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NPTEL

Courses » Spur and Helical Gear Cutting   Announcements   **Course**   Ask a Question   Progress   Mentor

Unit 5 - Week 4

Course outline

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Week 4

● Lecture 16: Gear Hobbing- II

● Lecture 17: Gear Hobbing- III

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● Lecture 20: Gear Hobbing- VI

○ Quiz : Week 4 Assignment 4

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Correct answers to the exam questions

Week 4 Assignment 4

The due date for submitting this assignment has passed.   **Due on 2017-08-30, 10:00 IST.**

Submitted assignment

Click only the correct answers. There is no negative marking.

In all cases of gear Hobbing – assume

(i) that the Hob is getting fed past the blank parallel to the axis of rotation of the blank.

(ii) And in Helical Hobbing, in addition to the feed of the Hob past the blank along axis of blank, there is additional rotational motion of blank provided through differential mechanism.

1) **On the gear hobbing machine, the speed ratio of the Hob and the blank is decided by**   *1 point*

○ Option (a) : The number of starts on the Hob and the number of teeth on the Hob

○ Option (b) : The number of teeth on the Hob and the number of teeth to be cut on the part

○ Option (c) : The number of teeth to be cut on the part and the number of starts on the Hob

○ Option (d) : None of the others

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (c) : The number of teeth to be cut on the part and the number of starts on the Hob

2) **There is a right hand helical gear to be cut with helix angle of 15^0. The left** *1 point* **handed hob is having an angle of 3^0 (Fig. 1). In order to cut the gear on the gear hobbing**

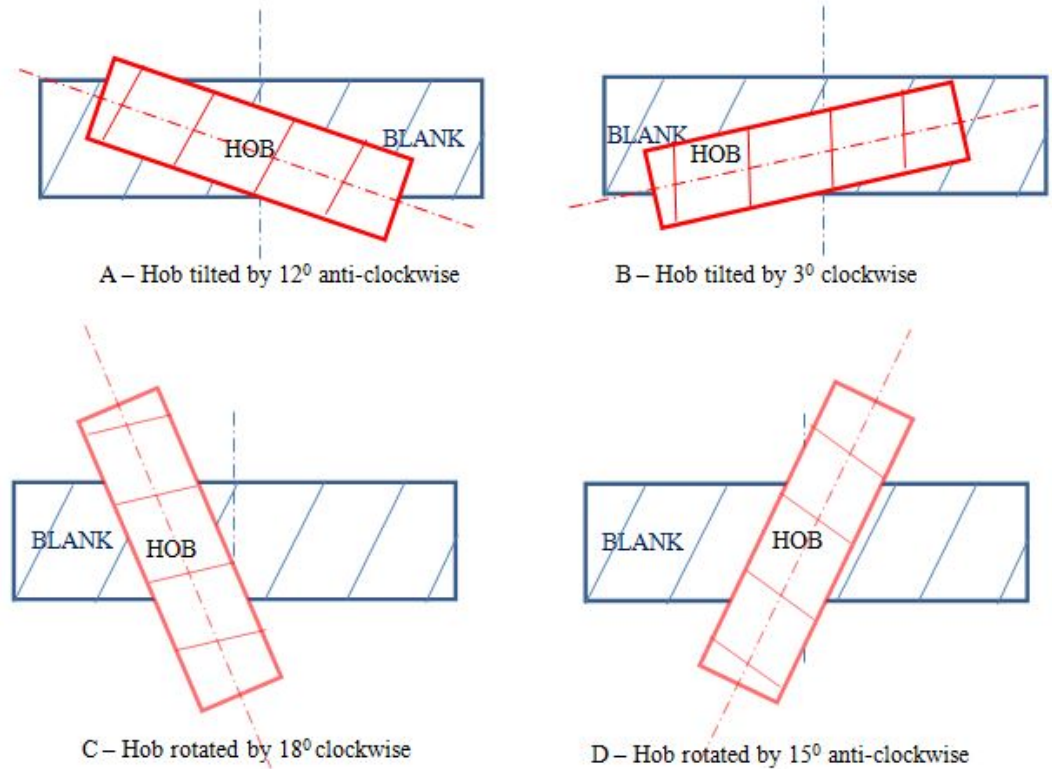**machine with this Hob, the following configuration is correct**

