

Scheme – I
Sample Question Paper

Program Name : Diploma in Production Engineering / Production Technology
Program Code : PG/ PT
Semester : Fifth
Course Title : Machine Tool Design
Marks : 70

22570

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a) Define factor of safety for brittle and ductile materials.
- b) State the functions of Machine Tool Structure.
- c) State any four features of hydrostatic slide ways.
- d) List materials used for Guide ways
- e) Name any two bearings used as spindle support with suitable examples
- f) State the advantages of G P series
- g) Explain any two ergonomic considerations applied to push buttons

Q.2) Attempt any THREE of the following.

12 Marks

- a) Describe design process in respect of machine tool with help of a block diagram.
- b) List different types of Vibrations occurred in Machine Tool. State its effect on Machine Tool performance.
- c) Draw any four profiles of Machine tool structure.
- d) Describe any four requirements of machine tool structure.

Q.3) Attempt any THREE of the following.

12 Marks

- a) Discuss any four methods to reduce stress concentration.
- b) List any Four Materials used for manufacturing machine tool structure with suitable example.
- c) Explain principle of operation of hydrostatic slide ways.
- d) Draw any four shapes of Guide ways.

Q.4) Attempt any THREE of the following.

12 Marks

- a) Draw an arrangement for Spindle support in Milling Machines. State its importance.
- b) List the sources of Vibrations in Machine tool. State their causes.
- c) Explain ergonomic considerations applied to toggles and crank.
- d) If minimum speed=30rpm and geometric progression ratio=2 then calculate next 6 speeds of speed box. State standard values of geometric progression ratio
- e) State any four design recommendations for display.

Q.5) Attempt any TWO of the following.

12 Marks

- a) Explain following terms
 1. Service factor
 2. Design for maintainability
- b) State factors affecting on stiffness of Machine Tool Structure. Explain in brief the method to improve stiffness of Machine tool.
- c) For structural formula 2(1)3(2)2(6), minimum speed=30rpm and maximum speed=1500rpm, no. of speed steps are 12 and $\phi=1.41$, draw the speed chart if motor rpm=1440.

Q.6) Attempt any TWO of the following.

12 Marks

- a) Draw following Spindle supports with their function
 1. Spindle end for Lathe machine spindle
 2. Spindle end for Drilling machine
- b) Write structural formulae for 2 stage 8 speed gear box. Draw structural diagrams and check the feasibility for $\phi=1.41$
- c) Draw structural diagram for following structural formulae: 2(1)3(2)2(6) and 2(3)3(1)2(6)

Scheme – I
Sample Test Paper - I

Program Name : Diploma in Production Engineering / Production Technology
Program Code : PG/ PT
Semester : Fifth
Course Title : Machine Tool Design
Marks : 20

22570

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

(8 Marks)

- a. Define machine tool
- b. Explain term “Service factor”
- c. State functions of structures of machine tools.
- d. List any four desired properties of machine tool structure.
- e. State any four requirements of guide ways.
- f. State the functions of Spindle in Machine tool.

Q.2 Attempt any TWO

(12 Marks)

- a. Discuss general design procedure in Machine Design
- b. State the factors on material selection of machine tools depend. Name any four materials used for Machine tool construction with proper justification.
- c. Explain antifriction Guide ways with suitable example. State its advantages

Scheme – I
Sample Test Paper - II

Program Name : Diploma in Production Engineering / Production Technology
Program Code : PG/ PT
Semester : Fifth
Course Title : Machine Tool Design
Marks : 20

22570

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

(8 Marks)

- a. State the initial information required for designing the speed box.
- b. Write the values of typical range ratio for any four machine tools.
- c. State standard values of geometric range ratio
- d. State any two ergonomic considerations applied to design of hand wheels.
- e. Explain the term ' Man-Machine relationship'
- f. List any four sources of Vibration in machine tool

Q.2 Attempt any TWO.

(12Marks)

- a. Write four structural formulae for 2 stage 8speed gearbox.
- b. Draw structural diagram for structural formulae 2(1)4(2)and 4(1)2(4)
- c. State the ergonomic considerations for Location of display with neat sketch.