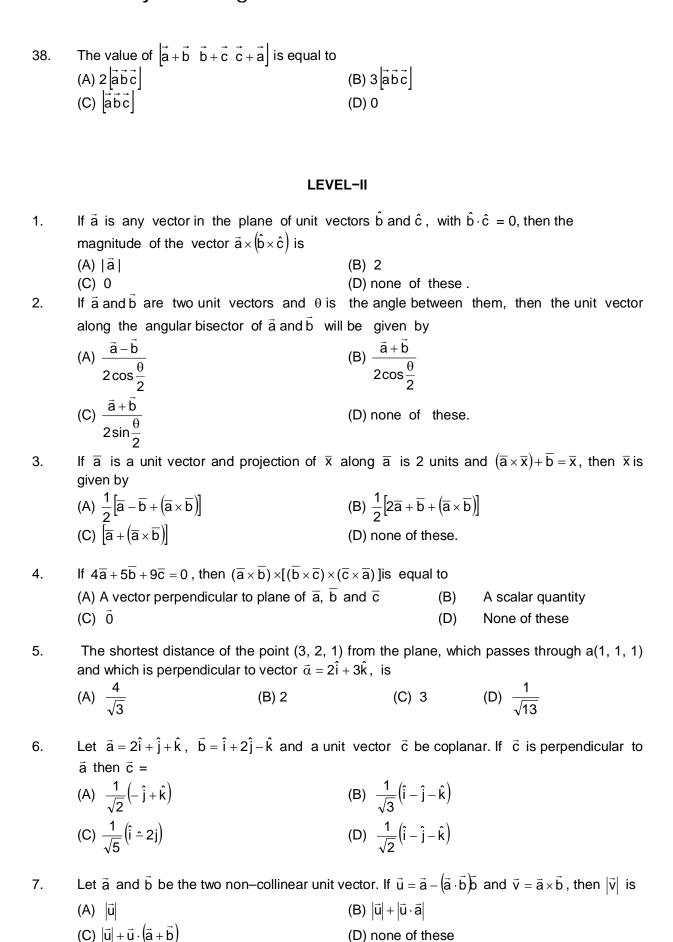
(A) 3 (B) 1

(C	z) z is the HM between \vec{b} and \vec{c}	(D) $z = \vec{b} + \vec{c} $	
20.	Let ABCDEF be a regular hexagon and Al	$\overrightarrow{B} = \overrightarrow{a}, \ \overrightarrow{BC} = \overrightarrow{b}, \ \overrightarrow{CD} = \overrightarrow{c} \ \text{then } \overrightarrow{AE} \ \text{is}$	
	(A) $\vec{a} + \vec{b} + \vec{c}$ (C) $\vec{b} + \vec{c}$	(B) $\vec{a} + \vec{b}$ (D) $\vec{c} + \vec{a}$	
21.	The number of unit vectors perpendicular to vectors $\vec{a}=\left(1,1,0\right)$ and $\vec{b}=\left(0,1,1\right)$ is		
	(A) One (C) Three	(B) Two (D) Infinite	
22.	If \hat{p} and \hat{d} are two unit vectors and θ is the	angle between them, then	
	$(A) \frac{1}{2} \left \hat{\mathbf{p}} - \hat{\mathbf{d}} \right ^2 = \sin \frac{\theta}{2}$	(B) $\hat{p} \times \hat{d} = \sin\theta$	
	(C) $\frac{1}{2}(\hat{p} - \hat{d})^2 = 1 - \cos\theta$	(D) $\frac{1}{2}(\hat{p} - \hat{d})^2 = 1 - \cos 2\theta$	
23.	The value of k for which the points A(1, 0, 3 D(k, 2, 5) are coplanar is	3) , B(-1, 3,4) ,C(1, 2, 1) and	
	(A) 1 (C) 0	(2)2 (D) -1	
24.	If $\begin{vmatrix} a & a^2 & 1+a^3 \\ b & b^2 & 1+b^3 \\ c & c^2 & 1+c^3 \end{vmatrix} = 0$ and the vector non - coplanar, then the value of abc will be	rs A = (1, a, a^2), B = (1, b, b^2), C = (1,c, c^2) are	
	(A) -1 (C) 0	(B) 1 (D) None of these	
25.	Let a, b, c be distinct non-negative numbe a plane, then c is (A) the arithmetic mean of a and b (C) the harmonic mean of a and b	rs. If the vectors $a\hat{i} + a\hat{j} + c\hat{k}$, $\hat{i} + \hat{k}$, $c\hat{i} + c\hat{j} + b\hat{k}$ lie in (B) the geometric mean of a and b (D) equal to zero	
26.	The unit vector perpendicular to the plane of (A) $\frac{i+2j+k}{\sqrt{6}}$	determined by P(1, -1, 2), Q(2, 0, -1), R(0, 2, 1) is (B) $\frac{i-j+2k}{\sqrt{6}}$	
	(C) $\frac{2i+j+k}{\sqrt{6}}$	(D) None of these	
27.	If $\overrightarrow{A}, \overrightarrow{B}, \overrightarrow{C}$ are non-coplanar vectors then	$\frac{\overrightarrow{A}.\overrightarrow{B}\times\overrightarrow{C}}{\overrightarrow{C}\times\overrightarrow{A}.\overrightarrow{B}} + \frac{\overrightarrow{B}.\overrightarrow{A}\times\overrightarrow{C}}{\overrightarrow{C}.\overrightarrow{A}\times\overrightarrow{B}}$ is equal to	

