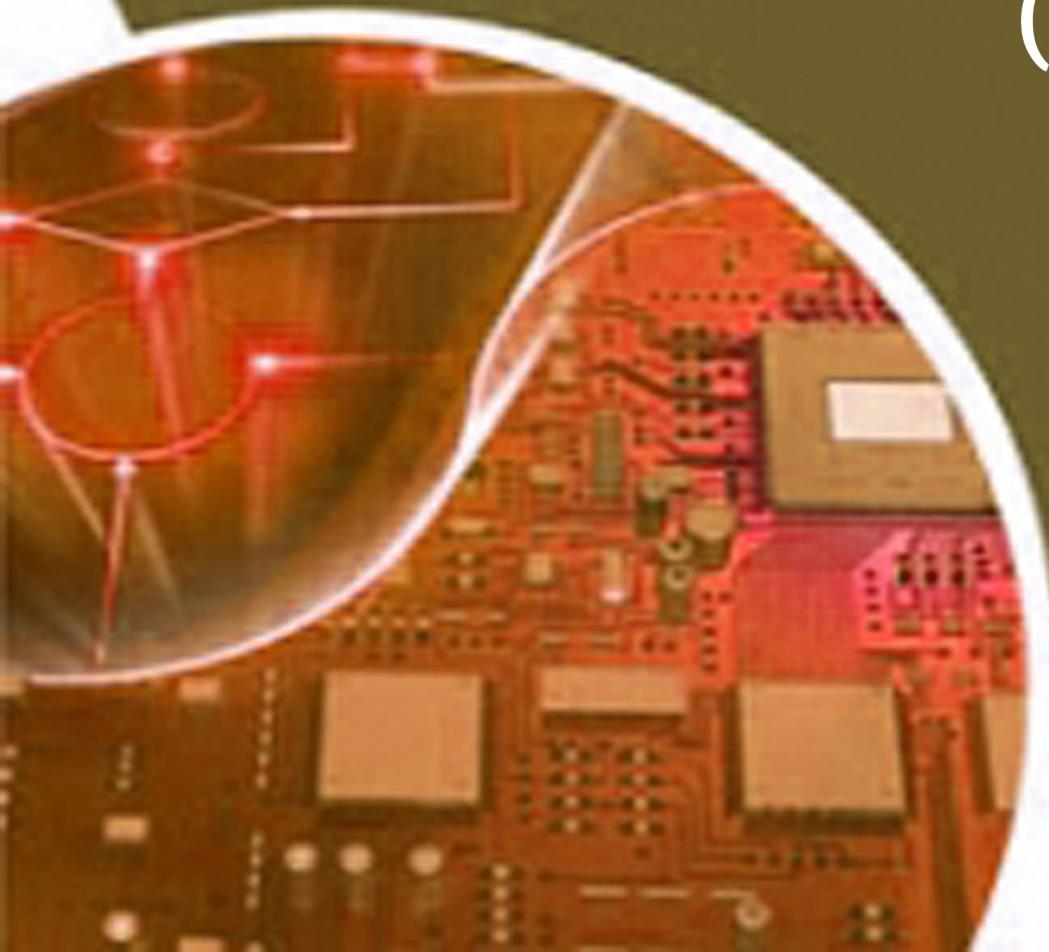


RGPV
7th & 8th
Semester
QUESTION PAPERS

Bachelor of Engineering
Mechanical Engineering
(2009-2014)



ME-701(C)/ AU-701(B)
B.E. VII Semester
Examination, Dccember:2013
Industrial Robotics
Time : Three hour
Maximum Marks : 70

Note: Attempt any live questions. All questions carry equal marks. Draw neat sketches wherever required.

- 1 . a) Define "Robot". Discuss the basic structure of robot in detail.
b) Describe the classification of robot.
2. a) Discuss various types of motions in robot.
b) State various drive systems used in robot. Discuss various characteristics of Electric motors.
3. a) Explain important design considerations for robot grippers.
b) Discuss various types of end-effectors used in robot for different tasks.
4. Explain the following:
 - i) Vision sensor,
 - ii) Voice sensor.
 - iii) Proximity sensor.b) Write a short note on " Image processing and object recognition" in robot.
5. a) Describe various types of progranuning methods used in robot.
b) State the features of any three selected robot languages.
6. a) Explain piezoelectric sensor, state its properties and applications.
b) Explain various safety basis involve in robots.
7. a) Discuss acceptance rule for industrial robots.
b) Define the term "Encoder" and "Compliance".
8. Write short technical note on following (Any two)
 - a) Work cycle time analysis for robot .
 - b) Economic considerations for robot.
 - c) Current and future applications of robot.
 - d) Robotic sottwares.

