



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

School of Metal Construction Skills
Session: 2021-22 (Summer Semester)
B. Voc. Program, 5th Semester,
2nd In-Sem. Examination

Course Code: MCS1501

Course Name: Advanced CNC laser/ punching / bending

Time: 1 Hour

Max. Marks: 20

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 Questions. Each question carries 1 Mark.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

Q.1 G00 code for_____.

- a) Circular interpolation CW
- b) Circular interpolation CCW
- c) Rapid Traverse
- d) Linear interpolation.

Q.2 In CNC Milling 'M08' code use for _____.

- a) Coolant on- mist coolant/ coolant thru spindle
- b) Coolant on- flood coolant
- c) Coolant off
- d) None of the above

Q.3 G91 Code use for_____.

- a) Increment command
- b) Absolute command
- c) Return to initial point in canned cycle
- d) Boring cycle

Q.4 G41 Code use for_____.

- a) Cutter compensation left
- b) Cutter compensation right
- c) Cutter compensation off
- d) None of the above



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Q.5 M30 code use for _____.

- a) Spindle off
- b) Spindle on
- c) End of program (reset)
- d) Return to origin

Section – B

03X02 = 06 Marks

Q.6 Write down the syntax of sub program call and sub program end.

Q.7 Write down the syntax of a clock wise & counter clock wise circle.

Q.8 What do you mean by NC machine or CNC Machine?