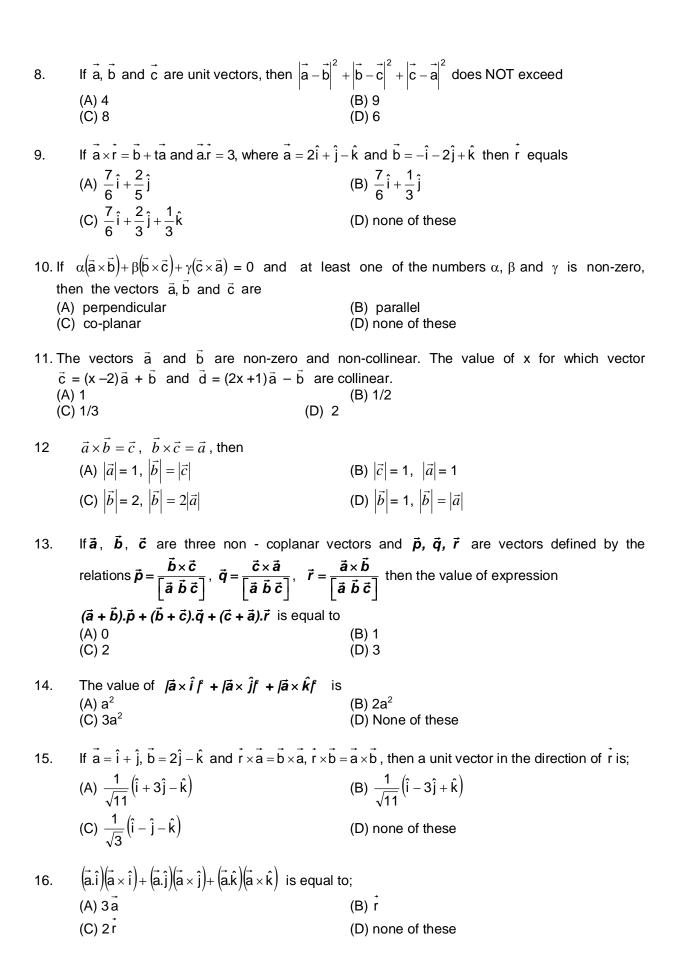
(B) 0

(D) None of there

28. of	If the vector $a\hat{i} + \hat{j} +$	i(k), $i(k)$ $i(k)$ and $i(k)$	$+\hat{j}+ck$ (a \neq b \neq c \neq 1) a	are coplanar, then the value		
	$\frac{1}{1-a} + \frac{1}{1-b} + \frac{1}{1-c}$	is equal to				
	(A) 1		(B) 0			
	(C) 2		(D) None of these			
29.	If $\vec{a}, \vec{b}, \vec{c}$ are vectors such that $\vec{a}.\vec{b}$ =0 and $\vec{a}+\vec{b}=\vec{c}$. Then					
	(A) $ \vec{a} ^2 + \vec{b} ^2 = \vec{c} ^2$		(B) $ \vec{a} ^2 = \vec{b} ^2 + \vec{c} ^2$			
	(C) $\left \vec{b} \right ^2 = \left \vec{a} \right ^2 + \left \vec{c} \right ^2$		(D) None of these			
30.	The points with points (A) $a = -40$	sition vector 60i + 3j, (B) a = 40	40i – 8j and ai –52j a (C) a = 20	are collinear if (D) none of these.		
31.	Let â and b be two	o unit vectors such	that â + b̂ is also a ui	nit vector. Then the angle		
	(A) 30°	(B) 60°	(C) 90°	(D) 120°		
32.	If vectors $ax\hat{i} + 3\hat{j} - 5\hat{k}$ and $x\hat{i} + 2\hat{j} + 2ax\hat{k}$ make an acute angle with each other, for all $x \in R$, then a belongs to the interval					
	(A) $\left(-\frac{1}{4},0\right)$	(B) (0, 1)	$(C)\left(0,\frac{6}{25}\right)$	(D) $\left(-\frac{3}{25},0\right)$		
33.	A vector of unit mag	A vector of unit magnitude that is equally inclined to the vectors $\hat{i} + \hat{j}$, $\hat{j} + \hat{k}$ and $\hat{i} + \hat{k}$ is;				
	(A) $\frac{1}{\sqrt{3}}(\hat{i}-\hat{j}-\hat{k})$		(B) $\frac{1}{\sqrt{3}} \left(\hat{i} + \hat{j} - \hat{k} \right)$			
	(C) $\frac{1}{\sqrt{3}}(\hat{i}+\hat{j}+\hat{k})$		(D) none of these			
34.				\overline{p} , \overline{q} , \overline{r} lie in plane, where		
	p = ai - aj + bk, q = (A) A.M of a, c	$\hat{i} + \hat{k}$ and $\vec{r} = c\hat{i} + c\hat{j} + c\hat{j}$	bk then b is (B) the G.M of a, c			
	(C) the H.M of a, c		(D) equal to c			
85.	The scalar $\vec{A} \cdot \left\{ (\vec{B} + \vec{C}) \times (\vec{A} + \vec{B} + \vec{C}) \right\}$ is equal to					
36.	If \vec{a} , \vec{b} , \vec{c} are unit coplanar vectors, then the scalar triple product $\left[2\vec{a} - \vec{b}, 2\vec{b} - \vec{c}, 2\vec{c} - \vec{a}\right]$ is equal to					
37.	The area of a pa $\hat{i} - 3\hat{j} + 4\hat{k}$ is	rallelogram whose d	liagonals represent tl	ne vectors $3\hat{i} + \hat{j} - 2\hat{k}$ and		
	(A) $10\sqrt{3}$		(B) $5\sqrt{3}$			
	(C) 8		(D) 4			



