Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14ME2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Engineering Mechanics** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Find the resultant of an 800N force acting towards eastern direction and a 500N force acting towards north eastern directions with an angle 45°. | CO1 | 5 |
| b. | A system of four forces acting on a body is shown in figure below. Determine the resultant force and its direction.  200 N  120 N  1  4  2  3  40o  60o  50N  100 N | CO1 | 15 |
| (OR) | | | | |
| 2. | a. | State and prove parallelogram of forces. | CO1 | 10 |
| b. | String AO holds a smooth sphere on an inclined plane ABC, as shown in figure below. The weight of the sphere is 1000N, and the plane is smooth. Calculate the tension in the string and the reaction at the point of contact B.  12_0 | CO1 | 10 |
| 3. | a. | The tension in cables AB and AC are 100N and 120N respectively as shown in figure below. Determine the magnitude of the resultant force acting at A.   * 1. 49_0 | CO1 | 15 |
|  | b. | Write short notes on principle of transmissibility. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | Determine the supports and reactions of the given figure. | CO1 | 15 |
|  | b. | Explain varignons theorem. | CO1 | 5 |
| 5. | a. | A block of weight 150N is resting on a rough inclined plane as shown in the fig.The block is tied up by a horizontal string, which has a tension of 50N.Find ( i) the frictional force on the block (ii) the normal reaction of the inclined plane (iii) the co-efficient of friction between the surfaces of contact. | CO3 | 15 |
|  | b. | Write short notes on laws of friction. | CO3 | 5 |
| (OR) | | | | |
| 6. | a. | Find the moment of inertia of a un symmetrical I section about its centroidal axes having top flange as 60mm \*20mm, bottom flange as 100mm\*20mm and web is 60mm\*20mm. | CO2 | 20 |
| 7. | a. | Two weights W1 and W2 are connected by a string and move along a horizontal plane under the action of force P = 200N applied horizontally to the weight W1.the coefficient of friction between the weights and the plane is 0.25.determine the acceleration of the weights and tension in the string.  WP_20161102_10_19_35_Pro | CO4 | 20 |
| (OR) | | | | |
| 8. | a. | A bullet of mass 30 gram is moving horizontally with avelocity of 450 m/s and strike a wodden block of weight 45 N , restin g on a horizontal floor. The bullet is embedded in to the block and then both block nd bullet move as a single unit. Calculate the distance moved ? Take μ = 0.45 . | CO4 | 10 |
|  | b. | Two blocks A and B of weights 80N and 60N are connected by a string passing through a smooth pulley as shown.Calculate the acceleration of the body and the tension in the string. | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | A uniform ladder weighing 100N and 5 meters long has lower end B resting on the ground and upper end A resting against a vertical wall as shown in fig. The inclination of the ladder with horizontal is 60°. If the coefficient of the friction at all surfaces of contact is 0.25, determine how much distance up long the ladder a man weighing 600N can ascent without causing it to slip. | CO3 | 20 |

ALL THE BEST