

22.MISCELLANEOUS

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Section-B JEE Main /AIEEE

- 16) With two forces acting at point, the maximum affect is obtained when their resultant is $4N$. If they act at right angles, then their resultant is $3N$. Then the forces are [2004]
- $2 + \frac{1}{2}\sqrt{3}N$ and $2 - \frac{1}{2}\sqrt{3}N$
 - $2 + \sqrt{3}N$ and $2 - \sqrt{3}N$
 - $2 + \frac{1}{2}\sqrt{2}N$ and $2 - \frac{1}{2}\sqrt{2}N$
 - $2 + \sqrt{2}N$ and $2 - \sqrt{2}N$
- 17) In a right angle $\triangle ABC$, $\angle A = 90^\circ$ and sides a, b, c are respectively $5cm, 4cm$ and $3cm$. If a force \vec{F} has moments $0, 9$ and 16 in $N\text{ cm}$ units respectively about vertices A, B and C , then magnitude of \vec{F} is [2004]
- 9
 - 4
 - 5
 - 3
- 18) Three forces \vec{P}, \vec{Q} and \vec{R} acting along IA, IB and IC , where I is the incentre of $\triangle ABC$ are in equilibrium. Then $\vec{P} : \vec{Q} : \vec{R}$ is [2004]
- $\frac{A}{2} : \frac{B}{2} : \frac{C}{2}$
 - $\sin \frac{A}{2} : \sin \frac{B}{2} : \sin \frac{C}{2}$
 - $\sec \frac{A}{2} : \sec \frac{B}{2} : \sec \frac{C}{2}$
 - $\cos \frac{A}{2} : \cos \frac{B}{2} : \cos \frac{C}{2}$
- 19) A particle moves towards east from point A to a point B at the rate of 4 kmph and then towards north from B to C at the rate of 5 kmph . If $AB = 12\text{ km}$ and $BC = 5\text{ km}$, then its average speed for its journey from A to C are respectively [2004]
- $\frac{13}{9}\text{ kmph}$ and $\frac{17}{9}\text{ kmph}$
 - $\frac{13}{4}\text{ kmph}$ and $\frac{17}{4}\text{ kmph}$
 - $\frac{17}{9}\text{ kmph}$ and $\frac{13}{9}\text{ kmph}$
 - $\frac{17}{9}\text{ kmph}$ and $\frac{13}{9}\text{ kmph}$
- 20) A velocity $\frac{1}{4}\text{ m/s}$ is resolved into two components along OA and OB making angles 30° and 45° respectively with the given velocity. Then the component along OB is [2004]
- $\frac{1}{8}\sqrt{6} - \sqrt{2}\text{ m/s}$
 - $\frac{1}{4}\sqrt{3} - 1\text{ m/s}$
 - $\frac{1}{4}\text{ m/s}$
 - $\frac{1}{8}\text{ m/s}$
- 21) If t_1 and t_2 are the times of flight of two particles having the same initial velocity u and range R on the horizontal. Then $t_1^2 + t_2^2$ is equal to [2004]
- 1
 - $\frac{4u^2}{g^2}$
 - $\frac{u^2}{2g}$
 - $\frac{u^2}{g}$
- 22) Let $R = \{3, 3, 6, 6, 9, 9, 12, 12, 6, 12, 3, 9, 3, 12, 3, 6\}$ be a relation set $A = \{3, 6, 9, 12\}$. The relation is [2005]
- reflexive and transitive only
 - reflexive only
 - an equivalence relation
 - reflexive and symmetric only
- 23) ABC is a triangle. Forces $\vec{P}, \vec{Q}, \vec{R}$ acting along IA, IB, IC respectively are in equilibrium, where I is the incentre of $\triangle ABC$. Then $P : Q : R$ is [2005]
- $\sin A : \sin B : \sin C$
 - $\sin \frac{A}{2} : \sin \frac{B}{2} : \sin \frac{C}{2}$
 - $\cos \frac{A}{2} : \cos \frac{B}{2} : \cos \frac{C}{2}$
 - $\cos A : \cos B : \cos C$
- 24) If in a frequency distribution, the mean and median are 21 and 22 respectively, then its mode is approximately [2005]
- 22.0
 - 20.5
 - 25.5
 - 24.0
- 25) A lizard, at an initial distance of 21 cm behind an insect, moves from rest with an acceleration of 2 cm/s^2 and pursues the insect uniformly along a straight line at a speed of 20 cm/s . Then the lizard will catch the insect after [2005]
- 20s
 - 1s
 - 21s
 - 24s

- 26) Two points A and B move from rest along a straight line with constant acceleration f and f' respectively. If A takes m sec more than B and describes 'n' units more than B in acquiring the same speed then [2005]
- $f - f'm^2 = ff'm$
 - $f + f'm^2 = ff'm$
 - $\frac{1}{2}f + f'm = ff'n^2$
 - $f' - fn = ff'm^2$
- 27) A and B are two like parallel forces. A couple of moment H lies in the plane of A and B and is contained with them. The resultant of A and B after combining is displaced through a distance [2005]
- $\frac{2H}{A-B}$
 - $\frac{H}{A+B}$
 - $\frac{2A+B}{H}$
 - $\frac{H}{A-B}$
- 28) Let $x_1, x_2 \dots x_n$ be n observations such that $\sum x_i^2 = 400$ and $\sum x_i = 80$. Then the possible value of n among the following is [2005]
- 15
 - 18
 - 9
 - 12
- 29) A particle is projected from a point O with a velocity u at an angle 60° with the horizontal. When it is moving in a direction at right angles to its direction at O , its velocity is given by [2005]
- $\frac{u}{3}$
 - $\frac{u}{2}$
 - $\frac{2u}{3}$
 - $\frac{u}{\sqrt{3}}$
- 30) The resultant R of two forces acting on a particle is at right angles to one of them and its magnitude is one third of the other force. Then the ratio of larger force to the smaller one is [2005]
- 2: 1
 - 3: $\sqrt{2}$
 - 3: 2
 - 3: $2\sqrt{2}$