Government of Karnataka
Department of Technical Education
Board of Technical Examinations, Bangalore

	Course Title: **INDUSTRIAL MANAGEMENT**		
	Scheme (L:T:P) : **4:0:0**	Total Contact Hours: **52**	Course Code: **15ME51T**
	Type of Course: **Lectures, Self Study & Quiz**	Credit **:04**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 100 Marks

Prerequisites: Knowledge of English Communication and Discipline Courses

Course Objectives:

1. Technicians of mechanical engineering disciplines are expected to work during most of their career at middle level. They are also expected to deal with workforce and management problems.
2. In the present era of competition, optimum utilization of the resources with achieving higher productivity is essential for any industry to survive. Quality and cost controls are also other important factors which contribute to the day to day supervision issues.

COURSE OUT COMES

On successful completion of the course, the students will be able to:

Course Outcome		CL	Linked PO	Teaching Hrs
CO1	Interpret given organization structure, and acquire major management skills, familiarize with different leadership styles	***R/U/A***	2,8,9	**08**
CO2	List stages in product design, and explain different types of plant layout, Production modes and PPC functions	***R/U/A***	2,4	**08**
CO3	Explain material requirement planning and store keeping procedure and analyze importance of inventory control	***R/U/A***	2,4	**11**
CO4	Explain the need of Total Quality management and appreciate the usage of TQM tools in quality control	***R/U/A***	2,4	**09**
CO5	Explain the different types of Plant maintenance and measures and procedure observed in industry towards safety	***R/U/A***	2,5	**08**
CO6	Appreciate the social responsibilities of engineer and ways to protect our environment	***R/U/A***	2,6	**08**
			Total Sessions	**52**

Legend: R; Remember, U: Understand A: Application

COURSE-PO ATTAINMENT MATRIX

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
INDUSTRIAL MANAGEMENT	**0**	**03**	**00**	**02**	**01**	**01**	**00**	**01**	**01**	**00**

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.
Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.
If ≥40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3
If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2
If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1
If < 5% of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

COURSE CONTENT AND BLUE PRINT OF MARKS FOR SEE

Unit No	Unit Name	Hour	Questions to be set for SEE/MARKS			Marks Weightage	Weightage (%)
			R	U	A		
1	BASICS OF MANAGEMENT	08	05	05	10	20	13.79
2	PRODUCTION MANAGEMENT	08	05	05	10	20	13.79
3	MATERIALS MANAGEMENT	11	05	10	20	35	24.16
4	TOTAL QUALITY MANAGEMENT	09	05	05	20	30	20.68
5	PLANT MAINTENANCE AND INDUSTRIAL SAFETY	08	05	05	10	20	13.79
6	SOCIAL ISSUES AND THE ENVIRONMENT	08	05	05	10	20	13.79
	Total	52	30	35	80	145	100

Legend: R; Remember, U: Understand A: Application

UNIT I : BASICS OF MANAGEMENT 08Hrs

Management - Definition – Administration- Definition – Henry-Fayol's principles of management- Business Organisation-Types- Proprietorship-Partnership- Joint stock- Co-operative Society-Advantages and disadvantages -Functions of Management – Planning-Definition-Functions-Organisation-Definition- types of organisation –Line-Functional-Line &staff-advantages and disadvantages- Leadership -Types –Quality of good leader-Motivation - Maslow's Theory of Motivation -Hierarchy of needs- Communication - Process of Communication – Barriers for effective communication.

UNIT II : PRODUCTION MANAGEMENT 08Hrs

Concept of project work - Project planning -Market survey- Project capacity-selection of site for project- Plant layout-Types of Plant layout- Product design-Stages in product design-drawing-Specifications-Material requirement-operation-Planning-Production-definition-Job, Batch & Mass production with their advantages and disadvantages-Productivity-definition-factors to improve productivity- Production planning and Control (PPC)-definition-Functions of PPC- planning, routing, scheduling, dispatching and Inspection-Introduction to CPM and PERT –Comparision.

