重庆大学《机械原理》课程试卷

A卷

B卷

2017—2018 学年第 2 学期

开课学院：UC 课程号： ME31803 考试日期：20180428

考试方式： 开卷 闭卷 其他 考试时间：90 分钟

题号	一	二	三	四	五	六	七	八	九	十	总分
得分											

考试提示

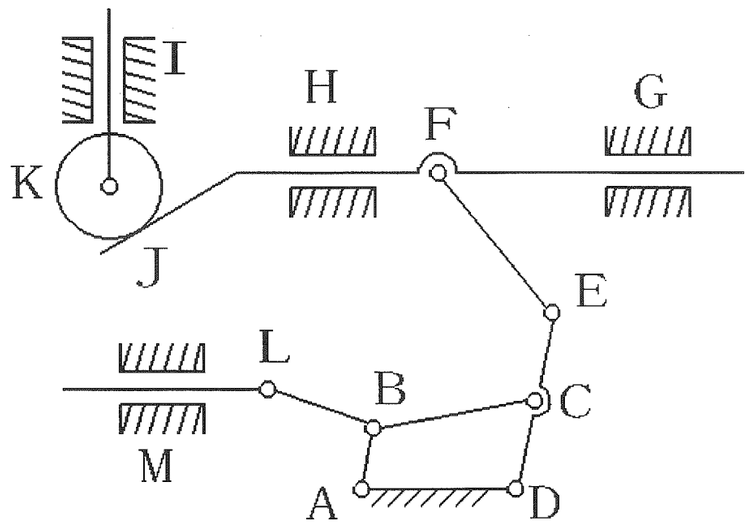
1.严禁随身携带通讯工具等电子设备参加考试；

2.考试作弊，留校察看，毕业当年不授学位；请人代考、替他人考试、两次及以上作弊等，属严重作弊，开除学籍。

TASK-1 (20points)

Determine the number of degrees of freedom (DOF) of the mechanism as show in the figure. Mark out the compound hinges, the isolated (local) degrees of freedom and/or the redundant constraints in the figure (if exist).(10 points)

Dismember the mechanism into Assur kinematic chains, and the initial links are assumed by yourself. Determine the class of the mechanism.(10 points)



命题人：刘达斌 组题人：魏静 审题人：刘达斌 命题时间：20180423 教务处制

密 封 线

公平竞争、诚实守信、严肃考纪、拒绝作弊

学院专业、班级学号姓名考试教室

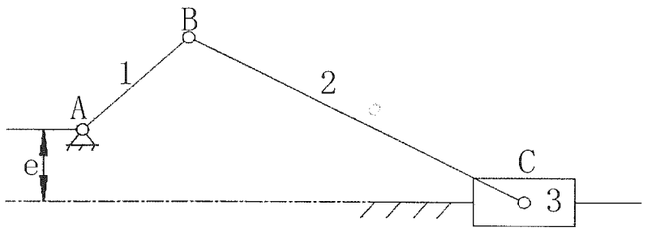
TASK-2 (20 points)

Assume that the length of each link of mechanism shown in the figure below,

Known link AB angular velocityω_2 and ε_2 by yourself.

Solve graphically (with instant centers) ω_3, ω_4(10 points)

Solve graphically, $\varepsilon_3, \varepsilon_4$ (10 points)

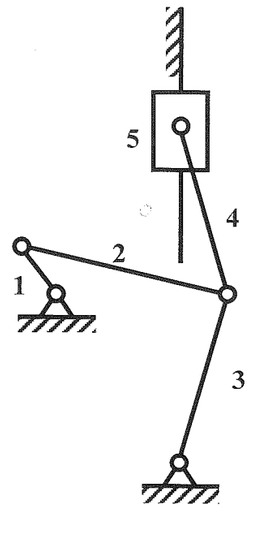


TASK-3 (15 points)

Assume that the length of each link of mechanism shown in the figure below

Draw imbalance angle(θ); (5 points)

Determine Time ratio K, γ_{min}(10 points)



TASK-4 (15 points)

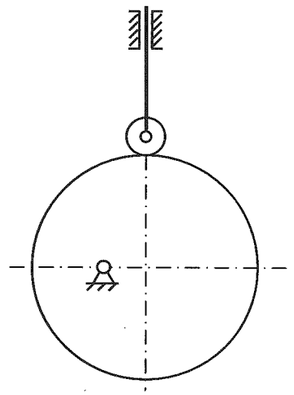
Answer the following questions according to the Figure ,:

1) **Draw** the theory profile of cam shown in the figure (Mark: 3 points)

2) **Draw** the radius of base circle r_b、 lift h 、 rise angleΦ、high dwell angleΦs、fall angleΦ′、low dwell angleΦs′. (Mark: 4 points)

3) **Draw** the displacement s and pressure angle α at the position shown in figure. (Mark: 4 points)

4) **Draw** the displacement s and pressure angle α at the position after the cam turns around 90° in clockwise (Mark: 4 points)

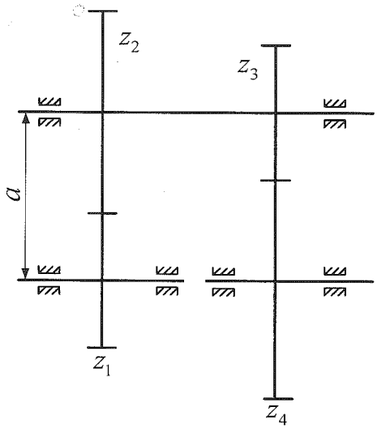


TASK-5 (15 points)

As shown in the figure, the involute spur gears are used in the system. The teeth number are:, Z2=18, Z2=28, the modulus of each gear is $m=5mm$, the pressure angle is $\alpha=20^{\circ}$, $h_a^*=1.0$, $c^*=0.25$. The center distance of gear 1 and 2, 3 and 4 are $a'_{12}=a'_{34}=a'=120mm$.

Questions:

To calculate Geometric parameters $r_1, r_2, r_{f1}, r_{f2}, r_{b1}, r_{b2}$ and center distance a. (Mark: 10 points)



TASK-6 (15 points)

For the shown gear train, gears z_1=20, z_2=50, z_3=15, z_4=30, z_6=40, z_7=18, z_8=51, 5 is a worm, and 6 is a worm wheel.

Determine:

1) To calculate i_{18}

2) rotation direction of gear 1 when weight lifts.