

Program: FE (All Branches)

Curriculum Scheme: (Revised 2019)

Examination: First Year Semester I

Course Code: FEC104

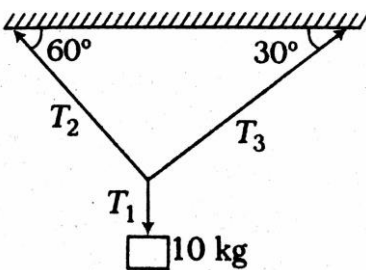
Course Name: Engineering Mechanics

Time: 01 Hour

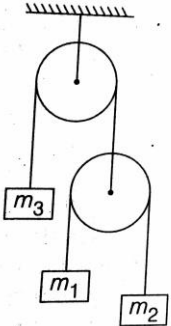
Max. Marks: 50

Note: All questions are compulsory and carry equal marks.

Q-1	The splitting of a force into two perpendicular directions without changing its effect is called.
Option A	Resultant
Option B	Resolution
Option C	Moment
Option D	Couple
Q-2	Find resultant of forces when two like parallel forces of 70 N and 40 N which act at the ends of the rod 40 cm long.
Option A	110 N
Option B	50 N
Option C	30 N
Option D	160 N
Q-3	Centroidal distance of an equilateral triangle with side 'a' from any of the three sides is
Option A	0.866 a
Option B	0.471 a
Option C	0.288 a
Option D	0.235 a
Q-4	Varignon's theorem of moment is used to find
Option A	Moment of resultant
Option B	Position of resultant
Option C	Algebraic sum of moments
Option D	All of the above
Q-5	What is/are common property/properties between Resultant and Equilibrium forces
Option A	Magnitude
Option B	Direction
Option C	Neither magnitude and direction
Option D	Both magnitude and direction
Q-6	Which is a valid condition of equilibrium in the case of a given concurrent force system.
Option A	$\Sigma F_x = 0$ and $\Sigma M = 0$
Option B	$\Sigma M_1 = 0$ and $\Sigma M_2 = 0$
Option C	$\Sigma F_y = 0$ and $\Sigma M = 0$
Option D	$\Sigma F_x = 0$ and $\Sigma F_y = 0$

Q-7	The coefficient of friction depends on
Option A	area of contact
Option B	shape of surfaces
Option C	strength of surfaces
Option D	nature of surface
Q-8	Limiting force of friction is the
Option A	tangent of angle between normal reaction and the resultant of normal reaction and limiting friction
Option B	ratio of limiting friction and normal reaction
Option C	the friction force acting when the body is just about to move
Option D	the friction force acting when the body is in motion
Q-9	How many reaction acts on hinged support?
Option A	0
Option B	2
Option C	3
Option D	4
Q-10	<p>A block of mass 10 kg is suspended by three strings as shown in figure. The tension T_2 is</p> 
Option A	100 N
Option B	57.73 N
Option C	173.20 N
Option D	86.60 N
Q-11	A body was thrown vertically down from a tower and travels 40 m, during its 4 th second of its fall. Determine the initial velocity of the body. Take $g = 9.8 \text{ m/s}^2$
Option A	$u = 6.7 \text{ m/s}$
Option B	$u = 7.7 \text{ m/s}$
Option C	$u = 5.7 \text{ m/s}$
Option D	$u = 8.7 \text{ m/s}$
Q-12	Kinetic Friction witnessed by an object (while it is in motion) is _____ Static Friction.
Option A	Equal to
Option B	Smaller than
Option C	Negligible than
Option D	Greater than

Q-13	If a body hits the ground from a height h_1 and rebounds to a height h_2 after having inelastic collision with the ground then the coefficient of restitution is
Option A	$e = h_2/h_1$
Option B	$e = h_1/h_2$
Option C	$e = \sqrt{h_2/h_1}$
Option D	$e = \sqrt{h_1/h_2}$
Q-14	A 10 kg body is moving with a constant acceleration of 5 m/s^2 . If the initial velocity of the body is 2 m/s, determine the change in momentum in 5 s.
Option A	50 Ns
Option B	250 Ns
Option C	200 Ns
Option D	100 Ns
Q-15	The v-t graph is shown in the figure, for a particle. The acceleration of particle is
Option A	22.5 m/s^2
Option B	5 m/s^2
Option C	-5 m/s^2
Option D	-3 m/s^2
Q-16	What is ICR?
Option A	Instantaneous circle of rotation
Option B	Instantaneous centre of rotation
Option C	Instantaneous curve of rotation
Option D	None of the above
Q-17	What will be the effect on the body in the following situation? A rigid body of 100 kg kept on a horizontal rough surface with coefficient of friction equal to 0.4 is acted upon by a horizontal pull force of 350N.
Option A	Body will be on the verge of moving
Option B	Insufficient data
Option C	Body will move
Option D	Body will not move
Q-18	For a particle moving along a straight line, position x is expressed by $x = t^4 - 2t^3 + 1$ where x is in m and t is in second. The velocity attained by the particle at 1.5 s will be
Option A	Minimum

Option B	Maximum
Option C	Zero
Option D	None of the above
Q-19	The velocity of the particle is expressed as $v = t^2 - 8t + 12$, where v is in m/s and t is in s. Determine the time at which velocity is zero.
Option A	6 s
Option B	2 s
Option C	2 and 6 s.
Option D	None of the above
Q-20	In projectile motion, horizontal Range is calculate by
Option A	$R = [u \sin 2\theta] / g$
Option B	$R = [u^2 \sin 2\theta] / 2g$
Option C	$R = [u^2 \sin 2\theta] / g$
Option D	$R = [u^2 \sin \theta] / g$
Q-21	In the Figure , pulleys are smooth and strings are massless, $m_1 = 1\text{kg}$ and $m_2 = 1/3 \text{ kg}$.to keep m_3 at rest, mass m_3 should be
	
Option A	1kg
Option B	0.666kg
Option C	0.25 kg
Option D	2 kg
Q-22	A rifle of 5 kg fires a bullet of 10 gm mass at a velocity of 300 m/s. Determine the velocity with which the rifle recoils.
Option A	0.1 m/s
Option B	0.3 m/s
Option C	0.6 m/s
Option D	0.9 m/s
Q-23	A 10 kg body is moving with constant acceleration of 2 m/s^2 starting from rest. What is Kinetic Energy of the body after 2 s?
Option A	8 J
Option B	80 J
Option C	0.8 J
Option D	800 J
Q-24	In an elastic collision
Option A	Both momentum and kinetic energy are conserved.
Option B	Only momentum is conserved.
Option C	Only kinetic energy is conserved
Option D	Neither kinetic energy nor momentum is conserved.
Q-25	If mass of moving body is much greater than the mass of the body at rest

	then the approximate velocity of the moving body after head on collision is
Option A	Same and in same direction.
Option B	Same and in opposite direction
Option C	Different and in same direction
Option D	Different and in opposite direction