ME 701(C)
B.E. VII Semester
Examination, December 2014
Industrial Robotics
Time : Three Hours
Maximum Marks :70

Note: Attempt any live questions with internal choices.

1. a) Explain the types of motion for industrial robot.
- b) What is an industrial robot? Explain classification of industrial robots.

OR

2. a) Discuss the difference between polar arm and articulated arm configurations.
- b) What is repeatability? Discuss about accuracy and resolution.
3. a) Explain classification of End effectors.
- b) Explain the significance of point, line and surface contact in the context of gripper design.

OR

4. Define term end effectors? What factors should be embodied in the design of end effectors for use on industrial robots.
- b) Explain robot drive system and its types.
5. a) Explain various types of sensor used in industrial robots.
- b) Explain in brief machine vision

OR

6. a) Explain proximity and range sensors in detail.
- b) What are the characteristics one should check while selecting a sensor?
7. a) Distinguish between VAL and platy robot programming languages.
- b) State various robot programming languages. Discuss them in brief.

OR

8. a) What is program algorithm? Differentiate between walk through and lead through programming.
- b) Discuss with help of an example basic characteristic of robot level languages.
9. a) Discuss in brief the various economic considerations in Robotics.
- b) What is the importance of work envelope when considering robot design?

OR

10. a) Briefly discuss the mode of programming industrial robots from point of view of safety.
- b) What is effectiveness of robots? Suggest six reasons by which the introduction of robots into the workplace may be justified from the economical point of view.

Roll No

ME/AU - 701 (D)

B.E. VII Semester

Examination, December 2012

Work Study & Ergonomics

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks :35

Note: Attempt all the five questions.

All questions have internal choice. Attempt any two parts out of three parts given in each question.

1. (a) What is the purpose of work study? Describe the procedure for carrying out a method study. 10

(b) Name the various recording techniques used in method study. Given the following information construct a multiple activity chart for the machining operation.

The operator engaged on the machine performs the following operations :

(i) Pick up the job, place it between the jaws of a hydraulic vice (0.2 min).

(ii) Make the switch 'ON' to tightly hold the part (0.8 min)

(iii) Make the switch 'ON' to start automatic cycle of the operation (0.08 min)

(iv) Machining of the part on auto cycle (1.5 min).

(v) Wait till the vice opens automatically (0.08 min)

(vi) Pick up the machined job from the vice (0.05 min)

(vii) Keep it on the tray (0.05 min)

Comment on the utility of the chart. 10

- (c) What are cycle graphs and Chrono cycle graphs? Under what situations they are used? Explain the procedure of conducting a chrono cycle graph study. 10

2. (a) How is a job selected for time study? Why is it necessary to break job into elements? How does one determine the number of cycles to be timed? 10

- (b) The following data refers to the study conducted for an operation. Table shows actual time for elements in minutes.

Cycle	1	2	3	4	5
Elements					
1	2.5	2.1	2.2	5.4	2.5
2	6.2	6.00	6.1	5.9	5.9
3	2.3	2.0	2.1	2.1	2.2
4	2.4	2.1	2.8	3.0	2.3

- (i) Element 2 is a machine element.
 (ii) Consider the observations as abnormal and delete the same if they are more than 25% of average time of that element.
 (iii) Take performance rating as 120
 (iv) Take following allowances.

Personal allowance : 30 minutes in a shift of 8 hrs,
 fatigue allowance = 15%, contingency allowance = 2% . Estimate the standard time of operation and production per 8 hrs shift. 10

- (c) Explain the steps in Work Sampling Study. What are its merits and limitations? Describe the situations where such a study is useful. 10

3. (a) What is job evaluation? What are its objectives? Describe any two methods of job evaluation and compare them. 10
- (b) What are incentives? Name the different types of incentives. Explain Merrick's differential piece rate system. 10
- (c) How can standard time for a job or an operation be established with the help of predetermined motion time analysis? Explain the different types of predetermined motion time systems. 10
4. (a) Explain the term 'Ergonomics'. Also state its objectives and advantages. 10
- (b) What do you understand by 'man - machine system'? How are man - machine systems classified? 10
- (c) What is information theory? Explain the factors that affect information reception and processing. 10
5. (a) Define anthropometry and explain its importance. 10
- (b) From anthropometric considerations, how will you arrive at the suitable work surface for (i) Seated (ii) Standing operations. 10
- (c) What are visual displays? Explain general principles of auditory and tactual displays. 10

Roll No

ME/AU - 701(D)
B.E. VII Semester
Examination, December 2013
Work Study & Ergonomics

Time : Three Hours

Maximum Marks : 70

Note: All questions carry equal marks.

1. a) Write in brief scope and purpose of work study. Discuss various steps to carry out work study project.
- b) "Flow Diagrams are drawn to support flow process charts" Explain with suitable examples.

