SVKM INSTITUTE OF TECHNOLOGY, DHULE

Mid-Semester Examination – October 2019

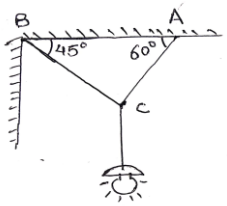
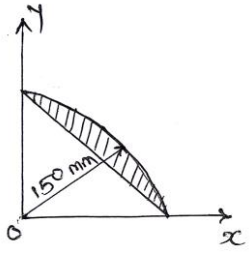
Course: F.Y.B. Tech **Div: 'C, D, E'** **Semester: I**

Subject Name: Engineering Mechanics **Subject Code: BTES103**

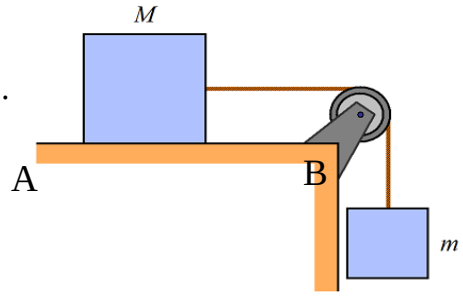
Max Marks:20 **Date: /10/2019** **Duration:- 1 Hr.**

Instructions to the Students:

1. All questions are compulsory
2. Illustrate your answers with neat sketches, diagrams etc. wherever necessary.
3. Use of non-programmable calculator is allowed.

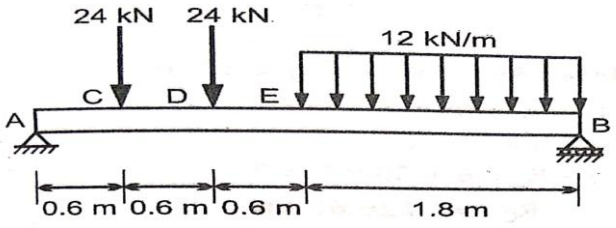
		(Level/CO)	Marks
Q. 1	**Choose the most appropriate option from the following.**		**6**
1.	A truss having the number of members less than (2j – 3) is called **a) redundant truss** **b) imperfect/deficient truss** **c) perfect truss** **d) none of the above**	**Remember**	**1**
2.	The sketch of an isolated body free from constraints and showing active and reactive forces acting on the body is referred as… **a) Rigid body diagram** **b) Free body diagram** **c) Sketch of the body.** **d) Equilibrium body**	**Remember**	**1**
3.	The force of friction depends upon…… **a) Nature of surface of contact** **b) Material of objects in contact** **c) Both 'a' and 'b'** **d) None of the above**	**Remember**	**1**
4.	How many forces are acting on a body at a point in Lami's theorem? **a) Two** **b) Five** **c) Four** **d) Three**	**Remember**	**1**
5.	In hinged support, ……movement are allowed. **a. horizontal and rotation** **b. vertical and rotation** **c. rotation only** **d. none**	**Remember**	**1**
6.	Moment of a force about a point is equal to……. of force and the perpendicular distance of the point and line of action of the force. **a. addition** **b. subtraction** **c. multiplication** **d. division**	**Remember**	**1**
Q.2	**Solve Any Two of the following.**		**3 × 2**
(A)	An electric light fixture weighing 15 N hangs from point C by two strings AC & BC. The string AC is inclined at 60^0 & BC is 45^0 to horizontal as shown in figure. Find tension in strings AC & BC. 	**Apply**	**03**
(B)	Determine the position of centroid of the shaded area as shown in figure. 	**Apply**	**03**

(C) Draw two separate free body diagrams for block of weight M and block of weight m for the smooth surface A and B. **Apply**

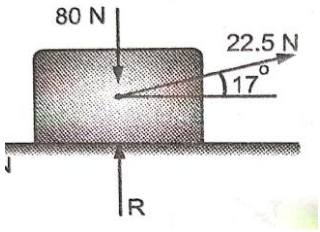


Q. 3 Solve Any One of the following. **8**

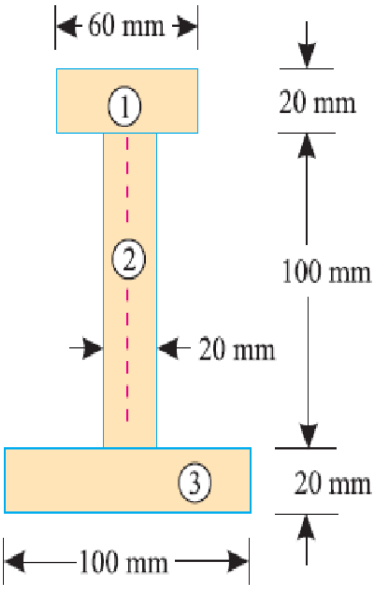
(A) Determine the reactions at the supports A & B of the beam AB loaded as shown in figure. **Analyse** **08**



(B) The force required to pull a body of weight 80 N on a rough horizontal plane is 22.5 N. Determine the coefficient of friction if the force is applied at an angle of 17^0 with the horizontal. **Analyse** **08**



(C) An I-section is made up of three rectangles as shown in figure. Find the moment of inertia of the section about the horizontal axis passing through the center of gravity of section. **Analyse** **08**



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