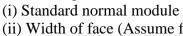
	Enrolln	nent No:								
			C.U.SHAH	UNIVERSITY						
	Summer Examination-2017 Subject Name: Machine Design - II									
	Subject	Code: 4	TE07MDE1	<b>Branch: B.Tech</b> (Mechanical)						
	Semeste	er: 7	Date: 27/03/2017	Time: 02:30 To 05:30 Marks: 70	0					
	(2) (3) (4)	Use of F Instructi Draw ne Assume	Programmable calculator & an lons written on main answer beat diagrams and figures (if ne suitable data if needed.  PSG Design data book is pern	ecessary) at right places.						
Q-1	a)		- · · · · · · · · · · · · · · · · · · ·	diameter of an output shaft greater than input	(14) 01					
	<b>b</b> )		ich gear drive is self-locking p	possible?	01					
	c)		is the stub involute gear tooth		01					
	d)		e cycloidal curve?		01					
	<b>e</b> )		is crowing of gear teeth?		01					
	f)		is the lead angle of the worm?	?	01					
	<b>g</b> )		is reboring allowance?		01					
	<b>h</b> )		one end of connecting rod is n	nade bigger than the other?	01					
	i)		is a multi-throw crankshaft?	0	01					
	<b>j</b> )		are the forces acting on rocker		01					
	k)		any one goal of material hand	ling?	01					
	l)		is AGMA?		01					
	m) n)		e optimum design? do you understand by contain	orization?	01 01					
Atte	,		estions from Q-2 to Q-8	erization:	V1					
Q-2	}	Atten	npt all questions		(14)					
~	<b>a</b> )		ss in detail modified Lewis eq	quation? Why it is required?	04					
	<b>b</b> )	pinion helix made	a is to have 30 teeth and rotate angle is 35°, and gears are o of carbon steel having ulti	rt are to be connected by helical gears. The es at 800 rpm. The speed reduction is 4:1. The of 20° full depth involute teeth. The gears are mate strength of 450 MPa and the surface factor of 1.25 and EOS of 3. Determine on the						



static strength basis

(ii) Width of face (Assume face width = 12 m)

(iii) Power transmission capacity on the basis of static load, if  $K_S = 1.25$ .



Q-3	a) b)	Attempt all questions State the thermal consideration of worm & worm gear? Design a speed gear box for a head stock of a lathe o give speed variation from 100 to 1120 rpm in 8 steps. The power is supplied by an electric motor of 15 kW running at 1000 rpm, through a belt drive giving a speed reduction of 1.6:1. Draw the structural diagram, speed chart, and calculate the number of teeth on each gear. Also show the kinematic arrangement.	02 12
Q-4	a) b)	Attempt all questions Explain with neat sketch Piston Geometry? A speed reducer unit is to be designed for transmission ratio 27. The speed of the hardened steel worm is 1440 rpm. The worm wheel is to made of phosphor bronze. The tooth form is to be 20° involute. Take center distance 100 mm.	(14) 04 10
Q-5	a) b)	Attempt all questions State the design procedure for crankshaft? Design a cast iron piston for a single acting four stroke engine for the following data: Cylinder bore = $100 \text{ mm}$ Stroke = $125 \text{ mm}$ Maximum gas pressure = $5 \text{ N/mm}^2$ Indicated mean effective pressure = $0.75 \text{ N/mm}^2$ Mechanical efficiency = $80\%$ Fuel consumption = $0.15 \text{ kg}$ / BPH Higher calorific valve of fuel = $42 \times 103 \text{ kJ/kg}$ Speed = $2000 \text{ rpm}$ Any other data required for the design may be assumed.	(14) 04 10
Q-6	a) b)	Attempt all questions Explain screw conveyors in brief? Design a rocker arm and exhaust valve for a 4-stroke diesel engine from the following data: Bore = 100 mm, stroke = 120 mm Mean gas velocity = 60 m/s Maximum gas pressure = 3.5 MPa Effective reciprocating mass = 0.3 kg Exhaust gas pressure = 0.35 MPa Spring pressure = 0.028 MPa Total angle of cam action = 120° Operating speed = 1600 rpm Length of moment arms: 140 mm & 150 mm Cross-section of the rocker arm: elliptical, with major axis twice the minor axis. Motion of follower: S.H.M	(14) 04 10
Q-7	a)	Attempt all questions Give the classification of wire rope and its construction with neat sketches. How does the flexibility of wire rope influenced by its construction?	(14) 06
	<b>b</b> )	does the flexibility of wire rope influenced by its construction?  The initial preload for a helical compression spring is 675 N. the maximum	08



spring load is limited by permissible torsional shear stress of the spring wire, which is 750 MPa. Due to space limitations, the outer diameter of spring should not exceed 50 mm. specify the spring dimensions for minimum weight.

Q-8		Attempt all questions	
	a)	State the classification of material handling equipment?	
	<b>b</b> )	State the belt requirement used in conveyor system?	04
	c)	Explain vertical gravity take-up mechanism in detail with neat sketch?	04