Section – C

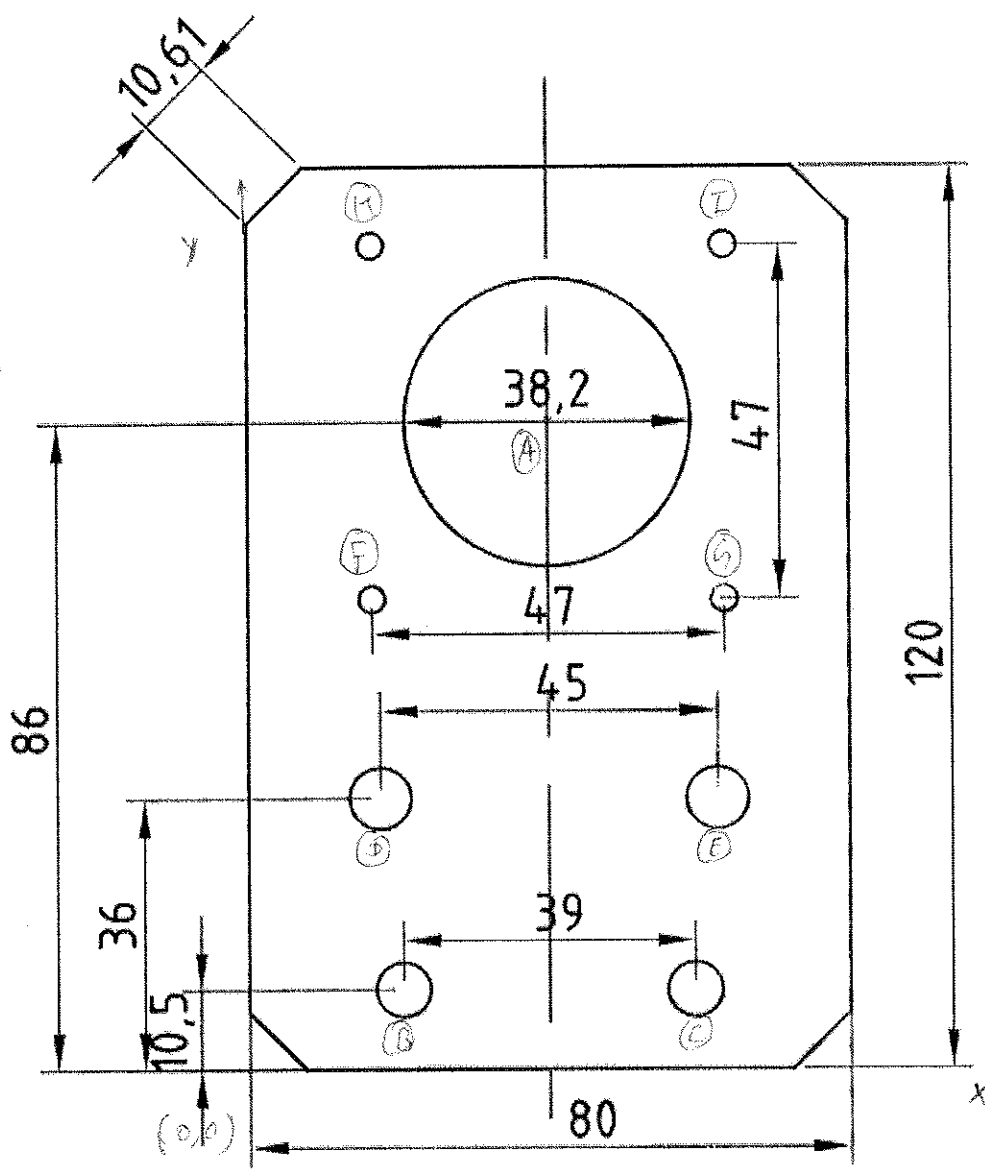
03X03 = 09 Marks

Q.9 Explain the given G code and M code for CNC Plasma.

- | | |
|----------|---------|
| i) M02 | iv) G21 |
| ii) M08 | v) G03 |
| iii) M07 | vi) G99 |

Q.10 Write down the coordinates of given drawing 1 (a to i).

Q.11 Write a CNC Plasma program of outer profile and circle of dia. 38.2 for given drawing 1.



Drawing 1





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Section – A

05X01 = 05 Marks

Q.1 G00 code for_____.

- i) Circular interpolation CW
- ii) Circular interpolation CCW
- iii) Rapid Traverse**
- iv) Linear interpolation.

Q.2 In CNC Milling 'M08' code use for _____.

- i) Coolant on- mist coolant/ coolant thru spindle
- ii) Coolant on- flood coolant**
- iii) Coolant off
- iv) None of the above

Q.3 G91 Code use for_____.

- i) Increment command**
- ii) Absolute command
- iii) Return to initial point in canned cycle
- iv) Boring cycle

Q.4 G41 Code use for_____.

- i) Cutter compensation left**
- ii) Cutter compensation right
- iii) Cutter compensation off
- iv) None of the above

Q.5 M30 code use for_____.

- i) Spindle off



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- ii) Spindle on
- iii) End of program (reset)
- iv) Return to origin

Section – B

03X02 = 06 Marks

Q.6 Write down the syntax of sub program call and sub program end.

Ans: `M98 P... L...`

P – program number being called.

L – number of repetitions subprogram will be called.

As the program being called (Subprogram) must be in program list and subprogram must end with M99.

Q.7 Write down the syntax of a clock wise & counter clock wise circle.

Ans: Circular interpolation at a given feedrate.

G02 Clockwise arc motion at feedrate.

G03 Counterclockwise arc motion at feedrate.

The clockwise direction is determined by viewing the arc from the positive side of a vector normal to the arc plane.

Like the G01 command, G02 and G03 require a feedrate (F) as well as destination (or distance) coordinates (X, Y, and/or Z). The feedrate will default to the current feedrate if it has been commanded previously in the program. For full circles, the X, Y and Z can be omitted (see I, J, K Method below).

The arc must lie parallel to a plane defined by two axes of machine motion. This plane must be set (usually in the program header) by G17, G18, G19.

Q.8 What do you mean by NC machine or CNC Machine?

Ans: The comparison of NC and CNC machine are:

- NC stands for Numerical Control whereas CNC stands for Computer Numerical Control.
- In NC Machine the programs are fed into the punch cards. But in CNC machine the programs are fed directly into the computer with the help of a small keyboard similar to our traditional keyboard.
- In NC machine if an error occurs in the program than its debugging and modification is not easy. In CNC machine the debugging and modification is very easy.
- High skilled operator is required to operate the NC machine whereas to operate a CNC machine, a semiskilled operator may work.
- The cost of the NC machine is less as compared with the computer control machines.
- The maintenance cost of NC is less whereas it is costly in the case of CNC machine.
- No programs can be stored in the NC machine. In CNC machine, numbers of programs can be stored and can be used again and again for the production.
- The accuracy of the NC is less as compared with the CNC.
- In NC machine the execution of the job takes more time but the CNC machine executes the job without taking much time.
- NC cannot be run continuously for 24 hours but CNC machine can be run for 24 hours continuously.

Section – C

Q.9 Explain the given G code and M code for CNC Plasma.

- | | |
|--------------------------------|--|
| i) M02 = Program End | iv) G21 = Metric unit |
| ii) M08 = Stop cutting cycle | v) G03 = anticlockwise arc cutting |
| iii) M07 = start cutting cycle | vi) G99 = rotation, proportion, mirror image |

Q.10 Write down the coordinates of given drawing 1 (a to i).

