BASIC MECHANICAL ENGINEERING FOR CIVIL ENGINEERS
(CE402ES)
COURSE PLANNER

I. COURSEOVERVIEW:

After learning the course the students should be able to

- To understand the fundamentals of mechanical systems.
- To understand and appreciate significance of mechanical engineering in different fields of engineering.

II. COURSEOBJECTIVES:

1.	Basic machine elements,
2.	Sources of Energy and Power Generation,
3.	Various manufacturing processes,
4	Power transmission elements, material handling equipment.

III. COURSEOUTCOMES:

.No	Description	Bloom's Taxonomy Level
1.	**Understand** To understand the mechanical equipment for the usage at civil engineering systems,	Understand (Level 2)
2.	**Analyze** To familiarize with the general principles and requirement for refrigeration ,manufacturing,	Analyze (Level 4)
3.	**Apply** To realize the techniques employed to construct civil engineering systems.	Apply (Level 3)

IV. HOW PROGRAM OUTCOMES AREASSESSED:

Program Outcomes (PO)		Level	Proficiency assessed by
PO1	Engineering knowledge: Graduates will demonstrate the ability to use basic knowledge in mathematics, science and engineering and apply them to solve problems specific to mechanical engineering.	1.66	Assignments
PO2	Problem analysis: Graduates will demonstrate the ability to design and conduct experiments, interpret and analyze data, and report results.	0.66	Assignments
PO3	Design/development of solutions: Graduates will demonstrate the ability to design any mechanical system or thermal that meets desired specifications and requirements.		
PO4	Conduct investigations of complex problems: Graduates will demonstrate the ability to identify, formulate and solve mechanical engineering problems of a complex kind.	0.66	Assignments
PO5	Modern tool usage: Graduates will be familiar with applying software methods and modern computer tools to analyze mechanical engineering problems.		---
PO6	The engineer and society: Apply reasoning informed by the contextual know ledge to assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	0.66	Assignments
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	0.33	Assignments
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	--	---
PO9	Individual and team work: Graduates will demonstrate the ability to function as a coherent unit in multidisciplinary design teams, and deliver results through collaborative research.	--	---
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	--	---
PO11	Project management and finance: Graduate will be able to design a system to meet desired needs within environmental, economic, political, ethical, health and safety, manufacturability and management knowledge and techniques to estimate time, resource to complete project.	--	---
PO12	Life-long learning: Graduates should be capable of self-education and clearly understand the value of life-long learning.	--	--

1: Slight(Low) **2:Moderate (Medium)** **3:Substantial (High)** **- : None**

V. HOW PROGRAM SPECIFIC OUTCOMES AREASSESSED:

Program Specific Outcomes (PSO)		Level	Proficiency assessed by
PSO1	**Foundation of mathematical concepts:** To use mathematical methodologies to crack problem using suitable mathematical analysis, data structure and suitable algorithm.	1	Reaseach
PSO2	**Foundation of Mechanical System:** The ability to interpret the fundamental concepts and methodology of Mechanical systems. Students can understand the functionality of different machine, men and material.	--	--
PSO3	**Layout of plant:** The ability to grasp the knowledge of plant layout and material handling along with the systematic allocation of all the facilities.	--	---

1: Slight (Low) **2: Moderate (Medium)** **3: Substantial (High)** **- : None**

VI. SYLLABUS:

JNTUH:

UNIT - I: Machine Elements: Cams: Types of cams and followers Introduction to engineering materials-Metals, ceramics, composites-Heat treatment of metals Riveted joints- methods of failure of riveted joints-strength equations-efficiency of riveted joints eccentrically loaded riveted joints.

UNIT - II: Power Transmission Elements: Gears terminology of spur, helical and bevel gears, gear trains. Belt drives (types). Chain drives. Material Handling equipment: Introduction to Belt conveyors, cranes, industrial trucks, bull dozers

UNIT - III: Energy: Power Generation: External and internal combustion engines (layouts, element/component description,advantages, disadvantages, applications). Refrigeration: Mechanical Refrigeration and types – units of refrigeration – Air Refrigeration system, details and principle of operation –calculation of COP Modes and mechanisms of heat transfer – Basic laws of heat transfer –General discussion about applications of heat transfer.