UNIT III : MATERIALS MANAGEMENT 11Hrs

Material management - definition, functions- Purchase - Objectives, different methods of purchasing -Purchase procedure-Comparative statement-purchase order-Tender-Types of tender- Storekeeping- classification of stores - Functions of store keeper. Store management-Bin Card - Material Issue Requisition- Material Returned Note- Store ledgers -Codification of stores-Inventory Management- Definition - functions of Inventory Control- Advantages of Inventory Control

Enterprise resource planning - concept, features and applications.- Material Requirement Planning (MRP)-concept, applications -Just in Time (JIT)-concept and benefits-Supply chain management-concept and benefits –FIFO(first in first out) concept-definition.

UNIT IV: TOTAL QUALITY MANAGEMENT 09 Hrs

Quality–Concept-Quality control- Definition - Factors affecting quality- Advantages of quality control –Inspection-Different types of inspection

Total Quality Management-Meaning- Principles of total quality management-PDCA cycles-Quality Circles-definition-Function.

TQM Tools- Flow charts, Control charts, Histograms, Pareto charts, Cause and effect diagram-5-S- Kaizen, and Six-sigma

Quality Certification Systems- ISO 9000 series quality standards, QS14000– ISO 9000, ISO 9001,ISO9002,ISO9003 & ISO 9004- ISO9000 quality certification procedure.

UNIT V: PLANT MAINTENANCE AND INDUSTRIAL SAFETY 08 Hrs

Plant maintenance-Definition -Types of maintenance-Preventive maintenance- Break down maintenance-Advantages and disadvantages- Total Productive Maintenance-Meaning-benefits of TPM -Tools of TPM- planned maintenance and predictive maintenance.

Industrial safety –Meaning - Accident- causes for accident- Direct and indirect losses due to an accident-Personal protective devices for preventions of accidents-Safety department- role of safety officer – safety supervisor -safety committee – Fire prevention and Protection- Fire triangle-principles of fire extinguishing- various classes of fire- A, B,C, D types of fire extinguishers

UNIT VI: SOCIAL ISSUES AND THE ENVIRONMENT 08 Hrs

Environment - Definition and scope-Solid waste management: causes, effects and control measures of municipal solid wastes (hospital wastes, hazardous wastes and e-wastes)- Water conservation and rain water harvesting. Climate change: global warming, acid rain, ozone layer depletion.-environment and human health-role of information technology in environment and human health

TEXT BOOKS AND REFERENCES

Sl.No.	Title of Books	Author	Publication
1.	Industrial Organization and Engineering Economics	T.R.Banga & S C Sharma	Khanna.Publishers
2.	Industrial management and organizational behavior	K.K.Ahuja	-
3	Industrial management and engineering economics	O.P.khanna	Khannapublishers
4.	Production and operations management	-Dr .K.Aswathappa and Dr.Sreedhar Bhatt	Himalaya publishers
5	Safety Management in Industry	Krishnan.N V	Jaico Publishing House, Bombay, 1997
6	Total Quality Management	S Raja Ram, Shivashankar	-
7	Project planning and control with PERT&CPM	By Dr.P.C. PUNMIA & K.K.KHANDELWAL	LP Publication, New Dhelli

LIST OF SOFTWARES/ LEARNING WEBSITES:

1. www.youtube.com/watch?v=SF53ZZsP4ik
2. www.youtube.com/watch?v=iPZlQ3Zx5zc

SPECIAL INSTRUCTIONAL STRATEGIES

UNIT NO	UNIT NAME	STARATEGIES
1	BASICS OF MANAGEMENT	Showing charts, presentations, Video movies
2	PRODUCTION MANAGEMENT	Presentations, Video movies, Expose to real life industries situation, industrial visits
3	MATERIALS MANAGEMENT	Discussions, real life industries situation, industrial visits. Expose to practiced procedures
4	TOTAL QUALITY MANAGEMENT	Teaching, Presentations, Industrial visits, movies.
5	PLANT MAINTENANCE AND INDUSTRIAL SAFETY	Industrial visits, movies
6	SOCIAL ISSUES AND THE ENVIRONMENT	Discussions, real life industries situation, industrial visits

SUGGESTED LIST OF STUDENT ACTIVITIES

Note: the following activities or similar activities for assessing CIE (IA) for 5 marks (Any one)

- Each student should do any one of the following type activity or similar activity related to the course and before take up, get it approved from concerned Teacher and HOD.
- Each student should conduct different activity and no repeating should occur