Ans:

A = (40,86)

B = (20.5,10.5)

C = (59.5,10.5)

D = (17.5,36)

E = (62.5,36)

F = (16.5,62.5)

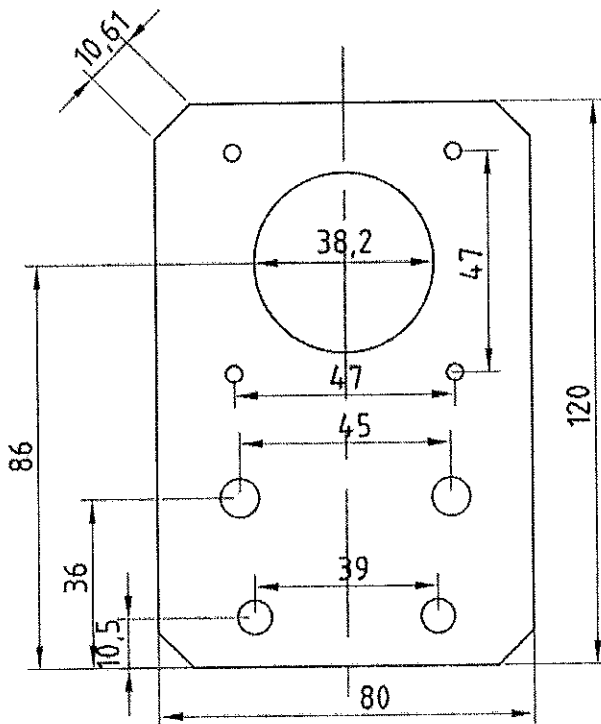
G = (63.5,62.5)

H = (16.5,109.5)

I = (63.5,109.5)

Q.11 Write a CNC Plasma program of outer profile and circle of dia. 38.2 for given drawing

1.



Ans:

G92 X0 Y0;

G91;

G21;



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G00 X20.9 Y86;

G41;

M07;

G02 X0 Y0 I19.1 J0;

M08;

G40;

G00 X-20.9 Y-86

G41;

M07;

G01 X0 Y120;

G01 X80 Y0;

G01 X0 Y-120;

G01 X-80 Y0;

M08

G40;

M02;



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Registration No.:

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Session: 2021-22 (Summer Semester)
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Course Code: MCS1502

Time: 1 Hour

Course Name: Robot Welding Programing

Max. Marks: 20

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 Questions. Each question carries 1 Mark.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

Q1. A Robot is a

- a) Programmable
- b) Both (A) and (B)
- c) multi-functional manipulator
- d) None of the above

Q.2 The main objective(s) of Industrial robot is to

- a) To minimize the labor requirement
- b) To enhance the life of production machines
- c) To increase productivity
- d) All of the above

Q.3 Match the following

Robot part	Function
a. Manipulator arm	1. For holding a piece or tool
b. Controllers	2. Move the manipulator arm and end effector
c. Drives	3. Number of degrees of freedom of movement
d. Gripper	4. Delivers commands to the actuators

- a) a-1, b-4, c-2, d-3
- b) a-3, b-4, c-2, d-1
- c) a-3, b-2, c-4, d-1
- d) a-4, b-3, c-2, d-1

Q.4 Drives are also known as

- a) Actuators
- b) Sensors
- c) Controller
- d) Manipulator

Q.5 Which of the following work is done by General purpose robot?

- a) Part picking
- b) Spray painting
- c) Welding
- d) All of the above



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Section – B

03X02 = 06 Marks

- Q.6 What are the coordinate systems use in robot?
Q.7 List out Major components of robot.
Q.8 Draw a block diagram of robot.

Section – C

03X03 = 09 Marks

- Q.9 How to create a new program?
Q.10 Explain this program line
 moveJ * v1000 z10 tool0
Q.11 What are the important specification you look in a robot?

Section – B

03X02 = 06 Marks

Q.6 What are the coordinate system use in robot?

Ans: there are four coordinate system

- a. World coordinate
- b. Base coordinate
- c. Tool coordinate
- d. Work object coordinate.

Q.7 List out Major components of robot.

