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KHULNA POLYTECHNIC INSTITUTE, KHULNA

TC	TF	PC	PF
60	90	25	25

MECHANICAL TECHNOLOGY (70)

SUBJECT: DESIGN OF MACHINE ELEMENTS (27071)

SEMESTER PLAN

THEORY

WEEK	CLASS	ART	DESCRIPTION	REMARKS
1	1/1	1.1-1.3	Define stress, define stress concentration, describe working stress & factor of safety.	
	2/2	1.4	State selection of suitable factor of safety for static, dynamic & fatigue loading	
	3/3	1.5	Describe thermal stress, impact stress, bending stress, torsional shear stress & combine stress	
	4/4	1.6-1.7	State the stress concentration factor for variable machine elements, describe stress concentration factors for both static & fatigue loading.	
2	1/5	2.1-2.3	Define pressure vessel, mention the classification of pressure vessels, distinguish between thin & thick pressure vessels	
	2/6	2.4-2.5	Define hoop & circumferential stress, discuss longitudinal & circumferential stresses.	
	3/7	2.6-2.7	Deduce the equation relating to longitudinal & circumferential stresses for design pressure vessels, solve problems related to the design of thin pressure vessels considering internal pressure	
3	1/8	3.1-3.3	State common types of screw fastening & fastener, list important terms used in screw threads, explain the advantage & disadvantages of screwed joints.	
	2/9	3.4-3.6	Describe the designation of screw thread, state the stress developed in screwed fastening, deduce the formula of axially loaded screw joints.	
	3/10	3.7-3.8	Express the formula of eccentric loaded screw joints, solve problems related to screwed joints.	QUIZE TEST 01 →
4	1/11	4.1-4.2	Define cotter joint, define knuckle joint	
	2/12	4.3-4.5	Explain different types of knuckle joints, design of sleeve	
	3/13	4.6-4.7	Express the strength equations of knuckle joints, solve problems related to the design of different components of knuckle joints.	
5	1/14	5.1-5.3	Define shaft, distinguish among spindle, shaft and axle, state various loading types of shafts	
	2/15	5.4-5.5	Explain shock & fatigue factors, deduce the equation of combine torsional & bending stress on shaft	CLASS TEST 01 →
	3/16	5.6-5.7	Describe the design procedure of shaft, state the effect of torque, bending moment, axial thrust, combined torque & bending moment & rigidity.	
	4/17	5.8-5.9	Express the diameter of a shaft (solid or hollow) subjected to torque, bending moment, axial thrust, combine torque & bending moment and on the basis of rigidity.	
6	1/18	6.1-6.2	Define key, explain different types of keys	
	2/19	6.3	Deduce strength equations for keys	
	3/20	6.4	Solve the problems relating to the design of keys.	

7	1/21	7.1-7.2	Define coupling, classify coupling	
	2/22	7.3	Deduce strength equations for bolt & flange of flange coupling	
	3/23	7.4-7.5	Describe design procedure of flanged & coupling, solve the problems relating to the flanged coupling	
MID SEMESTER EXAMINATION				
8	1/24	8.1-8.3	Define power screw, state the uses of power screw, describe screw threads used in power screws	
	2/25	8.4-8.5	Point out advantages & disadvantages of different threads used in power screw, describe stresses induced in screw threads	
	3/26	8.6-8.7	Deduce of the formula for calculating torques to raise & to lower loads by square threaded screw, express the efficiency of screw threads	
	4/27	8.8-8.9	Explain self-locking & overhauling of screw threads, solve problems related to the design of power screw threads	
9	1/28	9.1-9.3	Define belt, state the uses of belt, describe different of belt	
	2/29	9.4-9.6	Explain many types of belt drive, formula of power transmitted by belts, explain centrifugal tension of belt	
	3/30	9.7-9.9	Formula of V.R of belt drive slip or without slip, tension ratio of belt drive, condition of P (max) transmission	
	4/31	9.10-9.11	Formula of cross section of belts to transmit power, solving problems.	
10	1/ 32	10.1-10.3	Define rope, uses of rope, describe different types of rope.	
	2/33	10.4-10.5	Formula of power transmission by rope, equation of tension ratio of rope drive	
	3/34	10.6	Solving problems relating to design of rope	
11	1/35	11.1-11.3	Define spring & narrating some kinds of spring as Helical & Leaf Spring.	QUIZE TEST 02 →
	2/36	11.4-11.5	Explain solid height, free height, spring index, spring rate & pitch, stress equation for Helical Spring of circular wire.	
	3/37	11.6-11.7	Deflection of circular wired helical spring, condition of Helical compression springs.	
	4/38	11.8-11.9	Discuss the load shared by the two concentric Helical compression springs, stresses induced in term & the deflections of them	
12	1/39	12.1-12.3	Define gear, classify gear, details of spur & helical gear.	CLASS TEST 02 →
	2/40	12.4-12.5	Describe addendum, dedendum, root Dia, circular pitch, pitch Dia, outside Dia, whole depth, working depth, interference of gear etc.	
	3/41	12.6-12.7	Strength of spur gear tooth, Solving problems of spur gear.	
13	1/42	13.1-13.2	Define different types of brakes & function of brakes	
	2/43	13.3-13.4	Force requires to operate the brake, frictional torque of brakes	
	3/44	13.5	Design the sizes of shoe brake, band brake, shoe & band brake	
	4/45	13.6	Solving problems of design of brakes.	
14	1/46	14.1-14.3	Define clutch & classify it, function of clutch.	
	2/47	14.4-14.5	Force requires to operate disc clutch, frictional torque for disc clutch.	
	3/48	14.6-14.7	Design the size of disc clutch, solving problems	
			REVIEWS	

HEAD OF THE DEPARTMENT

CLASS TEACHER