

Program: FE (All Branches)

Curriculum Scheme: CBCGS (Revised 2016)

Examination: First Year Semester I

Course Code: FEC104

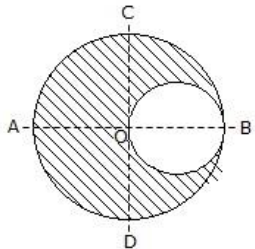
Course Name: Engineering Mechanics

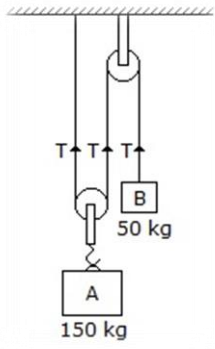
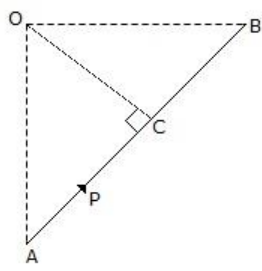
Time: 01 Hour

Max. Marks: 50

Note: All questions are compulsory and carry equal marks.

Q-1	The forces, which meet at one point and their lines of action also lie on the same plane, are known as
Option A	Coplanar concurrent forces
Option B	Coplanar non-concurrent forces
Option C	Non-coplanar concurrent forces
Option D	Non-coplanar non-concurrent forces
Q-2	Lami's theorem states that
Option A	Three forces acting at a point will be in equilibrium
Option B	Three forces acting at a point can be represented by a triangle, each side being proportional to force
Option C	If three forces acting upon a particle are represented in magnitude and direction by the sides of a triangle, taken in order, they will be in equilibrium
Option D	If three forces acting at a point are in equilibrium, each force is proportional to the sine of the angle between the other two
Q-3	Angle of friction is the
Option A	Angle between normal reaction and the resultant of normal reaction and the limiting friction
Option B	Ratio of limiting friction and normal reaction
Option C	The ratio of minimum friction force to the friction force acting when the body is just about to move
Option D	The ratio of minimum friction force to friction force acting when the body is in motion
Q-4	Two forces are acting at an angle of $120^\circ$ . The bigger force is 40 N and the resultant is perpendicular to the smaller one. The smaller force is
Option A	20 N
Option B	40N
Option C	120 N
Option D	None of the above
Q-5	D' Alembert's principle is used for
Option A	Reducing the problem of kinetics to equivalent statics problem

Option B	Determining stresses in the truss
Option C	Stability of floating bodies
Option D	Designing safe structures
Q-6	A circular hole of 50 mm diameter is cut out from a circular disc of 100 mm diameter as shown in the below figure. The center of gravity of the section will lie 
Option A	In the shaded area
Option B	In the hole
Option C	At 'O'
'Option D	None of the above
Q-7	A couple produces
Option A	Translatory motion
Option B	Rotational motion
Option C	Combined translatory and rotational motion
Option D	None of the above
Q-8	The center of gravity of a semi-circle lies at a distance of _____ from its base measured along the vertical radius.
Option A	$3r/8$
Option B	$4r/3\pi$
Option C	$8r/3$
Option D	$3r/4\pi$
Q-9	The horizontal range of a projectile ( $R$ ) is given by
Option A	$R = u^2 \cos 2\alpha/g$
Option B	$R = u^2 \sin 2\alpha/g$
Option C	$R = u^2 \cos \alpha/g$
Option D	$R = u^2 \sin \alpha/g$
Q-10	Two like parallel forces are acting at a distance of 24 mm apart and their resultant is 20 N. If the line of action of the resultant is 6 mm from any given force, the two forces are
Option A	15 N and 5 N
Option B	20 N and 5 N
Option C	15 N and 15 N
Option D	None of the above
Q-11	Which of the following statement is correct in connection with projectiles?
Option A	A path, traced by a projectile in the space, is known as trajectory.
Option B	The velocity, with which a projectile is projected, is known as the

	velocity of projection.
Option C	The angle, with the horizontal, at which a projectile is projected, is known as angle of projection.
Option D	All of the above
Q-12	<p>Two blocks 'A' and 'B' of masses 150 kg and 50 kg respectively are connected by means of a string as shown in the below figure. The tension in all the three strings _____ be same.</p> 
Option A	Will
Option B	Will not
Option C	Either A or B
Option D	None of these
Q-13	The motion of a wheel of a car is
Option A	Purely translation
Option B	Purely rotational
Option C	Combined translation and rotational
Option D	None of these
Q-14	The moment of the force 'P' about 'O' as shown in the below figure is
	
Option A	$P \times OA$
Option B	$P \times OB$
Option C	$P \times OC$
Option D	$P \times AC$
Q-15	The coefficient of restitution for inelastic bodies is
Option A	Zero

Option B	One
Option C	Between zero and one
Option D	More than one
Q-16	If $u_1$ and $u_2$ are the velocities of two moving bodies in the same direction before impact and $v_1$ and $v_2$ are their velocities after impact, then coefficient of restitution is given by
Option A	$(v_1 - v_2)/(u_1 - u_2)$
Option B	$(v_2 - v_1)/(u_1 - u_2)$
Option C	$(u_1 - u_2)/(v_1 - v_2)$
Option D	$(u_2 + u_1)/(v_2 + v_1)$
Q-17	Work done is said to be zero, when
Option A	Some force acts on a body, but displacement is zero
Option B	No force acts on a body but some displacement takes place
Option C	Either (A) or (B)
Option D	None of the above
Q-18	The acceleration of a body sliding down an inclined surface is
Option A	$g \sin\theta$
Option B	$g \cos\theta$
Option C	$g \tan\theta$
Option D	None of these
Q-19	A ladder is resting on a rough ground and leaning against a smooth vertical wall. The force of friction will act
Option A	Downward at its upper end
Option B	Upward at its upper end
Option C	Zero at its upper end
Option D	Perpendicular to the wall at its upper end

Q-20	The total momentum of a system of masses (i. e. moving bodies) in any one direction remains constant, unless acted upon by an external force in that direction. This statement is called
Option A	Newton's first law of motion
Option B	Newton's second law of motion
Option C	Principle of conservation of energy
Option D	Principle of conservation of momentum
Q-21	In the equation of virtual work, following force is neglected
Option A	Reaction of any smooth surface with which the body is in contact
Option B	Reaction of a rough surface of a body which rolls on it without slipping
Option C	Reaction at a point or an axis, fixed in space, around which a body is constrained to turn
Option D	All of the above
Q-22	A truss is perfect, if the number of members are _____ ( $2j - 3$ ), where $j$ is the number of joints
Option A	Equal to
Option B	Less than
Option C	Greater than
Option D	None of these
Q-23	The three forces of 100 N, 200 N and 300 N have their lines of action parallel to each other but act in the opposite directions. These forces are known as
Option A	Coplanar concurrent forces
Option B	Coplanar non-concurrent forces
Option C	Like parallel forces
Option D	Unlike parallel forces

Q-24	<p>The v-t graph is shown in the figure, for a particle. The acceleration of particle is</p>
Option A	22.5 m/s <sup>2</sup>
Option B	5 m/s <sup>2</sup>
Option C	-5 m/s <sup>2</sup>
Option D	-3m/s <sup>2</sup>
Q-25	All the members of the truss are _____ force members
Option A	Zero
Option B	One
Option C	Two
Option D	four