



# 17556

15116

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) *All questions are compulsory.*
  - (2) *Answer **each** next main question on a **new** page.*
  - (3) *Illustrate your answers with neat sketches **wherever** necessary.*
  - (4) *Figures to the **right** indicate **full** marks.*
  - (5) *Assume suitable data, if **necessary**.*
  - (6) *Use of Non-programmable Electronic Pocket Calculator is **permissible**.*
  - (7) *Mobile Phone, Pager and any other Electronic Communication devices are **not** permissible in Examination Hall.*
  - (8) *Preferably attempt answers in given order.*

**Marks**

1. Attempt **any 5** : **20**
  - a) Give four reasons supporting the need of development of non-traditional machining. **4**
  - b) What are different types of maintenance ? Explain predictive maintenance. **(1+3)**
  - c) Show calculation to find index crank-movement to turn a job through  $19^{\circ}14'$ .  
(19 degrees and 14 minutes). Write the inference. **(3+1)**
  - d) Draw a neat proportionate labelled sketch of pull type Broach. **4**
  - e) State the purpose of providing dry run facility and Jog mode on CNC machines. **(2+2)**
  - f) Explain Dressing and Truing of grinding wheels. **(2+2)**
  - g) Give the advantages and disadvantages of AJM. **4**
2. Attempt **any 2** : **16**
  - a) For the component shown in Fig.1, prepare the part programme for CNC taper turning operation using linear interpolation and absolute mode. Raw material is M.S. bar of  $\phi$  20 mm. **8**

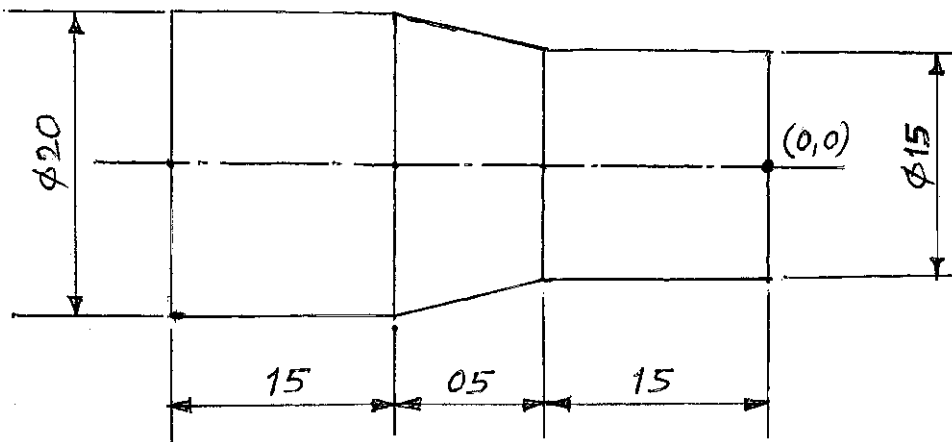


Fig. 1

**P.T.O.**



- b) An indexing device uses 3 plates made by Brown and Sharp.

**Marks**

A gear is to be cut with 60 teeth. Calculate index crank movement using simple indexing and write inference.

Also calculate the index crank movement to cut a gear with 35 teeth along with inference.

- c) Define Adaptive Control System. With the help of block diagram explain Adaptive Control System. List 4 advantages of Adaptive Control Systems.

**3. Attempt any 4 :**

**16**

- a) Explain construction and working of Spark Erosion Machining.
- b) List four safety precautions to be followed in CNC machines.
- c) Explain Honing Process with neat sketch.
- d) Explain how to use maintenance manual.
- e) Differentiate between Capstan and Turret on four different basis which are important.
- f) Explain the working of WJM.

**4. Attempt any 2 :**

**16**

- a) Explain construction and working of Universal dividing head with neat exploded sketch.
- b) Explain construction and working of LASER beam machining with neat labelled sketch. State its 2 applications.
- c) Explain Gear hobbing process with neat sketch. State its advantages and limitations (4 points in each).

**5. Attempt any 4 :**

**16**

- a) Explain vertical turret lathe with neat labelled sketch.
- b) Explain how grinding wheels are specified.
- c) State principle of Plasma Arc Machining with neat sketch. State its 2 applications.
- d) Compare Gear shaping with Gear hobbing (on 4 important points).
- e) State need and importance of maintenance activity.
- f) Give any two functions and applications of broaching machine.

**6. Attempt any 4 :**

**16**

- a) Explain factors affecting selection of grinding wheels.
  - b) Explain Plano-Miller machine with neat sketch.
  - c) Explain centreless grinding operation with neat sketch.
  - d) State advantages and limitations of Broaching operation (4 points in each).
  - e) Explain maintenance procedure for i) Bearing and ii) Coupling.
  - f) Explain the working of W-EDM.
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