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121755/031755

5th Sem. / Mech / Prod / T&D / CADCAM / Mechatronics / Fab. Tech.

Subject : CNC Machines & Adutomation

Time : 3 Hrs.   M.M. : 100

SECTION-A

Note: Very Short Answer type questions. Attempt any 15 parts.   (15x2=30)

Q.1 a) What is DNC?

b) What is thermo symmetrical design of CNCs?

c) Define zero-offset?

d) Convert decimal 58 into equivalent Binary number

e) Define CAD/CAM?

f) What do you understand by Backlash error being taken care while designing a CNC?

g) What is the function of sensor?

h) Define Qualified tool?

i) What is "Automaticity"?

j) Explain punched card?

k) What do you understand by servo motor?

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l) Define wrist in robots.

m) Name two feedback devices in CNC machines.

n) What are the names of rotory axes in CNC machines?

o) Defined canned or fixed cycles.

p) Define "repeatability" in feedback sensors.

q) What is BTR approach of DNC?

r) Define block number in CNC part program.

SECTION-B

Note: Short answer type questions. Attempt any ten parts   10x4=40

Q.2 i) What is hard/fixed automation? Why it is called fixed?

ii) Differentiate between conventional and NC machines.

iii) Explain briefly the robot and its related terms.

iv) What is tool offset and cutter radius compensation?

v) Why special construction features are required in CNCs? Explain briefly.

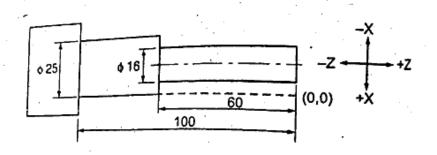(2)   121755/031755

vi) Describe briefly the characteristics and examples of flexible automation.

vii) Differentiate between open loop and closed loop CNCs?

viii) Explain with example, the use of I, J and K words in CNC programming.

ix) Explain any Binary coded scale with diagram.

x) Describe the rules for designating X,Y and Z axes in CNC programming.

xi) Describe the types of DNC.

xii) Calculate the step angle for a stepper motor which need 200 pulses for one rotation.

xiii) Where the pallete system is used in CNC and why?

xiv) Write short note on LVDT.

xv) Give the relative differences between absolute and incremental systems.

SECTION-C

Note: Long answer type questions. Attempt any three questions.   3x10=30

Q.3 Describe the problems in Mechanical components of a CNC and how to rectify them?

Q.4 What are the different types of slideways. Explain with diagrams.

Q.5 a) Write short note on recirculating ball an screw mechanism with its applications.

b) Describe with diagrams the two basi motions in robots.

Q.6 What is ATC? Give its types and explain any on of them with diagram.

Q.7 Write a program for

i) Facing

ii) Cleaning cut

iii) Reduction of dia to 16mm from 25mm di bar. Take a cut of 2mm depth and assumi feed and speed accordingly.