1	Each student will give an activity to prepare Comparative statement, Placing the purchase order with necessary terms and conditions
2	Given the data, prepare the scheduling using Gantt chart.
3	Each student will give an activity to visit local municipality garbarage plant, how the

	garbarage has been segregated. List the harm full effects of your local garbarage dump yard on the nearby environment
4	Identify any one product ,being manufactured in local industry, Study the process they are following for manufacturing the product, submit hand written report
5	Visit a nearby industry, make a report on Plant layout, type of production, quality system is put in practice and quality tools they are using in work place
6	Motivate student to take case study on plant maintenance of nearby industry, observe what type of maintenance they undertake in their industry.
7	Each student should prepare a detailed project report on selected product.

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE	IA	Students	Three IA tests(Average of three tests will be computed)	20	Blue books	1,2,3,4,5,6
				Student Activities	05	Activity sheets	
	SEE	End Exam		End of the course	100	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1, 2,3 Delivery of course
	End of Course Survey			End of the course		Questionnaire	1,2,3,4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

CIE- Continuous Internal Evaluation SEE- Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Note to IA verifier*: *The following documents to be verified by CIE verifier at the end of semester

1. Blue books (20 marks)
2. Student suggested activities report for 5 marks evaluated through appropriate rubrics.
3. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods

- **MODEL OF RUBRICS /CRITERIA FOR ASSESSING STUDENT ACTIVITY**

RUBRICS MODEL

RUBRICS FOR ACTIVITY(5 Marks)						
Dimension	**Unsatisfactory**	**Developing**	**Satisfactory**	**Good**	**Exemplary**	**Student Score**
	1	**2**	**3**	**4**	**5**	
Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collect much information; but very limited relate to the topic	Collects some basic information; most refer to the topic	Collects a great deal of information; all refer to the topic	Ex: 4
Fulfil team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties but unreliable.	Performs very little duties	Performs nearly all duties	Performs all duties of assigned team roles	5
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Normally does the assigned work	Always does the assigned work without having to be reminded.	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Talks good; but never show interest in listening others	Listens, but sometimes talk too much	Listens and speaks a fair amount	2
Average / Total marks=(4+5+3+2)/4=14/4=3.5=4						

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned faculty (Course Coordinator) for assessing the given activity.

MODEL QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks
Ex: I test/6 th weak of sem 10-11 Am	VSEM	**INDUSTRIAL MANAGEMENT**	20
	Year: 2016-17	Course code:15ME51T	

Name of Course coordinator : Topic: Units:1,2 **CO: 1,2**

Note: Answer all questions

Question no	Question	MARKS	CL	CO	PO
1	List the barriers for effective communication. OR List the advantages and limitations of planning.	5	R	1	2,9
2	Develop the line diagram to suit a Functional organisation for pharmaceutical industry.	5	A	1	2
3	Explain job production and mention its advantages and disadvantages OR Explain routing procedure	5	U	2	2
4	Identify the factors to be considered to improve productivity in an organisation.	5	A	2	2

MODEL QUESTION PAPER(SEE)

V Semester Diploma Examination

INDUSTRIAL MANAGEMENT

Time: **3 Hours**] [Max Marks**: 100**

Note: Answer any **SIX** from Part A and any **SEVEN** from Part B

Part A

6x5=30 marks

1. Define planning and mention objectives of planning
2. Explain briefly the process of communication
3. Define planning and mention the functions of planning
4. Explain batch production and mention its advantages and disadvantages
5. List the duties of purchasing officer
6. List the objectives of plant maintenance
7. Explain break down maintenance and mention its advantages and disadvantages
8. List the effects and control measure for global warming
9. Explain the factors affecting for climate change

Part B

1. Illustrate the business organisation and explain Proprietorship organisation.
2. What are the duties and responsibilities of chief inspector
3. Develop the specimen copy for preparation of comparative statement
4. List the applications of Material Requirement Planning (MRP)
5. Explain centralized stores and mention its advantages & disadvantages
6. Illustrate Histogram with graphical representation
7. Illustrate ISO 9000–Requirements and Benefits
8. Explain the duties, functions and responsibilities of plant maintenance department
9. What are the causes and effects of environmental pollution
10. a) Define quality control and mention the objectives of quality control
    b) Explain 5S house keeping

MODEL QUESTION BANK

V- Semester Diploma Examination

INDUSTRIAL MANAGEMENT

Note: *The paper setter is of liberty to set the questions on his/her desecration based on cognitive levels notified for that unit. They have to follow only blue print of SEE question paper format. The model question bank is only for reference to students/course coordinator to initiate the process of teaching-learning only.*

CO-1: Interpret given organization structure, and acquire major management skills, familiarize with different leadership styles.