UNIT - IV: Manufacturing Processes: Sheet Metal Work: Introduction – Equipments – Tools and accessories – Various processes (applications, advantages / disadvantages). Welding: Types – Equipments –Techniques employed –welding positions-defects-applications, advantages / disadvantages – Gas cutting – Brazing and soldering. Casting: Types, equipments, applications

UNIT - V: Machine Tools: Introduction to lathe, drilling machine, milling machine, grinding machine-Operations performed

SUGGESTED BOOKS:

TEXT BOOKS:

1. Kumar, T., Leenus Jesu Martin and Murali, G., Basic Mechanical Engineering, Suma Publications, Chennai, 2007M
2. Basic Mechanical Engineering / Pravin Kumar/ Pearson
3. Introduction to Engineering Materials / B.K. Agrawal/ McGrawHill
4. Thermal Engineering-M.L.Marthur& Mehta/Jainbros
5. Thermal Engineering-R.S Khurmi/JSGupta/S.Chand.

REFERENCE BOOKS:

1. Prabhu, T. J., Jai Ganesh, V. and Jebaraj, S., Basic Mechanical Engineering, SciTech Publications, Chennai, 2000
2. Hajra Choudhary, S.K. and Hajra Choudhary, A. K., Elements of Workshop TechnologyVols. I & II, Indian Book Distributing Company Calcutta, 2007.
3. Nag, P.K., Power Plant Engineering, Tata McGraw-Hill, New Delhi, 2008.
4. Rattan, S.S., Theory of Machines, Tata McGraw-Hill, New Delhi, 2010.

NPTEL WEB COURSE:

nptel.ac.in/downloads/112107219/

NPTEL VIDEO COURSE:

nptel.ac.in/downloads/112107219/#

GATE:NA

VII. COURSEPLAN:

Lecture No.	Unit No.	Date	Topics to be covered	Link for PPT	Link for PDF	Course learning outcomes/Bloom's Taxonomy	Teaching Methodology	Reference
1	1	Week - 1	Types of cams and followers	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/tc/MzExMjU3NjYxNzQ2	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/tc/MzExMjUwMjg0NDcx	Explain, Understand	ICT	TB1&RB1
2	1		Metals, ceramics, composites-Heat treatment of metals	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/tc/MzExMjQ4NDMxMDQw	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
3	1		methods of failure of riveted joints	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/tc/MzExMjQ4NDMxMTg0	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
4	1	Week - 2	strength equations-efficiency of riveted joints	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/tc/MzExMjQ4NDMxMTg0	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
5	1		eccentrically loaded riveted joints.	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
6	1		Problems			Calculating	ICT	
7	1	Week-3	Problems			Calculating	ICT	
8	1		Gears terminology of spur	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
9	1		**MOCK TEST - 1**				ICT	

10	**2**	Week-4	helical and bevel gears	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	**TB1& RB1**
11	**2**		gear trains	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
12	**2**		Belt drives (types). Chain drives.	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
13	**2**	Week-5	Belt drives (types). Chain drives.	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
14	**2**		Introduction to Belt conveyors	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
15	**2**		Student PPT			Explain, Understand	ICT	
16	**2**	Week-6	cranes, industrial trucks, bull dozers	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
17	**2**		Problems			Calculating	ICT	
18	**2**		Problems			Calculating	ICT	
19	**2**	Week-7	Energy: Power Generation: External and internal combustion engines	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
20	**3**		layouts, element/component description	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	**TB1& RB1**
21	**3**		Student PPT			Explain, Understand	ICT	

22	**3**	Week-8	advantages, disadvantages, applications	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
24	**3**		Mechanical Refrigeration and types – units of refrigeration	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
25	**3**		Mechanical Refrigeration and types – units of refrigeration	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
26	**3**	Week - 10	calculation of COP	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	TB1& RB1
27	**3**		Basic laws of heat transfer	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain,	ICT	
28	**3**		Student PPT	-		Explain, Understand	ICT	
29	**3**	Week - 11	General discussion about applications of heat transfer.	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
30	**3**		Problems	-		Calculating	ICT	
31	**3**		Problems	-		Calculating	ICT	
32	**4**	Week - 12	Sheet Metal Work: Introduction – Equipments	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	**TB1& RB1**
33	**4**		Tools and accessories –	https://classroom.google.com	https://classroom.google.com/u/0/w/MzExMj	Explain, Understand	ICT	

			Various processes (applications, advantages / disadvantages).	/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Q4Mjc2MzU1/t/all			
34	**4**		Student PPT	-		Explain, Understand	ICT	
35	**4**	Week - 13	Types – Equipments – Techniques employed for Welding	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
36	**4**		welding positions-defects-applications	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
37	**4**		Student PPT	-		Explain, Understand	ICT	
38	**4**	Week - 14	advantages / disadvantages	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
39	**4**		Gas cutting – Brazing and soldering	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
40	**4**		Student PPT	-		Explain, Understand	ICT	
41	**5**	Week - 15	Casting: Types, equipments, applications	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	**TB1& RB1**
42	**5**		Casting: Types, equipments, applications	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
43	**5**		Student PPT	-		Explain, Understand	ICT	
44	**5**	Week - 16	Introduction to lathe	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	