Ans:

MAJOR COMPONENTS OF ROBOT

Manipulator (body of robot)

Controller (computer +drives)

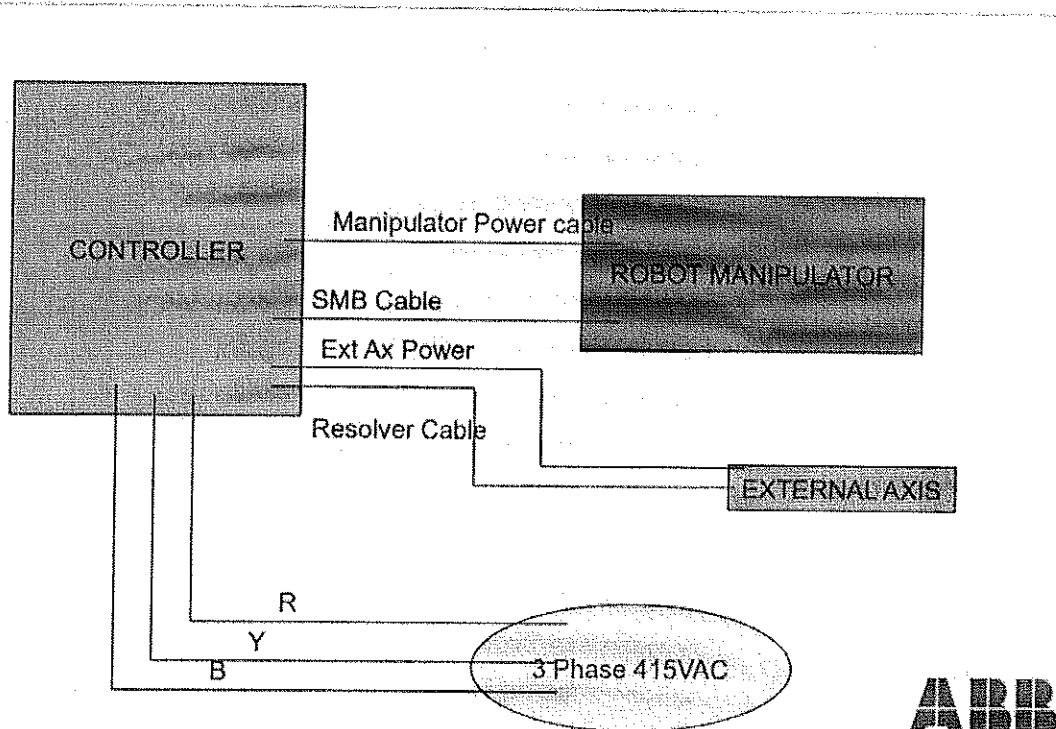
End-effector (tool)

Man Machine Interface (Teach Pendant/Lapt op)

Q.8 Draw a block diagram of robot.

Ans:

Block Diagram of Robot



Section – C

03X03 = 09 Marks



Q.9 How to create a new program?

Ans:

Tap to ABB main

Tap on program editor

Select Robot Task

Tap New.

Give your program a name

Tap ok

Q.10 Explain this program line

`moveJ * v1000 z10 tool0`

Ans: In the instruction above: move J

The robot is moving to: * point

At a speed of: v500

With a zone of: Z10

And a TCP of: Tool1

Q.11 What are the important specification you look in a robot?

Ans:

ROBOT SPECIFICATION v ABB robots are specified using a designation IRB say for example, IRB140, IRB1400, IRB2400, IRB1600, IRB6600, IRB340 etc.

