MARATHA VIDYA PRASARAK SAMAJ'S
KARMAVEER ADV. BABURAO GANPATRAO THAKARE
COLLEGE OF ENGINEERING
KBTCOE
www.kbtcoe.org
Permanently Affiliated to Savitribai Phule Pune University Vide Letter No: CA/1542
& Approved by AICTE New Delhi Vide Letter No: 740-89-32 (E) ET/98
AISHE Code - C-41622

Mechanical Engineering Department

Academic Year – 2019-20	Class: TE
Semester – II	Date : 31/01/2020
CO: CO1, CO2 and CO3	PO: PO1, PO2, PO3,PO12

Innovative Teaching Methods

Title of Innovation method/activity: Innovative Teaching Learning Method –Crossword Puzzle for Gears and Bearings

1. Name of Faculty: Mr. Patil Manoj Subhash
2. Subject: Design of Machine Elements-II
3. Objective of Method:
   I. Enable critical thinking
   II. To understand the basic concepts of gears and rolling contact bearings
   III. To revise the key concepts
   IV. To know the functions of gears and bearings
4. **Topic Covered through Activity:**

   Spur, Helical and Bevel gears and Rolling contact bearings

5. **Description of method with Benefits (8 – 10 lines):**

Crossword puzzle is prepared using the keywords from the first three units based on spur gears, helical gears, bevel gears and rolling contact bearings. Questions leading to answer in one word are prepared and arranged in such a way that the answer word can be across (horizontal) and down (vertical). Any alphabet from any answer word will lead to the clue for another word.

Benefits of method:

- It improves the thinking ability of the students
- It helps the students to be familiar with the key technical words
- Concentration of the students improves

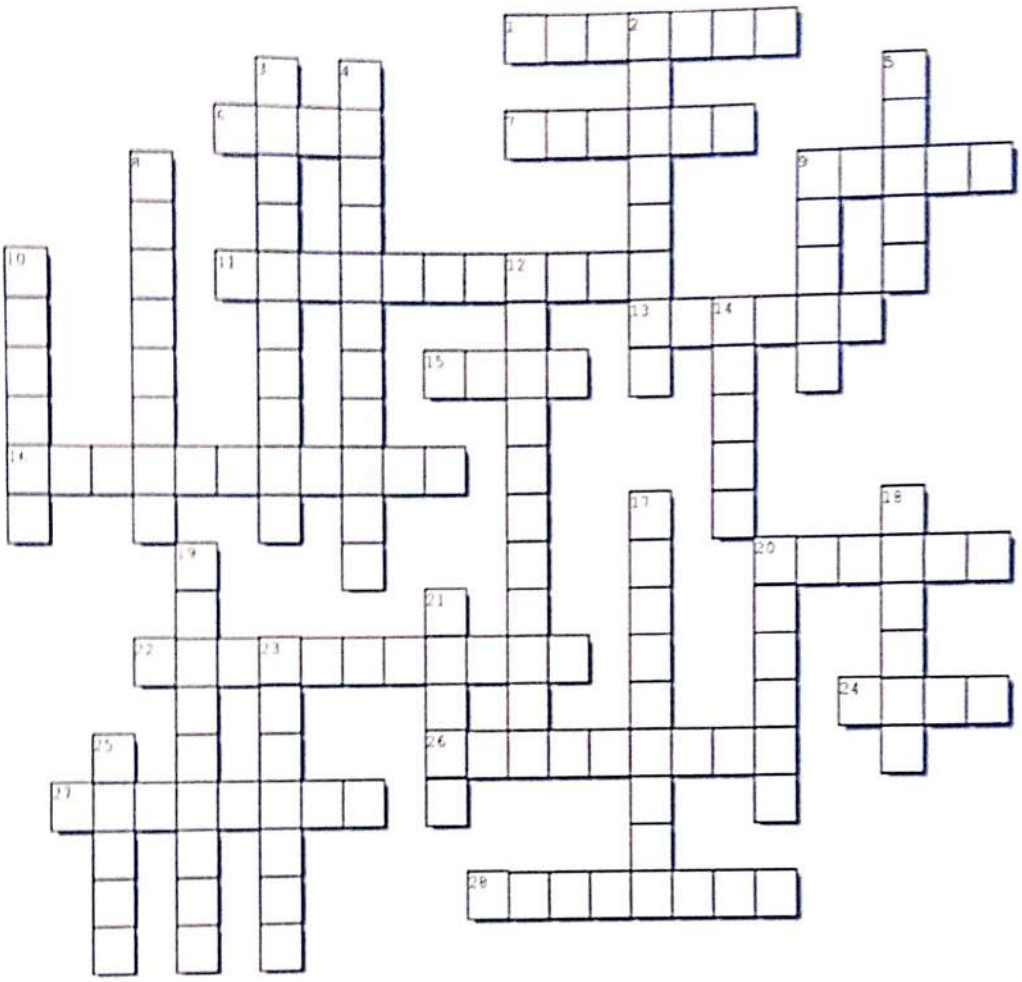
The method:

Crossword Puzzle: In this method after classroom teaching and explanation, a crossword puzzle is prepared by taking 30 clues. Arranging the clues across and vertical a sheet is prepared. This sheet is explained to the students by giving a demo presentation. Four sets are prepared by shuffling the order of questions and students are told to solve it within given period of time. The assessment is done manually and marks are displayed.

