KADI SARVA VISHWAVIDYALAYA

B.E. (MECH ENGG) SEMESTER VII EXAMINATION 2016

Sub: Production Technology | Sub Code: ME704

Time: 10:30am-1:30pm | Date: 16/11/2016

Maximum marks: 70

Instructions:

1. Use of scientific calculator is permitted.
2. Assume suitable data if necessary clearly stating the same.
3. Answers to both sections should be written separately.
4. Symbols and notations carry usual meanings.
5. Figures to the right indicate full marks.

SECTION I

Q.1 A What is rake angle? How does it affect the cutting process? Why are some tools provided with zero or negative rake angle? 05

B What are the sources of heat generation during a cutting operation? Show the distribution of heat between workpiece, tool and chip. Explain the significance of applying cutting fluid in machining. 05

C A medium carbon steel bar 400 mm long with 100 mm diameter is being machined using brazed tungsten carbide tool with a depth of cut of 2 mm and feed rate of 0.24 mm/rev. The following data is known about the operation. 05

Labour cost per hour= Rs 15
Machine overhead per hour=Rs 20
Grinding cost per hour=Rs 20
Grinding machine overhead per hour=Rs 70
Idle time=5 minutes
Tool changing time=2 minutes
Taylor's tool life equation $VT^{0.22}=7.90$
Insert cost=Rs 80
Grinding time=5minutes/edge
No of regrinds possible=9.Find optimal tool life, cutting speed, machining time and cost per piece using minimum cost criterion.

OR

C Explain the important requirements for machine tool guideways. Compare flat and inverted V-type slideways. 05

Q.2 A A square window 100 mm edge is to be cut in a C-40 steel sheet 3 mm thick. The maximum shear strength of the material may be taken as 440 MPa. With normal clearance on the tools cutting is complete at 40 % penetration of the punch. Give suitable dimensions of punch and die and shear angle on the punch to bring the work within the capacity of a 250 kN press available in the shop. Explain the significance of providing clearance between punch and die with sketch. 05

B Calculate the different speeds available on spindle of a lathe and show them on ray diagram using following data. 05

Maximum spindle speed=166 rpm

Minimum spindle speed=30 rpm
No of spindle speeds=6

OR

Q.2	A	Explain the steps involved in design of cam for single spindle automats.	05
	B	List the essential components of a transfer machine. Give classification of transfer machines.	05
Q.3	A	Discuss basic requirements for tool materials in EDM. What is overcutting in EDM and on factors does it depend?	05
	B	Compare EBM and LBM processes from their capability point of view.	05

OR

Q.3	A	Explain gear generating and gear forming process. Explain gear hobbing process.	05
	B	Discuss the method of producing thread by thread rolling process with sketch. How is material spring back action taken care in thread rolling process?	05

SECTION II

Q.4	A	Discuss headed bushes, renewable bushes and slip bushes.	05
	B	How are press working operations classified? Give examples.	05
	C	Explain various types of cutting tool inserts used in machining.	05

OR

	C	Explain the principle and working of mechanical copying machine with sketch.	05
Q.5	A	Discuss the method to measure cutting forces in metal cutting and state the assumptions of Merchant's analysis.	05
	B	What are the unique characteristics of a laser beam? What are the common types of lasers used for material processing?	05

OR

Q.5	A	Explain stepped regulation of speed. Also discuss the advantages of using G.P. series.	05
	B	Differentiate between capstan and turret lathe.	05
Q.6	A	Explain the principle of ECM process. What are the functions and requirements of electrolyte in ECM?	05
	B	Sketch, label and explain the components of turning fixture.	05

OR

Q.6	A	Explain tool geometry of twist drill with sketch.	05
	B	Give important requirements of structure of a machine tool. Why are stiffening ribs provided on machine tool structures?	05

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B.E SEMESTER VII - EXAMINATION (DECEMBER - 2015)

SUBJECT CODE: ME-704 SUBJECT NAME: PRODUCTION TECHNOLOGY

DATE:01/12/2015 TIME: 10:30Am to 01:30PM TOTAL MARKS:70

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate **clearly**, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

Section - 1

Q:1 (All Compulsory)

(A) Draw neat sketch of single point cutting tool with label of six major angles and other terminology of it. Discuss essential characteristics and function of cutting fluids. 05

(B) Draw neat sketch of chip formation in metal cutting and derive following relation for the shear angle (ϕ) 05

$$\emptyset = \left(\frac{r\cos\propto}{1 - r\sin\propto}\right)$$

(C) Draw Merchant's force diagram. Derive the equation for frictional force, normal reaction, shear force and normal force. 05

OR

(C) Describe each type of chip with the help of suitable sketch. 05

Q:2 Answer the Following Question

(A) Describe different type of dies and explain anyone with design procedure. 05

(B) What are guide ways? What are the principal requirements of them? Enlist various types of guide ways used in machine tools. Explain any two in detail. 05

OR

(A) Explain ray diagram and its calculation for gear teeth. 05

(B) Explain static and dynamic stiffness in detail. 05

Q:3 Answer the following Question

(A) Explain design procedure of blanking die. 05

(B) Describe the essential parts of turret lathe. What is the field of application of turret lathe? 05

OR

(A) Describe different types of machine tool elements. Explain any two of them in detail. 05

(B) Explain design of CAM for single spindle Automat in detail. 05

Section - 2

Q:4 (All Compulsory)

(A) What is LASER? Explain LBM 05

(B) Explain Abrasive Jet Machining with schematic diagram. List out its advantage and limitation. 05

(C) Differentiate Capstan and Turret Lathe. 05

OR

(C) Give the classification of Transfer devices. Explain any one in detail. 05

Q:5 Answer the Following Question

(A) Write short note on Gear finishing process. 05

(B) Classify the generating process for gear cutting. Explain "Gear Hobbing" in detail 05

OR

(A) State and Explain the principal of EDM. State characteristics of dielectric fluid. 05

(B) List the various types of locating devices used for both Jigs and Fixture. Explain ant three of them with neat sketch. 05

Q:6 Answer the following Question

(A) Distinguish between Jigs and Fixture. State advantages of jigs and fixture. 05

(B) What are the advantages of using jigs and fixture 05

OR

(A) Write short note on "Electric Tracking System" 05

(B) State and explain Economics of Jig and Fixture. 05

---- All the Best ----