



5220

December-2008

Machining and Casting Processes (MA-302)

Time : 3 Hours]
(2 : 30 P.M. to 5 : 30 P.M.)

[Max. Marks : 100

- Instructions :**
- (1) Attempt all questions.
 - (2) Answer to the two sections must be written in separate answer book.
 - (3) Assume suitable data if require.
 - (4) Figures to the right indicate full marks.
 - (5) Draw neat sketches where required.

SECTION - I

1. (1) A single start "V" threads of 6 mm pitch is to be cut on a lathe having the lead screw of 4 TPI. Find the change gears required. The gears available are from 20 to 120 teeth in step of 5 teeth and one gear of 127 teeth. **(6)**
- (2) List the various Taper turning methods and explain with neat sketch the taper turning attachment method with its limitations. **(6)**
- (3) List various lathe accessories and attachments. Explain any two with neat sketch in detail. **(4) 16**

OR

- (1) Find the time required for one complete cut on a piece of work 100 mm long and 45 mm in diameter. The cutting speed is 30 m/min, depth of cut 1 mm and the feed is 0.5 mm/rev. **(6)**
 - (2) List various lathe operations and explain in detail about the following : **(6)**
 - (a) Eccentric turning (b) Knurling (c) Threading .
 - (3) Differentiate between : **(4)**
 - (a) Steady rest & Follower rest
 - (b) 3 jaw chuck & 4 Jaw chuck
 - (c) Centre lathe & Tool room lathe.
 - (d) Capstan & Turret lathe.
2. (1) List various operations that can be performed on a drill machine. Explain, Spot facing, Counter boring, Reaming, Trepanning with neat sketch. **(6)**
 - (2) Explain "straddle milling, Gang milling and Form milling" operations with neat sketch. **(6)**
 - (3) Compare "Down milling" with "up milling" process. **(4) 16**

OR

- (1) What do you understand by "Indexing" ? Explain simple indexing method. **(6)**
- (2) List various types of Milling machine and explain about "Column and knee" type milling machine with neat sketch. **(6)**
- (3) Name and describe the principle parts of a twist drill with neat sketch. **(4)**

3. Write short notes : (Any Three) (18)
- (1) Write short note on " Shaping operations".
 - (2) Explain the quick return mechanism of a crank and slotted link mechanism with neat Sketch, used in shaping machine.
 - (3) Write short note on "work holding devices" for planner and shaper.
 - (4) List types of broaching machines and write advantages and limitations of broaching method.
 - (5) Write short note: Centerless grinding machine
 - (6) Explain the marking of grinding wheel as per IS with one example.

SECTION – II

4. (1) What is pattern ? What are the different allowances are added to the pattern to get the required size of the casting and why ? (6)
- (2) Explain about the following : (6)
- (a) Sweep pattern
 - (b) Skeleton pattern
 - (c) Loose piece pattern
- (3) Explain about different elements of gating system with neat sketch. (4) 16

OR

- (1) List various materials can be used to prepare a pattern and describe its merits and demerits. (6)
 - (2) Explain in brief about the procedure to be followed in making a green sand mould by turn-over method. (4)
 - (3) List various types of "Gates" and describe any two with neat sketch. (4)
5. (1) Explain "Centrifugal casting method" and list its advantages over conventional green sand moulding. (6)
- (2) What are the different tests are carried out to measure the properties of moulding sand ? Explain any one in detail with neat sketch stating its importance. (6)
- (3) What is the use of core ? Explain different types of cores with neat sketch. (4) 16

OR

- (1) Describe casting defects stating their causes and remedies. (6)
 - (2) Describe the shell moulding casting process. (6)
 - (3) List the different colour codes used in pattern and write the meaning of each colour. Which colour is used to identify the core print in pattern ? (4)
6. Write Short notes : (Any three) (18)
- (1) Investment casting process
 - (2) Centrifugal casting process
 - (3) Cupola furnace
 - (4) Pattern allowances
 - (5) Moulding sand properties.