Roles and Responsibilities

- **Teacher**
  - Develop the crossword puzzle on the topics taught
  - Explain the students how to solve it by giving presentation
  - Remain available during the completion of task.
  - Prepare assessment methodology.
- **Student**
  - Go through the hardcopy of the puzzle
  - Think and solve the puzzle within given period of time.

6. Assessment Tools



Across

1. Dynamic load depends upon_____of rotating masses
6. If diameter of gear is double than that of pinion than its module will be
7. Ratio of PCD to number of teeths
9. velocity factor is also known as
11. Double helical gear
13. In designation of beanngs second digit stands for bearing
15. Used along with pinion to convert rotary motion into reciprocating motion
16. Service factor is also known as_____factor
20. Beanngs may be subjected to axial and this load
22. Cross section of V-belts
24. Driving member used for higher gear ratios
26. Brittle material used for making gears
27. Compound gear train with coaxial input and output shafts
28. FDI stands for full depth

Down

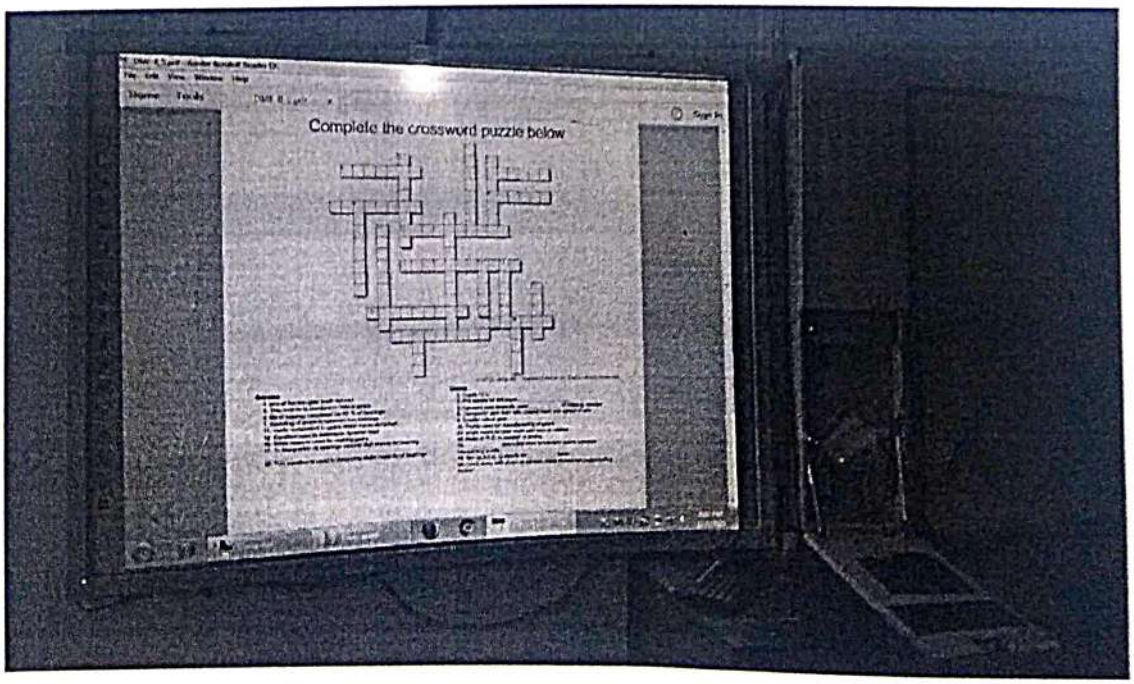
2. Grade 12 is
3. useful component in gears which transmits power
4. This factor denoted by C depends on modulli of elasticity
5. These bevel gears are having spiral teeth with zero spiral angle
8. mounting of gears in between two bearings
9. _____ gears are used to transmit power between intersecting shafts
10. This module is standard in helical gears
12. Equation used to determine dynamic load
14. fw dp b k Q. Q stands for_____factor
17. Profile used for manufacturing of gears
18. If material properties of pinion and gear materials are same than _____is always weaker
19. This equation is used to determine static capacity of bearings
20. life of bearing completed by 90 % of beanngs
21. Imaginary circle which by pure rolling action would transmit the same motion as the actual gears
23. one of the two gear tooth failures
25. angle made by gear tooth with axis of rotation