A – Hob tilted by 12⁰ anti-clockwise

B – Hob tilted by 3⁰ clockwise

C – Hob rotated by 18⁰ clockwise

D – Hob rotated by 15⁰ anti-clockwise

Fig. 1

○ Option (a) : A
○ Option (b) : B
○ Option (c) : C
○ Option (d) : D
○ Option (e) : None of the others

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (c) : C

3) **One advantage of hobbing over shaping of gears is that**   *1 point*

○ Option (a) : Hobbing can produce internal gears far more easily than shaping
○ Option (b) : Hobbing can cut helical gears more easily than shaping
○ Option (c) : Hobbing employs continuous indexing while Shaping uses discontinuous indexing
○ Option (d) : None of the others

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (b) : Hobbing can cut helical gears more easily than shaping

4) **The differential mechanism inside a gear Hobbing machine is useful for**   *1 point*

○ Option (a) : Developing very high or very low values of cutting speed
○ Option (b) : Cutting of helical gears
○ Option (c) : Cutting of gears with employment of differential indexing
○ Option (d) : None of the others

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (b) : Cutting of helical gears

5) **In the figure of a gear hobbing machine (Fig. 2) , the correct position of the**   *1 point*
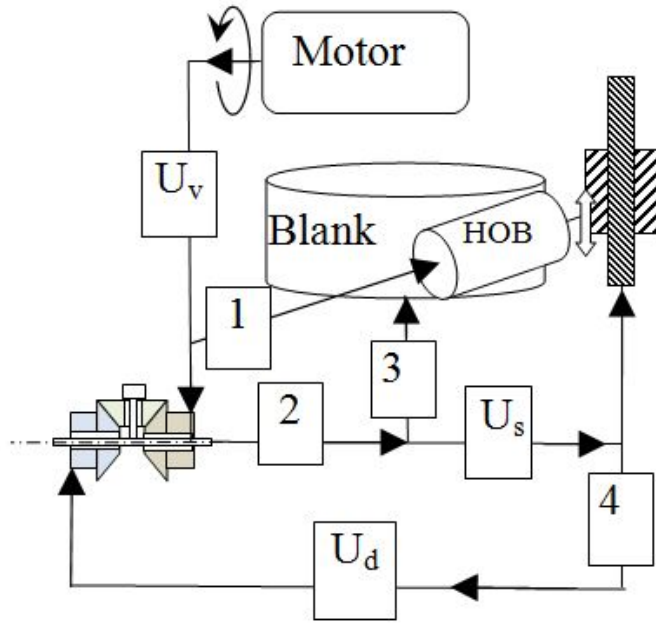**index change gear box is**

Fig. 2

○ Option (a) : 1
○ Option (b) : 2
○ Option (c) : 3
○ Option (d) : 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (b) : 2

6) **In the following gear hobbing machine configuration as shown in Fig. 3, there**   *1 point*
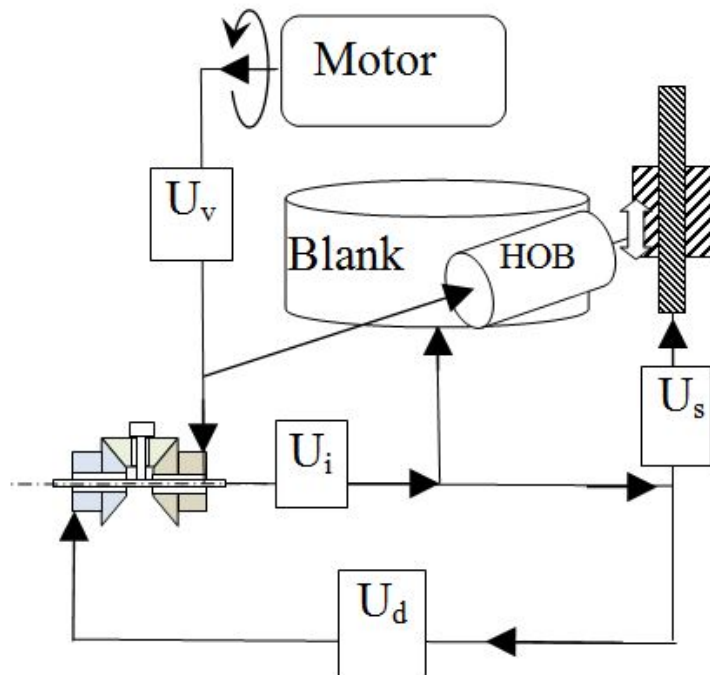**will be a problem as follows**