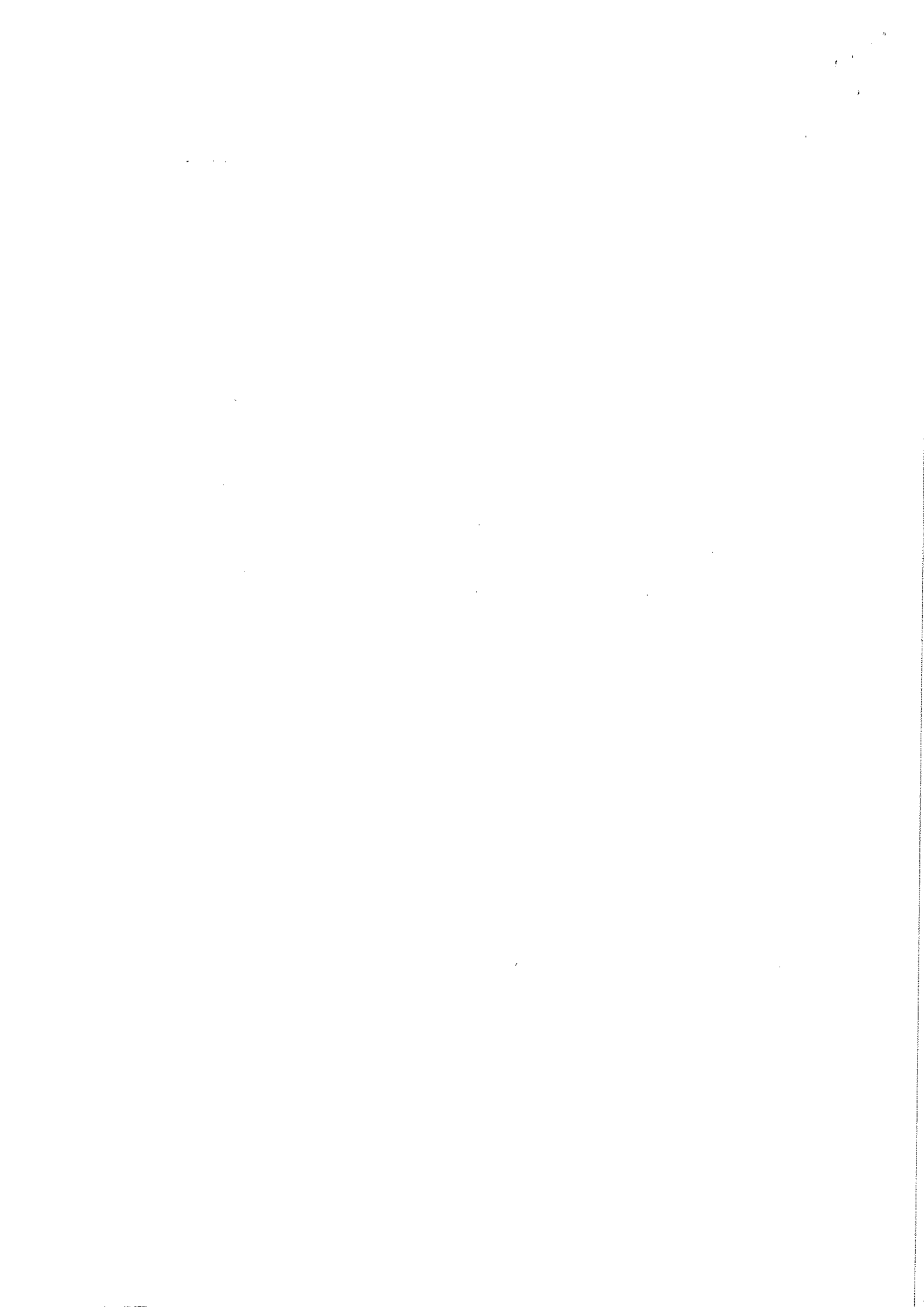
IRB stands for Industrial Robot Body Some important specifications to look for in a

Robot are: 1. Payload

2.Reach

3.Supplementary load.

4.Speed





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Session: 2021-22 (Summer Semester)
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2nd In-Sem. Examination

Course Code: MCS1504

Course Name: Quality measurement and assessment

Time: 1 Hour

Max. Marks: 20

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 Questions. Each question carries 1 Mark.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

Q.1 Which of the following is responsible for quality objective?

- a) Top level management
- b) Middle level management
- c) Frontline management
- d) All of the above

Q.2 TQM & ISO both focuses on

- a) Customer
- b) Employee
- c) Supplier
- d) All of the above

Q.3 The following is (are) the machine down time.

- a) Waste
- b) No material
- c) Breakdown
- d) All of the above

Q.4 What are the types of quality?

- a) Product Quality
- b) Service Quality
- c) Experience Quality
- d) All of the above

Q.5 What is DMAIC?

- a) Define, measure, analysis, improve, control.
- b) Define, Mean, analysis, implement, control.
- c) Décor, measure, Analysis, import, control.
- d) Design, measure, analysis, Improve control



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Section – B

03X02 = 06 Marks

- Q.6 what is quality?
- Q.7 what is quality assurance?
- Q.8 what is quality control?

Section – C

03X03 = 09 Marks

- Q.9 what are the importance of quality management?
- Q.10 Difference between QA & QC?
- Q.11 Explain cost of quality.



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School of Metal Construction Skills
Session: 2021-22 (Summer Semester)
B. Voc. Program, 5th Semester,
2nd In-Sem. Examination

Course Code: MCS1504

Time

Course Name: Quality measurement and assessment

Marks

Instruction:

1. Attempt all questions.
2. Use of Calculators is Prohibited.
3. Section A contains 05 Questions. Each question carries 1 Mark.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

Q.1 Which of the following is responsible for quality objective?

