

BASIC MECHANICAL ENGINEERING FOR CIVIL ENGINEERS

Subject code: **CE402ES**

Regulations: R18-JNTUH

Class: II Year B. Tech CE II Sem



DEPARTMENT OF CIVIL ENGINEERING
BHARAT INSTITUTE OF ENGINEERING AND TECHNOLOGY
Ibrahimpattam - 501 510, Hyderabad

**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 report sand 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/JS Gupta/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 Technology Vols. 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

IES :NA

VII.COURSEPLAN:

Lecture No.	Week	Unit No	Date	Topics to be covered	Topic Learning Outcome	Teaching Methodology	Reference
1	1	I	12/18/2019	Machine Elements: Cams	Explain working principle of cam	Chalk and Talk,PPT	1. Kumar, T., Leenus Jesu Martin and Murali, G., Basic Mechanical Engineering, Suma Publications, Chennai, 2007
2		I	12/20/2019	Types of cams and followers	Recall various types	Chalk and Talk,PPT	

					cams		<p>2. Basic Mechanical Engineering / Pravin Kumar/ Pearson</p> <p>3. Introduction to Engineering Materials / B.K. Agrawal/ McGrawHill</p> <p>1. Kumar, T., Leenus Jesu Martin and Murali, G., Basic Mechanical</p>
3		I	12/21/2019	Introduction to engineering materials-Metals, ceramics,	Identify the various materials	Chalk and Talk,PPT	
4	2	I	12/27/2019	Composites-Heat treatment of metals	Femilari ze the heat treatment process	Chalk and Talk,PPT	
5		I	12/28/2019	Riveted joints	Distiguh between various types joints	Chalk and Talk,PPT	
6	3	I	12/03/2019	Methods of failure of riveted joints	Identify the types of failure in riveted joints	Chalk and Talk,PPT	
7		I	12/04/2019	Strength equations	Determi ne the strength of joints	Chalk and Talk,PPT	
8	4	I	01/08/2020	Efficiency of riveted joints eccentrically loaded riveted joints.	Determi ne the strength of joints	Chalk and Talk,PPT	
9		I	01/10/2020	Mock Test – I			

10		II	01/11/2020	Power Transmission Elements; gear trains.	Recall the Transmission Systems	Chalk and Talk,PPT	Engineering, Suma Publications, Chennai, 2007 2. Basic Mechanical Engineering / Pravin Kumar/ Pearson
11	5	II	01/17/2020	Gears terminology of spur gear	know the terminology of gears	Chalk and Talk,PPT	
12		II	01/18/2020	Helical and bevel gears	know the terminology of gears	Chalk and Talk,PPT	
13	6	II	01/22/2020	Belt drives (types).	Identify various types of belt drives	Chalk and Talk,PPT	
14		II	241-01-2020	Chain drives	Recall the various types of chain drives	Chalk and Talk,PPT	
16		II	01/25/2020	Material Handling equipment: Introduction to Belt conveyors, cranes,	Identify the types of Material Handling equipment:	Chalk and Talk,PPT	
17	7	II	01/29/2020	Belt conveyors, cranes,	Identify the types of	Chalk and Talk,PPT	

					Material Handling equipment:		1. Thermal Engineering- M.L.Marthur & Mehta/Jainbros 2. Thermal Engineering-R.S Khurmi/JS Gupta/S. Chand.
18		II	01/31/2020	Industrial trucks, bull dozers	Identify the types of Material Handling equipment:	Chalk and Talk, PPT	
19		II	02/01/2020	Tutorial / Bridge Class # 1		Chalk and Talk, PPT	
20	8	III	02/05/2020	Energy: Power Generation: External combustion engines (layouts, element/component)	Familiarize with the general principles and requirement for Power generation	Chalk and Talk, PPT	
21		III	02/07/2020	Description, advantages, disadvantages, applications).	Explain working principle of engines	Chalk and Talk, PPT	
22		III	02/08/2020	Internal combustion engines (layouts, element/component description, Advantages, disadvantages,	Discuss about elements of IC engines	Chalk and Talk, PPT	