45	**5**		drilling machine, milling machine	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
46	**5**		Student PPT	-		Explain, Understand	ICT	
47	**5**	Week -17	grinding machine-Operations performed	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
48	**5**		grinding machine-Operations performed	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	
49	**5**		Revision	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	https://classroom.google.com/u/0/w/MzExMjQ4Mjc2MzU1/t/all	Explain, Understand	ICT	

VIII. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFICOUTCOMES:

	Program Outcomes												Program Specific Outcomes		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	**3**	-	-	-	-	**1**		-	-	-	-	-	-	**1**	-
CO2	**1**	**2**	-	-	-	**1**	-	-	-	-	-	-	-	**1**	-
CO3	**1**	-	-	**2**	-	-	**1**	-	-	-	-	-	-	**1**	-
AVG	**1.66**	**0.66**	-	**0.66**	-	**0.66**	**0.33**	-	-	-	-	-	-	**1**	-

IX. QUESTION BANK

UNIT-I

SHORT ANSWER QUESTIONS:

S.No	Question	Blooms Taxonomy Level	Course Outcomes
1.	Define Cam?	Remember	1, 2
2.	What are the various types of cam?	Remember	1, 2
3.	Define composite?	Remember	2
4.	Distinguish between composite & alloy?	Remember	2
5.	What is mean by eccentric loading?	Remember	2
6.	Recall the types of ceramics?	Remember	2
7.	What are the heat treatment methods?	Remember	2

LONG ANSWER QUESTIONS:

S.No	Question	Blooms Taxonomy Level	Course Outcomes
1.	What are the types of failure of riveted joints ?	Analyze	2
2.	Identify the various Heat treatment methods for metals ?	Analyze	2
3.	Explain the types of cams and followers with neat sketch?	Understand	1,2
4.	Discuss the eccentrically loaded riveted joints?	Evaluate	2
5.	Briefly explain about strength and efficiency of riveted joints?	Understand	2
6	Compare the ceramics and composites?	Understand	2

UNIT-II

SHORT ANSWER QUESTIONS:

S. No	Question	Blooms Taxonomy Level	Course Outcomes
1.	What are the power transmission elements?	Remember	1
2.	State the advantage of chain drive?	Remember	1
3.	Types of gears?	Remember	1

4.	What are the material handling devices?	Understand	1
5.	Types of belt drives?	Remember	1
6.	Difference between helical and spur gear?	Understand	1
7.	Define gear trains?	Remember	1
8	What type of material used for convyers?	Understand	1
9	Types of cranes?	Remember	1
10	What is mean by creep of the belt?	Remember	1
11	Define term slip of the belt?	Remember	1

LONG ANSWER QUESTIONS:

S.No	Question	Blooms Taxonomy Level	Course Outcomes
1.	Detail discussion of Gears terminology with neat sketch?	Understand	1&2
2.	Explain the material handling systems in industrieswith suitable examples?	Understand	1
3.	What are types belt drives? Compare the various belt drives?	Analyze	1
4.	What re advantages & disadvantages of belt drives?	Understand	1
5.	Distinguish between spur, helical & warm gear?	Understand	1
6.	Compare belt drives and chain drives?	Analyze	1

UNIT-III

SHORT ANSWER QUESTIONS

S. No	Question	Blooms Taxonomy Level	Course Outcomes
1.	Advantages of Refrigeration	Remember	2
2.	Applications of IC engines?	Understand	2
3.	What are the modes of heat transfer?	Remember	2
4.	Define conduction ?	Remember	2
5.	Define conevection ?	Remember	2
6.	Define radiation?	Remember	2
7.	What is Mechanical Refrigeration and its types?	Remember	2
8.	Define Unit of refrigeration and C.O.P	Remember	2
9.	Explain the term “Ton of refrigeration”	Understand	2
10	Define Refrigeration	Remember	2
11	State the term of heat transfer?	Remember	2

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LONG ANSWER QUESTIONS:

S. NO	Question	Blooms Taxonomy Level	Course Outcomes
1.	Distinguish between External and internal combustion engines ?	Analyze	1,2
2.	What is the necessity and application of refrigeration systems	Understand	2
3.	Explain the principle of working of Bell Coleman cycle	Understand	2
4.	Write the short note on Refrigeration needs of Air crafts.	Understand	2
5.	List the various components of IC engines.	Understand	2
6.	Briefly explan the applications of heat transfer?	Understand	2
7.	Discuss the principle of operation and calculation of COP?	Remember	2
8.	What are modes of heat transfer and explain with examples?	Remember	2