- a) **Top level management**
- b) Middle level management
- c) Frontline management
- d) All of the above

Q.2 TQM & ISO both focuses on

- a) **Customer**
- b) Employee
- c) Supplier
- d) All of the above

Q.3 The following is (are) the machine down time.

- a) Waste
- b) No material
- c) Breakdown
- d) **All of the above**

Q.4 What are the types of quality?

- a) Product Quality
- b) Service Quality
- c) Experience Quality
- d) **All of the above**

Q.5 What is DMAIC?

- a) **Define, measure, analysis, improve, control.**
- b) Define, Mean, analysis, implement, control.
- c) Décor, measure, Analysis, import, control.
- d) Design, measure, analysis, Improve control

Section – B

Q.6 What is quality?

Ans: A definition of quality is "your focus on the satisfying your customer's needs" be said that the "quality of a product or service" is the extent to which it



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incorporates **features** and **characteristics** that allow the customer to use it. At the same time you are satisfying their **needs**.

Quality can also be defined as being fit for the intended purpose, or "fit for purpose".

In addition, a simple definition is "conformance to requirements".

Q.7 What is quality assurance?

Ans: Quality assurance can be defined as "part of *quality management* focused on providing confidence that *quality requirements* will be fulfilled." The confidence provided by quality assurance is twofold—internally to management and externally to customers, government agencies, regulators, certifiers, and third parties. An alternate definition is "all the planned and systematic activities implemented within the quality system that can be demonstrated to provide confidence that a product or service will fulfill requirements for quality."

Q.8 What is quality control?

Ans: The ISO definition of quality control (QC) is: "*part of quality management focused on fulfilling quality requirements*".

Quality management emphasises the monitoring and control of a process that is producing a product or service. This may mean an entity has to analyse all aspects involved in production, and ensure they are fulfilling requirements.

Quality control is a set of procedures to ensure that a product or service adhere to a defined set of quality criteria or meets the requirements of the customer.

Section – C

03X03 = 09 Marks

Q.9 what are the importance of quality management?

Ans: The top 10 benefits for having a quality management system are:

1. Ensures your organisation, product or service are all consistent.
2. Focuses on the means to achieve product and service quality.
3. Increases efficiency due to using time and resources more suitably.
4. The higher perceived quality of your product or service from customers, the more they will be willing to pay for it.
5. Ensures your customers will always get quality products and services which leads to increase customer satisfaction/loyalty and repeat purchases.
6. Increased knowledge and understanding of your customer's needs
7. Ability to differentiate yourself from your competitors
8. Reduced costly errors
9. Decrease in non-conformances
10. Increased employee morale

Q.10 Difference between QA & QC?

Ans: Here is the exact difference between Quality Control and Quality Assurance that one needs to know:

Quality Assurance	Quality Control
It is a process which deliberates on providing assurance that quality request will be achieved.	QC is a process which deliberates on fulfilling the quality request.
A QA aim is to prevent the defect.	A QC aim is to identify and improve the defects.
QA is the technique of managing quality.	QC is a method to verify quality.



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QA does not involve executing the program.	QC always involves executing the program.
All team members are responsible for QA.	Testing team is responsible for QC.
QA Example: Verification	QC Example: Validation.
QA means Planning for doing a process.	QC Means Action for executing the planned process.
Statistical Technique used on QA is known as Statistical Process Control (SPC.)	Statistical Technique used on QC is known as Statistical Quality Control (SPC.)
QA makes sure you are doing the right things.	QC makes sure the results of what you've done are what you expected.
QA Defines standards and methodologies to followed in order to meet the customer requirements.	QC ensures that the standards are followed while working on the product.
QA is the process to create the deliverables.	QC is the process to verify that deliverables.
QA is responsible for full software development life cycle.	QC is responsible for <u>software testing life cycle.</u>

Q.11 Explain cost of quality.

Ans: Cost of Quality is a methodology used to define and measure where and what amount of an organization's resources are being used for prevention activities and maintaining product quality as opposed to the costs resulting from internal and external failures. The Cost of Quality can be represented by the sum of two factors. The Cost of Good Quality and the Cost of Poor Quality equals the Cost of Quality, as represented in the basic equation below:

$$\text{CoQ} = \text{CoGQ} + \text{CoPQ}$$

The Cost of Quality equation looks simple but in reality it is more complex. The Cost of Quality includes all costs associated with the quality of a product from preventive costs intended to reduce or eliminate failures, cost of process controls to maintain quality levels and the costs related to failures both internal and external.

