IMPORTANT QUESTIONS FOR FINAL EXAM

Semester: - Second

Subject:- Engineering Mechanics

1. Definea) Simple machineb) Compound machineb) Effortd) Load

2. Define velocity ratio and Mechanical advantage.

3. State relation between M.A, V.R, and efficiency.

4. Define Ideal Machine, Ideal effort, and Ideal load.

5. What are the characteristics of an Ideal Machine.

6. Explain law of machine .State its use.

7. Certain machine has a law of machine P=0.025 W + 20 N with V.R =40 Calculate its efficiency at a load of 1KN.

8. In a simple lifting machine a load of 1000 N is lifted by 50 N effort while load moves up by 0.2m the point of application of effort moves by 8m .Find M.A,V.R , Efficiency and idea effort.

9. For a certain machine, V.R is 120 to lift a load of 10KN an effort of 180 N is required. Calculate the effort required to lift a load of 70 KN and identify the type of Machine

10. Calculate effort lost in friction and load lost in friction, if machine lifts a load of 100 N by an effort of 8 N at an efficiency of 60 %.

11. In a machine load of 500 N was lifted by an effort 50 N. Another load of 750 N was lifted by an effort of 60 N. Obtain law of machine.

12. In differential axle and wheel the diameter of the wheel is 40 cm And diameters of axle are 10 cm And 8 cm.If an effort of 50 N can Lift a load of 1500 N. Find the efficiency of the machine and Effort Lost in friction.

13. For three sheave pulley block an effort of 40 N can lift a load of 200N can lift a load of 200 N. Calculate the effort lost in friction and load lost in friction along with efficiency.

14. A screw jack has a pitch of 5mm and length of lever as 150mm. An effort required to lift a load of 80 KN is 500N Calculate the efficiency and state the type of machine.

15. In a worm and worm wheel, the number of teeth on the worm wheel is 120. The diameter of effort Wheel is 100mm and that of loading drum is 150mm. This worm and worm wheel lifts a load of 2.5 kN by applying 100 N effort. Calculate efficiency and effort lost in friction.

16. The diameter of bigger and smaller pulleys of Weston's differential pulley block are 250 mm and 100 mm respectively. Determine effort required to lift a load of 3 KN with 80 % efficiency.

- 17. Define Statics and Dynamics.
- 18. Define force and state its S.I unit.
- 19. State any four effects of force on rigid body.
- 20. Write classification of force system.
- 21. State characteristics of Force.
- 22. Difference between scalar and vector quantities.
- 23. Find the magnitude and direction of resultant force as shown in figure.



24. Calculate the magnitude and direction of resultant for concurrent force system as shown





25. State the relation between equilibrant and resultant force.

- 26. Define free body diagram with one example.
- 27. State and explain Lamis theorem.
- 28. Define beam and state types of beam.
- 29. A weight of 1.25 kN is attached by two ropes as shown in figure No.2. Calculate the tension in the ropes.



30. A sphere having diameter 350mm and 750 kN as weight is placed as shown in

Figure. Calculate the reaction at point of contacts.



31. Calculate graphically the reactions of beam at the support as shown in Fig.



32. For a beam as shown in Fig. No.calculate reaction at roller and hinge support

by analytical method.



33. Calculate the support reactions of beam loaded as shown in Figure. Use analytical

Method only.



34. A simply supported beam of 6m span has subjected to loading as shown in Figure.

Find support reactions by analytical method.



35. Calculate reactions of beam loaded as shown in Figure



36. Calculate reactions of beam loaded as shown in Figure



- 37. State advantages of friction.
- 38. Explain four laws of friction.
- 39. Define coefficient of force of friction.
- 40. Define angle of repose with diagram.
- 41. What is the relation between coefficient of friction and angle of repose?

42. What is the relation between coefficient of friction and angle of friction?KHAN M.A (ME STRUCTURE)Maticsninja.inMaticsninja.inYouTube : ma civil lecture

43. Find the value of μ if the body is in limiting equilibrium as shown in fig.



44. A block is resting on a rough inclined plane whose inclination to the horizontal is 15° . The force of 11 N applied parallel to the plane on which block is resting will just move it down. If the coefficient of friction between the block and the plane is 0.40, estimate the weight of the block.

45. A block weighing 300 N is resting on an inclined plane making an angle of 30° with the horizontal. Calculate the pull applied parallel to the plane to move the block up the plane if co-efficient of friction is 0.35.

46. Find the centroid on an inverted T-section with flange 200 mm \times 10 mm and web of 300 mm \times 10 mm.

47. Calculate the position of centroid from bottom left corner 'B' for a retaining wall as shown in fig.



48. A solid sphere of 18 cm in diameter is placed on the top of a cylinder which is also 18 cm in diameter and 40 cm high such that their axes coincide. Find the center of gravity of the combination. Refer fig.



49. Locate the position of centroid for a shaded lamina as shown in fig.



50. State the centroid of semicircle and show it on the sketch.

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