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312312 - Engineering Mechanics (Sem II)

As per MSBTE's K Scheme

ME / AE / NK / PG

Unit I		Simple lifting machine	Marks - 14	
S. N.	MSBTE Board Asked Questions	Exam Year	Marks	
1.	What is law of machine	W-23	2M	
2.	Define effort lost in friction and load lost in friction. Give expression of them.	W-23	4M	
3.	Certain machine has a law of machine $P = 0.025 W + 20 \text{ N}$ with $VR = 50$ Calculate its efficiency at load of 1 kN.	W-23	4M	
4.	For three sheave pulleys block an effort of 40 N can lift a load of 180 N. Calculate the effort lost in friction and load lost in friction along with efficiency.	W-23	4M	
5.	In a lifting machine an effort of 110 N raised a load of 1100 N and an effort 500 N raised a load of 5800. Find the law of machine.	W-23	4M	
6.	Define load lost in friction.	S-23	2M	
7.	In a machine load of 500 N was lifted by an effort 50 N. Another load of 750 N was lifted by an effort 60 N. Obtain law of machine.	S-23	4M	
8.	Explain law of machine. State its use.	S-23	4M	
9.	In a 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.	S-23	4M	
10.	Certain machine has a law of machine $p = (0.025 w + 20) \text{ N}$ with $VR = 60$, calculate its efficiency at a load of 1 kN.	S-23	4M	

11.	Define self locking machine and state the condition for it.	S-22	2M
12.	In a simple lifting machine, a load of 1400N is lifted by 50N effort. While load moves up by 0.2m, the point of application of effort moves by 6m. Find MA, VR and efficiency and ideal effort.	S-22	4M
13.	State law of machine and it's use. Also give expression for maximum MA and maximum efficiency of a lifting machine.	S-22	4M
14.	In a differential axle and wheel, the diameter of the wheel is 40cm and that of axles are 10cm and 8 cm. If an effort of 50N can lift a load of 1500N, find the efficiency of the machine.	S-22	4M
15.	Certain machine follows the law $P = (0.02W + 14)N$. When the load is lifted by 2cm, the effort has to move 150cm. State with reason, whether the machine is reversible or not.	S-22	4M
16.	State the meaning of reversible machine and state condition for reversibility.	W-22	2M
17.	A screw jack lifts a load of 41.25 kN with an effort of 550 N, applied at the end of handle of 60 cm. If the pitch of screw is 15 mm, calculate velocity ratio, mechanical advantage and efficiency of machine.	W-22	4M
18.	For differential wheel and axle, the diameter of wheel is 36 cm and the diameters of axles are 9 cm and 6 cm. If the efficiency of machine is 80%, effort applied is 120 N, then find the load lifted by it.	W-22	4M
19.	State law of machines and explain it with help of sketch.	W-22	4M
20.	A certain machine lifts loads of 400 N and 600 N by an efforts of 60 N and 80 N respectively. Determine law of machine. Also calculate efficiency of 1 kN load if VR is 24.	W-22	4M
21.	State ideal machine and write it's any two characteristics.	S-19	2M
22.	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 %.	S-19	4M
23.	Explain law of machine. State it's use.	S-19	4M
24.	Calculate load lifted by differential axle and wheel, if the diameter of wheel is 36 cm and that of axles are 9 cm and 6 cm. The	S-19	4M

	efficiency of the machine is 80 % and an effort is of 100 N.		
25.	Calculate effort required to lift a load of 3 kN. In a machine a load of 1 kN is lifted by an effort of 56 N and 2 kN is lifted by an effort of 96 N.	S-19	4M
26.	State VR of geared pulley block	W-19	2M
27.	For a certain machine, VR is 125. To lift a load of 11.90 kN, an effort of 190 N is required. Calculate the effort required to lift a load of 72 kN and identify the type of machine.	W-19	4M
28.	State law of machine and explain its significance.	W-19	4M
29.	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.	W-19	4M
30.	A machine lifts a load of 19kN and 29kN by efforts of 700N and 900N respectively. Calculate the law of machine and efficiency of a load of 50kN if VR is 50.	W-19	4M
31.	Define Mechanical Advantage and Velocity Ratio.	W-18	2M
32.	The law of certain machine is $P = W/50 + 8 \text{ N}$ and VR 100. Find the maximum possible M.A. and maximum possible efficiency in %. While lifting a load of 600 N, what will be the efficiency?	W-18	4M
33.	Define ideal machine and state law of machine for it with help of sketch.	W-18	4M
34.	A screw jack having 5 mm pitch and has 300 mm as diameter of effort wheel is used to lift a load of 80 kN. Find V.R. and effort required if efficiency of machine is 40%.	W-18	4M
35.	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.	W-18	4M
36.	Define load lost in friction	S-18	2M
37.	In a machine, an effort required to lift a certain load is 200 N. When efficiency is 60%, find the ideal effort.	S-18	4M
38.	What are the characteristics of ideal machine?	S-18	4M
39.	The diameter of bigger and smaller Pulley's of Weston's	S-18	4M

	differential pulley block is 250 mm and 100 mm respectively. Determine effort required to lift a load of 3 kN with 80 %efficiency.		
40.	A machine has a V.R. of 250 and has its law $P = (0.01W + 5)$ N, Find M.A., efficiency, effort lost in friction at a load of 1000 N and also state whether machine is reversible or not.	S-18	4M

Thank You

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