Remember

1. List Henry Fayol's principles of management
2. List the types of Business Organization
3. Define sole proprietorship and list advantages and disadvantages of proprietorship.
4. List the applications of proprietorship
5. Define Partnership Organization and mention the applications of Partnership Organization
6. List the advantages and disadvantages of Partnership Organization
7. List the advantages and disadvantages of Joint Stock Company
8. List the advantages and disadvantages of Co-operative society
9. Define planning and mention objectives of planning
10. List the advantages and limitations of planning
11. Define organization and list the types of organization.
12. Define leadership and explain types of leaders
13. List the qualities of good leader
14. Define motivation and state Maslow's theory of motivation
15. Define communication and mention the elements of communication
16. What are the barriers for effective communication
17. What are the functions of management

Understanding

1. Explain management
2. Explain administration
3. Explain the formation of partnership and List the types of partners for Partnership Organization
4. Explain about Joint Stock company
5. Explain two types of Joint Stock Company a. Private limited company and b. private limited company
6. Explain Co-operative society and state the objectives of Co-operative society
7. Explain line organization and mention its advantages and limitations.
8. Explain functional organization and mention its advantages and limitations.

9. Explain Line & staff organization and mention its advantages and limitations.
10. Explain the process of communication

Application

1. Apply the reasons for Proprietorship organisation best suit for small business organisation.
2. Apply the reasons for partnership organisation best suit for small business organisation.
3. Identify the requirements to start - Joint stock organisation.
4. Select best - Co-operative Society organisation for societal needs
5. Develop Line organisation with its advantages.
6. Develop Line &staff organisation with its advantages
7. Develop Functional organisation with its advantages

CO-2: List stages in product design, and explain different types of plant layout, Production modes and PPC functions

Remember

1. Define production and explain the needs for production
2. Define productivity
3. List the factors to improve productivity
4. Define production-planning and control and mention its needs
5. Define planning and mention the functions of planning
6. Define scheduling and explain master schedule
7. Define scheduling and explain manufacturing schedule
8. Define despatching and mention its types
9. List the functions of despatching
10. Define inspection and mention the objects of inspection
11. What are the inspection standards
12. List the functions of inspection department
13. Which are the types of Inspection
14. Define PERT & CPM
15. What are the duties and responsibilities of chief inspector

Understanding

1. Explain job production and mention its advantages and disadvantages.
2. Explain batch production and mention its advantages and disadvantages.
3. Explain mass production and mention its advantages and disadvantages.
4. Explain routing.
5. Explain centralised despatching.
6. Explain decentralised despatching.
7. Explain centralised inspection and mention its advantages and disadvantages
8. Explain Floor Inspection and mention its advantages and disadvantages
9. Explain Patrolling Inspection and mention its advantages and disadvantages

10. Explain the role and application of PERT and CPM for project scheduling

Application

1. Identify the factors for routing
2. Select the functions of PPC
3. Select the functions of despatching
4. Identify the factors affecting the productivity.

CO-3: Explain material requirement planning and store keeping procedure and analyze importance of inventory control

1. **Remember**
2. Define material management and mention its functions
3. Define purchase and mention the objects of purchasing department
4. What are the duties of purchasing officer
5. Define the terms and forms used in purchase department
6. Define tender
7. Define storekeeping and explain the purpose of store keeping
8. List the classifications of store
9. Define bin card and write the specimen copy of bin card
10. Define store ledgers and write the codification of stores
11. List the advantages of good store keeping
12. What are the advantages and disadvantages of inventory control
13. List the benefits of Just in Time (JIT)
14. What are the benefits of Supply chain management

