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PART – B

(5×16=80 Marks)

11. a) i) With the suitable example, explain various steps in maintenance planning. (12)
ii) List out the maintenance functions and activities. (4)
(OR)
- b) i) What are the basic elements of reliability and explain the factors to be considered in designing for reliability? (8)
ii) With an example, discuss maintenance economics. (8)
12. a) i) Explain various types of maintenance approach with neat sketch. (8)
ii) List and explain the sequence activities carried out in machine shut down operation. (8)
(OR)
- b) i) Explain various stages involved in implementation of TPM. (8)
ii) Explain the different types of automatic lubrication system with suitable sketch. (8)
13. a) i) What is condition monitoring? Explain condition monitoring. (8)
ii) Explain briefly about the objective of cost estimating in condition monitoring. (8)
(OR)
- b) Explain temperature sensitive tapes, pistol thermometers and wear debris analysis. (16)
14. a) Explain repair methods of the following (i) Slide ways (ii) Spindles, (iii) Lead screws and (iv) Bearings. (16)
(OR)
- b) What is failure analysis? Explain failure and their development. (16)
15. a) Explain the maintenance procedure of chain block, conveyor and trolley for material handling system. (16)
(OR)
- b) With the case example, explain the use of computer in maintenance. (16)



Reg. No. :

Question Paper Code : 53289

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Seventh/Eighth Semester

Mechanical Engineering

ME 6012 — MAINTENANCE ENGINEERING

(Common to Mechanical and Automation Engineering/Production Engineering)

(Regulation 2013)

(Also common to PTME 6012 — Maintenance Engineering for B.E. (Part-Time)
Seventh Semester — Mechanical Engineering — Regulation 2014)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the objectives of maintenance?
2. What is meant by maintenance economics?
3. Give the merits of condition based maintenance.
4. What is TPM? Give the benefits.
5. List the advantages of condition monitoring.
6. How to analyze the vibration?
7. Define failure analysis.
8. State the purpose of bearing in a machine.
9. State the benefits of proper maintenance of material handling equipments.
10. What is work permit?

PART B — (5 × 13 = 65 marks)

11. (a) (i) What are the important factors to be considered in maintenance planning? (7)
- (ii) Explain about the reliability in maintenance in detail. (6)

Or

- (b) Explain the terms MTBS, MTBF, MTTF, MTTR and FIT. (13)

12. (a) What do you understand by maintenance categories? Explain common types and explain. (13)

Or

- (b) Discuss clearly the process steps and features of working of TPM in Indian industries. (13)
13. (a) What is condition monitoring? Explain. What types of condition monitoring are normally used in industry and mention its advantages and disadvantages. (13)

Or

- (b) What is thermal monitoring and how thermal monitoring are used in industries? Explain about thermography in detail. (13)
14. (a) Explain about the repair method for spindles. (13)

Or

- (b) Name the various techniques for failure and explain the different failure analysis. (13)
15. (a) Discuss briefly about the maintenance methods for conveyors. (13)

Or

- (b) Explain about the job cards and job card procedures in detail. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Explain about the tasks, functions, types of maintenance followed in an industry.

Or

- (b) Discuss in detail about the maintenance process for a equipment used for moving loads.



Reg. No. :

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Question Paper Code : 50834

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Seventh/Eighth Semester
Mechanical Engineering
ME 6012 : MAINTENANCE ENGINEERING
(Common to Mechanical and Automation Engineering/Production Engineering)
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What is the difference between maintenance and maintainability ?
2. Write the principles of reliability centered maintenance.
3. What are the advantages of preventive maintenance ?
4. What are the lubricant and wear particle tests generally carried out ?
5. What are the condition monitoring techniques generally adapted ?
6. List any four equipments used for temperature monitoring.
7. What are the geometric properties that are checked for slide ways ?
8. Define fault tree diagram.
9. Write the major stages in preventive maintenance of material handling equipments.
10. What are the functions of CMMS ?