UNIT-IV

SHORT ANSWER QUESTIONS

S.No	Question	Blooms Taxonomy Level	Course Outcomes
1.	What are the tools used for sheet metal operation?	Remember	2
2.	Types of welding?	Remember	2
3.	What are demerits of welding?	Remember	2
4.	What are the applications of welding?	Remember	2
5.	List out components in brazing ?	Understand	2
6	What are elements in soldering opweration?	Understand	2
7	Identify the defects of welding?	Remember	2
8	List out applications of casting?	Remember	2
9	Types of casting?	Remember	2

LONG ANSWER QUESTIONS:

S.No	Question	Blooms Taxonomy Level	Course Outcomes
1.	what are the advantages & disadnatages of Manufacturing Processes	Understand	1,2
2.	Discuss the types of Casting and its applications?	Understand	2

3.	Explain working principle of gas cutting?	Understand	2
4.	Summarize the term of brazing equipment with neat sketch?	Understand	2
5.	List out welding positions and its defects ?	Understand	2
6.	Differentiate between Brazing and soldering ?	Analyze	2
7.	Advantages & disadvantages of welding?	Understand	2

UNIT-V

SHORT ANSWER QUESTIONS

S.No	Question	Blooms Taxonomy Level	Course Outcomes
1.	What are the various machining operations?	Understand	1,2,3
2.	Types of lathe machines?	Remember	2,3
3.	Types grinding machines?	Remember	2,3
5.	Types of milling machines?	Remember	2,3
6.	List out applications of machining operations?	Remember	2,3
7.	What is necessity of machining in industries?	Remember	2,3
8	What type of tool material is used marching operations?	Analyze	2,3

LONG ANSWER QUESTIONS:

S.No	Question	Blooms Taxonomy Level	Course Outcomes
1.	Briefly summarize the functioning of lathe machine and its types?	Understand	1,2,3
2.	Explain the Working principle of milling machine with neat sketch?	Understand	2,3
3.	Discuss the Working principle of grinding machine with neat sketch	Understand	2,3
4.	Distinguish between horizontal & vertical lathe machine?	Analyze	2,3
5	What are advantages and disadvantages of machining operations?	Understand	2,3
6	What is mean by drilling and how it can helpful in industries?	analyze	2,3

X. OBJECTIVE

QUESTIONS:JNTUH

UNIT-I

1. Define cam_____.
2. Cam size depends upon
   a) base circle
   a) pitch circle
   c) prime circle
   d) outer circle.
3. The cam follower generally used in aircraft engines is
   a) knife edge follower
   b) flat faced follower
   c) spherical faced follower
   d) roller follower.
4. Which of the following is not a characteristic of ceramics?
   a) Non-metallic
   b) Inorganic
   c) Amorphous
   d) None of the mentioned
5. The word ceramic stands for which of the following meaning?
   a) Soft
   b) Burnt
   c) Hard
   d) None of the mentioned
6. Which of the following isn't a main part of rivet?
   a) Head
   b) Shank
   c) Point
   d) Thread
7. In hot riveting the shank portion is subjected to compressive stress.
   a) True
   b) False

UNIT-II

1. Thickness of tooth measured along the pitch circle is known as
   a) Tooth thickness c) Face widthd) Top land.
   b) Backlash
2. Difference between space width and to thickness of tooth along the pitch circle is known as
   a) Tooth thickness b) Face width
   c) Top land d) Backlash

3. Length of tooth parallel to gear axis is known as
   a) Tooth thickness
   b) Backlash
   c) Face width
   d) Top land
4. Bottom surface of the tooth between two adjacent fillets is known as
   a) Flank
   b) Face
   c) Bottom Land
   d) Fillet
5. Surface of tooth between pitch circle and top land is known as
   a) Flank
   b) Face
   c) Bottom Land
   d) Fillet
6. Ratio of speed of the follower to the speed of driving gear is known as
   a) Gear ratio
   b) Module
   c) Velocity ratio
   d) None of the mentioned
7. Material handling consists of movement of material from
   a) one machine to another
   b) one shop to another shop
   c) stores to shop
   d) all of the above
8. Economy in material handling can be achieved by
   a) employing gravity feed movements
   b) minimizing distance of travel
   c) by carrying material to destination without using manual labour
   d) all of the above
9. Fork lift truck is used for
   a) lifting and lowering
   b) vertical transportation
   c) both 'a' and 'b'
   d) none of the above
10. The ratio of driving tensions in V-beltdrives is_____flat beltdrives.