OR

2. a) Write merits and demerits of travel charts over string diagrams.
- b) Discuss principles of motion economy applicable to use of Human Body.
3. a) "What do you understand by Standard time?" Why it is necessary to rate the operator? Discuss.
- b) Write in brief the procedure of work-sampling? Write merits and demerits of work-sampling over stop-watch time study.

OR

4. a) Explain performance Rating. Discuss any one method of performance rating.

- b) How will you estimated standard time by work sampling?
Explain.
5. a) Write in brief the importance of Job-evaluation.
Differentiate between Job description and job specification.
- b) Write merits and demerits of Merrick's differential piece rate system over Taylor's differential piece rate system:

OR

6. Write brief note on any two of the following:
- a) Gantt incentive plan
- b) Predetermined motion time system.
- c) Therbligs.
- d) Work-Factor System. §
- e) MOST.
7. a) "Ergonomics is a Multidisciplinary subject". Discuss.
- b) Compare Relative capabilities of Human being over Machines.

OR

8. a) Discuss different types of Man-Machine systems.
- b) Explain how information is received and processed by Human Body.
9. a) What do you Know about displays? Explain various types of displays used in Practice.
- b) What is the importance of warning signals? Explain.
Differentiate between factorial and graphic displays.

OR

10. a) What are the general principles of auditory and tacheal displays? Explain
- b) Differentiate between indicators and displays with suitable example.

ME - 701(D)
B.E. VII Semester
Examination, December 2014
Work Study & Ergonomics
Time : Three Hours
Maximum Marks : 70

Note: Attempt any one question in each unit. All questions carry equal marks.

Unit - I

1. What are the objectives, significance, and applications of Work Study? Discuss briefly.

OR

2. Describe various recording techniques in Method Study. Explain in brief.

Unit - II

3. Discuss the criteria in selection of the task for conducting time study,

- a) When such study has already been carried out earlier.
- b) When no time study has been conducted earlier.

OR

4. In a time study for a job done by a worker whose rating is 90, the data are as follows:

Observed time = 20 minutes, Personal needs allowances = 4% of Basic time,
Fatigue allowance = 2.5% of Basic time, Contingency work allowance = 2% of
Basic time, Contingency delay allowance = 1% of Basic time. Find:

- i) Basic time
- ii) Work content and
- iii) Standard time

Unit - III

5. "Incentives are necessary for smooth and efficient running of a factory". In this context discuss the significance and relevance of Incentive schemes.

OR

6. Explain the method of job evaluation with the help of suitable example.

Unit - IV

7. Discuss the ergonomic considerations for the design of work place layout.

OR

8. What do you understand by Man-Machine system? Explain its characteristics.

Unit - V

9. What do you understand by 'display' and hence describe various types of visual display and visual indicators.

OR

10. What is importance of warning signals; factorial and graphic display?

Roll No

AU/ME - 702 (A)

B.E. VII Semester

Examination, December 2012

Renewable Energy System

Time : Three Hours

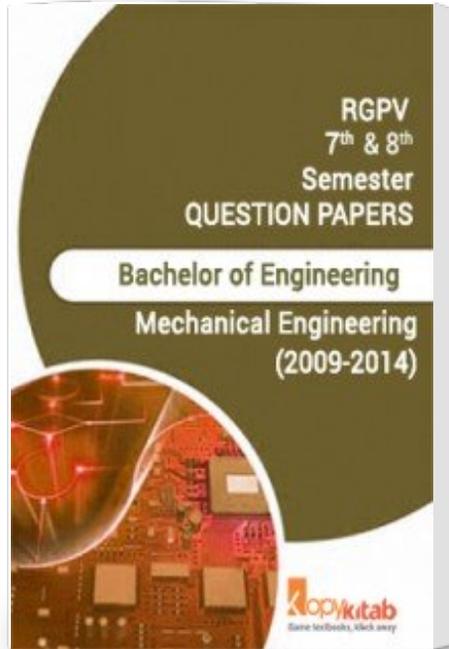
Maximum Marks : 100

Minimum Pass Marks :35

Note: Attempt any five questions out of eight.
All questions carry equal marks.

- I. (a) Estimate the rate at which sun emits energy. What fraction of this energy is intercepted by the earth and what is the amount intercepted.
(b) What is a pyranometer. Explain the working principle of it with the help of a neat sketch.
- II. (a) What are the main components of flat plate solar collector, Explain the functions of each.
(b) What are the main application of solar air heater. Explain one of them in detail.
- III. What do you understand by wind energy. How are wind turbines classified. Describe a horizontal axis wind energy conversion system in detail.

RGPV QUESTION PAPERS 4th Year Mechanical Engineering (2009-2014)



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