Fig. 3

○ Option (a) : No problem at all – this configuration is correct
○ Option (b) : The index change gear U_i is not at the correct position

○ Option (c) : During helical Hobbing, change in vertical feed will change the helix angle being cut

○ Option (d) : Every time lead change gear box (U_d) setting is changed, the vertical feed is going to get affected

○ Option (e) : None of the others

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (c) : *During helical Hobbing, change in vertical feed will change the helix angle being cut*

7) **A mechanical engineer buys a junked Hobbing machine, takes out the** 1 *point* **differential mechanism and fits it into an Electric rickshaw. All the bevel gears of the differential are identical. Motors are fixed to the rickshaw bodies. If Z_1 = 50, Z_2= 150, Z_3 = 100, Z_4= 100, Z_5 = 40, Z_6= 160, motor rpm = 300 with direction of rotation as shown, the model that will give him speed higher than 30 km/hr is**
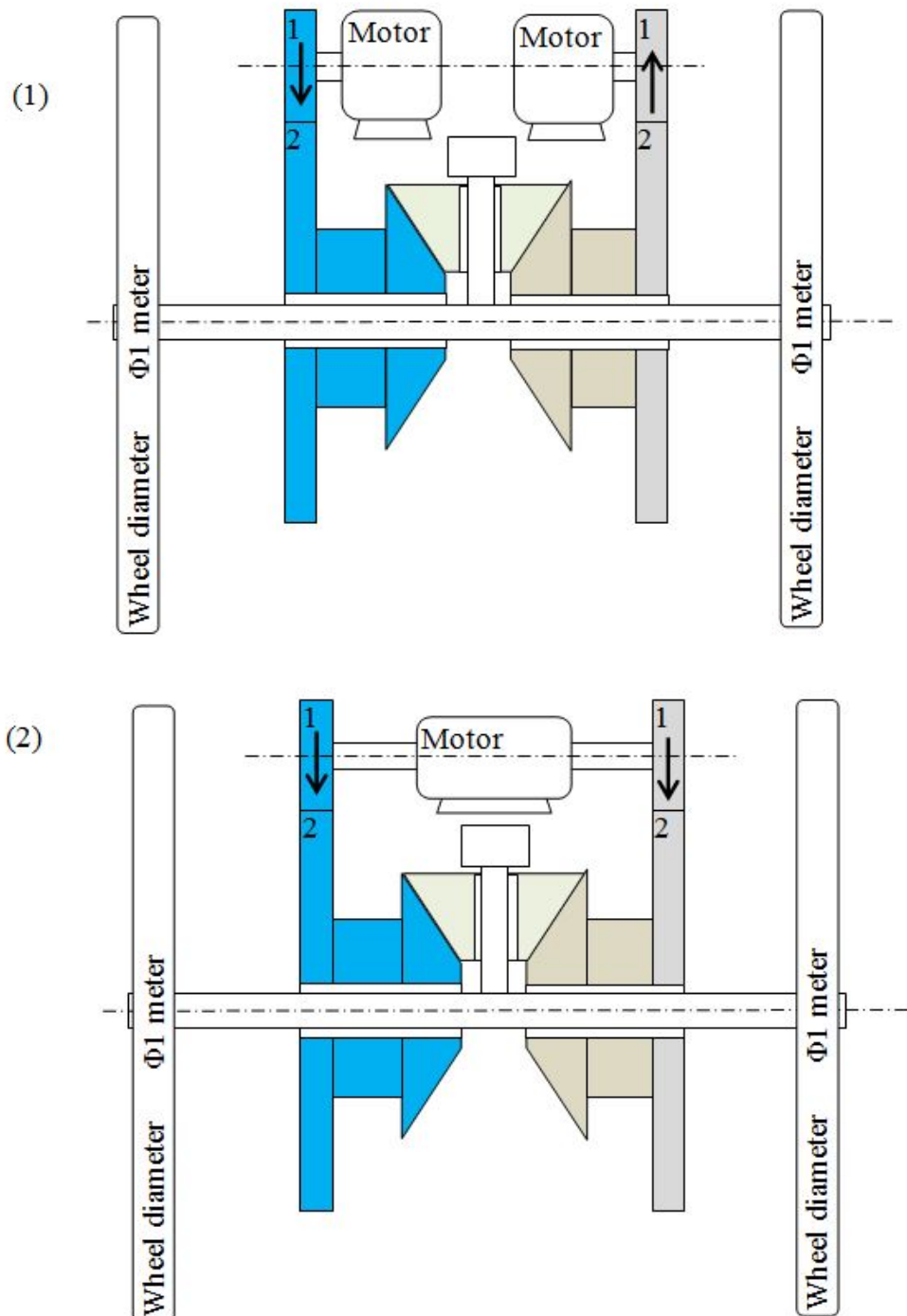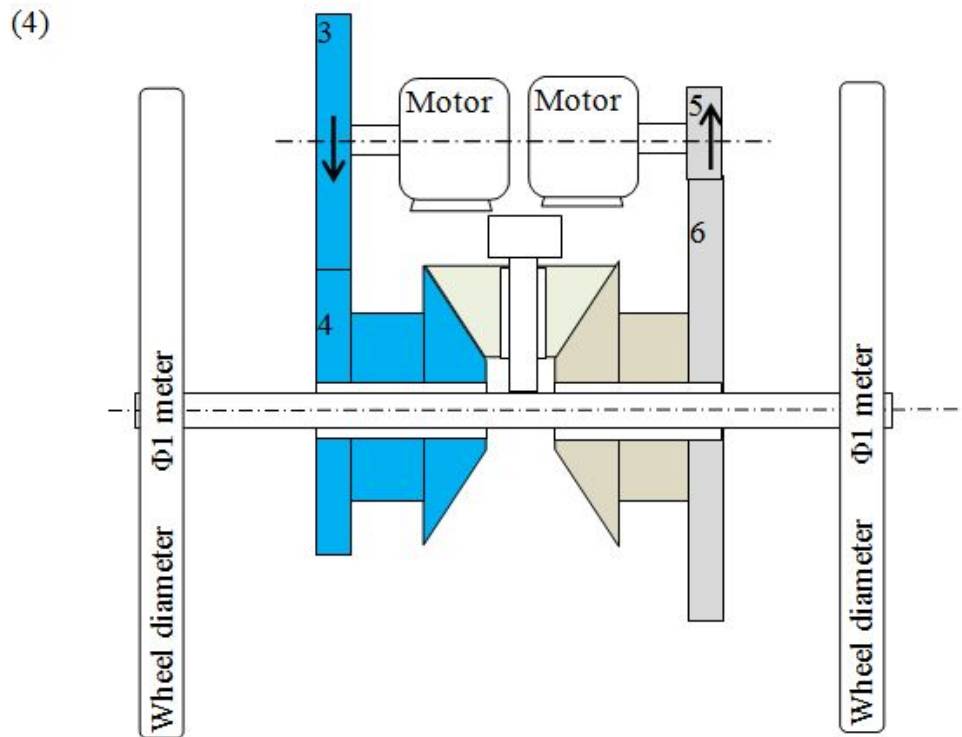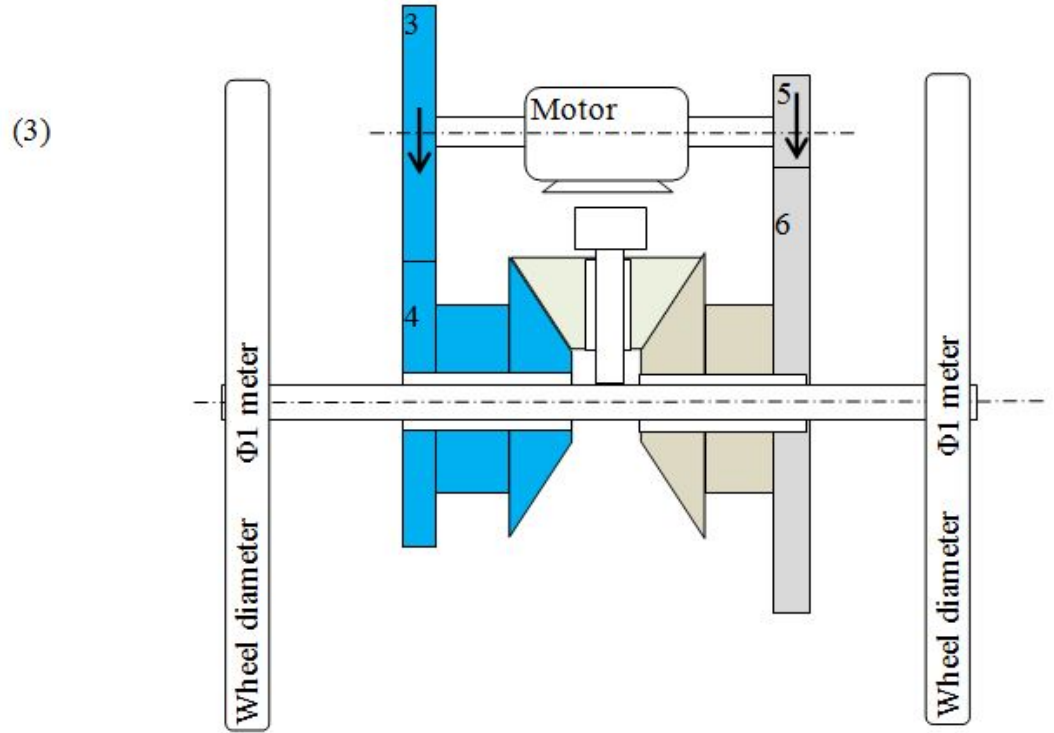
(3)