(D) none of these



- If the vertices of a tetrahedron have the position vectors $\vec{0}$, $\hat{i} + \hat{j}$, $2\hat{j} \hat{k}$ and $\hat{i} + \hat{k}$ then the 17. volume of the tetrahedron is
 - (A) 1/6

(C) 2

- (B) 1 (D) none of these
- $\vec{A} = (1, -1, 1), \vec{C} = (-1, -1, 0)$ are given vectors; then the vector \vec{B} which satisfies $\vec{A} \times \vec{B} = \vec{C}$ 18. and $\overrightarrow{A}.\overrightarrow{B} = 1$ is _____
- If \vec{a} , \vec{b} , \vec{c} are given non-coplanar unit vectors such that $\vec{a} \times (\vec{b} \times \vec{c}) = \frac{\vec{b} + \vec{c}}{2}$, then the angle 19. between a and c is
- Vertices of a triangle are (1, 2, 4) (3, 1, -2) and (4, 3, 1) then its area is_____ 20.
- A unit vector coplanar with $\vec{i}+\vec{j}+2\vec{k}$ and $\vec{i}+2\vec{j}+\vec{k}$ and perpendicular to $\vec{i}+\vec{j}+\vec{k}$ is 21.

LEVEL-III

1.	If a, b, c are coplanar vectors and	a is not parallel to	o b	then	$\left(\!$	$\times \overline{c}$) $\cdot (\overline{a} \times \overline{b}) \overline{b}$ is
	equal to					

(A)
$$\left[\left(\bar{a} \times \bar{b}\right) \cdot \left(\bar{a} + \bar{b}\right)\right]\bar{c}$$

(C) $\left(\bar{a} \times \bar{b}\right) \cdot \left(\bar{a} - \bar{b}\right)\bar{c}$

(B)
$$(\bar{a} \times \bar{b}) \cdot (\bar{a} \times \bar{b}) \bar{c}$$

(C)
$$(\overline{a} \times \overline{b}) \cdot (\overline{a} - \overline{b}) \overline{b}$$

The projection of $\hat{i} + \hat{j} + \hat{k}$ on the line whose equation is $\dot{r} = (3 + \lambda) \hat{i} + (2\lambda - 1)\hat{j} + 3\lambda\hat{k}$, λ 2. being the scalar parameter is;

(A)
$$\frac{1}{\sqrt{14}}$$

(C)
$$\frac{6}{\sqrt{14}}$$

(D) none of these

If \vec{p} , \vec{q} are two non-collinear and non-zero vectors such that $(b-c)\vec{p} \times \vec{q} + (c-a)\vec{p} + (a-b)\vec{q} = 0$ 3. where a, b, c are the lengths of the sides of a triangle, then the triangle is

(A) right angled

(B) obtuse angled

(C) equilateral

(D) isosceles

L-I

1.	В
3.	Α
_	_

С 5. 7. Α

С 9. В 11.

С 13. В 15.

17. Α

С 19. В 21.

23. D

В 25.

27. В 29. Α

D 31.

С 33.

35. 0

37. В

L-II

1. Α В

3. 5. Α

7. Α D 9.

С 11.

13. D 15. Α

17. Α

19. $\theta = \pi/3$ 2. Α

4. D

6. В

8.

10. D 12. В

14. Α

16. Α 18. Α

С 20. Č 22.

24. Α

С 26.

Α 28. 30. Α

С 32.

С 34.

36. 0 38. Α

2. В

4. С 6. Α

В 8.

10. С D 12.

14. В

16. D 18. Κ

20. $5\sqrt{5/2}$

21.
$$-\frac{\hat{J}+\hat{K}}{\sqrt{2}}$$
 ON $\frac{\hat{J}-\hat{K}}{\sqrt{2}}$

L-III

1. 3. C 2. C