UNIT-III

1. Define Refrigeration_____.
2. For obtaining high COP, the pressure range of compressor should be
   a) High b) low c) medium d) any value
3. In a refrigeration system, the expansion device is connected between the
   a) Compressor and condenser b) Receiver and evaporator c) Receiver and compressor d) none
4. Metal to metal heat transfer_____type of heat tansfer
5. Modes of heat transfer_____

6. Unit of the rate of heat transfer is
   a) Joule
   b) Newton
   c) Pascal
   d) Watt
7. Which of the following generation station has minimum running cost?
   a) Thermal power station
   b) Hydro-electric power station
   c) Nuclear power station
   d) None of these
8. How many types of convection process are there?
   a) One
   b) Three
   c) Four
   d) Two
9. Thermal conductivity is maximum for which substance
   a) Silver
   b) Ice
   c) Aluminum
   d) Diamond
10. Convective heat transfer coefficient doesn't depend on
    a) Surface area
    b) Space
    c) Time
    d) Orientation of solid surface

UNIT-IV

1 Which kind of resistance is experienced in upset butt welding?
   a) Electric resistance
   b) Magnetic resistance
   c) Thermal resistance
   d) Air resistance
2 Which of the following can be easily be welded from flash butt welding process?
   a) Tin
   b) Lead
   c) Cast irons
   d) Carbon steel
3 Electrodes used in spot welding are made up of which material?
   a) Only Copper
   b) Copper and tungsten
   c) Copper and chromium
   d) Copper and aluminium
4 Which of the following method is not used in applying pressure in spot welding process?

a) Hand lever
b) Foot lever
c) Air pressure
d) Hydraulic cylinder

5 Copper and aluminum can be joined by brazing when_____alloy is used.
a) Copper-zinc
b) Aluminum-silicon
c) Copper-tellurium
d) Aluminum-zinc

6 Tin-zinc solders are used for joining
a) Aluminum
b) Zinc
c) Copper
d) Glass

b) The commonly used flux in brazing
isa)Borax Rosin
c) Lead sulphide
d) Zinc chloride

7 The filler metal used in brazing has melting point of above
a.)250 b)420 c)350 d) 400

8 Write any application of casting_____

9 The pattern used for mass production is
a.)match plate pattern b)split pattern c)skeleton pattern d) single plate pattern

10 Which of the following pattern is used to produce a number of castings?
a) loose piece pattern
b) split pattern
c) gatted pattern
d) match plate pattern

UNIT-IV

1. Which machine tool is known as the mother machine tool?
a) drill
b) milling
c) lathe
d) none of mentioned
2. Lathe is primarily used for producing_____surfaces.
a) flat
b) curve
c) taper
d) none of the mentioned
3. Which type of surface is produced by turning operation in lathe machine?

a) flat
b) cylindrical
c) taper
d) none of the mentioned

4. Lathe cannot produce internal features like holes.
   a) true
   b) false
5. Shaping can be performed more effectively by_____milling machine.
   a) horizontal
   b) vertical
   c) can't say anything
   d) none of the mentioned
6. surfacing can be performed more effectively by_____milling machine.
   a) horizontal
   b) vertical
   c) can't say anything
   d) none of the mentioned
7. Form cutting can be performed more effectively by_____milling machine.
   a) horizontal
   b) vertical
   c) can't say anything
   d) none of the mentioned
8. Which of the following operation, we can't perform on drilling machine?
   a) reaming
   b) tapping
   c) lapping
   d) none of the mentioned
9. Tapping attachment is included in_____method of tool holding devices.
   a) by chucks
   b) by a sleeve
   c) by directly fitting in the spindle
   d) none of the mentioned
10. Removing dull grains in order to make grinding wheel sharp is known as
    a) Loading
    b)Glazing
    c) Dressing
    d) Trueing

XI. GATEQUESTIONS:

NA

XII. WEBSITES:

1. www.iitd.ac.in

2. www.nptel.ac.in
3. www.mit.edu

XIII. EXPERTDETAILS:

1. Dr.PravinKumar
2. K. Agrawal/ McGrawHill
3. Meenakshi/AnjaliBagad.

XIV. JOURNALS:

1. ASME Journal of Energy Resource Technology
2. ASME Journal of Engineering for Industry
3. ASME Journal of Solar Energy Engineering
4. Australian Journal of Mechanical Engineering

XV. LIST OF TOPICS FOR STUDENTSEMINARS:

1. Refrigeration.
2. Machine Tools
3. Engineeringmaterials.
4. I.CEngines

XVI. CASE STUDIES / SMALLPROJECTS:

1. Material Handling equipmen