PART – B

(5×16=80 Marks)

11. a) i) Explain the various costs associated with maintenance. (8)
ii) What are important factors to be considered in maintenance planning ? (8)

(OR)

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- b) i) Briefly explain the structure of maintenance organization. (8)
ii) Briefly explain MTBF and MTTR. (8)
12. a) Explain various maintenance categories with their merits and demerits. (16)
(OR)
b) i) Briefly explain TPM. (8)
ii) Briefly explain methods of lubrication. (8)
13. a) Explain the various levels/methods of condition monitoring. (16)
(OR)
b) i) Briefly explain the on-line and off-line condition monitoring system. (8)
ii) Briefly explain the basic steps in condition monitoring. (8)
14. a) Briefly explain the following :
i) Failed part analysis. (8)
ii) Any 4 approaches for risk management. (8)
(OR)
b) Briefly explain the following :
i) Repair methods of machine guideways. (8)
ii) FMEA and RPN (8)
15. a) Explain the work order flow diagram. (16)
(OR)
b) Explain the maintenance strategies for
i) Cranes (8)
ii) Conveyors. (8)

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Reg. No. :

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Question Paper Code : 20792

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Seventh/Eighth Semester

Mechanical Engineering

ME 6012 — MAINTENANCE ENGINEERING

(Common to Mechanical and Automation Engineering, Production Engineering)

(Regulations 2013)

(Also Common to PTME 6012 – Maintenance Engineering for B.E. Part Time – Seventh Semester – Mechanical Engineering – Regulations 2014)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List any two benefits of Sound maintenance system.
2. Differentiate between inherent reliability and achievable reliability.
3. State the limitations of breakdown maintenance.
4. Define maintenance scheduling.
5. State the advantages and disadvantages of condition monitoring.
6. List any three typical tests conducted on lubricating oil.
7. Mention the common two factors contributing to gear tooth breakage.
8. Define Root cause analysis.
9. What is job card?
10. State the major phases in preventive maintenance of material handling equipments.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the principle of planned maintenance. (13)
- Or
- (b) Discuss about any two types of maintenance organization model with neat sketch. (13)
12. (a) Describe with neat sketch about various types of maintenance approach. (13)
- Or
- (b) Explain the various roles of stakeholders in maintenance scheduling. (13)
13. (a) In detail discuss the process involved in condition monitoring. (13)
- Or
- (b) With neat flow chart, Explain on-load and off-load testing used in condition monitoring. (13)
14. (a) Explain with neat sketch about fault tree analysis. (13)
- Or
- (b) Describe about various steps involved in Failure Mode and Effect Analysis (FMEA). (13)
15. (a) Explain about a typical work order flow diagram. (13)
- Or
- (b) Explain the general structure of computerized maintenance management system. (13)

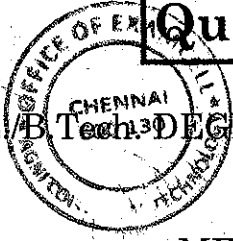
PART C — (1 × 15 = 15 marks)

16. (a) Explain in detail about Logical fault location method and Sequential fault location method. (15)
- Or
- (b) Explain the maintenance procedure for overhead crane, hydraulic lift and conveyor. (15)



Reg. No. :

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Question Paper Code : 91824

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Seventh/Eighth Semester

Mechanical Engineering

ME 6012 : MAINTENANCE ENGINEERING

(Common to Mechanical Engineering/Mechanical and Automation Engineering/
Production Engineering)

(Regulations 2013)

Also Common to : PTME 6012 – Maintenance Engineering for B.E. (Part-Time) –
Seventh Semester – Mechanical Engineering
(Regulations – 2014)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What are the basic principles of Maintenance Engineering ?
2. How to improve the Reliability of a Machine which is used for a long time ?
3. What is known as preventive maintenance ?
4. Why lubrication is required ?
5. How condition monitoring is useful ?
6. What is known as Pistol Thermometers ?
7. Mention any two repair methods for slide ways.
8. What are known as Logical fault location methods ?
9. What for Equipment Records can be used ?
10. State the use of computers in Maintenance Engineering ?

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PART – B

(5×13=65 Marks)

11. a) Using the objectives and principles how to plan for maintenance activities ?
(OR)
b) Compare Maintenance Economics for different types of maintenance.
12. a) How Lubrication is associated with Maintenance engineering ?
(OR)
b) Write all about the principles and methods of lubrication.
13. a) How condition monitoring is related with overall expenditure for maintenance in an Industry ?
(OR)
b) How to reduce Cost of maintenance ?
14. a) Explain repair methods for spindles and gears ?
(OR)
b) Write in detail about fault location methods.
15. a) Name the different types of material handling equipments and explain about their repair methods.
(OR)
b) What are known as Job Order Systems and how they are useful ?

PART – C

(1×15=15 Marks)

16. a) How preventive maintenance engineering and condition monitoring are related ?
(OR)
b) Write about overall Successful coordination and management of various maintenance activities in an industry ?