KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agrl. Engg.) 2021 Admission
I Semester Final Examination- May 2022

Iden.1101   **Engineering Mechanics (2+1)**   Marks:50
Time: 2 hours

I   **Fill in the blanks**   (10x1=10)
1. The forces having same line of action is known as ……………
2. The deformation on a rigid body is ……………
3. Parallel forces are having their lines of action ………..to each other.
4. The ratio of the limiting force of friction (F) to the normal reaction (R) between two bodies is known as …………………….
5. The bending stress on neutral axis is ………………

State True or False
6. Anti-clockwise moment is taken +ve whereas clockwise moment is taken –ve.
7. The centre of gravity of a uniform rod lies not at its middle point.
8. If a given section is symmetrical about X-X axis or Y-Y axis, the C.G. of the section will lie on the axis symmetry.
9. The shear stress is maximum on the surface of the shaft and is zero at the axis of the shaft.
10. If the top layer of the section is subjected to compressive stress then the bottom layer of the section will be subjected to tensile stress

II   **Write short notes on ANY FIVE of the following**   (5x2=10)
1. What is Principle of transmissibility of forces?
2. State Varignon's theorem.
3. State parallel axis theorem.
4. Define elastic limit and Hook's law.
5. What is a bending stress in beams? Write down the bending euation.
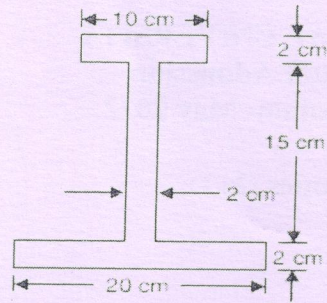6. State Lami's theorem.
7. What is neutral axis and section modulus?

**III**   **Answer ANY FIVE of the following**   (5x4=20)
1. Explain in detail the method of finding resultant in magnitude and direction of three or more forces acting at a point by analytical method?

2. Find the centre of gravity of the I-section shown in Fig.

3. Derive an expression for Young's modulus and Bulk modulus?
4. Find the Young's Modulus of a brass rod of diameter 25 mm and of length 250 mm which is subjected to a tensile load of 50 kN when the extension of the rod is equal to 0.3 mm.
5. Write notes on different types of friction?
6. Draw the SFD and BMD of the following cantilever beam?

(a) BEAM
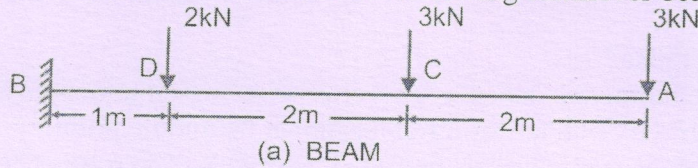
7. A solid shaft of 150 mm diameter is used to transmit torque. Find the maximum torque transmitted by the shaft if the maximum shear stress induced to the shaft is 45 N/mm².

IV   **Write an essay on ANY ONE of the following**   (1x10=10)

1. Find the forces in the members AB,BC and AC of the truss as shown in figure
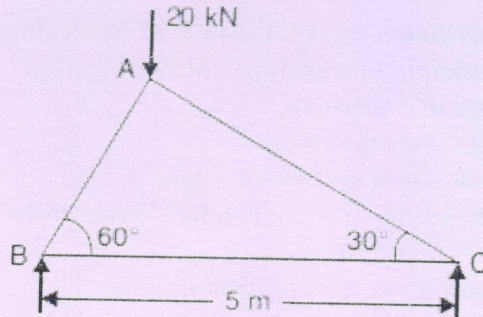
2. Derive an expression for the torque transmitted by a hollow circular shaft?

****