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]
   a) $2+\frac{1}{2}\sqrt{3}Nand2-\frac{1}{2}\sqrt{3}N$
   b) $2+\sqrt{3}Nand2-\sqrt{3}N$
   c) $2+\frac{1}{2}\sqrt{2}Nand2-\frac{1}{2}\sqrt{2}N$
   d) $2+\sqrt{2}Nand2-\sqrt{2}N$

17) In a right angle △ABC , ∠A=90°and sides a,b,c are respectively $5cm, 4cmand3cm$.If a force $\vec{F}$ has moments 0,9 and 16 in N cm units respectively about vertices A,B and C, then magnitude of $\vec{F}$ is [2004]
   a) 9
   b) 4
   c) 5
   d) 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]
   a) $\frac{A}{2}:\frac{B}{2}:\frac{C}{2}$
   b) $\sin\frac{A}{2}:\sin\frac{B}{2}:\sin\frac{C}{2}$
   c) $\sec\frac{A}{2}:\sec\frac{B}{2}:\sec\frac{C}{2}$
   d) $\cos\frac{A}{2}:\cos\frac{B}{2}:\cos\frac{C}{2}$

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 =12km and BC=5km , then its average speed for its journey from A to C are respectively [2004]
   a) $\frac{13}{9}kmph$ and $\frac{17}{9}kmph$
   b) $\frac{13}{4}kmph$ and $\frac{17}{4}kmph$
   c) $\frac{17}{9}kmph$ and $\frac{13}{9}kmph$
   d) $\frac{17}{9}kmph$ and $\frac{13}{9}kmph$

20) A velocity $\frac{1}{4}$m/s is resolved into two components along OA and OB making angles $30°and45°$ respectively with the given velocity. Then the component along OB is [2004]
   a) $\frac{1}{8}\sqrt{6}-\sqrt{2}m/s$
   b) $\frac{1}{4}\sqrt{3}-1m/s$
   c) $\frac{1}{4}m/s$
   d) $\frac{1}{8}m/s$

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]
   a) 1
   b) $\frac{4u^2}{g^2}$
   c) $\frac{u^2}{2g}$
   d) $\frac{u^2}{g}$

22) Let R=3,3,6,6,9,9,12,12,6,12,3,9,3,123,6 be a relation set A=3,6,9,12.The relation is [2005]
   a) reflexive and transitive only
   b) reflexive only
   c) an equivalence relation
   d) 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]
   a) $\sin A:\sin B:\sin C$
   b) $\sin\frac{A}{2}:\sin\frac{B}{2}:\sin\frac{C}{2}:$
   c) $\cos\frac{A}{2}:\cos\frac{B}{2}:\cos\frac{C}{2}$
   d) $\cos A:\cos B:\cos C$

24) If in a frequency distribution, the mean and median are $21and22$ respectively,then its mode is approximately [2005]
   a) 22.0
   b) 20.5
   c) 25.5
   d) 24.0

25) A lizard ,at an initial distance of $21cm$ behind an insect, moves from rest with an acceleration of $2cm/s^2$ and pursues the insect uniformly along a straight line at a speed of $20cm/s$. Then the lizard will catch the insect after [2005]
   a) $20s$
   b) $1s$
   c) $21s$
   d) $24s$

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]
   a) $f - f'm^2 = ff'n$
   b) $f + f'm^2 = ff'n$
   c) $\frac{1}{2}f + f'm = ff'n^2$
   d) $f' - fn = ff'm^2$

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]
   a) $\frac{2H}{A-B}$
   b) $\frac{H}{A+B}$
   c) $\frac{H}{2A+B}$
   d) $\frac{H}{A-B}$

28) Let $x_1, x_2 \ldots x_n$ 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]
   a) 15
   b) 18
   c) 9
   d) 12

29) A particle is projected from a point O with na 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 the is given by [2005]
   a) $\frac{u}{3}$
   b) $\frac{u}{2}$
   c) $\frac{2u}{3}$
   d) $\frac{u}{\sqrt{3}}$

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]
   a) 2 : 1
   b) 3 : $\sqrt{2}$
   c) 3 : 2
   d) 3 : $2\sqrt{2}$