				applications			
MID-I EXAMINATIONS (10/2/2020 - 12/02/2020)							
23	9	III	02/11/2020	Refrigeration: Mechanical Refrigeration ,types – units of refrigeration	Familiarize with the general principles	Chalk and Talk,PPT	3 Nag, P.K., Power Plant Engineering, Tata McGraw-Hill, New Delhi, 2008.
24		III	02/12/2020	Air Refrigeration system, details and principle of operation calculation of COP	Determine the COP of air refrigeration system	Chalk and Talk,PPT	
25		III	02/15/2020	Modes and mechanisms of heat transfer	Recall the various heat transfer modes	Chalk and Talk,PPT	
26	10	III	02/19/2020	. Basic laws of heat transfer	Recall the various heat transfer modes	Chalk and Talk,PPT	
27		III	02/22/2020	General discussion about applications of heat transfer	Identify the applications of heat transfer	Chalk and Talk,PPT	
28	11	III	02/26/2020	Tutorial / Bridge Class # 2			
29		IV	02/28/2020	Manufacturing Processes: Sheet	Discuss the	Chalk and Talk,PPT	

				Metal Work: Introduction – Equipments	manufau ring process	
30		IV	02/29/2020	Tools and accessories	Recall the various tools for sheetmetal operation	Chalk and Talk,PPT
31		IV	03/04/2020	Various processes (applications, advantages disadvantages).	List out the manufau ring process	Chalk and Talk,PPT
32	12	IV	03/06/2020	Welding: Types – Equipments – Techniques employed – welding positions	Recall the various joints & its working principle	Chalk and Talk,PPT
33		IV	03/07/2020	Defects, applications, advantages / disadvantages	Recall the applicatio n of welding	Chalk and Talk,PPT
34	13	IV	03/11/2020	Gas cutting – Brazing and soldering	Discuss the working principle of Various operations	Chalk and Talk,PPT

1.Kumar, T.,
Leenus Jesu
Martin and
Murali, G., Basic
Mechanical
Engineering,
Suma
Publications,
Chennai, 2007M

35		IV	03/13/2020	Casting: Types, equipments, applications	Explain the working principle of casting	Chalk and Talk,PPT	
36		IV	03/14/2020	Mock Test – II			
37		V	03/18/2020	Machine Tools: Introduction	Discuss the various operations	Chalk and Talk,PPT	
38	14	V	03/20/2020	Lathe machine	Summarize working principle of lathe machine	Chalk and Talk,PPT	Hajra Choudhary, S.K. and Hajra Choudhary, A. K., Elements of Workshop Technology Vols. I & II, Indian Book Distributing Company Calcutta, 2007
39		V	03/21/2020	Lathe machine-operations	Summarize working principle of lathe machine	Chalk and Talk,PPT	
40	15	V	03/25/2020	Drilling machine operations	Discuss the working principle of Drilling machine	Chalk and Talk,PPT	
41		V	03/27/2020	Milling machine operations	Discuss the working principle of	Chalk and Talk,PPT	

					Milling machine	
42		V	03/28/2020	Grinding machine operations	Explain the working principle of Grinding machine	Chalk and Talk,PPT
43		V	04/01/2020	Tutorial / Bridge Class # 3		
44	16	V	04/03/2020	Operations performed	Identify the various operations for different application	Chalk and Talk,PPT
45		V	04/04/2020	Revision		Chalk and Talk,PPT
MID-II EXAMINATIONS (08/4/2020 - 11/4/2020)						

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

	Program Outcomes	Program Specific Outcomes
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	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 conveyers?	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.N o	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 industries with 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 & worm 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
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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 convection ?	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

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 explain 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 operation?	Understand	2
7	Identify the defects of welding?	Remember	2
8	List out applications of casting?	Remember	2

9	Types of casting?	Remember	2
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LONG ANSWER QUESTIONS:

S.No	Question	Blooms Taxonomy Level	Course Outcomes
1.	what are the advantages & disadvantages 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 machining 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
 - b) 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
 - b) Backlash
 - c) Face width
 - d) Top land.
2. Difference between space width and to thickness of tooth along the pitch circle is known as
 - a) Tooth thickness
 - b) Backlash
 - c) Face width
 - d) Top land
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-belt drives is _____ flat belt drives.

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 transfer
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
 - 7 The commonly used flux in brazing is
 - a) Borax
 - b) Rosin
 - c) Lead sulphide
 - d) Zinc chloride
 - 8 The filler metal used in brazing has melting point of above
 - a.)250 b)420 c)350 d) 400
 - 9 Write any application of casting_____
 - 10 The pattern used for mass production is
 - a.)match plate pattern b)split pattern c)skeleton pattern d) single plate pattern
 - 11 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
11. We can't perform grinding operation in a drilling machine.
- a) true
 - b) false
12. In drilling operation, work should be held by hand.
- a) true
 - b) false

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