PMM/KS/15 – 2443/2983

Fifth Semester B. E. (Mechanical Engineering) Examination

MANUFACTURING PROCESS – III

Time : Three Hours] [Max. Marks : 80

N. B. : (1) All questions carry marks as indicted.
(2) Answer **Three** questions from Section A and **Three** questions from Section B.
(3) Due credit will be given to neatness and adequate dimensions.
(4) Assume suitable data wherever necessary.
(5) Illustrate your answers wherever necessary with the help of neat sketches.

SECTION A

1. (a) Discuss the theory of chip formation under the influence of cutting speed, depth of cut and rake angle of the tool. 6

(b) In a plain milling operation on a M.S block the following data are collected.

Cutting speed	= 30 m/min
Feed velocity	= 72 mm/min
Diameter of cutter	= 70 mm
No. of teeth in cutter	= 8
Width of cut	= 80 mm
Depth of cut	= 5 mm

Average cutting pressure for the given material = 570 N/mm^2

Calculate the rotational speed of the cutter, maximum

Contd.

chip thickness, Average area of chip cross section, the peripheral force and power required for the cutting. 7

2. (a) Explain various factors affecting force and power in metal cutting. 6

(b) The following equation for tool life is given for turning operation

$V.T^{0.13} f^{0.77} d^{0.27} = c$

A 60 minute tool life was obtained while cutting at V = 30 m/min f = 0.33 mm/rev and d = 2.5 mm, determine the change in tool life if the cutting speed, feed and depth of cut are increased by 25% individually and also taken together. 7

3. (a) Differentiate between combination die, compound die and simple die. 6

(b) Bring out and discuss the difference between Bending, forming and Drawing operations of sheet metal shaping. 7

4. (a) Describe the gear milling process for manufacture of spur and Helical gear. 6

(b) What are the main details to be considered in the construction of jigs ? What are jig Bushes ? Describe the construction and use of different types of jig Bushes you know. 7

5. Write short notes on (any **three**) :

(a) Special purpose machine

(b) Bevel Gear Manufacturing

(c) Gear Hobbing

(d) 3-2-1 principle of location 14

SECTION B

6. (a) Explain with neat sketch constructional features of Turret Lathe 7

(b) Describe the Turret indexing mechanism with neat sketch. 6

7. (a) Explain the principle of ultrasonic machining with the help of neat diagram. What are the main applications of USM process. 7

(b) What is Abrasive Jet Machining (AJM) process ? Explain its principle of operation. What are its industrial application ? 6

8. (a) What do you understand by laser beam Welding ? Explain How ruby laser works in welding a metal joint. 7

(b) Describe the electron beam welding process. How the atmosphere around the work piece affect the weld obtained. 6

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9. (a) What is MIG Welding ? Explain its principle of operation with help of neat diagram. State its advantages and application. 6

(b) What is EDM ? Explain its 'Principle of operation' with the help of suitable diagram. State its application. 14

10. Write short notes on (any **three**) :—

(i) Machining centre

(ii) ECM

(iii) Barfeeding mechanism of Turrent lathe.

(iv) Plasma Arc Welding.

(v) Water Jet Machining. 14