(4)

     ⭘ Option (a) : 1
     ⭘ Option (b) : 2
     ⭘ Option (c) : 3
     ⭘ Option (d) : 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (c) : 3

8) **In a Hobbing machine, the operator has just finished the cutting of one Left**   *1 point*
Hand helical gear. The blank rotational axis is vertical. The Hob started from the top

and has reached the lowest point of its vertical motion. The worker now takes out the finished gear and puts another blank for the same Left Hand gear and without any other change, starts the machine in reverse, which reverses ALL motions of the machine. In that case

   ○ Option (a) : Cutting will be done properly

   ○ Option (b) : Cutting will not be done and accident may occur

   ○ Option (c) : Cutting will be done properly but Right Hand helical gear will get cut

   ○ Option (d) : None of the others

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (b) : *Cutting will not be done and accident may occur*

9) **Two straight tooth spur gears of the same module, same width have 25 (Gear** *1 point* **A) and 100 (Gear B) numbers of teeth respectively. They are cut on the same gear hobbing machine with same speed (m/min), feed (mm of Hob travel past blank per rotation of blank) and depth of cut values. In that case**

   ○ Option (a) : Gear A will necessarily require more Hobbing time for completion compared to that for Gear B

   ○ Option (b) : Gear B will necessarily require more Hobbing time for completion compared to that for Gear A

   ○ Option (c) : The two gears will necessarily require equal Hobbing time for completion

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (b) : *Gear B will necessarily require more Hobbing time for completion compared to that for Gear A*

10) **The main problem in Gear Hobbing is that, since blank and cutter rotation are** *1 point* **related, increase in cutting speed necessarily results in**

   ○ Option (a) : Increase of feed motion in mm of Hob travel past blank parallel to the axis of blank/rev of blank

   ○ Option (b) : Increase in depth of cut

   ○ Option (c) : Increase in the number of teeth being cut

   ○ Option (d) : None of the others

No, the answer is incorrect.
Score: 0

Accepted Answers:
Option (d) : *None of the others*

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