7. Evaluation sheet of attendee

Roll No.	Name of Student	Marks Obtained (out of 30)	Remark
65	MORE SHIVAM JEETENDRA	20	Good
66	MULMULE DUSHYANT SANJAY	AB	
68	NANKAR MANSI NITIN	AB	
69	NETAWANE TEJAS RAJENDRA	22	Good
70	NIKAM KALPESH SATISH	AB	
71	NIKAM NIKITA BHAUSAHEB	30	Excellent
72	NIKAM SAURABH YUVARAJ	AB	
73	PAGARE TANMAY SUNIL	AB	
74	PATADE PRATIK CHINDHU	AB	
75	PATIL AKSHAY DILIP	22	Good
76	PATIL ANIKET RAJENDRA	19	Can Do Better
77	PATIL DHANASHRI RAJENDRA	15	Can Do Better
78	PATIL GANESH HIRAMAN	15	Can Do Better
79	PATIL JAYESH RAMCHANDRA	AB	
80	PATIL NIRAJ SHRIDHAR	29	Excellent
81	PATIL PIYUSH SUNIL	30	Excellent
82	PATIL PRACHI RAJENDRA	30	Excellent
83	PATIL RUTUJA SUNIL	23	Good
84	PATIL SAMEER SANJAY	AB	
86	PATIL SIDDHARTH SUNIL	AB	
87	PATOLE TUSHAR SURESH	30	Excellent
88	PAWAR AKASH RAJENDRA	30	Excellent
89	PAWAR ANKITA SUNIL	AB	
90	PAWAR MAYUR RAVINDRA	30	Excellent
91	PAWAR MEGHANA RAJENDRA	AB	
92	PAWAR PRANALI RAJENDRA	29	Excellent
93	PAWAR PRIYANKA GAUTTAM	AB	
94	PAYGHAN PRADIP BHAGWAN	28	Excellent
95	PRAJAPATI PRAKASH MOHAN	29	Excellent
96	SEN PREETHESH TANMOY	30	Excellent
97	RAIJADE GAJANAN BALASAHEB	AB	
98	RAJPUT KETURAJ KOMALSING	20	Good
99	RAKIBE MANGESH VIJAY	AB	
100	RANDIVE PRANAV MOHAN	30	Excellent
101	RASAL ANIKET SHASHIKANT	AB	
102	RAYATE AMRUTA MUKUND	15	Can Do Better
104	SAOKAR NEHA UKHA	14	Can Do Better
106	SHAIKH JISHAN CHANDBHAI	AB	
107	SHARDUL ESHWARY ARUN	AB	
108	SHELKE ABHISHEK SUNIL	29	Excellent
110	SHINDE VAIBHAV DNYANESHWAR	29	Excellent
111	SHIRSAT DARSHAN TANAJI	29	Excellent
112	SHIRSATH POOJA SANJAY	11	Can Do Better
113	SOMVANSHI AKASH NANDKUMAR	AB	
114	SONAR ANUJA KAILAS	26	Very Good

115	SONAWANE HARSHALI SHIVAJI	AB	
116	BODHARE SUNIL VISHNU	30	Excellent
117	SURAVASE VITTHAL KONDIBA	29	Excellent
118	TAKATE DHIRAJ MANIK	AB	
119	TALELE PRIYA HEMANT	23	Good
120	THORAT ABHISHEK SATISH	28	Excellent
121	KOLI VIVEK DILIP	AB	
122	VYAVAHARE CHINMAY CHARUDATTA	AB	
123	WABLE MANSI BHIKAN	25	Very Good
125	WAGH TUSHAR ANIL	20	Good
126	WATPADE RUSHIPRASAD RAGHUNATH	AB	
128	BURAD YASH RAJESH	22	Good
129	DEORE AMOL RAMESH	27	Very Good
130	GUPTA SWAMI HEMANT	28	Excellent
131	HIRAY PRASANNA ABHAY	AB	
132	KHOLAMKAR MRUNAL MANISH	AB	
133	MOHAN DARSHANA SANJAY	AB	
134	KUTE GAURAV BHALA	AB	
135	PATIL NACHIKET SANJAY	AB	
136	KARE AVANTI DIPAK	AB	
137	WEDHANE NIKHIL JAYWANT	18	Can Do Better
138	SANGEWAR VYOMKESH JEETENDRA	AB	
140	GAWARE KRISHNALEE DATTATRAY	AB	
141	BHADANE SAURABH RAVINDRA	AB	
142	KOTWAL GAURAV VIJAY	AB	
143	PAWAR YASH KRISHNA	AB	
144	BHOYE ROHIT PADMAKAR	AB	
145	SHIKALIKAR DANISH M SALIM	24	Good

8. Activity Picture



9. **For review and critique contact: e-mail address of faculty and HOD**
   patil.manoj@kbtcoe.org, kakade.amol@kbtcoe.org

Mr. M. S. Patil
Subject In charge

Dr. S. P. Mogal
Module Coordinator

Dr. A. B. Kakade
NBA Coordinator

Dr. V. C. Shewale
HoD