Understanding

1. Explain the different methods of purchasing
2. Explain different types of tender
3. Explain centralized stores and mention its advantages & disadvantages
4. Explain decentralized stores and mention its advantages & disadvantages
5. Explain the methods of storing
6. Explain material return note and write the specimen copy of material return note
7. Explain stock or inventory control and mention the functions of inventory control
8. Explain the steps in inventory control
9. Infer the concept and features of Enterprise resource planning
10. Illustrate the concept of Material Requirement Planning (MRP)
11. Explain the concept Just in Time (JIT)
12. Explain the concept of Supply chain management
13. Explain First in First out Method
14. Outline the advantages AND disadvantages of FIFO

Application

1. Identify the functions of purchasing department
2. Select the procedure for purchasing the materials
3. Develop the purchase requisition format
4. Develop the specimen copy for preparation of comparative statement
5. Develop the Performa of purchase order
6. Construct the layout of stores organization and list the duties of store keeper
7. Develop the specimen copy of materials issue requisition form
8. Identify the applications of Enterprise resource planning
9. Identify the applications of Material Requirement Planning (MRP)

CO-4: Explain the need of Total Quality management and appreciate the usage of TQM tools in quality control

Remember

1. Define quality and list the factors affecting quality
2. Define quality control and mention the objectives of quality control
3. List the advantages of quality control
4. Define Total quality management
5. Define the principles of Total quality management
6. Define quality circle and mention its functions
7. list different types of control charts
8. Define flow charts
9. What are the benefits in implementing 5S
10. List the benefits of ISO 14000

Understanding

1. Explain continuous process improvement in TQM
2. Explain basic concepts of TQM
3. Explain the benefits of TQM
4. Explain about PDCA cycles
5. Explain about control charts
6. Explain 5S house keeping
7. Explain Kaizen principle
8. Explain about Six Sigma concepts
9. Illustrate the Need for ISO 9000- ISO 9000-2000 Quality System
10. Explain about ISO 9000 Family

Application

1. Identify the functions of quality control department
2. Develop Histogram with graphical representation
3. Construct Pareto charts with graphical representation
4. Construct and Illustrate the Cause-and-Effect Diagram

5. Identify QS 9000 – ISO 14000 –Requirements and Benefits
6. Identify the Obstacles associated with TQM Implementation

CO-5: Explain the different types of Plant maintenance and measures and procedure observed in industry towards safety

1. **Remember**

2. Define plant maintenance and explain its needs
3. List the objectives of plant maintenance
4. List the types of maintenance
5. List personal protective devices for preventions of accidents
6. Define safety department and mention the objectives of safety department

Understanding

1. Explain Preventive maintenance
2. Explain Corrective maintenance
3. Explain Predictive maintenance
4. Explain scheduled maintenance
5. Explain plant maintenance schedule
6. Explain break down maintenance and mention its advantages and disadvantages
7. Explain Total Productive Maintenance
8. Explain planned maintenance
9. Explain industrial safety and mention the needs and importance of safety
10. Explain industrial accidents and accident sequences
11. Summarise the Direct and indirect losses due to an accident
12. Explain the role of safety officer , safety supervisor and safety committee
13. Explain Fire prevention and Protection
14. Explain detection and prevention of fire, fire alarms and fire extinguisher

Application

1. Identify the duties, functions and responsibilities of plant maintenance department
2. Select the benefits of Total Productive Maintenance
3. Develop the Organization Structure for TPM Implementation.
4. Identify the types of fire and construct fire triangle.
5. Identify the causes for accident

CO-6: Appreciate the social responsibilities of engineer and ways to protect our environment

1. **Remember**

1. Define environment and explain the scope of environment
2. What are the effects of municipal solid wastes.
3. List the advantages of rain water harvesting.

4. Define climate change.
5. List the effects and control measures for global warming.
6. List the effects and control measures of acid rain.
7. List the effects and control measures for ozone layer depletion.
8. Relate the role of information technology in environment and human health.

Understanding

1. Explain Solid waste management.
2. Explain the factors affecting for climate change.
3. Explain global warming.
4. Explain acid rain.
5. Explain ozone layer depletion.
6. Interpret about environment and human health.

Application

1. Identify the causes and effects of environmental pollution.
2. Plan the control measures of municipal solid wastes.
3. Identify the causes of municipal solid wastes
4. Making use of rain water harvesting technique plan water conservation for future.